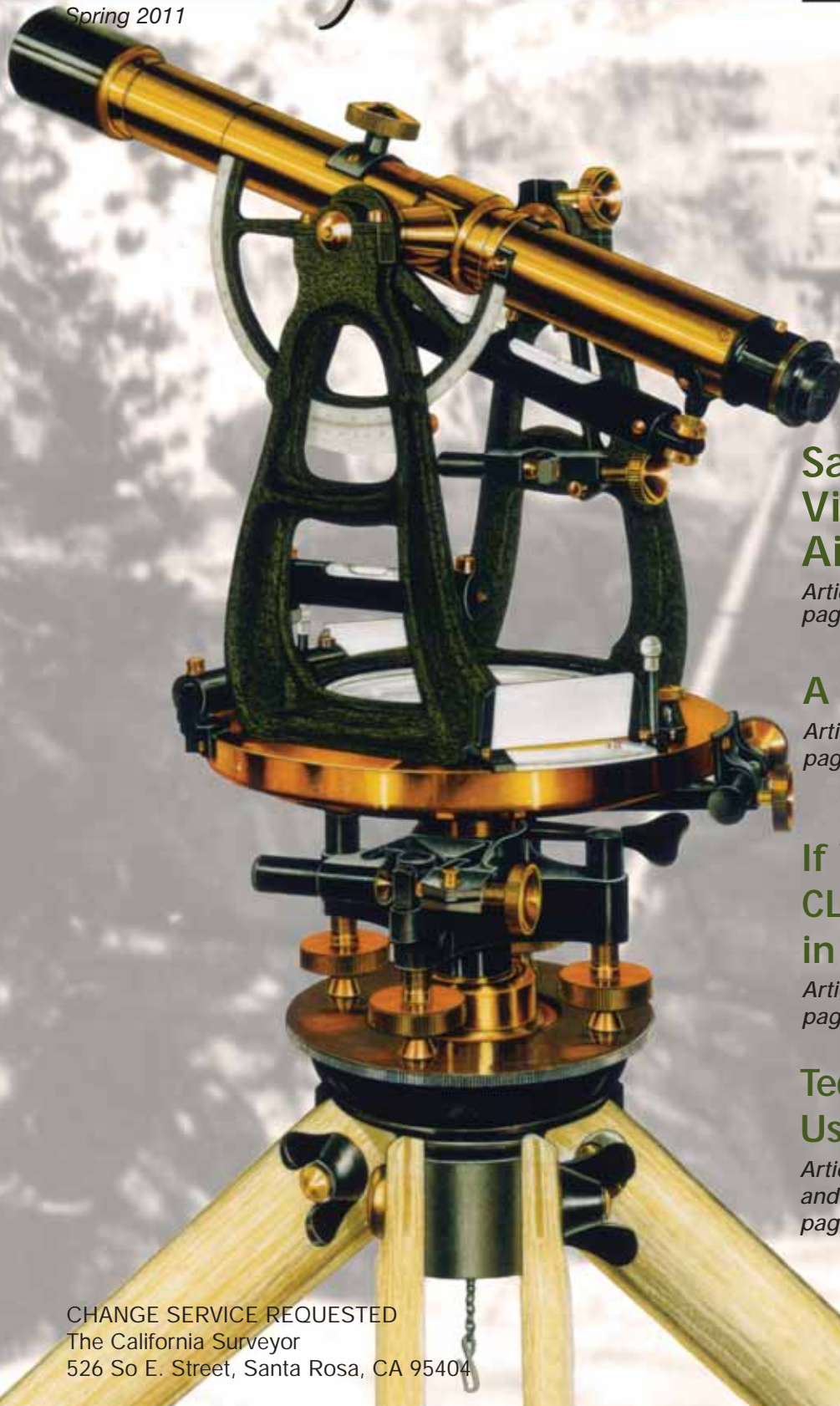


SURVEYOR

California

Spring 2011

Issue #165



Sacramento Surveyors Visit the NGS Airborne Gravimeter

*Article by Marti Ikehara
page 14*

A New Approach

*Article by Greg Sebourn, PLS
page 20*

If Years Had Names CLSA Accomplishments in 2010

*Article by Stephen Hughey, PLS, PhD
page 24*

Tech Tips - Positioning Using GPS and CORS, Part 1

*Article by Robert Reese, PLS
and Tom Mastin, PLS
page 34*

CHANGE SERVICE REQUESTED
The California Surveyor
526 So E. Street, Santa Rosa, CA 95404



Introducing... Leica Geosystems Solutions Centers

Offering Local Sales, Service and Support

Service



- Fast turnaround time
- Competitive prices
- Factory certified technicians
- All major brands

Rental



- Daily, weekly + monthly rentals
- Full line of rental inventory
- New models... not outdated

Supplies



- Everyday low prices
- Large inventory
- Quantity discounts

Leica Viva



- Latest technology from Leica Geosystems
- Knowledgeable sales people



Combining industry leaders to bring you
Leica Geosystems Solutions Centers

Local presence ■ National reach ■ Global resources

Convenient locations to serve you:

2942 Century Place
Costa Mesa, CA
800-938-0606
Formerly Servico

1447 Rollins Rd
Burlingame, CA
650-348-7247
Formerly Haselbach





The shortest distance between two points
is not a trip back to the tripod.

TRIMBLE S8 TOTAL STATION



"Back and forth." Easily two of the most hated words for any surveyor. Except perhaps, "again".

Trimble® VISION™ technology brings new levels of productivity to the Trimble S8 Total Station by dramatically reducing trips back to the tripod. Now you can see everything the instrument sees from your controller.

Why walk back? With the longer range EDM you can stay put and use your controller to aim, acquire, and capture measurements to reflectorless surfaces – at more than twice the distance you're used to.

The Trimble S8 also gives you live video streaming with surveyed data on the screen to confirm your task list. With photo documentation, you have visual verification for all data before leaving the site. Eliminating an even costlier form of back and forth.

Trimble VISION is the latest in a long line of innovations designed to make surveying more productive, in the field, in the office, and wherever the next opportunity takes you.



© 2010, Trimble Navigation Limited. All rights reserved. Trimble and the Globe & Triangle logo is a trademark of Trimble Navigation Limited, registered in the United States and in other countries. Trimble Access is a trademark of Trimble Navigation Limited. All other trademarks are the property of their respective owners. SUR-185

Trimble 2010
DIMENSIONS

**FOR MORE INFORMATION
CALL YOUR
TRIMBLE DEALER**

Allen Instrument
Anaheim, CA
714-238-3434

California Survey and Drafting
Sacramento, CA
916-344-0232

GET SPECIAL DISCOUNTS at Office DEPOT with your CLSA Membership

The program includes:

- Savings of up to 70% on commonly used items
- FREE next-business-day delivery
- Thousands of products in stock
- Unparalleled expertise
- Ultimate shopping convenience by phone, fax or online
- The latest in office technology
- Office Supplies, Furniture and More!

**OFFICE DEPOT
IS YOUR
ONE STOP SHOP!**

**CALL CLSA
at 707-578-6016
FOR MORE INFO**

**Office
DEPOT** *Taking Care of Business*

2011 Board of Directors

CLSA Officers 2011

William R. Hofferber, President
Frank R. Lehmann, President-Elect
Thomas A. Taylor, Secretary
Rolland VanDeValk, Treasurer
Aaron R. Smith, Immediate Past President
Dorothy Calegari, Executive Director

Chapter Representatives

BAKERSFIELD CHAPTER

Ron Nelms

CASCADE CHAPTER

Leslie J. Gross

CENTRAL COAST CHAPTER

Randy Ellison • Ian E. McClain • Linda Richardson

CENTRAL VALLEY CHAPTER

Michael D. Jones • Keith W. Spencer

CHANNEL ISLANDS CHAPTER

Marta Alvarez • Jim Pilarski

DESERT CHAPTER

Douglas E. Redlin

EAST BAY CHAPTER

Harold B. Davis • Steven J. Martin

GOLD COUNTRY CHAPTER

Marc R. Van Zuuk

HUMBOLDT CHAPTER

Pete Jackson

LAKE/MENDOCINO CHAPTER

Michael Gilmore

LOS ANGELES CHAPTER

Stephen M. Hughey • Mark Price • Jay K. Seymour • Diane W. Wells

MARIN CHAPTER

Lionel K. Vincent

MONTEREY BAY CHAPTER

Christopher Bateman

MOTHER LODGE CHAPTER

John P. Gnipp

NORTHERN COUNTIES CHAPTER

Roger K. Hanlin • Jim Herrick

ORANGE COUNTY CHAPTER

Lisa Gaston • Peter Fitzpatrick • Greg Sebourn • Michael Simon • David E. Woolley

RIVERSIDE/SAN BERNARDINO CHAPTER

James A. Drenon • William T. Smith • Ryan Versteeg • Peter Wiseman

SACRAMENTO CHAPTER

Jerry Jones • William E. Telling

SAN DIEGO CHAPTER

David W. Ambler • Anne L. Hoppe • Gary L. Hus
Andrew G. Karydes • Pat McMichael

SAN JOAQUIN VALLEY CHAPTER

Kevin Nehring

SANTA CLARA/SAN MATEO CHAPTER

Paul W. Lamoreaux • Keith L. Nofield

SONOMA COUNTY CHAPTER

Mike Ford • Richard Maddock

Surveyor *California*

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 the 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 of land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in Land Surveyors and their work."

PERSONNEL

OWNER

California Land Surveyors Association, Inc.

CENTRAL OFFICE

526 So. E Street
Santa Rosa, CA 95404

E-Mail address: clsa@californiasurveyors.org
CLSA Homepage: www.californiasurveyors.org

EDITOR

John P. Wilusz, PLS, PE

ASSISTANT EDITORS

Paul M. Brown, PLS – Jill Van Houten, PLS

CONTRIBUTING WRITERS

Michael P. Durkee, Esq.
Richard R. Hertzberg, CPUC, ARM
Ian Wilson, PLS
David E. Woolley, PLS

DESIGN AND PRODUCTION

Tony Monaco

ADVERTISING

Commercial advertising is accepted by The California Surveyor. Advertising rates and information can be obtained by contacting CLSA 526 So. E Street, Santa Rosa, CA 95404, Tel. (707) 578-6016 - Fax (707) 578-4406. Circulation: 4,800.

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 should be emailed to clsa@californiasurveyors.org. We can accept WordPerfect or Microsoft Word files. We can accept ASCII text files or word processor files from the following programs: WordPerfect or Microsoft Word.

EDITOR'S ADDRESS

John P. Wilusz, PLS, PE
E-mail: johnwilusz@gmail.com

DEADLINE DATES

Spring February 1 Summer May 1
Fall August 1 Winter November 1

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

Opinions expressed by the editor or individual writers are not necessarily endorsed by the California Land Surveyors Association Officers or its Board of Directors. Original articles may be reprinted with due credit given to the source and written notification to the California Land Surveyors Association, unless otherwise noted.

Inside This Issue:

Features:

Girl Scout Survey Merit Badge Event

By: Dan Walsh, PLS 12

Sacramento Surveyors Visit the NGS Airborne Gravimeter

By: Marti Ikehara 14

The Right-of-Way Acquisition Process

By: Teri Kahlen, PLS 18

A New Approach

By: Greg Sebourn, PLS 20

If Years Had Names

By: Stephen Hughey, PLS, PhD 24

CLSA Awards

..... 28

What About Me? Personal Risk Management

By: Richard Hertzberg, CPCU, ARM 32

Tech Tips - Positioning Using GPS and CORS, Part 1

By: Robert Reese, PLS and Tom Mastin, PLS 34

SMA Expert Q&A

By: Michael P. Durkee, Esq. 42

Department:

From the Editor - El Dorado County Map Contest 6

Kids Korner 8

Letters to the Editor 9

President's Message 10

Welcome New CLSA Members 22

CLSA Education Foundation Report 26

Postcards 27

The More Things Change 30

Index of Advertisers 31

CLSA/NALS Conference Review 38

CLSA/NALS Conference Photo Highlights 40

Crossword Puzzle 44

Sustaining Members 46

On The Cover:

Antique transit from the collection of Bryant N. Sturgess, PLS, PE.

By: John P. Wilusz, PLS, PE - Editor

John works in the Delta Levees Program at the California Department of Water Resources in Sacramento, CA.

From the Editor



The 17th Annual El Dorado County Student Map Drawing Contest

My editorial this issue features a great example of professional outreach that I hope will inspire others across the state. On Saturday, February 26, 2011, I visited the El Dorado County Surveyor's Office in

Here's how it works. First, flyers outlining the rules and deadlines are distributed to all schools in El Dorado County (public, private, charter, home school coordinators, etc). Each school gets enough flyers for all its teachers. Then members of S.A.G.E. volunteer to visit classrooms to make presentations on what makes a great map. After that the kids go to work and all maps entered into the contest go on display inside county administration buildings. That's where I met the volunteers, hanging maps in the halls of the County Surveyor's Office.



Placerville. I went there to meet a group of volunteers; they were hanging maps made by local school kids for the 17th Annual El Dorado County Student Map Drawing Contest.

The map contest is sponsored by S.A.G.E., a local organization of professionals dedicated to enhancing their community. S.A.G.E. stands for Surveyors, Architects, Geologists and Engineers, and among its members is Rich Briner, PLS, the El Dorado County Surveyor. As County Surveyor Rich is an active proponent of the map contest; former County Surveyor Dan Russell, PLS, founded the event in 1994. The objective is to promote a better understanding of the importance of geography and to encourage the creative talents of youth in the community. S.A.G.E. President Dallas Sweeney, PLS, told me this year the organization is donating over \$4,000 in prizes.



Following are some of my favorite map titles. They are in no particular order and are from various grades. See if you can guess which titles are from the little ones.

Continued on next page

Continued from previous page

Map Titles

- *My House is a Fun Place (Lucky kid.)*
- *Twenty Festivals to See Before You Die (I was disappointed Burning Man wasn't mentioned.)*
- *Where the Singles Are (This one by a young lady, I was told.)*
- *Soccer Fields I Have Played On (There were quite a few for a youngster.)*
- *Tires From Around the World (?!)*
- *America's Ten Most Miserable Cities (Turns out I live in one of them!)*
- *My Quarter Collection (Each state has its own quarter.)*
- *The Five Weirdest Buildings in the United States (This map shows, among other things, the location of a building that looks like a big blue shoe.)*
- *Have You Seen Bigfoot? (Did you know that only Hawaii has had no Bigfoot sightings?)*



Rich Briner, PLS
El Dorado County Surveyor



The volunteers that hung the maps for the 17th Annual El Dorado County Student Map Drawing Contest.

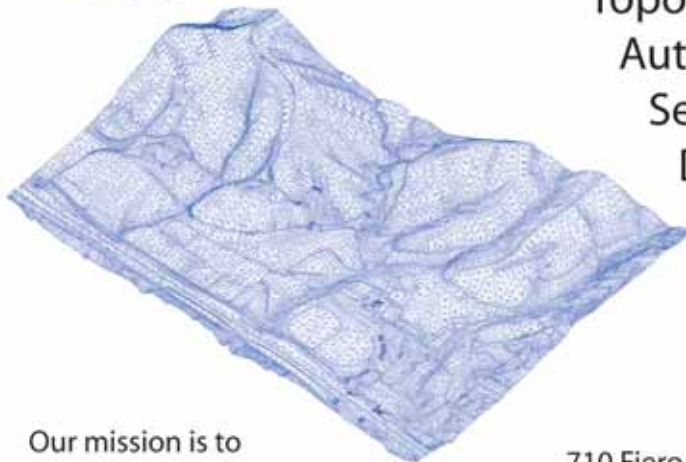
Management of the Map Drawing Contest is provided by El Dorado County & Georgetown Divide Resource Conservation District. For more information you can call Mark Egbert at (530) 295-5630, or visit the website: <http://eldoradorcd.org/sage/welcome.htm>

You can find information about the El Dorado County Surveyor at: <http://edcgov.us/Surveyor/>

One of the great benefits of the California Surveyor is that it provides a forum for sharing ideas, and the El Dorado County Student Map Drawing Contest is an idea worth sharing. I hope it catches on elsewhere. ■



Central Coast Aerial Mapping, Inc.



Topographic Mapping
 AutoCAD/Microstation/ArcGIS Formats
 Seamless Color Digital Orthophotos
 Digital Terrain Models (DTM)
 Photogrammetric Scanning
 SMBE/SWBE Certified

Our mission is to provide high quality, cost-effective services to our clients.

710 Fiero Ln. #24
 San Luis Obispo, CA 93401
 P(805) 543-4307 F(805) 543-7257
 mail@aerial-maps.com www.aerial-maps.com



ASPRS Certified

Kids Korner

Do you have a picture of a "junior surveyor" in your family that you would like to share? Send it in and we will put it in the Kids Korner.



Engineers' Day at the Mall

The Sacramento Chapter of CLSA kicked off National Engineers' week by participating in the ASCE Sacramento Section's Engineers' Day at the Sunrise Mall in Citrus Heights, CA. This was a great outreach opportunity, reinforcing the fact that land surveying is an integral part of engineering. Chapter members attending the event included Annette Lockhart, PLS, pictured here with an unidentified future surveyor. Also pictured is Nicholas Toutges (on the chair), son of Wayne and Sherry Toutges, both Professional Land Surveyors. The Sacramento Chapter of CLSA thanks California Surveying and Drafting Supply, Inc., for providing the Trimble VX hybrid total station that "wowed" the participants, especially the engineers.

Surveyor trainee Aryelle Parrish (age 7), granddaughter of Steve & Gloria Parrish, helping "Grandpa Steve" tie in a GLO brass cap 1/4 corner near Reno, Nevada. Gotta start 'em young.

Proudly Supporting CLSA Since 1978



Custom orders your way ... when you need them.

When your name is on it, our name is behind it.

Berntsen delivers.

The professional's choice in survey products • www.berntsen.com • 877.686.8561



National Museum of Surveying



*Historical Adventures in Mapping America
Home of NOAA Science on a Sphere®*

February 4, 2011

Mr. John P. Wilusz, PLS, PE – Editor
California Surveyor Magazine
California Land Surveyors Association
526 So. E Street
Santa Rosa, CA 95404

RE: LETTER TO THE EDITOR

Dear Editor Wilusz,

First, I want to thank you on behalf of the National Museum of Surveying (NMoS) Board of Directors for taking time out of your busy schedule to come and visit the museum. Second, we want to thank you for the wonderful article that you wrote about the museum in the Winter Issue #164 of the *California Surveyor* Magazine.

We are sure that surveyors not only in California, but also all that read the article across the nation, will get a sense of what the museum is all about. We hope that everyone gets excited about having a truly national surveying museum.

Thank you for including in your editorial that in order to make the Springfield, Illinois museum a truly "national" museum we need to have the support of all of the land surveying state associations throughout the country. We also need each State to work with us by sending information, maps, equipment and especially the stories of how land surveyors affected each State.

I would be remiss in not mentioning and extending my gratitude the large donation of \$25,000 from your California Land Surveyors Association, which allowed the museum to finally open our doors. With your help, NMoS has become another jewel of downtown Springfield's Abraham Lincoln Historic District. We encourage everyone to think about visiting Springfield this Spring, Summer and Fall to see what their National Museum of Surveying has to offer, along with all of the Abraham Lincoln sites.

Best regards,

Robert E. Church,
Treasurer, NMoS



By: William R. Hofferber Jr, PLS - President

President's Message

As we begin the climb out of the worst recession California has seen since the great depression of the 1930s, I am confident that Land Surveyors will be at the forefront of this economic recovery. Many firms throughout California have been very hard hit with some not surviving, while others have drastically downsized to simply keep the doors open. When we do get out of this, and we will, it will be the Land Surveyor that will see the first signs of recovery with requests for mapping for future development and infrastructure projects coming.

In speaking with others throughout the state, many land surveying and engineering firms are starting to see these first signs trickling in. This is encouraging, for the road to recovery can come none too soon for the many families that are struggling throughout California and the rest of the nation.

One thing that I feel is almost certain, when development and infrastructure projects do pick up, there will be a much different perspective than what we are all familiar with. For many years the meat and potatoes for land surveying and engineering firms has been the 2 or 3 person survey crew setting grade stakes on residential and commercial development projects. Now, with Machine Guidance Systems (MGS) tested and proven, I believe with the next wave of development, MGS will be the standard method on projects not the occasional choice. It will be up to the Land Surveyor to establish control on the development site, monitor the use of MGS by contractors, and assure they have a Land Surveyor or qualified Civil Engineer in responsible charge. If we, as Land Surveyors, observe the use of MGS practice without a Land Surveyor or engineer in responsible charge it is imperative that we contact the Board for Professional Engineers, Land Surveyors and Geologists or your local chapter Professional Practice Committee. Many of the elements that go into the development and implementation of the use of MGS are activities protected for Land Surveyors in the LSAct and PEAct.

The need for a survey crew, or multiple crews, to be onsite day-in and day-out setting grade stakes has disappeared, however, many of the requirements for pre-development mapping, onsite monitoring, and post construction certification and as-built plans remain. Herein lies where the largest transformation in land surveying will take place in the next decade. Just as photogrammetry replaced the labor intensive plane table topographic surveys 50 plus years ago,

terrestrial and mobile scanning, airborne LiDAR, and robotic and reflector-less total station equipment will continue to reduce the number of field surveyors required to capture data in the coming years. Terrestrial scanning will take the place of rod and level for certifying of pad elevations, mobile and terrestrial scanning will replace or enhance the accuracy of photogrammetry, and LiDAR in fixed wing airplanes or helicopters will continue to improve the accuracy of the mapping product. I see terrestrial and mobile scanning being the data capture tool of choice in the near future, and yes, this will reduce the need for field surveyors.

What I do see is the balance of need for land survey technicians and professionals swinging more toward the office and away from the field. In years past, one or two office staff could provide the needed research, documents, and computations for 2 or 3 survey crews, maybe more. In the future, I see this changing to maybe 70% office staff compared to 30% field staff, or perhaps your technicians will do 1 day of field data capture and 3 or 4 days of research, analysis, compilation, project assembly, and delivery under the supervision of a professional Land Surveyor. This will require a new level of highly skilled, trained, and educated employees that will be able to understand and use the latest in technology. They will need to have the ability to go afield and capture data with every tool available, download, compile, process point cloud data, analyze, draft, and package final product for review and delivery. I believe it is going to become more and more difficult to find this level of highly technically skilled employees from within the "on the job training" ranks.

This is where we, as a profession and CLSA, must partner to assure that California will continue to provide the level of formal college education courses, technical training programs, conference, workshops and seminars, to educate and train the Land Surveyors of tomorrow. If we do not, California will fall further and further behind the rest of the nation in technology and land surveying. ■





FACTS: Tighter Tracking
Faster Speed
Stronger EDM

NEW
X Series SRX

Improved auto-tracking virtually eliminates frustrating interference from traffic, trees, and other tough environments. New drive system improves auto-pointing accuracy by 20 percent and rotation speed by over 30 percent. New RED-tech® 800 EDM boosts accuracy by 25 percent and extends prismless operation to 800m.

Get all of the new SRX facts.
Contact your Sokkia dealer today.

SOKKIA
www.sokkia.com

Please visit your local dealer:

ABC Surveying Instruments • 1110 S. Glendale Ave., Ste. B • Glendale, CA 91205 • 818.507.5758

Prism Surveying & Construction Systems • 5959 Mission Gorge Rd., Ste. 104 • San Diego, CA 92120 • 619.283.3137

Western Engineering Supply • 343 Stealth Ct. • Livermore, CA 94551 • 925.960.9550



By: Dan Walsh, PLS



Girl Scout Survey Merit Badge Event

Sponsored by the Riverside / San Bernardino Chapter of CLSA



The Riverside / San Bernardino Chapter of the California Land Surveyors Association held a Girl Scout Merit Badge Event on Saturday, October 23, 2010, at Camp Arnaz in Ojai. There were 17 Girl Scouts, aged 11 - 17, from the Conejo Valley Girl Scouts in attendance along with 9 volunteer surveyors. Two of the volunteers arrived Friday to set up points, hubs and stakes for the field work.

This Merit Badge program was originally developed in 2006 by Delia "Dee" Smith of the Riverside / San Bernardino Chapter. This is the first time Dee re-visited the program since then and it was a great hit with the girls. Dee Smith and Mike Parks spent about 5 hours of their day on the road just to come up and help with the program.

The main goal was to teach the girls the different types of measurements that are made and used in our profession and provide knowledge that land surveying is

a professional career option. We started the day with breakfast and followed that with two hours of classroom training. Dee began with first aid training and then other volunteers presented on the following topics: chaining & pacing, leveling, traversing, and global positioning systems (GPS). The objective was to introduce the girls to horizontal measurements, vertical measurements, traversing and GPS. The first aid training covered heat related injuries, cuts & scratches, poisonous plants and animals.

After classroom training, we went into the field and separated into groups of 3-4 and rotated through stations that the volunteers set up for hands-on training. At the traverse station the girls had a chance observe a

backsight using a total station, set the horizontal angle to zero, measure a distance, then turn an angle to a second station. At the leveling station they had to level the instrument, read a back site rod, then read a foresight rod and calculate the elevation of the foresight point. At the GPS station the girls were given a chance to operate an RTK rover



receiver and a handheld GPS receiver and with these they located a predetermined point. At the chaining and pacing station the girls had a chance to determine their walking pace and to use that as well as a plumb bob and steel chain to measure distances between three points.


Continued on next page

This was a great time for all of us. After the field training, we finished back in the classroom with drawing up our field notes and some follow up discussion. The volunteer surveyors reviewed and certified all of the Scouts' work, and everyone received their badge. At the end of the day goody bags were given to all attendees courtesy of the County of San Bernardino, Storm Water Program. The Girl Scouts also presented each volunteer surveyor with a gift. We all have lasting memories and according to Chris Lindsay, Co-Manager of the Conejo Valley Girl Scouts, "they (the girls) are still talking about what they learned. It will have a lasting impression on our girls." We have been asked to return next year and volunteer surveyors are already signing up to help.

Thank you to Lewis & Lewis Enterprises for donating field books for the girls to write their notes in, and thanks to the Riverside / San Bernardino Chapter for providing the safety vests and drafting triangles for them to use. And thank you goes out to all our survey volunteers: Steve Opdahl, Joey Waltz, Dee Smith, Mike Parks, Walter Gamboa, Marta Alvarez, Dan Walsh, Nertila Cela and Kathy Gumber. ■



Survey Volunteers (left to right):
Kathy Gumber, Steve Opdahl, Dan Walsh, Marta Alvarez, Dee Smith, Mike Parks,
Joey Waltz, Nertila Cela and Walter Gamboa (not pictured)



Tri State Photogrammetry

Northwest Region Office
1925 E. Prater Way
Sparks, Nevada 89434
(775) 358-9491
Fax: (775) 358-3664

Southwest Region Office
3471 W. Oquendo Rd., Ste. 102
Las Vegas, Nevada 89118
(702) 222-0986
Fax: (702) 895-9652



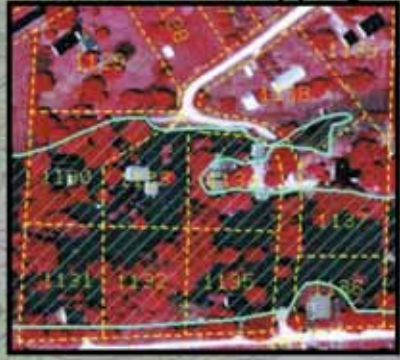
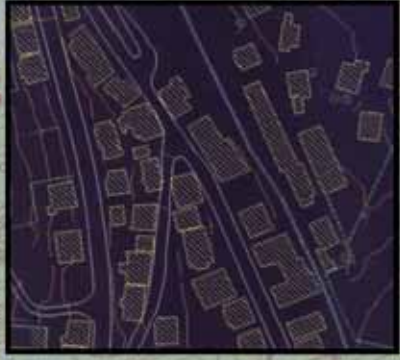
Topographic & Planimetric Mapping For Design Engineering

Digital Orthophotography & Cadastral Mapping

GPS/RTK Surveys

Image Matched DTM/DEM & Contouring

1-800-411-3752
www.TriStateLtd.com



By: Marti Ikehara



Marti is the State Geodetic Advisor with National Geodetic Survey, an agency within NOAA. She has been in this position in California for 11+ years. Prior to that, she was a ground-water hydrologist with the U.S. Geological Survey for nearly 20 years, first in Honolulu (5 years) and then in Sacramento, investigating land subsidence while in California. One of her main duties is to help the public locate and utilize accurate horizontal and vertical control in their surveying, engineering, and mapping projects. Of increasing interest is determining and understanding the relationship between geodetic vertical and tidal datums along the coast and tidally-influenced waters. As we shift to a spatial reference system that is defined by permanent continuous GPS reference stations (rather than passive monuments in the ground) and real-time surveying rather than static, a key role for the Advisor is to provide assistance in expanding, accessing, and utilizing the National Spatial Reference System.

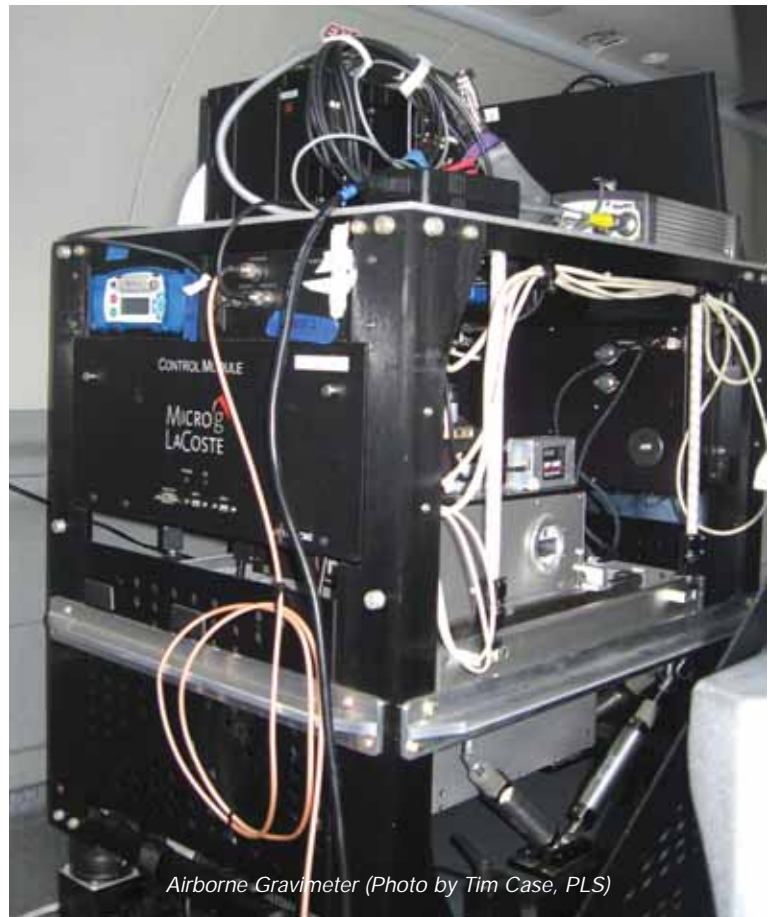
Sacramento Surveyors Visit the **NGS Airborne Gravimeter**

On the sunny, clear, crisp, calm morning of February 5, 2011, about two dozen people got a close-up look at the National Geodetic Survey's (NGS) airborne gravimeter installed in an airplane stationed at McClellan Field, Sacramento. NGS California Geodetic Advisor (GA), Marti Ikehara, and members of the NGS GRAV-D (Gravity for the Redefinition of the American Vertical Datum) team, Justin Dahlberg and Carly Weil, hosted a 'Show-n-Tell' for Land Surveyors from the Sacramento Chapter of CLSA, the Caltrans Office of Land Surveys, as well as for the GA emeritus (retired!), Don D'Onofrio. Because a production flight was scheduled for that day at 8:30 a.m., the 'show' was set for 7:00 a.m. promptly. Early birds got to munch on donuts, apples and bananas provided by the Chapter in the passenger lounge at the McClellan Jet Service FBO (Fixed Base Operator).

Justin provided information about their operations, which commenced in Sacramento on January 3, 2011 and concluded on February 24, 2011. During this period, NGS utilized a Pilatus PC-12 aircraft owned by Bureau of Land Management (BLM), which is primarily used for their firefighting operations in Fairbanks, Alaska. The aircraft had not been reserved for other activities for the fall and winter, so NGS has been operating on this aircraft since mid-September, 2010 through a cooperative agreement with BLM. Operations continued in Fairbanks and Anchorage through mid-November when it became too cold for the Global Positioning System (GPS) base stations. After a holiday break, the GRAVD program initiated operations for the new year in Sacramento. Because it is a single-engine aircraft, the PC-12 is restricted to working within 55 nautical miles (nm) of the shoreline, the distance that the aircraft can glide in the event of engine failure. The U.S. west coast is a good candidate because the continental shelf break, which (more or less) is the farthest extent seaward that the GRAV-D survey must cover, is within 100 km of the coastline.

The Pacific Northwest was predicted by NOAA's National Weather Service to have heavier-than-normal precipitation associated with the strong La Niña regime this winter. Northern California was not expected to be as affected by this weather phenomenon as Washington. Given the flight duration of about 4-5 hours and the location of Sacramento as a

Continued on next page



Airborne Gravimeter (Photo by Tim Case, PLS)

base, the operations plan was a survey that covered the northern third of CA and the southwestern part of Oregon. On February 1, 2011, a second pilot was added to the project to enable two flights per day. NGS expects to be able to complete the current survey layout and some additional lines in another block south of the original survey plan.

Data Collection

Data collection consists of the following: The plane flies at 20,000 ft and between 200-250 knots (kts) ground speed, operating a relative airborne gravimeter, two GPS/inertial measurement unit (IMU) packages and one standalone GPS unit. These three GPS units help determine the pitch, roll, and yaw of the aircraft during flight. Here's how it works: Within the sensor, a "proof mass" on a pivoting beam is supported against the force of gravity by a "zero-length spring" (one that is pre-stressed so that its un-extended length is zero). As the force of gravity increases, the beam is deflected downward. The meter then exerts a greater force on the spring to keep the beam at a null position. The meter records how much tension is being exerted on the spring and the motion of the beam. These measurements are combined to compute a total vertical acceleration. Gravity is the difference between this total vertical acceleration and the vertical acceleration of the aircraft only as determined with kinematic GPS methods. Corrections are also made for the effects of measurement from a moving platform.

Like other airborne data collection efforts, the geometric location (latitude, longitude, and ellipsoid height) of the plane is determined by relating to data collected at GPS base stations. Three GNSS units are operated as static base stations at the airport. Additionally, the record interval at several of the CORS in northern CA and southern OR was increased to one second for this period so they could be used as base stations for the flights. The continuous GPS (CGPS) stations involved were all NGS Continuously Operating Reference Stations (CORS): LFLO (Florence) and LPSB (Eugene) in the Oregon RTN; DOT1 and ZOLE in the Washoe County (NV) RTN; MODB, YBHB, HOPB, and CMBB from the BARD (Bay Area Regional Deformation) network and ZOA1 which is the CORS associated with the Oakland airport control tower.

A passive control station, designated KMCC, was established in the sidewalk adjacent to the hanger at the FBO facility, to be used as a gravity bench mark. To convert

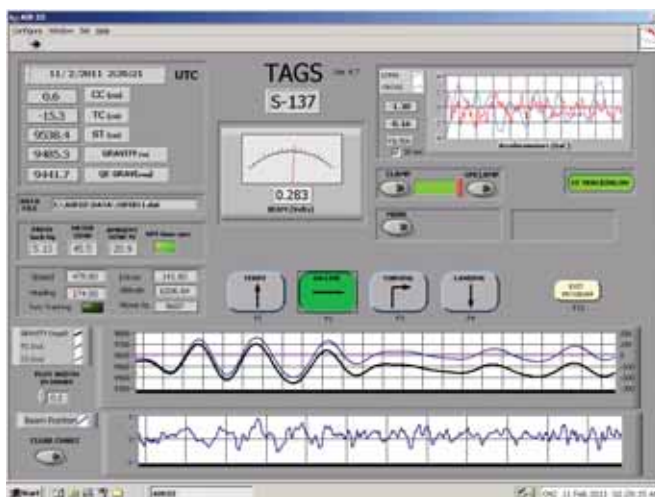
the relative gravity readings to absolute values of gravity, measurements were made with two relative meters at KMCC and at another gravity mark where gravity had been previously measured with an *absolute* gravimeter. This mark is located east of the southeast corner of the state capitol building in Sacramento. It was established in 1907, designated 21 B USGS, NGS PID JS1010, and was included in NGS' NAVD 88 leveling campaign in 1988. (To learn about web-based geodetic control and mapping tools see the accompanying article on page 17 "CGAR – California Geodetic Advisor Resources"). To tie the measurements from KMCC to the instrument, a relative meter was placed on an adjustable height pole, centered on the control mark over which the airplane parks, and was set at the exact height of the airborne gravimeter.

Planning the Survey

For the survey layout, primary tracks, or 'data lines', are spaced 10 km apart. How did NGS figure out the 'ideal' height and speed for operations? Program Manager Dr. Vicki Childers explains: "A test survey was conducted in Alabama in January 2008, where we flew a number of lines at three different altitudes--5,000', 20,000', and 35,000'-- in order to determine if we could fly at the higher altitude without compromising the signal we wish to recover. Through comparisons with data from EGM08 (Earth Gravitational Model 2008: http://earthinfo.nga.mil/GandG/wgs84/gravitymod/egm2008/egm08_wgs84.html), we were able to show there is a significant improvement in signal strength and a reduction in noise at 20,000' versus flying at 35,000'.

The increase in signal strength is simply a function of being closer to the ground. The data have to be "downward continued" to counteract the effects of measuring at high altitude. That continuation process enhances the noise; noise is amplified by a factor of seven at 35,000' and by a factor of two at 20,000'. We get at the accuracy of the gravity data by looking at intersection differences, termed 'crossover error'. This provides an estimate of the internal consistency of the survey, precision, if you will. We arrange our survey such that we have a large number of 'data' lines, spaced 10 km apart, and a smaller number of 'cross' lines, oriented perpendicular to the data lines and spaced 40-80 km apart. We use this population of intersection differences to give an assessment of the data accuracy. We aim for two milliGal (mGal) accuracy or better. "

Continued on next page



Screen capture of relative aerogravity meter in flight.

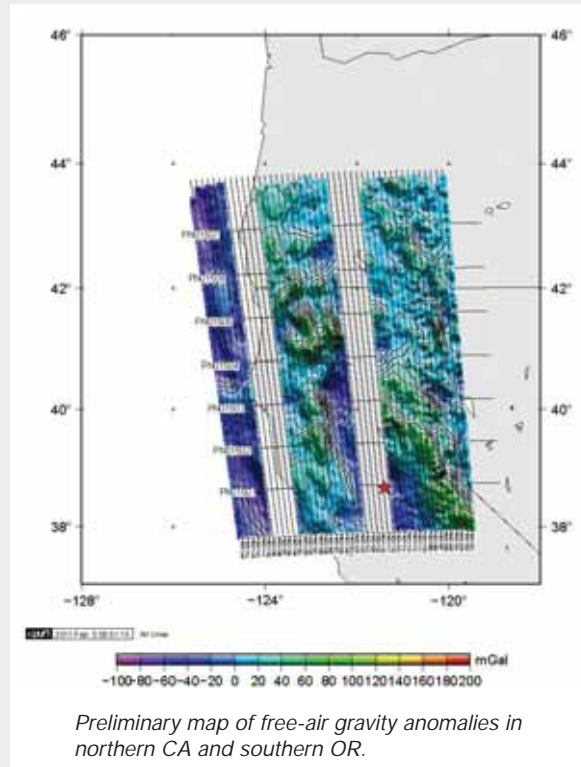
Let's talk about the data collection aspect of the GRAV-D program, which is explained in detail in the Project Plan, which can be found online: http://www.ngs.noaa.gov/GRAV-D/pubs/GRAV-D_v2007_12_19.pdf. The program has an approximate time line of 10 years which started in 2008. Phase I consisted of testing parameters for flight operations, and was performed in the Gulf of Mexico, Puerto Rico and the U.S. Virgin Islands. Phase II data collection is defined by six categories of areas; Parts 1 and 2 are in Alaska because the realization of NAVD 88 in the state is very poor, and that effort has been started. Part 3 is "littoral zones of continental U.S.," and California and southwestern Oregon are benefiting from this winter, 2011 operation. Flights in Alaska will likely be done between April and November, and the 2012 plan is to do the more remote western area of that state and begin working in the Great Lakes region. It is possible that the PC-12 will return next winter for flights in central and southern California. At the end of January, 9.78% of the area outlined in the plan had been completed; the goal for FY11 (end of September) is 13%, and for FY12, it is 20%. The annual budget is currently about \$3.0 million per year. The projected budget in the Plan was nearly \$40 million, so at this rate, it does appear that it will take until 2022 before Part A, The High Resolution Snapshot, is completed.

Getting Results

Vicki explains the time frame for getting results in areas that have been flown: "Since we have been developing our software tools at the same time as conducting field operations, getting the whole data processing component up and running has been challenging. We've now caught up with all of our backlog on the kinematic GPS processing (the first step in the procedure) and expect to complete the gravity processing in March for our first finalized data release of the Gulf of Mexico data. The program started with just me as Program Manager, and after three years, now includes eight full-time and four part-time staff. Ultimately, we expect to process data in a one-to-one relationship between collection time and processing time, although we're not there yet. I expect that pretty soon we'll be looking at about a three to four month turn-around time from the end of a survey until the production of a final airborne gravity data product. The data—which are depicted by maps that show contours of Free-Air Gravity Anomalies, in mGals-- are then turned over to our geoid team. The

'continuous' map provides vastly more gravity data than the 'spot' measurements that we have now at individual bench marks."

Will these California 2011 data be included in the next version of the NGS hybrid geoid model? The Geoid Team leader, Dr. Dan Roman stated that they were not likely to be included. "This is because the aerogravity survey edges may produce significant artifacts. Until I can better assess what the impact of this will be, I'm reluctant to include them. An exception to this may be Alaska, where the data will largely be complete as a block. That should give some insight into how the process works and the impacts. We will likely include the adoption of GRACE and GOCE [gravity data collected by satellites, see: http://www.science20.com/planetby/grace_goce] as a means of constraining the solutions either with or without EGM2008."



NGS is putting a lot of effort and money into doing this and here's why: NAVD 88 is the current vertical datum of the United States, which is realized (accessed by users) through the publication, by NGS, of "known" heights at hundreds of thousands of passive marks in the ground. Because the heights on these marks are not regularly checked, and because they are always at risk of destruction, the maintenance or improvement of this vertical datum by leveling of passive marks would be expensive and labor intensive. Only a new

method—through GPS and gravity—can allow NOAA to maintain a quality level of service to the nation in the definition of the vertical datum.

How Interested Parties Can Help

Interested parties can help accomplish Parts A and C, Terrestrial Partnership Surveys.

For the airborne gravimeter flights, NGS is always ready to collaborate with those who might provide us with aircraft support. For instance, some states own aircraft that might be made available to the program at a reduced cost. The program requires: A pressurized, twin engine (ideally) aircraft capable of flying 3.5-4 hours at 20,000 ft, at least 850 nm per flight (1000 nm would be better!). We typically fly at ground speeds that are between 200 and 250 kts. The beam-style instrument requires straight and level flight

Continued on next page

in conditions of no-to-low turbulence. A well-functioning autopilot is a necessity. For ground work, measurements made with relative gravity meters, or by dual-frequency GPS equipment, at leveled bench marks might contribute to improvements in the vertical datum. For the latter, we would want four or more hours of data submitted to OPUS and published in that database so the observations could be available to the geoid modeling effort. We could fill in the 'gaps' which are defined as being 20-30 km from a geometric/leveled mark that was already used in GEOID09. The spreadsheet and map of those marks can be found at the "Outreach" tab on the CGAR webpage: <http://www.dot.ca.gov/hq/row/landsurveys/geodetic/Outreach/outreach.html>.

If interested parties have a specific area of interest, the Geodetic Advisor can provide more detailed advice about choosing a bench mark where GPS data observation (ellipsoid height) would help.

Turbulence Scrubs the Flight

So, going back to the activities of February 5, 2011, we all got to go out to the plane and squeeze through, a few people at a time, to look at the setup, as Justin explained the graphics on the screen. Because of the flight scheduled for

liftoff at 8:30 a.m., we were off the tarmac by 8:00 a.m. and reconvened in the passenger lounge. Marti provided information about the GRAV-D program and showed maps of locations where operations have been completed or are planned. Justin joined us shortly and explained that the day's flight had been scrubbed because turbulence was expected. Sure enough, the calm conditions of the early morning turned into windy, gusty conditions that afternoon. Everyone was appreciative that NGS provided an opportunity for a close-up look at this aspect of the airborne gravity data collection effort which will move us closer to a better realization of the vertical reference system. ■



Members of Sacramento Chapter of CLSA and others in front of the plane with NGS airborne gravimeter, at McClellan Field, Sacramento, Feb 5, 2011. (Photo by Rob McMillan, PLS)

Announcing CGAR (*cee-gar*) – California Geodetic Advisor Resources Web Pages

There is now a handy way to view 'modern' geodetic control in California using Google Earth (GE) or Google Maps (GM). The California Geodetic Advisor, Marti Ikehara, had a summer intern work on putting together web pages where control, organized by county, can be accessed. The ultimate goal is to have several different pages, each focusing on a geodetic topic, but this is still under construction. The most complete section of the site is the catalog of GE kmz files.

http://www.dot.ca.gov/hq/row/landsurveys/geodetic/geodetic_control.html

The website is hosted by Caltrans' Office of Land Surveys. The counties are organized into the 12 Caltrans Districts. The bottom half of the page, a table of counties, provides access to GE files. Go to the web page and click on a county. You will see that the first line is the kmz file, and the next files are ESRI shapefiles of varying datatypes. Click on the kmz and Google Earth should open automatically (presuming you have it installed).

With Google Earth open, go to the GE sidebar at left and look at "Temporary Places"; this is the last entry under "Places". Next click on the '+' box to expand the layers and up to five datatypes should appear. They are:

- HVHM – Horizontal and vertical survey control "Height Modernization Station"
- H – Horizontal survey control with orthometric heights
- HVL – Horizontal and vertical (leveled) survey control
- VL – Vertical (leveled) survey control (no horizontal data)
- CGPS or CORS – Continuous GPS or Continuously Operating Reference Station

A link at the top of the Geodetic Control page opens Google Maps, but not all counties are available because of technical difficulties. If you click on a survey control symbol in either GE or GM you will see an info box open with much of that station's data, AND a hot link to its NGS datasheet.

Note that these datasets are only non-VERTCON'd NAVD88 stations for vertical control and only GPS-observed horizontal control that was included in the 2007 Re-Adjustment or submitted later. For viewing ALL NGS control, use DSWorld software available here:

http://www.ngs.noaa.gov/PC_PROD/PARTNERS/index.shtml



By: Teri Kahlen, PLS

Right-of-way engineering and land surveying have been Teri's forte for over 25 years. She has been employed by both private firms and public agencies, and has been specializing in right-of-way acquisition for about four years. She holds a California real estate license and is a Notary Public. Currently she is a Project Manager for California Property Specialists, Inc., a Southern California firm whose primary business is assisting public agencies in acquiring rights-of-way for their projects.

The Right-of-Way Acquisition Process

At one time or another, many Land Surveyors contribute their services to highway projects – either before (field surveying to locate the boundaries of proposed property owners) or after (in the construction staking of the new highway, and filing a record of survey in the after condition). This article is intended to serve as a general overview of the right-of-way acquisition process for public agencies that seek the financial assistance of the Federal Highway Administration (FHWA).

Typically the FHWA provides funds to state governments that carry out highway projects. These funds are used to support activities related to building, improving, and maintaining public roads. Some states pass these funds to local governments or private entities. Many projects involve the acquisition of real property and the relocation of residents, businesses and others. Despite what some people might think, the government can't just take land away from owners. The 5th Amendment of the U.S. Constitution states that "No person shall.... be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation."

All acquisition and relocation companies working on federally assisted projects are regulated by Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, commonly called the Uniform Act. Public agencies and acquisition consultants work closely with state transportation departments (Caltrans, for example) during the acquisition process to ensure all federal and state requirements are met.

So what are the various phases required to build a federally assisted highway project? If you'd like to know, this general overview will be helpful and informative.

Planning and Project Development

The transportation planning process is an ongoing, ever evolving process and an integral part of project development. Once the need for

a new highway or to widen an existing highway has been identified, a more detailed study is undertaken. From a property acquisition point of view, the key element of the study is the preparation of the right-of-way cost estimate; this is the first step in building a credible budget. This includes estimating costs to acquire the real property, including improvements, costs of relocating people and businesses, and demolition costs. The right-of-way cost estimate will also include costs associated with appraisals, environmental reports, title and escrow services, acquisition services, relocation services, and litigation.

Environmental Issues

After the project scope has been defined, the potential environmental impacts must be assessed. This assessment is done in accordance with the National Environmental Policy Act (NEPA) which was signed into law on January 1, 1970, establishing national environmental policy and goals for the protection of the environment in federally funded projects. Section 102 of NEPA requires a public agency, when using federal dollars, to incorporate environmental considerations and mitigation measures to minimize the environmental impact of a proposed project. In general, the NEPA process consists of an evaluation of a project's environmental effects, including its alternatives. There are three levels of analysis:

- **Categorical exclusion determination;**
- **Preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and**
- **Preparation of an Environmental Impact Statement (EIS).**

Ultimately, the goal is to involve the public and private sectors in the process of identifying reasonable project alternatives to minimize or mitigate for the adverse effect to the environment. Obviously, the process is supposed to be completed before any right-of-way acquisition begins.

Project Design and Right-of-Way Engineering

Once the preferred project alternative is selected and fully addressed in the environmental documents, the engineering design can commence. In the project design phase, the construction plans, specifications, and estimates (PS&E) are developed for use in advertising and construction of the highway project. Utility relocation is a significant factor in the construction of a project, and early coordination is important in keeping the project on schedule. In addition to the utilities, railroads (for grade separation projects) also need early coordination. As part of the project design, right-of-way maps are prepared identifying the property required by the project. After the preliminary title reports are received, the right-of-way maps are prepared from the design plans to show the existing and proposed right-of-way lines, property lines (based on a field survey and boundary analysis), and owners' names for each property required. Other pertinent information to be shown includes the size of the parcels and type of estate, (i.e., fee, permanent easement, slope easement, temporary construction easement, storm drain easement, access easement, aerial easement, etc.) Depending on the agency involved, the right-of-way maps may also include the highway design centerline, design features, and other details of construction. These plans should be sufficient to prepare legal descriptions of the part take interests to be acquired for the project.

I enjoy right-of-way engineering because it is interesting and challenging to research property ownership and record information. I like to compile research data for the field crew and then evaluate what they actually find in the field. Boundary analysis is like solving a puzzle. It is exciting and educational to engage in surveying discussions with colleagues to help solve the puzzle. The map making is also exciting with the opportunity to be creative. I have to say my most favorite part is writing legal descriptions – and I am grateful for having been

Continued on next page

taught well. The man that taught us used to work with Gurdon Wattles, the author of *Writing Legal Descriptions*, at Ticor in the 1960s. We had weekly in-house classes too. We were given all kinds of properties to describe and then we had discussions on how we did it and why. Writing legal descriptions is rewarding because it allows me to be creative.

Appraisals

Property appraisals can begin once the right-of-way and construction needs of the project have been clearly defined. The appraisal practice is regulated by the Uniform Standards of Professional Appraisal Practice (USPAP). After the design is complete and the legal descriptions and plats are signed by the professional Land Surveyor for the acquisition parcels, we provide them to the appraiser. The appraiser will prepare their “value of opinion” based on the highest and best use, what improvements are on the property, any damages to the remaining property, etc. They walk the project, invite the property owner to accompany them on the appraisal inspection, and finally prepare a narrative report for submittal to the public agency. An appraisal review, prepared by another independent appraiser, is conducted to ensure that there is consistency among the property valuations on a project-wide basis.

Acquisition

Once the appraisals are completed and reviewed and the public agency has obtained their E-76 from the FHWA (E-76 gives the public agency authorization to proceed with the project), offers can be presented to the affected property owners. The right-of-way consultant (me, in this case) prepares the offer package. This includes the offer letter (based on just compensation), the purchase and sale agreement/contract, the grant deed/easement deed, and the statement of just compensation. The statement of just compensation is an abstract of the full narrative appraisal report for the benefit of the property owner.

We contact the property owners and make appointments to present the offer in person, discuss the project, and answer any questions they have about the process. Then the fun begins... the negotiation. It would be nice to check our emotions in at the door; however, it is not always possible. We're affecting someone's home where families were raised and celebrations were enjoyed. The right-of-way consultant (also known as the negotiator) serves a unique and sensitive dual role which involves being an advocate for both the public agency and the property owner.

Some characteristics of the successful negotiator include knowledge of the project, experience in negotiations, credibility, courage, empathy, integrity/ethics and patience. The vast majority of property owners believe their property is worth more than the appraised value; that is where Code of Civil Procedure Section 1263.025 comes in. This code states the public agency will reimburse an owner up to the amount of \$5,000 for the owner to secure an independent appraisal of the property if they choose. If the property owner chooses this option, we will review both appraisals and negotiate based on both appraisals and, ideally, have a win-win outcome.

Condemnation

When all attempts to negotiate an agreement fail it may be necessary for the agency to acquire the property by exercising its power of eminent domain. At this point, the acquisition should be turned over to legal counsel to begin condemnation proceedings. The right-of-way acquisition consultant continues to be involved in the process, as we are part of discovery. We can be disposed as our work provides the basis for the lawsuit. If the property owner challenges the proposed acquisition, the condemner may be required to prove necessity for the acquisition. Necessity is proved by offering engineering or design plans to substantiate the need to acquire.

Relocation Assistance

When private land is needed for public use and is occupied, it may be necessary to displace the occupants if the new right-of-way line lies within their house/business or if it is a full take parcel. The Uniform Act requires an acquiring agency to provide advisory and financial assistance to those displaced from their homes or businesses.

Almost there: Right-of-Way Certification

The final step in the right-of-way process is memorialized by the preparation of the right-of-way certification. Prior to advertising for construction bids for the project, the public agency must certify that the properties needed for construction have been acquired and are clear of any utilities and structures. The certification must state that the public agency has complied with the Uniform Act and the project is ready for construction.

Summary

So there you have it, in a nut shell. This is a very brief and simple explanation of the process. It can take anywhere from one to two years to complete and longer if condemnation is involved. What I enjoy about right-of-way acquisition is the challenge of coming to a mutually beneficial agreement. I'm always learning and stepping out of my comfort zone. As a professional Land Surveyor, what my skill set brings to the acquisition side of right-of-way is the ability to read and interpret engineering plans and legal descriptions in addition to a good understanding of land titles. That is particularly valuable in communicating with property owners with little experience in real estate. ■



Santiago Canyon College
SURVEY/MAPPING SCIENCES PROGRAM

Preparing for California LSIT or LS exams? Need to upgrade your skills? New surveyor? We offer:

- Affordable classes with certified instructors
- Survey/mapping certificate and degree programs
- Computer labs equipped with GPS, ESRI-GIS, and AutoDesk software
- Total Stations and GPS for field exercises
- Evening classes in City of Orange
- Career training for new surveyors

For more information call (714) 628-4883 or visit www.sccollege.edu/survey

 Santiago Canyon College
8045 East Chapman Avenue
Orange, CA 92869



By: Greg Sebourn, PLS

Greg is a husband, father, professional land surveyor, educator, adult Boy Scout leader, and political/community activist. To learn more about Greg, go to his blog at <http://gregsebourn.blogspot.com/>.

A New Approach

45 Years of Professional Association

In the last issue of the California Surveyor, Issue No. 164, we read about the importance of professional association in Pat Tami's article "Choices." We also read about the professional rut we are in David E. Woolley's column "The More Things Change," an article which also emphasized the importance of professional association.

In one sense our professional association is the time we take to rub elbows with our peers and bounce ideas off one another; it is a foundation for our professionalism. It's the home base from which we operate, and it is our participation in the CLSA. However, what we do in our daily lives is as important to the welfare of our profession as what we do at work and at CLSA meetings. This story might anger some and may humor others. Whatever your reaction to my ideas, I hope it inspires you to think about how you conduct your life when you are out of the office and your orange vest is off.

California Land Surveyors Association was founded in 1966 to advance the interests of the profession of Land Surveying, to maintain the highest possible standards of professional ethics and practice, to encourage uniformity of practices and procedures, and foster public faith in and understanding of Land Surveyors and their work.

How Can Members Further CLSA's Mission?

Although it is ultimately the Board of Directors responsibility to fulfill the CLSA mission, it is imperative for each member to participate. In order to "...foster public faith in and understanding of Land Surveyors and their work," the CLSA has worked hard to get inside the classrooms of high schools and colleges. Through an active Legislative Committee, CLSA has worked to change California's laws. CLSA has created videos, developed brochures, hosted radio interview and other means of getting the word out. However, it is this surveyor's opinion that we can, and should, do more.

Who is the CLSA? That would be all of us; the members. Most of us have families and friends that are not surveyors. They may have heard what we do but they really don't understand the significance. They lack understanding because we have failed to educate them, much less the public.

As individuals it is our responsibility to represent the profession to the public in the best light possible. We cannot rely on our field crews to do this for us, especially considering that few field crews have licensed staff. Our professional presence in the community is extremely limited.

Most land development-related contracts are administered through the civil engineer or architect which means that the property owner, our parent client, never sees or hears from us directly except maybe when we need access to the site. Let's face it; we have done a poor job of promoting our profession beyond the classrooms of California and even that has mixed results. The public, which is made up of property owners, retailers, public officials, bankers, doctors, etc., need to see the face of the Professional Land Surveyor.

Professional Land Surveyors In the Community

We, as professionals, not Professional Land Surveyors but simply professionals, need to be involved with our community organizations. We need members involved in the Lions Club, Rotary Club, Chamber of Commerce, and other organizations that benefit our communities at large.

The other professionals in our community, the bankers, public officials, retailers, etc., know as little about us as those high school kids we visit; and yet we wish to be accepted by them as professionals. Most, if not all, can only identify with the "guy in the orange vest and the tripod" stereotype. Generally, the person they see is the technician who, in some cases, may not be the ideal poster-child of Land Surveyors.

Continued on next page



CLOSE HAS ITS CONSEQUENCES. Even when something is slightly off it can have a big impact, especially with property data. Make sure you get the exact data you need with ParcelQuest. It's the only data company dedicated solely to California property. ParcelQuest, precise data for precise people.



PARCELQUEST

www.ParcelQuestSearch.com

Continued from previous page

I don't know of many engineers involved with organizations other than engineering-/surveying-related organizations. A few belong to the local chamber of commerce but I don't think that these few adequately represent us, the Professional Land Surveyors of California. More importantly, every child knows what engineers do because their teachers and parents tell them. And how do the teachers and parents know? Engineers, and architects for that matter, are everywhere in the media, whether the silver-screen, television, or magazines. With those other disciplines so prevalent, I believe we too should endeavor to have the public to perceive us as the professionals we are.

Looks Can Kill

From my earliest days, I remember my parents and teachers always talking about first impressions. Having gone to a private school with uniforms strictly enforced, I was up early ironing my shirts by the seventh grade. By the ninth grade I was attending a public high school where the girls wore make-up and short skirts, the guys had shaggy hair and un-tucked t-shirts, and I tried to fit in. Having gone through my own adolescent growing pains, I can attest to

the fact that some people make broad and wild assumptions on a person's appearance. Your first impression upon them can leave them with doubts about the quality of work you do.

It was 1988 and my hair was long; not that wimpy shoulder-length Fabio hair but the kind that hangs down to the belt and looks great on stage. I was in a rock band and having a great time. I was also 15 and very naïve. I think many of us have been there at one time or another. I was 22 when I cut my hair and I witnessed within an hour, a significant change in the way people treated me. I realized people had been overtly cautious around me. Although I can look back on it with humor, I was terribly upset at the time to see just how unfairly I thought people had treated me. Back then I was selling a rock-n-roll image.

These days, I'm selling confidence, trust, and integrity. I want my clients to believe that they have hired the very finest professional available. On most days that I'm in the office, you will find me wearing a suit. In the field, I wear a clean company shirt and clean blue jeans, free from wholes or stains. I am not trying to look cool; I'm trying to look like

Continued on next page

Welcome New CLSA Members

CORPORATE

William Benson, Arleta
 Curtis Burfield, Sacramento
 Christopher Glantz, Albany, OR
 Wilson Gorman, Palmdale
 Lee Goss, Oklahoma City, OK
 David Graebner, Grass Valley
 Michael Hartley, Fresno
 Oscar Jarquin, Manhattan Beach
 Clifford Johnson, Arcadia
 Gregory Jones, Watsonville
 Gary Poor, Riverside
 Timothy Reilly, Decanso
 Mathew Sawyer, San Diego
 Richard Snedaker, Irwindale
 James Steines, San Juan Capistrano
 Wayne Toutges, Folsom
 Khin Voong, Brentwood
 Herbert Votaw, Chico
 Robert Wheat, San Ramon

AFFILIATE

Daniel Dietrich, Clovis
 Michael Hall, San Francisco
 Thomas Newman, Palmer, AK

ASSOCIATE

Dylan Crabtree, Healdsburg
 Matthew Fallau, San Francisco
 Ray Freiwald, Yucca Valley
 Gregory Gibson, Benicia
 Gary Gilliland, Santa Cruz
 Jaroslaw Grabarek, Simi Valley
 Raymond Lillibridge, Mansfield, TX
 Margaret Martinez, Ventura
 Mike Maysey, Carlsbad
 Raymond Min, Fairfield
 Michael Robert, Beaumont
 Carlos Silva, Yucaipa
 David Slater, Santa Rosa
 Pete VanAmmers, Wildomar

STUDENT

Adrian Aguirre, Fresno
 Jason Ellis, Yucaipa
 Jay Janisse, Thousand Oaks
 Robert Jones, Sacramento
 Jasen Leatherman, Jamesburg, NJ
 Jonathan Luconi, Fresno
 Tiffany Padilla, Orange
 Jacob Straub, Sacramento

A New Approach

the professional that my client has contracted. This perception is not limited to my clients, however. It extends to every person that I contact, whether in a professional capacity or as a private person.

One-on-One

Often, while my wife and I are at functions for our children's schools, parents will ask what I do for a living. I could say I'm a surveyor and leave it at that, but I'm not one to sit quietly. Like many of you, I love to sell the profession! When they ask what I do, my eyes light up. I tell them I'm a Professional Land Surveyor. They get a funny look as their brain tries to process "professional" and "Land Surveyor." I take that opportunity to expand their knowledge of surveying beyond that "guy in the street."

I tend to add my own Hollywood touch about how exciting it is to work on some very cool projects or the necessity to have an affinity for history. For me, surveying really is that exciting and cool, so it is easy to express my fervor for the profession. I seize on the opportunity to impress upon them the importance of consulting with a Professional Land Surveyor. Whether they are considering a minor addition to their home or developing that piece of family property they've been holding on to for years, I want them to know that consulting with a Professional Land Surveyor at the beginning of the project can result in significant savings for them by identifying potential issues before they become issues and they're up to their neck in entitlement, engineering, and architect fees.

We need to get the public excited about what we can do for them. We need the public to need AND appreciate our professional services. I'm not condoning that we generate a false need where none exists. We must become community partners and show the public what we have to offer our communities as individual professionals.

Since 1966, we have accomplished a lot, however, there is more to be done. There have been many people that have had a profound impact on land surveying in California since the CLSA was founded. Many of these icons are gone now and, in time, the void created will be filled. Will it be filled by the youth who may take for granted the footsteps they follow on this trail blazed so many years ago or will it be filled by those who will continue to have "an eye on the future?"

With our current economy, I can see no reason why we can't reach out just a little further. All of us seem to have a little more time on our hands these days. What a great opportunity we have before us to continue what was started in 1966. Let's seize the moment! ■



Stay on target in locating the land records you need.



Fast, **easy**, convenient

Land surveyors and engineers across the nation are discovering the benefits of having unlimited access to the single largest digital database of recorded land documents online, anytime. DocEdge.com® is transforming the cumbersome process of retrieving property documents into a quick and simple task.

With DocEdge.com, you have the ability to access over 4 billion public land records directly from any web-enabled computer. Quickly search for deeds, maps, reports and more by street address, owner name, assessor parcel number, legal description, or document ID with DocEdge.com's intelligent search capability.

We help land surveyors and engineers quickly:

- Obtain recorded copies of parcel, tract, and subdivision maps and records of survey
- Determine boundary discrepancies and obtain flood zone information
- Easily locate deeds to review and prepare legal descriptions

Additional benefits include:

- Access the recorded documents you need from any web-enabled computer 24/7
- Use viewer tools to annotate documents and zoom in on map details



*First American
Data Tree*

DocEdge.com®

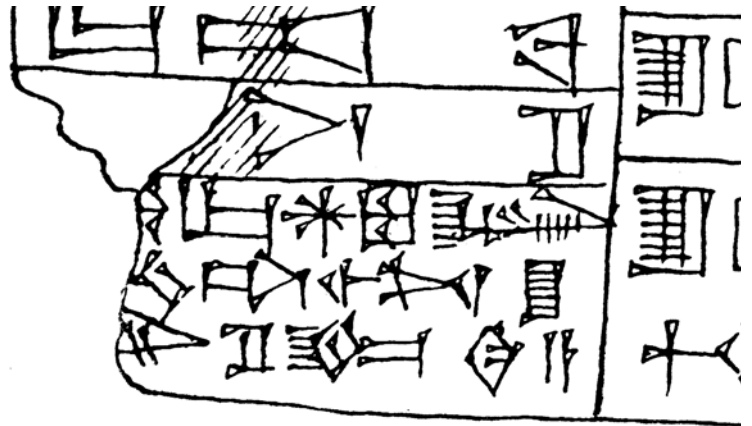
4 First American Way, Santa Ana, CA 92707

800.708.8463 • www.DataTree.com • www.DocEdge.com

Copyright © 2010 First American Data Tree, LLC. All rights reserved.

First American Data Tree LLC makes no express or implied warranty respecting the information presented and assumes no responsibility for errors or omissions.

If Years Had Names



At the February Board of Directors meeting held in Oakland, CA, outgoing President Aaron Smith read through an impressive list of CLSA's accomplishments over the past year and thanked everyone who helped make it all happen. As he did this, an interesting thought occurred to me: 2010 was a busy year for CLSA; if one were to give the year a name, what might it be?

The earliest known method for naming years was developed on the plains of Mesopotamia over 4,000 years ago. The accompanying graphic is a portion of a chronicle that dates from the time of King Ur Namma, circa 2047-2030 BC. The figures record an important year in the king's reign: "The year Ur Nammu, the king, straightened the road from south to north."

To follow this ancient year naming convention, Aaron, as our chief administrative officer, would have to pick a single accomplishment to designate a name for 2010. As you read through the following list I hope the true value of this whimsical exercise becomes obvious.

CLSA Accomplishments in 2010

- CLSA, in an effort, to be fiscally responsible, reviewed and revised their travel reimbursement policy and developed a new policy for requesting budget items.
- CLSA participated in the UDC v CH2MHill petition.
- CLSA reviewed and monitored the NSPS/ACSM reorganization plan.
- CLSA donated \$25,000 to the National Museum of Surveying in Illinois which enabled the museum to open to the public.
- CLSA implemented a TrigStar Stimulus program for 2010.
- CLSA developed and published a Safety Tailgate Handbook which is available complimentary to all CLSA members via the Members Only Website.
- CLSA further enhanced their website providing each chapter with pages on the site and the ability to update the pages through a chapter portal.
- CLSA provided members with a huge discount on the 2009 BLM Manual
- CLSA conducted an audit of the financials.
- CLSA sent a letter of support to the CSRC.
- CLSA reviewed the contract for small projects and made it available to members on a complimentary basis by posting it on the Members Only Website
- CLSA hosted a Copyright workshop in Ontario and Concord.
- CLSA hosted booths at multiple conferences: CalGIS, ESRI, CSU-Fresno, and CLSA/NALS.
- CLSA developed a new tri-fold brochure "GIS and Surveyors" to promote the need for land surveyors in the GIS community.
- CLSA hosted a panel discussion on GIS and Surveyors at the ESRI Conference.
- CLSA promoted Land Surveyors Week and received a proclamation from the Governor.
- CLSA developed a Lobby Day Handbook and participated in NSPS Lobby Day efforts.
- CLSA was successful in obtaining amendments to Stanislaus County Board of Supervisors to protect the position of County Surveyor.


Continued on next page

- CLSA recognized those members with 25 years or more continuous membership.
- CLSA supported ACSM railroad monumentation proposed language.
- CLSA, in an effort to educate the public, developed the Monument Conservation tri-fold.
- CLSA was successful in requesting the City of Millbrae remove information from its website providing instructions to the public on how to "locate property lines."
- CLSA supported Napa County v Vendrillo amicus which was victorious.
- CLSA Education Foundation distributed over \$40,000 in scholarships to land surveying students
- CLSA monitored and provided input regarding changing workers compensation regulations.
- CLSA chartered Santiago Canyon College Student Chapter.
- CLSA received the NSPS journalism award (3rd year in a row) for the California Surveyor.

So, what will you name 2011? Will it be the year you get involved and serve in office? Will it be the year you determine to become a 25-year member? Or the year you pay your state and chapter dues early? Will it be the year you help grow your chapter's membership so as to gain another state representative? Will it be the year you attend

your first Board of Director's meeting? Or maybe the year you resolve to read every issue of the California Surveyor?

If you can't think of anything else, incoming CLSA President Bill Hofferber would be very, very happy if you named 2011 AD, "The year I joined the CLSA voluntary Professional Development Program (PDP)." ■



The Subdivision Map Act:


A One-Day Seminar in Several California Locations

Allen Matkins
in association with
LAND USE NAVIGATORS

Cost: \$195
Group discounts available

Time
9:00 am - 4:30 pm
Registration opens at 8:30 am

Includes:
Map Act Navigator: 2011 a \$49.95 value




WHAT IS COVERED?
This seminar provides guidelines for effective use of the Subdivision Map Act. The instructor will discuss the responsibilities and powers of local agencies under the Act, as well as particular issues regarding when the Act applies.

SEMINAR HIGHLIGHTS:

- Discussion of new Legislative and Judicial developments in 2010
- Relationship of Map Act to other planning, zoning and development laws, and to CEQA
- When the Map Act applies (and when not)
- What kind of Map (tentative/final or parcel map) to use
- Certificates of Compliance, Lot Line Adjustments, Contiguity, Remainder Parcels
- Exemptions and Exceptions under the Map Act
- Life of Tentative Map
- Getting the most out of Vested Rights (including Vesting Maps, Development Agreements and Common Law Vesting)
- Conditions of Approval/Exactions/Dedications/Fees
- Creative mapping approaches
- Appeals/Judicial Actions

WHO SHOULD ATTEND?
This seminar is designed for public and private planners, surveyors, engineers, public works and utilities staff, developers, builders, environmentalists, attorneys, project managers, architects, planning commissioners, city council and board members, property managers, zoning board members, neighborhood groups, and all others involved with the land use process. This course qualifies for 6.0 hours of California MCLE Credit.

Instructor



Michael P. Durkee

How to Register for a seminar: Call us: 415-273-0310 web: LandUseNavigators.com or, register and pay at the door

Petaluma March 24 Petaluma Community Center Club Room	San Mateo May 12 San Mateo County Event Center	Marina June 23 Marina Airport Conference Room	Rancho Cucamonga September 15 Rancho Cucamonga Community Center	Burbank October 27 Burbank Moose Lodge
Lafayette April 28 Lafayette Library and Learning Center	Stockton May 26 Best Western Plus Heritage Inn	Santa Maria July 28 Santa Maria Misami Community Center	Fresno September 22 Pardini's Catering & Banquets	San Diego November 17 San Diego Concourse



By: Steve Martin, PLS

Steve is the chairman of the CLSA Education Foundation, a chapter representative for the East Bay Chapter, past president of the San Diego Chapter and CLSA member since 1990. In his day job, he is the Survey Supervisor for the East Bay Municipal Utility District. Previously he worked for the County of San Diego for over 17 years and started his career with the City of San Diego in 1988 as the 4th man on a survey crew, a position below Chairman called "Engineer Trainee."

CLSA Education Foundation Report

This year the CLSA Education Foundation awarded a total of \$45,975 scholarships to 43 deserving land surveying students. With 17 of CLSA's 22 Chapters now participating in raising funds, the Foundation has flourished, growing each year from \$9000 in scholarships being awarded in 2004 to our current level of nearly \$50,000! It is inspiring to see CLSA members and Chapters working hard to raise money for the scholarship program.

One thing that is apparent from reviewing the scholarship applications is the number of intelligent, energetic and dedicated students of land surveying who have made it their career goal to become Professional Land Surveyors. It is refreshing to read how another soul has discovered that problem solving, working out-of-doors and following in the footsteps of history, all fit with their ideal career. Many students are making hay while the sun shines by dedicating themselves to furthering their education during this downturn in the economy, or continuing on towards a Masters degree before entering the job market.

CLSA does so many good things for the profession, but if I had to pick one single thing to call the most important thing CLSA does, I would say that it is supporting the scholarship program through the CLSA Education Foundation.. These dedicated and intelligent students are the future stewards of our profession and we need to encourage as many as possible to join our ranks.

Keep up the good work! ■

To my friends at CLSA:

William Hollerich here - I want to say thank you for the \$750 scholarship I received from the Desert Chapter of CLSA. Forgive me for my inexperience with writing thank you letters for scholarships; I've never won one before!

According to the monetary breakdown at the bottom of the check page approximately 66% of the scholarship was from the Desert Chapter and 33% was from a general Scholarship Awards fund, or something along those lines. That is how I interpret it at least.

First, thank you to the Desert Chapter. This scholarship made my day and made the Fresno State University Annual Geomatics Conference just that much more fun. It also made the pill of finding my bike lock cut and the bike stolen that the morning a little easier to swallow.

Second, I would like to thank CLSA as a whole. The support you guys put out for students is amazing. To be perfectly honest, I could not believe the stories until I attended the conference and saw it for myself. In none of the various majors my friends have chosen, has the same level of support been shown. What you guys do is amazing and one day I'll be proud to take my spot and help out, too. So kudos to you CLSA, you deserve it.

With great thanks,
William C. Hollerich



Steve Martin, PLS with Matt Black at the Fresno State University Annual Geomatics Conference in January 2011.

Postcards



Tim Case, PLS of RBF Consulting taking a photo ID measurement at Lake Clementine Dam on the North Fork of the American River in Placer County, CA.



California Property Specialists, Inc.

YOUR projects our solutions

Our services:

- Real Estate Services
- Project Management
- Right of Way Engineering
- Cost Studies
- Report Preparation
- Property Acquisition
- Relocation Plans
- Relocation Assistance
- Property Management



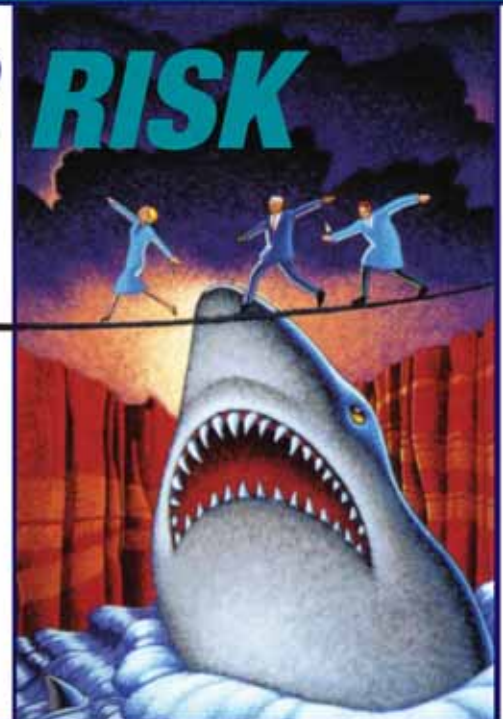
Teri Kahlen, PLS

tkahlen@cpsi-row.com | www.cpsi-row.com
(714) 352-4182 direct | (714) 550-4628 main

MANAGE YOUR RISK

Insurance Products for the Professional Land Surveyor
From Vista International

- ✓ Professional Liability
- ✓ Office Package
(Property, General Liability, Equipment)
- ✓ Business Auto
- ✓ Workers Compensation
- ✓ Personal Insurance



CLSA MEMBER DISCOUNT

Vista International Insurance Brokers is the only authorized insurance broker for California Land Surveyors Association



Vista Affinity Group Services

1318 Redwood Way, Suite 250
Petaluma, Ca 94954
Call (707) 796-7180 or (800) 819-8808
www.vistainternational.com
License No. OF64200

CLSA Awards



Congratulations to the following award winners that were recognized at the CLSA/NALS Conference.

Dorothy Calegari Distinguished Service Award



*President Bill Hofferber and Jim Herrick
James Herrick, PLS was awarded the Dorothy Calegari Distinguished Service Award for his long time service and dedication to CLSA.*

Jim is a Past President of CLSA and has served on numerous committees. He has been an advocate of education and helped to develop the CLSA Voluntary Professional Development Program. He has been a long time Director of the CLSA Education Foundation and has reviewed hundreds of scholarship applications. In addition, he, along with his wife Barbara, have contributed countless hours working at the Scholarship auction and donated wonderful items which have raised thousands of dollars for scholarships.

Member of the Year



Steve Martin receives Member of the Year Award from President Bill Hofferber

The CLSA Member of the Year Award is given to an individual that has best supported and promoted the objectives of CLSA and who has contributed most to CLSA activities at the state level. This year's recipient, Steve Martin, is a member of the CLSA Board of Directors and served on the 2010 CLSA/NALS Conference Program Committee. In addition, Steve has contributed to the advancement of the surveying profession by serving as Chairman of the CLSA Education Foundation for over 6 years.

Chapter Newsletter of the Year

Chapter of the Year



CHAPTER OF THE YEAR – Sacramento Chapter
 (Left to Right) Matt Stringer, Rob McMillan, Jon Scarpa, Annette Lockhart,
 Ian Wilson, Tom Cardenas, Evan Page, Bill Telling (Center)



CHAPTER NEWSLETTER OF THE YEAR
 Riverside/San Bernardino Chapter,
 Side Shot President Bill Hofferber
 & Pete Wiseman

Photo of the Year



President Bill Hofferber & Robert Reese



PHOTO OF THE YEAR - Taken by Robert Reese



The More Things Change...

By: *David E. Woolley, PLS*

Dave, is the CLSA Orange County Chapter Legislative Chairman, Chapter Representative, State PPC Member, and owner of D. Woolley & Associates, Tustin, CA

Quotes from the near and distant past that prove the point: the more things change, the more they remain the same.

The following quote was taken from a paper titled "What Should be the Education for Land Surveying?" by Curtis M. Brown (1957). For the complete paper and full context of Mr. Brown's statements, see LSACTS.com.

"I think of boundary surveying as including many technical levels and also a professional level. We must distinguish among the chainman, instrument man, technician, and the professional surveyor. The doctors have laboratory assistants who are called technicians, not doctors. Unfortunately, the professional surveyor has many assistants who are often thought of and are considered by many to be surveyors.

The property surveyor is given a deed and told to mark it on the ground. He makes measurements, observations and sets markers in accordance with his opinion, and he charges a fee. The only correct location for a boundary line is in the position that a court of competent jurisdiction will uphold. Thus, in setting his property marks, the surveyor is giving his opinion of where he thinks the court will uphold him. It takes superior knowledge to know where and how to set property lines. And if the surveyor fails to set his boundaries in that position that a reasonably prudent surveyor would, he must pay damages. He is a professional man.

A man may be a beautiful technician, a skilled mathematician, and an expert at making measurements, but of what value is his skill if he does not know where to place a legal boundary corner? Almost 100% of the fault we find with the men we employ is their ignorance of where to place property corners. Everyone is expected to obey the law and everyone is presumed to know the law. The property surveyor is licensed to set property corners [corners are not the same as monuments marking corners] and he is expected to set them in accordance with the correct principles of law. He is not practicing law; he is merely obeying law in the same fashion that you or I do when we obey the speed limit."

Commentary by David E. Woolley, PLS

I am particularly struck by the quote: "... if the surveyor fails to set his boundaries in that position that a reasonably prudent surveyor would, he must pay damages." This begs the question, what place is there for a "record boundary?" Some in our profession use this term to mean: a calculated boundary based on available records and rotated to two field located monuments without consideration of all other evidence. The definition of "record boundary" does not exist in case law nor in any text books on land surveying. Brown emphasizes that "The only correct location for a boundary line is in the position that a court of competent jurisdiction will uphold". I have yet to find a definition of "record boundary" which may be referenced to determine a written standard of care. Please note that an unlicensed planner's opinion, written or spoken, is of no value. The surveyor's defense against a negligence claim is showing he or she has met the standard of care. How will the surveyor prove these "record boundaries" have met the standard of care without any substantiation except perhaps the fact that many in the industry produce these same "record boundaries?"

Now riddle yourself this, why would any surveyor show a "record boundary" in connection with a field survey if, according to the courts and standard of care texts, there is no such thing? If a client does not need a boundary survey, arguably they would be less in need of a "record boundary" survey (which could result in their harm). Nothing states every topographic survey needs a boundary. A record boundary is no substitute for a boundary.

The litmus test is to remove the boundary altogether and ask the following questions. Who is asking for the boundary and why? What is their understanding of a boundary survey? If the lines serve little purpose, why show them at all? Suppose the property has non-contiguous parcels, gaps, overlaps, improvements crossing the line, will the "record boundary" negatively impact the client? Clients (or planners), who are not licensed, do not dictate the acceptable practice for any licensee (engineer, surveyor or other). There are only a few legal exceptions in which a record boundary connected to a field survey is acceptable; for instance, some jurisdictions allow record data parcel maps. The recent legislation changes for record data parcel maps changed the criteria so it no longer fits the definition of a record boundary as defined herein.

Few surveys have more exposure to liability than an in fill project boundary, projects subject to setback minimums, or an ALTA survey. The surveyor must remember the client has several thousands, hundreds of thousands or millions of dollars to buy and/or develop a project, why would the surveyor be willing to break the law, and in so doing, jeopardize the project, the title company's insurance, and his license just to save the client a micro percentage of the overall project cost? A boundary survey adds value to any property, whether it is developed at this time or a future date. There is only one true location of the boundary and yet there are a number of "record boundary" positions. Again, in law or in accepted treatise a "record boundary" does not exist in connection with a field survey, this is for good reason.

We'll occasionally encounter field work product with craftily worded record boundary disclaimer notes (among others) presumably meant to absolve the surveyor of liability. The courts have held that these notes will seldom meet the standard required for informed consent and, contrary to intent, these notes are often viewed as a signed confession to negligence. In California there is no alternative to a Professional Land Surveyor, and therein lies the liability. Liability is the hallmark of a profession. Liability separates us from tradesmen or vocations. Accept it, respect it, and manage it. To those that choose to ignore their liability, deliver your "record boundary" invention and hope the title company, your client, and other professionals do not recognize your negligence. Do not be surprised when either of them delivers it. ■

Index To Advertisers

Allen Precision Equipment	37
Berntsen International, Inc	8
California Property Specialists, Inc.	27
California Surveying & Drafting	48
CD Data - Parcel Quest	21
Central Coast Aerial Mapping, Inc.	7
Engineering Supply Company	33
First American Data Tree	23
Leica Geosystems Solutions Center	2
Lewis & Lewis	31
Office Depot (Member Benefit)	4
Reese Water & Land Surveying	31
Santiago Canyon College	19
Sokkia	11
Subdivision Map Act Seminar	25
Total Merchant Savings (Member Benefit)	45
Trimble	3
Tri State Photogrammetry, Ltd	13
Vista International	27

Hydrographic Surveying Services

Hydrographic Surveying Services:

- single beam bathymetry
- sidescan imaging
- ROV underwater video imaging

featuring:

- Trimble™ TerraModel® software for benthic surface models & reservoir volumes
- HyPack® Max for hydro surveys
- Imagenex Win881 for sidescan imaging



**REESE
Water
& Land
SURVEYING SERVICES**

For more information:
Tel/Fax: 805-543-5375 robert@reesesurveying.com
San Luis Obispo, CA

Geodetic & Land Surveying Services also available

QUALITY – PRODUCTS – SERVICE SUPPORT – FINANCING



Automatic Levels
Transits
Lasers and accessories
Robotic Total Stations
Total Stations



BUILD A PACKAGE

Buy a Total Station and we will Discount the Accessories.... (Data Collector, Tripods, Prisms, Poles, etc.)

You decide what you need.

- Complete Line of Topcon Total Stations, Robotic and GPS systems.
- PLUS Topcon Transits, Levels, Lasers and accessories.
- NEW, DEMO & USED

NEW, DEMO & USED EQUIPMENT SPECIALS

Topcon Special...

- FREE Tripod, Prism & Prism Pole with Purchase of a New Topcon Total Station
- While Special or Supply Lasts... Call for Info.



LEWIS & LEWIS ENTERPRISES

1800 CALLENS ROAD
P. O. BOX 1328 - VENTURA, CA 93002-1328
TELEPHONE (805) 644-7405

TOLL FREE
(800) 235-3377
sales@lewis-lewis.net

WEB SITE
www.lewis-lewis.net





RISK MANAGEMENT FOR LAND SURVEYORS



What About Me? Personal Risk Management

Over the last several years we've been discussing all forms of professional or business risk management as it pertains to your business of land surveying. We've gone over risk management principles, insurance, contract requirements, claims, and industry issues.

Now it's time to review some personal necessities. We'll review life, disability and long term care insurance as coverage for events that would, of course, affect your business but would definitely affect you and your family. You should consider protection against catastrophes that would alter your life, health and assets.

We won't worry about retirement, yet, and we'll leave homeowners, health and auto insurance alone for now since each of these items would take up a whole article. In the meantime, always be sure to consider your limits, deductible and policy forms and remember the minimal amount required by lenders or the Department of Motor Vehicles is probably not enough.

Life Insurance

Everyone is going to die and most everyone will be taxed on that event. You won't have to worry about it but someone such as your wife, your kids or your business partners will have to worry about it. You need to help out while you're around.

How much is enough? Generally you should consider getting 7-10 times your annual income maybe more. During hard financial times, like we have now, people need to consider looking at the conservative certainty of life insurance.

What could I use it for? To replace your income that would be lost on your death and to pay off the mortgage on your house or provide for your kid's education or your wife's retirement. It can even be used to fund a buy-sell agreement that would keep your business in the family and also guarantee they wouldn't need to sell your business to pay estate taxes.

What kind of insurance is there? Term, which is temporary, pays a death benefit and expires on a given date or after a number of years. Whole life, which is permanent, has a fixed cost and develops a cash value. Universal Life, which is like whole life, has an investment feature like a mutual fund.

Which is best? It depends on your age, your circumstances and your needs. Study up on the coverage available from different companies, talk to your financial advisor and your agent and get some proposals.

Disability Insurance

This is the Yogi Berra Insurance that pays you when you when you're out of work and you can't work and it pays you cash which is as good as money. There are all forms of coverage with deductibles and waiting periods and certain restrictions. Think of it as business interruption on yourself. Again, it's good to talk to your agent or broker and do some studying and get some quotes.

Long Term Care Insurance

With Nursing Homes costing up to \$70,000 a year, this is a good coverage to consider. There are certain requirements as respects types of disability and the care required and there are waiting periods but it is good to get some proposals and quotes. It's good coverage to buy early when it's less expensive even though most long term care occurs in the last 2-3 years of life.

Philosophical Observations

Considering all these coverages can be depressing. But it's real and you have to think about what would happen if you died or were disabled or had to go into long term care. What would happen to your finances, your family, and your business? Would there be enough money to take care of your expanded needs? Social Security, Medicare and your Health Insurance may pick up part of the cost, your assets can help, and you can get a reverse mortgage to pay some of the bills, but in the long run it is a good idea to have in place some of the coverage mentioned above.

Cost Benefit Analysis

Do a cost benefit analysis. What could happen? How much would it cost? And what can you do to fund it? Even if you don't do anything about it now, it's good to be aware of the risks, and start thinking about what you can do to mitigate them in the future. Like the looming California Earthquake it's not whether it will happen, but when. ■

ENGINEERING SUPPLY COMPANY

THE LEADER IN PRECISION POSITIONING SYSTEMS SINCE 1985

Call Toll Free: 800-788-3307

Two Full Service Locations To Serve You!

Concord, California
5700 Imhoff Dr., Suite J

W. Sacramento, California
1030 Riverside Pkwy., Suite 150

 **TOPCON** Sales - Service - Training - Rentals



There's No Limit To Your Productivity!

With Quality Topcon Products And World Class Customer Service!

Imaging and Scanning
Solutions



Advanced Robotic
Systems



RTK and Network
GPS Solutions



 **TOPCON**

UNIVERSITY

Factory Trained and Certified Sales, Service and Training!

Call Toll Free: 1-800-788-3307

www.escsurvey.com



Positioning Using GPS and CORS

Part I – Overview of GPS and Continuous GPS Stations (CGPSS)

Continuous GPS Stations (CGPSS) are permanently placed GPS receivers used by the academic and research community to monitor minute changes in the shape of the earth. Most surveyors are familiar with the Continuously Operating Reference Stations (CORS) that are managed by NGS. In this article “CORS” refers to official NGS stations and “CGPSS” is the generic term for Continuous GPS stations.

As with everything these days, surveyors want the quick fix that RTK surveying gives them. We could average a number of readings, but waiting 5 seconds to get a position is just sooooo slooow. Give me a number and give it to me now! It must be good since the data collector is showing the value to 0.0001 of a foot and it is in color! (Or so some people think.) RTK GPS excels in certain surveying tasks, but as with all tools, RTK has limitations.

There are times when relative accuracy might be a little more important than color. GPS is a very good tool to provide accurate *relative* positions for two survey points. In fact there are times when it would be nice to know where you are on some kind of datum thing. This series of articles is going to discuss post-processing static GPS observations, including the options available for determining the receiver's relative positions using CGPSS to process Static and Rapid-Static GPS sessions. We will look at on-line services that can process your GPS observations as well as how to obtain data files from CGPSS to use in your processing software. We will not discuss adjustment techniques for GPS sessions, only how to relate your surveys to CGPSS.

History

The predecessor to CORS came about in the late 1980's to provide fixed ground locations to compute more precise orbits for the satellites. As early as 1991, there were 21 operating stations installed for this purpose. NGS officially began CORS in 1994, with subsequent interest by the US Coast Guard; the US Army Corps of Engineers and the

FAA expanded the network. It is probably the interest by NASA's JPL and the US Geological Survey in studying crustal motion that contributed to the accelerated CORS network expansion for civilian uses. Since GPS is a very good relative positioning tool, small movements - cyclical, secular or episodic - could be monitored in near-real time to detect relative motions of large areas. California was one of the premier places to make these studies as this is where the North American Plate meets the Pacific Plate, and there is a great deal of earthquake activity.

For more information regarding the history of CORS, go to: <http://www.lacoastpost.com/SnaySolerCORS-JSE08.pdf>.

Datums, datums, my kingdom for only one datum.

In this article we won't try to untangle the mess we know as datums. This article acknowledges that the current reference frame of the North American Datum of 1983 (NAD83) is called the National Spatial Reference System of 2007 (NSRS2007). Also we will discuss the NAD83 Continuously Operating Reference System of 1996 (CORS 96) and a little bit about the International Terrestrial Reference Frame of 2000 (ITRF 2000) and 2005 (ITRF 2005). What is important for a surveyor to understand when working with these datums is that you must choose a consistent “epoch” or date for positions. Your epoch date does not have to be the date of the GPS survey, but it must be consistent for all positions for the survey.

On NGS Survey Data sheets and other official documents an epoch is shown as a year and decimal year. The epoch date for 1991.35 denotes approximately May 8, 1991, the midpoint of California's High Precision Geodetic Network (HPGN) observations. NAD83 (NSRS2007) has an epoch date of 2007.00, or January 1, 2007. Some of the CORS datasheets will also show an epoch of the date for their NAD83 coordinates.

Continued on next page

Relative vs. Absolute

Your local plane-surveyed topographic survey probably starts on an assumed grid location of N 5,000, E 5,000. All the data points located are relative to that origin using the latitudes/departures derived from angle and distance. Your grid origin coordinates really don't matter in your plane system. If you started at N 10,000, E 10,000, your topographic survey would still show features in their same relative position.

This is fundamentally true of GPS baselines as well. A "baseline", or "vector", between two receivers is derived from the differences of their 3D coordinates, but with much larger (and possibly negative) numbers than your plane topographic survey. This is the "relative" positional relationship. The "absolute" position of either of these two receivers comes from attaching one end of the vector to a known position on a particular datum on a particular date. The baseline or 3D difference from one point having a known "absolute" position is used to compute an "absolute" position of the other. But the concept of absolute is a misnomer, in that there is no absolute position on our forever changing earth. Absolute really means fixed to a datum on a specific date, allowing reference to that position.

GPS SURVEYS

Types of Surveys

Surveying with GPS can employ several techniques: static, rapid static, kinematic and real time kinematic (RTK). We will be considering the first two – static and rapid static – since these techniques require setting a receiver on a survey point, collecting satellite data for an appropriate amount of time and using data collected at a second receiver (either yours or a CGPSS) to compute a "baseline" or "vector" (the relative position between the two receivers). Using the data available from a CGPSS, it is possible to employ a single receiver and the concurrent CGPSS data to compute a baseline between the two receivers in a "differential" process. But don't mistake this differential process for "DGPS", which uses a completely different system of providing real time differences for your receiver.

GPS Survey Configurations

There are two types of surveys where the procedures discussed in this article might be used. The first type would be when doing a control survey. One variety of control survey is a radial survey where one receiver is a "Base" station that runs continuously during the survey at one point, while the other receiver is moved to all the other points being surveyed. The result is radial baselines emanating from one point. Another variation of control survey is a traverse type survey, where the receivers are moved from point to point, not unlike a total station traverse. The second type of survey is an RTK survey where you need to get good relative

positions. Your base station for the RTK survey can also be collecting data for post processing while the RTK survey is being done which will allow you to later place the RTK survey in a geodetic framework once you know the base receiver's "absolute" position.

The Antenna Height, ARP & Antenna Model



Rod with GPS antenna with notations.

When it comes to Antenna Height (AH) measurement, much like carpentry, it is better to measure twice, process once. A preferred practice is to measure the AH in feet and also in meters and verify both measurements are the same prior to processing. The AH is the vertical distance from the occupied point or station to the Antenna Reference Point (ARP). It is not the slant height. The ARP is usually the base of the antenna where it is attached to the rod or tribrach.

If you have measured the slant distance from the mark to the Antenna Slant Measuring Point (SMP), you must compute a vertical AH using the horizontal distance to the SMP and a vertical offset from the SMP to the ARP. These offsets may be found on the NGS antenna calibration page or usually on your antenna. Some software allows entering a slant height, and calculates a correct AH – be sure which measuring method is used. Errors in AH will cause errors not only in your vertical position, but your horizontal position as well.

The remaining components of the vertical measurement are the distances from the ARP to the L1 and L2 electrical phase centers (PC) of a particular GPS antenna. These offsets differ widely between antenna models and are different for the L1 and L2 frequencies. Separating the AH and the L1/L2 offsets for an antenna allows mixing antenna models on a survey, but therein lies a potentially significant error source. It is critical that the AH and L1/L2 offset values are correct for correct GPS baseline processing.

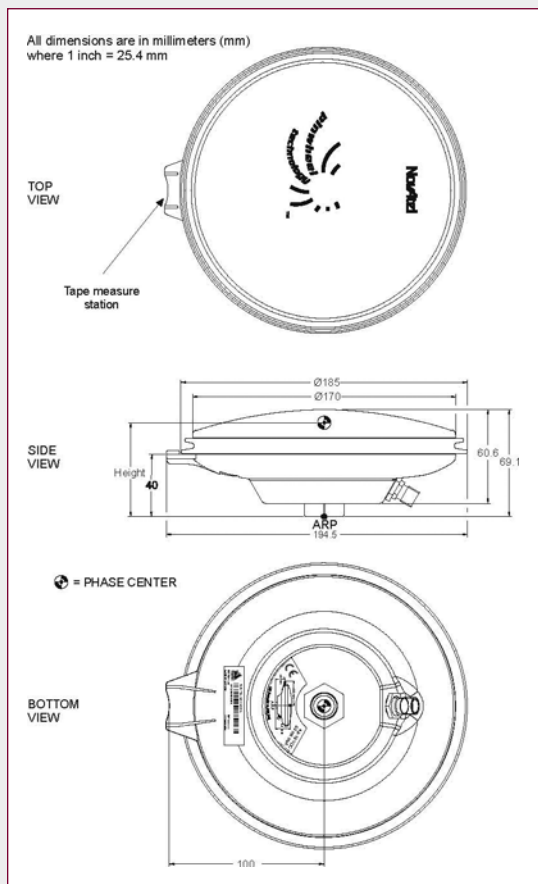
NGS has analyzed and developed the L1/L2 phase center offsets for many antenna models currently available

Continued on next page

Positioning using GPS and CORS

Continued from previous page

on the market and assigned very specific abbreviations denoting the manufacturer, model and version of a particular antenna. If you are processing GPS data using your own proprietary software, the offsets for each antenna model used in your survey must be properly applied. If you are submitting your GPS data in RINEX format to an online service, the proper abbreviations for your antenna model(s) must be used in order for the proper offsets to be assigned by the online service. To see a list of NGS antenna models and their observed offsets, go to <http://www.ngs.noaa.gov/ANTCAL/>.



Typical GPS antenna diagram from NGS Site (NOV702_3.00).

Common Times

When talking about the time a GPS receiver is collecting satellite data, it is important to remember that, for relative positioning techniques, data only counts when at least two receivers are running simultaneously. If you start Receiver 1, then go to a second point and start Receiver 2, the time used to process baselines starts when both Receiver 1 and 2 are collecting data. For a short base line (2-5 km long), dual frequency receivers can probably collect enough data in 5 or 6 minutes. However, in practice,

such a short time brings a high probability of a failed solution. It is customary to collect at least 15 minutes of common data with dual frequency receivers. Single frequency receivers usually need to collect data simultaneously for 20 to 30 minutes.

Observation Rate

In doing the field work you must set the epoch - or sampling rate - for your receiver to collect data. CGPSS have a variety of sampling rates from 1 to 30 seconds. A 5 second sample is a good rate to use on your receiver as it will provide parity with the available array of CORS observations rates, while still being thrifty with your receiver memory. If the local CGPSS are sampling at 1 second rates, and your receiver has the memory capacity to store the data for the desired duration, set your collection rate at 1 second.

Using CORS Data

Online vs. DIY CORS Options for Base Positions

For this article, a base station is any point for which you want to determine a position based on CORS sites. This processing can be done using either an on-line service such as OPUS, SCOUT or PPP, or by doing it yourself using your own post processing software. Both methods will be discussed, for if you do a lot of this, you will probably do both. Again, like all tools, there is no one perfect tool, and if you use them long enough you will eventually smack your thumb. To use CGPSS for rapid static you should wait for at least one day before you can download the CGPSS data. This is because although NGS provides data in hourly increments, it is easier to download data for a full 24 hour interval which is available online the following day. The non-NGS sites only provide data for a full 24 hour period.

CORS Data

CORS data are provided in 24-hour blocks for a particular "ordinal day." Sometimes these days are referred to as the "Julian" day, which isn't technically correct. The ordinal day is basically a day's number in the year: January 1 is day 001, and December 31 is day 365 in a non-leap year. An ordinal day begins on 0000 hours Universal Coordinated Time beginning at midnight in Greenwich, England. So, when you started your GPS receiver in California starting at 4:01pm Pacific Standard Time on day 050 (February 19), you will use CORS data posted for day 051 (February 20), since it was 0001 hrs on February 20 UTC when you began to record data. For a useful printable chart of the ordinal days for both leap years and non-leap years, go to: <http://amsu.cira.colostate.edu/julian.html> and <http://amsu.cira.colostate.edu/leap.html>.

Continued on next page



Proprietary Data Files

Your receiver is going to have some sort of proprietary file(s) that it creates to store the GPS data. The GPS data consist of carrier-phase measurement, the pseudorange measurement, observation times as well as the navigation code. In addition, the files might contain the station name, antenna height or AH, antenna model and receiver serial number. Assuming you are using post processing software from the same manufacturer as the receivers, the software will read all this information for processing. It is important to remember that the processing software is *not* determining the position of the GPS receiver; it is determining the relative position, or baseline or vector, between one or more receivers. If one of the receivers is not from the same manufacturer as the other receiver, say because you are using a CORS, then some additional magic has to happen so you can read both sets of data in your proprietary post processing software. That's where RINEX files come in.

RINEX, the DXF of GPS DATA

RINEX (Receiver Independent Exchange Format) is a generic text file format that allows for the processing of data from disparate GPS receivers. It stores in a single

ASCII file the phase, code and time information, as well as station name antenna type and antenna height. If you want to impress all your friends, remind them that this antenna height is not necessarily the same as the AH you measured (this will really impress all your non-surveyor friends).

RINEX formats have gone through some revisions, with the current version being 3.0. If your RINEX conversion software is converting to 2.0 or earlier, you should update your software. This update is most likely free, and may solve some problems you are having. If for some reason you cannot get a free RINEX converter from your manufacturer, there is a suite of programs from UNAVCO called "teqc" that will translate almost anything. It can be downloaded at <http://facility.unavco.org/software/software.html>. It is a command line program, so it is not what is called user friendly, but you can set up batch processing with it.

Coming up:

PART II - Using Online CORS Processing Utilities

The Editor thanks Rob McMillan, PLS, for his enthusiastic peer review of this article. He also thanks the authors for being such good sports about it. ■



ALLEN PRECISION EQUIPMENT

GeoMAX TOTAL STATION ZOOM 30 SERIES

Works when you do!



GEOMAX
A Hexagon Company

ZOOM 30 SERIES FEATURES:

- accXess™ EDM Technology
- USB Port
- Laser plummet
- Complete system
- Built for all environments
- Quadruple-axis compensation

NEW **PRICE AS LOW AS \$124.95/MONTH**

LEICA FLEXLINE TOTAL STATIONS

Combine features needed for any job



FEATURES AND BENEFITS:

- Complete flexibility in selecting features
- Removable USB memory stick
- Bluetooth® wireless technology
- ±1 mm accuracy in Prism mode
- > 1000 m range in Non-Prism mode
- 30 m Non-prism mode using laser pointer
- Quadruple axis compensation for best accuracy
- Integrated FlexField and FlexOffice software solution
- Lithium-Ion batteries for 20 hours of operation time

Like "New" demo models available



WWW.ALLENPRECISION.COM • 800-241-6223



By: Carl C. de Baca, PLS

Carl is the owner of Alidade, Inc., Elko, Nevada. He is a past editor of the California Surveyor, and is the current NSPS Area 9 Director.

Review of CLSA/NALS Conference 2011

The CLSA/NALS 2011 Conference at Bally's Hotel and Casino in fabulous Las Vegas, Nevada kicked-off on Saturday, March 5th with a pre-conference workshop on the new 2011 ALTA/ACSM Standards presented by the indefatigable Gary Kent, contributing author and overall organizer of the standards. The LS Review track, which ran for five days and featured accomplished instructors Tom Taylor, Steve Parrish, Tom Barnes, Jay Seymour, Neil King, Dave Woolley, Kelly Olin, and Jim Pilarski also began Saturday morning in an adjoining room.

Kent's very detailed presentation focused on the differences between this new, completely re-written set of standards and the 2005 set that came before. With a mixture of passion, humor and common sense, he easily demonstrated that this is the best set of standards in the 49 years since the first set was developed. A room full of professionals peppered him with questions, case examples and various scenarios which he fielded with enthusiasm, patience and no small amount of humor.

After the classes let out, fifty-some attendees queued up in front of Bally's for transport over to the Gold Coast Casino for an evening of bowling, organized by tireless CLSA Central Office. Making getting there (and back) an adventure in its own right, Jessica shepherded the erstwhile bowlers into a fleet of taxis and limos. In what is now a CLSA tradition, the bowlers let 'em roll with the help of a few Fresno State students filling out the teams. Mulligans were strategically employed, with hilarious results. One had only to purchase a special ticket entitling the bearer to step in and roll a frame in place of the unlucky recipient with a gutter-ball being the inevitable result. All proceeds of this great event went to the scholarship fund.

On Sunday, the opening remarks, delivered by NALS President Li Zhang and CLSA President Bill Hofferber marked the passing of long-time NALS members Bill Cuddy and Tom Foote, and CLSA member Ted Kerber. All three were active in their local and state organizations and will be sorely missed. RIP. The keynote address was delivered by Jeff St. John of the Obayashi Group, project manager in charge of construction of the Mike O'Callaghan – Pat Tillman Memorial Bridge over the Colorado River which just opened a few months ago. He discussed the challenges and innovations involved in constructing the bridge and accompanied his discussion with an informative slide show containing some very impressive pictures of various aspects of the project.

Once the conference proper started, prominent instructors Knud Hermansen, John Matonich, Steve Parrish and Gary Hancock offered three days of workshops on marketing, client relations and negotiations, public lands issues and forensic surveying. Other workshops offered by Lance Bishop and Jim McCavitt, Michael Binge, Tom Pisani, William VonKlug, Marti Ikehara, David Paul Johnson and Dave Henderson rounded out the educational track. This was a great lineup of instructors and there was much to be learned.

Our Conference was privileged to host the national student competition this year. On Monday, student teams from seven universities made half hour presentations on the topic of hydrographic surveys. Teams from Michigan Tech, University of Puerto Rico, Cal State University Fresno, Oregon Institute of

Technology, Troy University, New Jersey Institute of Technology and University of Maine talked expertly on a wide variety of aspects of hydrographic and bathymetric surveys. The judges, comprised of Wayne Harrison President of NSPS, Bill Coleman President-Elect of NSPS, Bob Dahn Vice President of NSPS, Carl C.de Baca NSPS Area 9 Director and CLSA Past-President and practicing hydrographer, Robert Reese, found all the presentations to be very good. Taken in conjunction with previously submitted technical papers and a poster accompanying each presentation, the judges found the Troy University team to have done the best job. Congratulations go out to Troy and to all the competitors and here's hoping that these schools and others as well continue to compete in future events.

Monday's luncheon included a humorous historic portrayal of P.T. Barnum by Doug Mishler, a history professor at University of Nevada - Reno, who kept the diners in stitches with his observations on American life made from the standpoint of one of the most famous Americans of the 19th century. I, for one, would like to experience that presentation again.

The scholarship auctions, both live and silent were as usual, a resounding success. The combined take from the events was over \$23,000.. It cannot be over-emphasized how much all involved (especially the students) appreciated both the generous donations of items and the generous bidding on said items. Lightnin' (Greg) Williams, as he always does, injected a feverish pace into the live auction with hilarious results – just ask Hans Hasselbach about that.

At the awards ceremony and luncheon, CLSA awards included: Member of the Year which went to Steve Martin and the recently renamed "Dorothy Calegari Distinguished Service" award – which went to Jim Herrick. CLSA Chapter of the Year was awarded to the Sacramento Chapter and Chapter Newsletter of the Year went to the Riverside/San Bernardino Chapter. The Photo of the Year was awarded to Robert Reese. NALS awards included Darryl "Skip" Harness, who received the Surveyor of the Year award, Nancy Almanzan who received the Meritorious Service Award, William "Bill" Mueller who received the Life Member Award, Terry McHenry who received an award for the Article of the Year and Sustaining Member of the Year was awarded to AeroTech Mapping. The winners of the Surveyor Olympics, which was overseen by NALS member and national TrigStar chairman Jerry Juarez, were recognized, as were the winners (and all of the competitors) in the aforementioned National Student competition. Congratulations to all the award winners!

A special thanks goes out to the vendors, sponsors, representatives of the host hotel and convention facilities, and the NALS and CLSA officers and CLSA Central Office who put this conference together – Great job everybody!

This was a great conference and a huge success, made even more exceptional, given the tough economic times we in both states are suffering through. Nearly five hundred people attended, satisfying their need for continuing education while demonstrating their commitment to the profession, making new friendships and renewing old ones. If you didn't make it to Las Vegas for this one, you can redeem yourself next spring as we hold another joint conference in Reno. **See you there!** ■

CLSA/ NALS Conference Thanks the Scholarship Auction Donors

Donations from Individual Members

John Atwood
 Claudia Barraqueta
 Lance Bishop
 Dorothy Calegari
 Carl C. de Baca
 Martin & Rhonda Crook
 Bill & Michael Cuddy
 Hal Davis
 Janice & Larry Durfee
 Dr. James Elithorp
 Vic Erickson
 Peter Friedmann
 Analisa Gonzalez
 Janine Hampton
 Jim & Barbara Herrick
 Mark & Debi Herrick
 Barry Hickerson
 Bill Hofferber
 Claude Hoffman
 Trent Keenan
 Kathy Kindall
 Errielle Lamb
 Chad Lansberry
 Frank Lehmann
 Barbara Littell
 Rick Martin
 Steve Martin

Armand & Chris Marois
 Les Marquoit
 Dan May
 Keith Nofield
 Paul Pace
 Evan Page
 Steve Parrish
 Larry Perkins
 Elmer Plummer
 Tom Propst
 Linda Richardson
 Steve Shambeck
 Dee Smith
 Brian Smith
 Lance Smith
 Lenard Smith
 Tim Smith
 Curt Sumner
 David Waddell
 Mike Welch
 Peter & Maureen Wiseman

Donations from Companies

Assurance Risk Managers
 Berntsen International, Inc.
 Boomers! Upland
 Boomers, Fountain Valley
 Boomers, Livermore
 Boomers, Modesto

Cache Creek Casino
 Central Coast Aerial Mapping
 Engineering Supply Company
 HJW Photo Science
 Infineon Raceway
 In-N-Out Burger
 Jackson Rancheria Casino & Hotel
 Monsen Engineering Supply of Reno
 Mountasia Family Fun
 Center/Skateland
 Mt Baldy Ski Resort
 Newmont Gold
 NV Cadastral Survey-BLM
 NV Energy
 Paramount's Great America
 Professional Surveyor Magazine
 Stantec Reno
 Vista International Insurance
 Wells Fargo Center for the Arts

Donations from CLSA Chapters

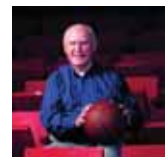
Cascade Chapter
 East Bay Chapter
 Northern Counties Chapter
 Orange County Chapter
 Sacramento Chapter
 San Diego Chapter
 Santa Clara/San Mateo Chapter
 Sonoma County Chapter

A special thank you to Claude Hoffman for donating his entire collection of antique survey instruments.

Special thanks to Marty Crook, Monsen Engineering for his time and talent in refurbishing and calibrating many of the antique instruments sold at auction.

And, of course, a special thank you to all those that purchased items at the auction!

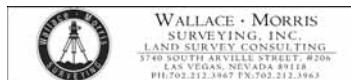
CLSA/ NALS Conference Thanks the Sponsors



William T. Cuddy, PLS



Central Coast Aerial Mapping, Inc



Nancy Almanzan & Li Zhang, NALS Members
 Los Angeles Chapter, CLSA
 Riverside/ San Bernardino Chapter, CLSA
 Santa Clara/ San Mateo Chapter, CLSA
 Bakersfield Chapter, CLSA
 Dave Morlan, NALS Member
 Southern Chapter, NALS

CLSA/NALS Conference 2011 Highlights

Special thanks to Steve Shambeck, PLS Photography







Michael P. Durkee, a partner in the Walnut Creek office of Allen Matkins, represents developers, public agencies and interest groups in all aspects of land use law. Mike is the principal author of Map Act Navigator (1997-2011), and co-author of Ballot Box Navigator (Solano Press 2003), and Land-Use Initiatives and Referenda in California (Solano Press 1990, 1991). 415.273.7455 mdurkee@allenmatkins.com

Q&A SMA Expert

Question

I have been working with a local jurisdiction on possible conditions of approval for my Tentative Map. Though we have been able to work out many of our disagreements, I am concerned that there may be some that we cannot work out and I might have to file a legal challenge. Can you tell me what kind of procedural steps are necessary in filing such a lawsuit, and are there any helpful tips you can provide?

Discussion

Thank you for your excellent and very important question. This may sound unusual coming from an attorney, but no one likes a lawsuit. Nevertheless, at times, it becomes the only option. And if it does become necessary, then it is crucial to know the procedural prerequisites to bringing a lawsuit. While these may seem at first to be minor details, not following them can result in your entire lawsuit being dismissed before the court ever considers the merits of your legal claims.

The first determination a subdivider must make before filing a lawsuit is the nature of the legal claim. Generally speaking, if the legal claim arises from a local agency decision concerning a subdivision map, then the controlling law is the Subdivision Map Act, and the Map Act's procedural requirements for filing a lawsuit would apply. However, a local agency's actions concerning a subdivision map can also implicate other statutes such as the Mitigation Fee Act, the Planning and Zoning Law, and the California Environmental Quality Act (CEQA). The importance of determining the nature of the claim and its controlling law, and therefore the procedural requirements that apply, is illustrated by the case of *Fogarty v. City of Chico* (2007) 148 Cal.App.4th 537.

The Fogarty lawsuit, successfully litigated by the author on behalf of the City of Chico, turned on a crucial mistake made by the subdivider: the subdivider filed its lawsuit within the Map Act's 90-day statute of limitations (Gov. Code § 66499.37), but failed to serve the lawsuit, i.e., deliver a copy of the lawsuit to the City and the Real Party in Interest, within that same 90-day statute.

The dispute leading to the lawsuit arose when the Chico Planning Commission approved the subdivider's map. That approval was appealed to the City Council. The City Council did not hear the appeal for some time (giving rise to a potential subdivider claim of automatic approval under Map Act section 66452.5). When it finally did act on the appeal, the City reconfigured lots on the Map in order to create some open space, which the subdivider opposed. The subdivider brought a lawsuit challenging the Council's decision under the Subdivision Map Act, but, as stated above, did not serve the lawsuit within the Map Act's statute of limitations. The trial court held for the City.

On appeal, the subdivider changed tactics and stressed that the Council's action was an "exaction" under the Mitigation Fee Act, which

Act has a longer statute of limitations and contains no "service on the City" requirement like the Map Act. Under the Mitigation Fee Act, prior to filing a lawsuit, the challenger must provide the local agency with a written "protest" that explains the nature of the challenger's claim within 90 days of the "imposition" of the challenged fee, dedication, reservation, or other exaction. The challenger then must bring his lawsuit within 180 of that written notice. (Gov. Code § 66020(d).) In the Fogarty case, the subdivider arguably had served a written protest within the 90-day deadline, and had filed the lawsuit within the 180-day deadline. However, the Court of Appeal found that the challenged City action was not an "exaction" under the Mitigation Fee Act. The Court found that the Mitigation Fee Act applies only to "the imposition of any fees, dedications, reservations, or other exactions imposed on a development project" (Gov. Code § 66020(a)), and that the common element to fees, dedications, reservations, and exactions is that the developer gives something tangible to the local agency. The City action challenged by the subdivider was not a requirement that the subdivider give something to the City, but rather a lot reconfiguration on a Tentative Map. Therefore, the Court held that the Subdivision Map Act, not the Mitigation Fee Act, applied, and since the subdivider failed to serve his lawsuit on the City within 90 days of the City's action, as required by the Map Act, the Court dismissed the subdivider's lawsuit.

But what if the challenged condition was clearly a condition of approval under the Map Act and also clearly an "exaction" under the Mitigation Fee Act? It is not clear which of the two Act's statute of limitations would apply. And if one were to decide that the Mitigation Fee Act does apply, further complicating this scenario is the language of the Mitigation Fee Act as to when its statute of limitations commences. Under the Mitigation Fee Act, the statute of limitations is said to begin when an exaction is "imposed" on the development. But the meaning of "imposition" is not clear under the statute. Does the imposition occur when the local agency approves the Tentative Map and the condition of approval requiring the payment of a fee? Or does the imposition occur when the subdivider applies for a building permit and actually pays the fee?

Since attorneys are risk averse, the safest answer is always to apply the shortest possible statute of limitations. Another strategy for eliminating this risk is for the subdivider and the local agency to agree on express conditions of approval, as I discussed in my previous column, that clearly establishes the date of "imposition."

The foregoing should make clear that filing a lawsuit after a local agency has made a decision concerning a subdivision map is complicated, and the different procedural requirements under controlling law must be strictly followed. If determining the applicable law is unclear, and the issue is not addressed in the local agency's conditions of approval, then the safest strategy is always to file and serve the lawsuit within the shortest applicable statute of limitations (i.e., the Map Act's). Otherwise, as occurred in the Fogarty case, the lawsuit might be dismissed without any consideration of its merits. ■

CLSA PUBLICATION ORDER FORM	CLSA MEMBER	PUBLIC AGENCY	NON MEMBER	NO. OF COPIES	TOTAL
2011 Complete Package: PLS Roster, Pre '82 CE Numerical Listing, PE & PLS Act, Board Rules, Subdivision Map Act & <i>Index</i> , Misc. Statutes & Binder	\$35.50	\$49.00	\$71.00		
2011 Complete Package (as above) plus CD	\$41.50	\$58.00	\$83.00		
2011 Refill Package includes: PLS Roster, PE & PLS Act with Board Rules, Subdivision Map Act <i>and Index</i> and Misc. Statutes	\$27.00	\$37.00	\$54.00		
2011 Refill Package (as above) plus CD	\$33.50	\$46.00	\$67.00		
2011 PE Act & PLS Act with Board Rules (5 ½ x 8 ½)	\$10.50	\$15.00	\$21.00		
2011 Subdivision Map Act and Index (5 ½ x 8 ½)	\$10.50	\$15.00	\$21.00		
SMA Navigator: by Mike Durkee, Esq.	\$42.00	\$45.95	\$49.95		
California Coordinate Projection Tables – NAD '83	\$10.00	\$15.00	\$20.00		
Chaining the Land, Second Edition	\$65.00	\$72.00	\$95.00		
Right of Entry Package 50 brochures, 10 flyers, 5 cards, 50 door hangers	\$22.50	\$32.50	\$45.00		
Right of Entry Cards (minimum order is 2)	\$1.50/ea.	\$2.00/ea.	\$3.00/ea.		
Right of Entry Door Hangers (Pkg. of 50)	\$5.00/Pkg.	\$7.00/Pkg.	\$10.00/Pkg.		
Right of Entry Brochures Info for law enforcement & land owners (Pkg. of 50)	\$10.00/Pkg.	\$15.00/Pkg.	\$20.00/Pkg.		
Right of Entry Flyers Info for Land Surveyors (Pkg. of 25)	\$5.00/Pkg.	\$7.00/Pkg.	\$10.00/Pkg.		
Corner Record Forms – BORPELS 1297 (Pkg. of 25)	\$10.00/Pkg.	\$15.00/Pkg.	\$20.00/Pkg.		
Land Surveying Brochures (Pkg. of 50)	\$15.00/Pkg.	\$18.00/Pkg.	\$30.00/Pkg.		
CLSA Exam Guide	\$25.00	\$35.00	\$50.00		
Standard Contract Forms Agreement for Professional Services (Pad of 25)	\$4.00/Pad	\$6.00/Pad	\$8.00/Pad		
Land Surveying for the Land Owner & Real Estate Professional , by Daniel E. Beardslee, PLS	\$8.00	\$12.00	\$16.00		
CLSA Safety Tailgate Meeting Guide	\$25.00	\$35.00	\$50.00		
CLSA Decal/Bumper Sticker (___ Decal or ___ Bumper)	\$1.50/ea.	N/A	N/A		
Land Surveying Story/Coloring Books (Pkg. of 10)	\$24.00/Pkg.	\$28.00/Pkg.	\$48.00/Pkg.		
CLSA Baseball Cap	\$12.00	\$17.00	\$24.00		
CLSA USB (256 MB)	\$8.00	\$12.00	\$16.00		
CLSA Padfolio	\$8.00	\$12.00	\$16.00		
CLSA Lapel Pin	\$6.00	N/A	N/A		
"Choose Your Path...Make Your Mark" DVD	\$3.00	\$5.00	\$6.00		

Subtotal

- Member prices are only available to State members of CLSA.
- Please allow 2 weeks for delivery.
- Orders must be received by 1:00 PM for next day FedEx Delivery.
- **Mail your order form and payment to:**
 CLSA Central Office
 526 South E Street
 Santa Rosa, CA 95404
 Phone: (707) 578-6016 Fax: (707) 578-4406
- Difference between member & non-member price may be applied toward membership.

Shipping & Handling
 Up to \$19.99 add \$9.50
 \$20.00 - \$40.00 add \$12.50
 \$40.01 - \$60.00 add \$14.50
 \$60.01 - \$10.50 plus 3% of total

Next Day Shipping provide FedEx Account Number
 # _____
Add \$10.00 Handling fee.

Subtotal – Include Shipping & Handling

CA Sales Tax
 Outside Sonoma County Tax 8.25%
 Sonoma County Tax 9%
 Santa Rosa 9.5%

TOTAL

Payment Enclosed:
 Check MasterCard Visa

Account #

Expiration Date & CID#

Authorized Signature

Shipping Information	
(Publications will be shipped FedEx Ground. Please provide physical address)	
Name _____	CLSA Member # _____
Company (if company is mailing address below) _____	
Address _____	
City/State/Zip _____	
Phone _____	Email _____



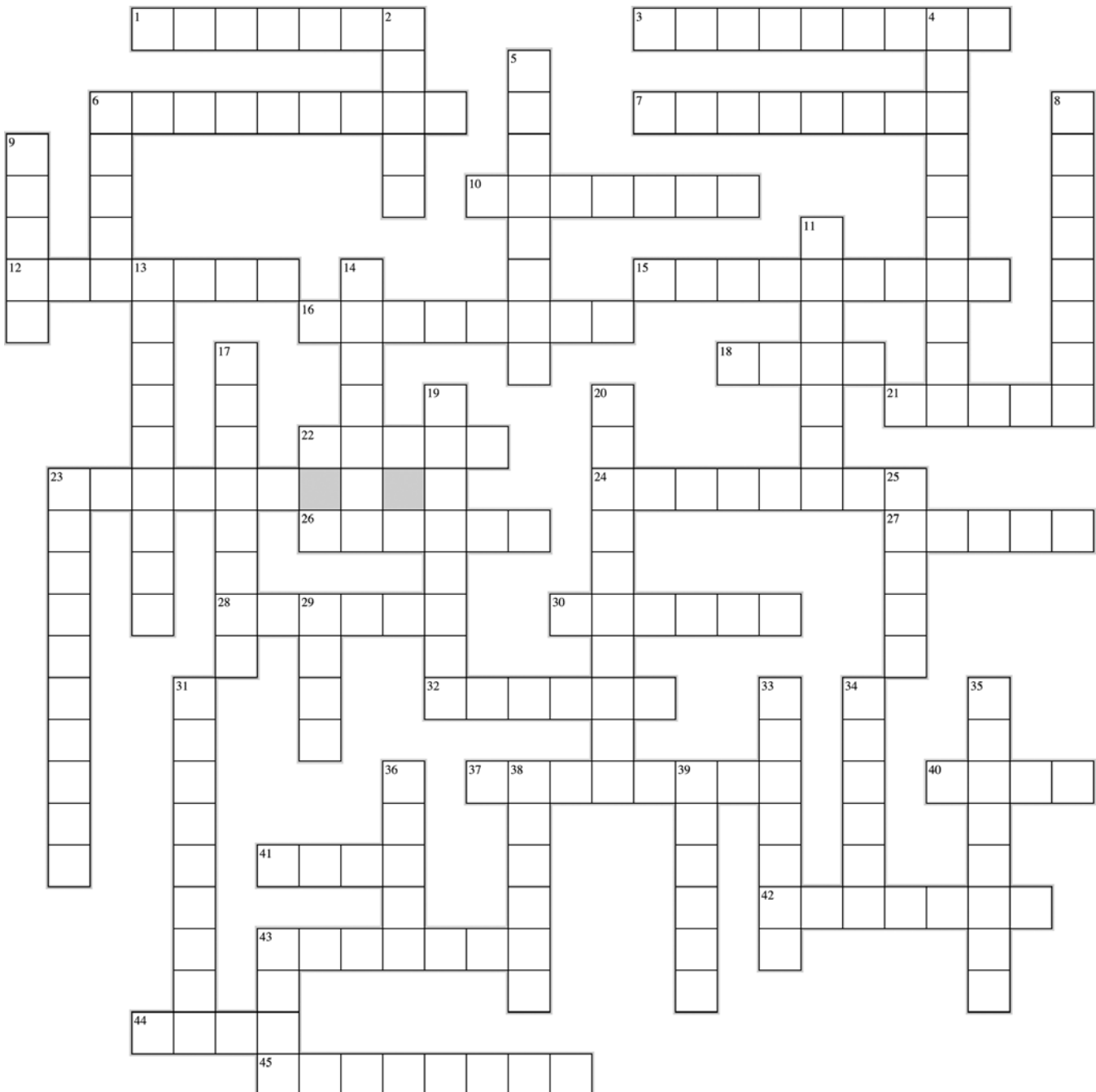
Crossword Puzzle

By: Ian Wilson, PLS

Ian Wilson, PLS is the Director of Survey for Cardno WRG, Inc. in Roseville, CA. He started surveying in 1988 in Southern California and is now enjoying life in Northern California. Ian enjoys hearing from fellow members about the crossword puzzle and is always looking for clue ideas and input. He is licensed in California and Nevada and has specialized in boundary, topographic and Land Title surveys. His expert witness practice in boundary and easement issues is growing. Ian has been a member of CLSA since 1988.

CLSA Crossword Puzzle #18

If you have an idea for a puzzle theme or a clue you would like to include in an upcoming puzzle, email to clsa@californiasurveyors.org



Across

1. BRAND OF AIRCRAFT USED FOR GRAV-D
3. LOCATION OF BRITISH OBSERVATORY NEAR ZERO
6. SPINNING OVAL
7. BAR OR IMPEDIMENT
10. PROJECTIONIST
12. STATE GEODETIC ADVISOR FROM NGS
15. AIRPORT SITE OF THE NGS GRAV-D PROGRAM
16. WRITTEN TITLE DEFENSE
18. TYPE OF CLAIM
21. MISSTATEMENT
22. AUSTRALIAN ROCK MOUND
23. ENGLISH ASTRONOMER AND CHAIN BUILDER
24. ONE WHO MAKES SURVEYS
26. SPONSOR OF AB 1023
27. NICKEL/IRON ALLOY
28. STATE OF NALS
30. TYPE OF TEST MENTIONED IN WOOLLEY ARTICLE
32. GREEK GEOMETRIST
37. EMPLOYER OF THIS YEAR'S KEYNOTE SPEAKER
40. EL DORADO COUNTY SURVEYORS AND OTHERS GROUP
41. NEW NAME FOR CORS
42. TITLE SYSTEM
43. PLAINTIFF IN 148 CAL.APP.4TH 537
44. SPC ELEVATION
45. SUBJECT OF PC 602.8

Down

2. GIRL SCOUT MERIT BADGE PROGRAM DEVELOPER
4. PARALLELLIFIER
5. OFFICIAL REAL ESTATE REGISTER
6. TIDAL BORE
8. INHERITABLE ESTATE
9. RIGHT OR TITLE
11. ABOUT THE SIZE AND SHAPE OF IT
13. MAINE PRESENTER IN VEGAS - 2011
14. SMALL HAWAIIAN FEE
17. A LAND OWNERS INTEREST
19. ALONG A STREET
20. TYPE OF INJURY INSURANCE
23. EARTH CENTERED
25. GPS DATA FORMAT
29. CONTINUOUS BODY OF ORE
31. MOVE IN A STRAIGHT LINE
33. SUCCESSIVE RELATIONSHIP RIGHTS
34. EL DORADO COUNTY SURVEYOR
35. COLOR OF EXHIBIT HALL 2011
36. HALF A HIDE
38. 2011 CLSA RESORT
39. CLSA LOBBYIST
43. THIRD OF A YARD

MERCHANT SERVICES Total Merchant Savings
PAYMENT SOLUTIONS


Credit Card Processing for Land Surveyors

**OPEN A NEW MERCHANT ACCOUNT AND RECEIVE
A FREE CREDIT CARD TERMINAL**

- Credit and Debit Cards Processing
- VERY COMPETITIVE RATES
- Gift Card and Electronic Check Processing
- Fast Turnaround for Processing Visa/MC American Express and Discover
- Wireless and Internet Processing Solutions



FREE
Credit Card
Terminal

*No set up charge. \$75 yearly maintenance fee.

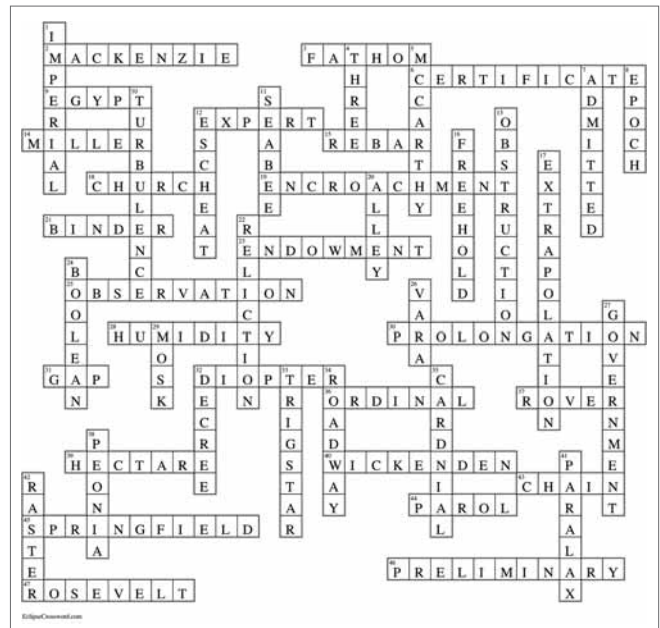
15 YEARS OF PAYMENT PROCESSING EXPERIENCE! Total Merchant Savings

Call or e-mail Julie Today

707-548-3086

julie@totalmerchantsavings.com www.totalmerchantsavings.com

Key to CLSA puzzle #17 (Surveyor Issue # 164)





Sustaining Members

Steve Dillon
ARROWHEAD MAPPING CO.
 431 Mac Kay Drive
 San Bernardino, CA 92408

Phone: 909-889-2420
 Fax: 909-889-2664



ALLEN Instruments & Supplies

Bill Stull
 Sales Manager
 602.359.0359 Mobile

800.272.0180 • Fax 480.994.8337
 7114 East Earll Drive
 Scottsdale, AZ 85251




MITCHEL E. BARTORELLI
 ASSOCIATE
(775) 358-9491

Digital Mapping
 Aerial Photography
 GIS Services
 Digital Orthophotography
 Volume Services
 Global Positioning Services

1925 E. PRATER WAY
 SPARKS, NV 89434-8938
 Email: MBartorelli@TriStateLtd.com

www.TriStateLtd.com
 FAX (775) 358-3664
 (800) 411-3752

SURV-KAP



520-622-6011
 1-800-445-5320
 FAX: 520-792-2030
 www.surv-kap.com

John G. Baffert
 President

P.O. Box 27367 • Tucson, AZ 85726 • 3225 E. 47th Street • 85713



First American Data Tree

The Nation's Single Largest Digital Provider of Recorded Land Documents and Property Information Online, Anytime

www.DataTree.com



Trimble Navigation Limited
 5475 Kellenburger Rd.
 Dayton, OH 45424-1099

800.538.7800
 937.233.8921
 937.233.9441 fax

SECO

www.surveying.com

4155 Oasis Road • Redding CA • 96003
 (800) 824-4744 or (530) 225-8155



LEJA SURVEYING CORP.

Land Surveying & Mapping • Court Diagrams
 Legal Descriptions


Steve Leja
 PLS, 5933

Telephone (909) 797-3043
 Cell (909) 709-6861 • Fax (909) 797-3876
 13642 Highland Oaks Dr. • Yucaipa, CA 92399

ENGINEERING SUPPLY COMPANY
 THE LEADER IN PRECISION POSITIONING SYSTEMS SINCE 1985

Two Full Service Locations
 To Serve You! 800-788-3307

Concord, California
 5330 Walnut Dr., Suite 7
 W. Sacramento, California
 1000 Riverbank Plaza, Suite 100



TOPCON Sales • Service • Training • Rentals

There's No Limit To Your Productivity!
 With Quality Topcon Products And World Class Customer Service!

Sustaining Members

SALES • RENTALS • SERVICE • TRAINING

CALIFORNIA SURVEYING & DRAFTING SUPPLY

SACRAMENTO • OAKLAND • FRESNO • LAS VEGAS
 LOS ANGELES • SAN DIEGO

800.243.1414 • www.csdsinc.com



Lewis & Lewis
 (800) 342-3607

Sales - Rental - Repair - Financing
 www.lewis-lewis.net

VENTURA: 1600 Callens Rd. Ventura CA 93003 (805) 644-7403
 FAX (805) 642-3970 Email: sales@lewis-lewis.net
 SAN DIEGO: 540 S. Andreasen Dr., Suite A Escondido, CA 92029
 (760) 747-8823 FAX (760) 480-5778 Email: jump@lewis-lewis.net



CARTWRIGHT AERIAL SURVEYS, INC.

BILL CALMES
 PRESIDENT

EXECUTIVE AIRPORT
 5979 FREEPORT BLVD.
 SACRAMENTO, CA 95822

CALMES@CASMAP.COM
 WWW.CASMAP.COM
 (916) 421-3465
 FAX (916) 422-9631



Leica Geosystems Solutions Center


GPS Systems Total Stations 3D Laser Scanning
 GNSS RTK Network Field Supplies Stakes & Lath

2942 Century Place
 Costa Mesa, CA 92626
 800-938-0606

1447 Rollins Road
 Burlingame, CA 94010
 650-348-7247

Local presence ■ National reach ■ Global resources

Sustaining Members



DJ Johansen
 Business Development Manager

2001 Broadway Street, 3rd Floor
 Oakland, CA 94612
 Office 510-834-2001 x105
 Fax 510-380-6332
 Mobile 510-407-2283
 Email dj@hjw.com
 www.hjw.com



VERTICAL MAPPING RESOURCES, INC.
 An Acquisition of Terra Mapping

San Diego, CA
 4451A Avenida
 Coronado, CA 92118
 Ph. 619.435.1330
 Fax 619.441.1251

Sacramento, CA
 191 Blue Bluff Road, #110
 Folsom, CA 95630
 Ph. 916.223.1486
 Fax 916.221.1487



Mira Solutions, Inc.
 Photogrammetric Services

Jan Gill
 Accounts Manager

29300 Kohautek Way, Unit 130
 Union City, CA 94587
 Tel: 510-487-9688
 Fax: 510-477-9019
 Cell: 510-543-5950
 jan.gill@mirasolutions.com
 www.mirasolutions.com

Sustaining Members

Berntsen
Custom Identification Products

Tim Klaben
Marketing Manager

Berntsen International, Inc.
PO Box 8670
Madison, WI 53708-8670
www.berntsen.com
tklaben@berntsen.com

Tel. (608) 249-8549
Fax (608) 249-9794
Tel. (800) 356-7388
Fax (800) 249-9794

Marking the Infrastructure of the World.

Tt TETRA TECH

Susan R. Jackson
Business Development Director

3746 Mt. Diablo Boulevard, Suite 300, Lafayette, CA 94549-3681
Tel 925.283.3771 Call 510.910.8669 Fax 925.283.0780
susan.jackson@tetratech.com www.tetratech.com

EngineerSupply.com

Your Resource for Engineering Tools and Supplies.

BluePrint Storage
Laser Measuring Devices
Measuring Wheels
Surveying Equipment
Calculators
Digitizers
Hand Trucks
Metal Locators



CALL TOLL-FREE 800-591-8907

Visit Us on the Web at www.EngineerSupply.com

**MOUNT DIABLO
SURVEYORS HISTORICAL SOCIETY**
A CALIFORNIA NON-PROFIT PUBLIC BENEFIT CORPORATION (955 311620)

Burt's Solar Compass



COLLECT, PRESERVE & DISPLAY
ARTIFACTS of the LAND
SURVEYING PROFESSION

5042 Amethyst Ct. San Jose, CA 95136

www.mdshs.org

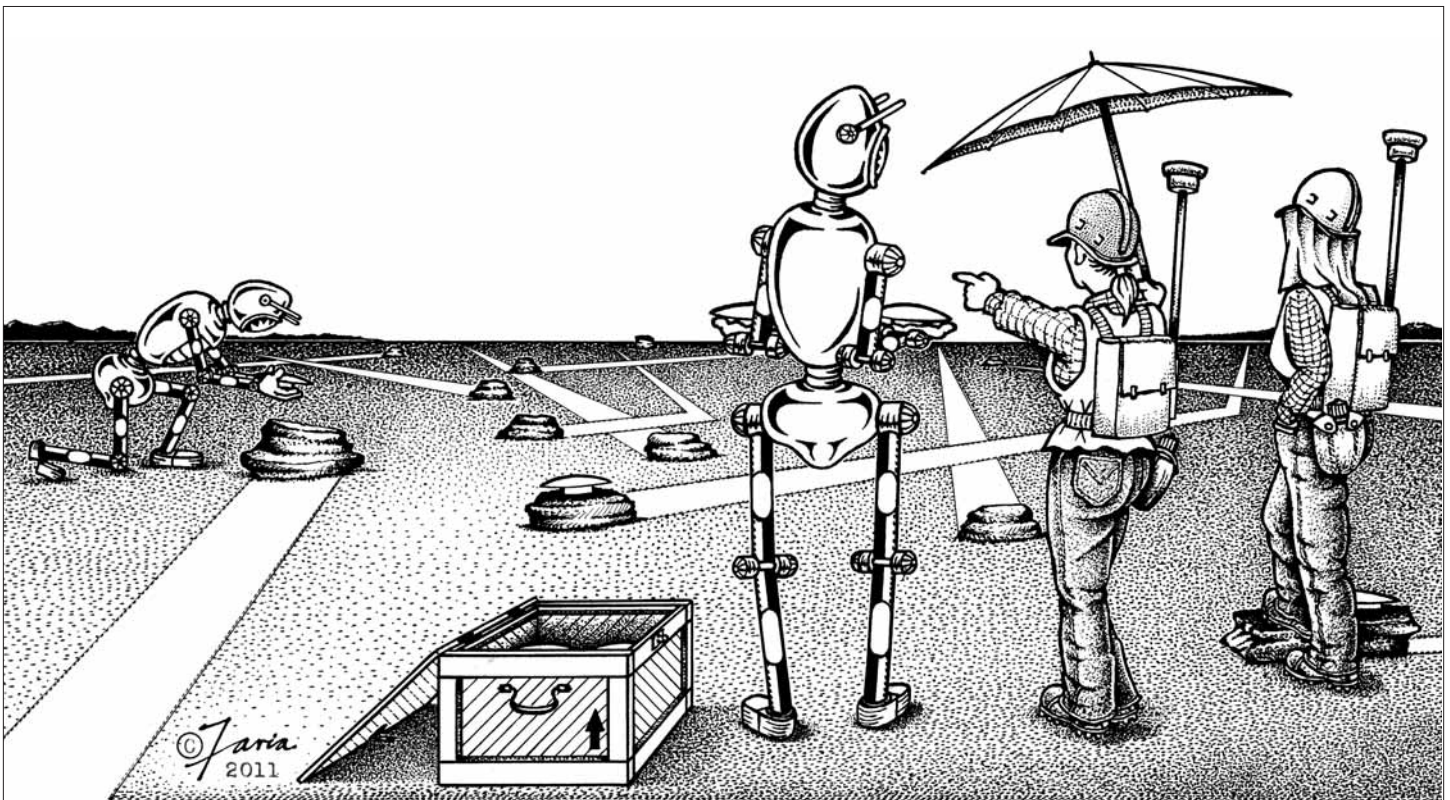
Sustaining Members

SUSTAINING MEMBERSHIP

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

526 So. E Street, Santa Rosa, CA 95404
Tel: (707) 578-6016 Fax: (707) 578-4406



A cartoon (by Nino Faria) is included in each issue of the California Surveyor. Many readers have commented on the cartoons over the years and we thought it would be fun to begin a cartoon caption contest.

Submit your caption for the cartoon above to clsa@californiasurveyors.org by June 1st. The top three captions will be published in the next issue of the California Surveyor.

Spectra Precision Reliability TDS Driven!

Does **LOW COST** mean
LOWER QUALITY?

YOU Decide.

Take our VSN Challenge:

Try the Spectra Precision
EPOCH 35 GNSS Rover with
Survey Pro software and a
one-day subscription to the
CSVSN (the Largest GNSS Network
in California) to see if this
low-cost network rover fits
your needs.



Lease for as low as
\$250 per month*
All purchases include a 6 month
subscription to the CSVSN, the only
FULL GNSS Network in California!
(a \$2,100 value)

To schedule your no-obligation trial, please contact:

<i>Sacramento</i>	Mike Woodel	916.847.8351	mike@csdsinc.com
<i>Bay Area</i>	Ben Scholes	510.909.7695	ben@csdsinc.com
<i>Fresno</i>	Chris Bardon	559.708.8593	chris@csdsinc.com
<i>Redding, Eureka Napa, Santa Rosa</i>	Tom Cardenas	916.806.2860	tomc@csdsinc.com

*Limited time promotion. OAC. See store for complete details.

Supporting productivity through innovative technology since 1986™



CALIFORNIA
SURVEYING  DRAFTING
S U P P L Y
SACRAMENTO • OAKLAND • FRESNO • LAS VEGAS
LOS ANGELES • SAN DIEGO