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SPRING 2021

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Material Deadline Dates

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Fall: September 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.

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COLUMNS

FEATURES

The *California Surveyor* is a bi-annual 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 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.

PRESIDENT'S MESSAGE

Robert M. McMillan, PLS, EiT
CLSA 2021 President

I hope you all had a happy National Surveyors Week. A resolution was introduced by Senator Brian Jones (R, 38th District, San Diego County) on March 10th recognizing National Surveyors Week in the State of California. On March 22nd, 2021, the first business day of our special week this year, the resolution was passed by the California Senate as Senate Resolution Number 18 of the 2021-2022 Floor Session. If you would like to watch the reading of the resolution and unanimous roll call vote you can find the recording at the following link. *https://www.senate.ca.gov/media-archive*. Scroll down the webpage to the 3/22/2021 Senate Floor Session and click WATCH on the right side of the table. The item starts at the 1:03:30 mark of the recording. While this may seem to be only a symbolic gesture for CLSA to pursue, it continues to bring CLSA in front of the California Legislature, and remind them that CLSA is the voice and advocate of the professional land surveyors of the state. The effort also increases exposure of our profession to the general public.

National Surveyors Week is a great opportunity for CLSA Chapters throughout the state to approach their local agencies for similar recognition of the hard work and critical nature of our profession. Next year, plan such an activity to not only inform the public, but also to remind local governing bodies of the importance of the profession, particularly in these times of budget challenges and competing priorities. If you are looking at our CLSA Strategic Plan, this is supporting Objective number 2: *Increase awareness of the surveying profession.*

Reflecting on the 2021 Conference, the Western Regional Virtual Survey Conference, just a few days ago I was anxiously awaiting starting it, and hoping for another success. Now that it is over, I can breathe a sigh of relief that it lived up to our expectations. Thanks to the hard work of all participating state conference committees and central office teams, this year was another great success, judging by feedback I've received. By the time this issue of the *California Surveyor* is published, the event will be long over, and the follow-ups will be well under way. Follow-ups for our attendees include reviewing the recorded sessions they were unable to be reviewed or to be attended in person, incorporating the ideas generated from the educational sessions into their daily practice, continuing to study for their professional license exams, and considering options for new and additional tools to help attain their business goals. For our vendors, they will be following up with interested parties to schedule in-person presentations, hands on demos and inking sales contracts. For our *California Surveyor* and CLSA teams, have written articles about the conference and specific sessions. At CAMS, CLSA's management team, the order of business will be reconciling the financials, reviewing what went right, what went wrong, and determining how we can improve for next year. Learning, growing, changing....

We at the *California Surveyor* will also be experiencing change, as we say goodbye and a big thank you to our editor, Paul H. Mabry. Paul has been the editor since issue 189 in Spring of 2019. As a contributing author, I recognize Paul's talent for making small adjustments to articles that make a world of difference to the end result. In addition to his editorial duties, Paul also worked closely with his Assistant Editors. This prepared Joseph "Joey" Waltz to step up with a red pen in hand and take the helm as the new Editor of the *California Surveyor* magazine. Joey is already bringing new ideas to our publication. Please share any ideas for improvement you have for the *California Surveyor* with Joey, and be ready to submit your own articles for publication. Involvement of our members contributes significantly to the quality of our periodicals.

Keep yourself and your people safe.

Robert M. McMillan, PLS, EiT

EDITOR'S MESSAGE

Joseph Waltz, PLS
California Surveyor Editor

It has been a pleasure to serve as your Editor these past couple of years. My wife and I faced a difficult decision last year to relocate out of state due to her work as an infectious disease specialist. Fortunately, that is recently resolved in favor of us remaining here in the Bay area. Even so, I am grateful that Joey Waltz has stepped into the role of Editor of the magazine. I am so thankful for the support that both Robert McMillan and Joey have showed over the years. Joey is well qualified and has authored articles and served on our editorial panel for several issues. He brings a respected voice from the public sector in the southern half of our state. I will continue to support Joey and the magazine, and I hope you will too! I wish to especially thank each of the former Editors (you know who you are) who have shared encouragement (and humor) with me over the years.

Best Regards,
Paul Mabry

When Rob and Paul asked me to step up to assist CLSA as Editor of this magazine I was excited. Every aspect I have been involved in with CLSA has been so helpful for my personal and professional growth. I'm looking forward to taking on this responsibility; Paul's excellent work over the last few years has left me with some big shoes to fill.

I've enjoyed the work I've done with the editing team thus far, and I am looking forward to editorship of a magazine with such a history and a deep knowledge base. To get a bit of inspiration, I've been reviewing the back issues, covering 54 years! These are accessible to all members. This issue includes the first of many "From the Archives" features.

Heraclitus of Ephesus, Greek philosopher, said "There is Nothing Permanent except Change," this has been illustrated vividly in the last 15 months or so. What a time of change we've seen as every one of us has been affected by COVID-19. The economy has kept chugging along, with construction and service industries deemed "Essential." One of the biggest changes has been the Working from Home concept rolled out across agencies and companies so swiftly.

Paul Mabry, *California Surveyor* Editor, 2019-2021

This year's conference was no exception, with many of us attending from our new Home Offices. On page 7 there is a quick summary of what my key takeaways were, and I offer a huge "Thank You" to the conference committee and other state associations for an excellent four days.

We have some other great articles in this issue, with another installment of the Business Ethics article series, as well as an excellent article regarding Tidal Boundaries. We also have another Software Tips and Tricks article, a historical biography of William Minto, surveyor in Modoc County and a crossword puzzle for all you wordsmiths out there to solve on your lunch break, in addition to others. As always, I am open to your opinions, ideas, and suggestions. I can be reached directly at *joeywaltz@gmail.com*.

Stay safe and take care.

LEGISLATIVE REPORT

Michael Belote, Esq.
CLSA Legislative Advocate

Spinning Heads in Sacramento

Where to begin? As summer approaches, political leaders in Sacramento are facing issues which are really, and we mean *really,* unprecedented. In no particular order, consider the following:

- **Effect of the pandemic on the legislative process and the Capitol building itself:** In a typical year, the California Legislature processes approximately 2500 bills, enacting perhaps 1000. Bills literally are the product manufactured by lawmakers. With most staff working at home, and in-person communication severely limited, it simply is not possible to consider this many bills with any degree of care. Recently the Assembly and Senate agreed to limit the number of bills actually moving forward to twelve bills per member. Last year fewer than 400 bills were enacted and signed into law; while the 2021 total will be higher than last year, the system cannot process the volume of bills in the usual way.

  The Capitol itself remains almost entirely closed to the public, even as the June 15 re-opening of the state approaches. When the public's house re-opens fully is not clear. Staff clearly is concerned about thousands of unvaccinated people entering the building, but there is also pressure to open up when the state does. The problem is that the Capitol must be open to all od the public or none; there clearly would be perception problems with allowing lobbyists and others who "work" in the Capitol but not the general public.

- **Unprecedented levels of budget surplus:** It is often said in legislative circles that too much money is as big a problem as too little. At the beginning of the pandemic, there were forecasts of California budget deficits in excess of $50 million. Due to the amazing strength of the stock market (California is a hugely income-tax dependent state) leading to massive capital gains revenue, the state now enjoys a budget surplus of many tens of billions, plus money from the federal rescue plans.

  Recently the Governor's "May Revision" to his proposed January budget proposal was released. Normally the "May Revise" is a relatively technical document reflecting changes in revenue resulting from April tax filings. This year the May document was a *real* revision, because of the massive surplus and federal largesse. Basically tens of billions are proposed to be dedicated to homelessness, pre-K education, Medi-Cal enrollment for the undocumented, and housing. The Legislature has about a month to decide whether to approve the Governor's spending ideas, or assert their own priorities. The 2021-2022 budget must be passed by the Legislature by June 15, to be effective at the start of the fiscal year on July 1.

- **Recall:** In the midst of all of this head-spinning activity, it now appears clear that a gubernatorial recall election will be held in the fall. The only thing which could change the inevitability of the recall is if enough signatories to recall petitions elect to *withdraw* their signatures in the next six weeks, but that seems unlikely. The election itself likely will occur sometime between the end of September and the end of November. Already the recall circus had begun, and a bevy of candidates will emerge in the coming days. It is exceedingly likely that the Governor will survive the recall, but the political environment in Sacramento will be destabilized until the matter is resolved. It is no exaggeration to say that most decisions coming out of the Governor's office are at least to some degree viewed through the prism of the recall.

In the midst of all of this chaos, the CLSA Legislative Committee and Board continue to work for the surveying profession in Sacramento. Three bills directly relating to regulation of surveyors were introduced in 2021, with two of those already dead. The only bill directly relating to the regulation of surveyors still moving this year is CLSA-sponsored SB 414 (Jones). The bill defines cadastral surveying (amazingly, cadastral surveying is limited in the law to licensed land surveyors, but the term has never been defined), separates negligence from incompetence in the disciplinary sections, allows both graphic and narrative information to be included in records of survey pursuant to Business and Professions Code Section 8764, and expands from 30 to 45 days the time allotted to conduct appeals of Subdivision Map Act decisions. SB 414 has passed the Senate and will be heard in the Assembly in the coming weeks.

Hopefully, the coming weeks and months will restore a sense of normalcy to the legislative process, and far beyond that, to our lives.

Stay safe.

CENTRAL OFFICE REPORT

Kim Oreno, CAE
CLSA Executive Director

Greetings CLSA Members! The *California Surveyor* team has put another great issue together for you all. I hope you enjoy it. We've got almost half of 2021 under our belt and I'm happy to share upcoming events for the rest of the year with you. More information on these events can be found on the CLSA website (*www.californiasurveyors.org*).

June 11, 2021 – Webinar
The County Surveyor's Perspective – A Panel
For CLSA's June 2021 webinar, we'll be joined by Gabe Gabrielson (Sonoma County Surveyor), Kevin Hills (Orange County Surveyor) and Warren Smith (Tuolumne County Surveyor). Gabe, Kevin and Warren will discuss their roles and responsibilities in each organization, their funding sources including general funds, cost recovery options and monument preservation funds. They'll also discuss Subdivision Map Act/PLS Act Reviews for each organization and GIS records and digital submissions.

July 9, 2021 – Webinar
Contract Basics for Land Surveyors
Many land surveyors assume contracts are a black box they aren't supposed to understand. That isn't true! You shouldn't be signing a contract you don't understand. In this webinar, Landon Blake will cover basics of business contracts for land surveyors. That will include the purpose of a contract, the parts of a contract, and the red flags you need to look for when reviewing contracts. Landon will review the language in the CLSA standard contract and will also look at a contract sent by a potential client with major problems.

July 24, 2021
CLSA Board of Directors Meeting, Oakland, CA

August 6, 2021 – Webinar
Python Code Slinging for Land Surveyors
Python is one of the most popular programming languages in the world. It is also free and open source! Python can be used to script programs like ArcGIS, QGIS, and Trimble Business Center. In this webinar, Landon will give land surveyors a quick introduction to the Python programming language. He will show you how to download a distribution of Python, how to use a simple Python code editor, and will teach you the basics of Python syntax. As time allows, Landon will demonstrate the power of Python by writing a simple tool to filter and manipulate point data in text delimited files.

September 10, 2021 – Webinar
Project Management Tools for Land Surveyors
In this webinar, Landon Blake will show you how to use two different tools for project management. The first is Trello. The second is Basecamp. Landon uses both tools in his small business. Landon will share suggestions where you can set-up both tools for project management, with tips on how the tools can make your team more organized and efficient.

October 15, 2021 – Webinar
A Review of Mandeni v. Rabinowitz
The California Court of Appeals recently decided a case related to a fence encroachment in Los Angeles. In its decision, the court restores a bit of the sanctity of boundary locations per paper title rather than physical occupation. It also makes it easier for land owners harmed by a physical encroachment to require the removal of that encroachment by the neighbor. In this webinar, Landon Blake reviews the facts of the case and the legal issues it discusses.

— Welcome New Members! —

Leif A. Adams
Timothy D. Alldrin
Kevin M. Almeter
Raul Alvarado
Mark P Andrilla
David Ayala Vanegas
David Michael Beckwith
Amy L. Bledsoe
Bruce Clark Bonde
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Daniel Fables
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Walter Gwizdak
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Armando Axel Herrera
Scott Kandarian
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Thomas Pope
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Mike Reyes
Raul Renteria Rubio
Caleb Schwab
Marisol Serrano
Brett K. Silva
Chris Silva
Arthur Jesse Smith
Todd R. Smith
Jeffery R. Sortman
Enrique Terrazas
Josiah Tiner
Craig Steven Turner
Matthew Van DeValk
Eric M. Wilson
Jon Masao Yamashita
Elizabeth R. Zuniga-Becerra

Seven State
One Virtual Conferenc
Magnificent Opportuniti

Western Regional Conference Summary

By Joseph Waltz, PLS

This year's virtual conference was a hit, with approximately 1,200 attendees! In this massive regional conference, we joined Alaska, Arizona, Montana, New Mexico, Nevada, and Washington to learn and grow from each other. Every state has different laws and regulations, but we as Professional Land Surveyors have more things in common than different. Gary Kent, Jan Van Sickle, and Knud Hermansen were featured, with many additional speakers and topics.

I was able to attend several of presentations, and some of my highlights are below. The team at NALS, CLSA, and the other state associations also put together a "Virtual" exhibit hall, which had a proximity sensor so you could "Approach" a group of people or table to talk. It was pretty slick, and I was impressed with the software system that made it possible.

I have attended a handful of conferences now, and I always enjoy what Jan Van Sickle has to say; this conference was no exception. He had an entire series on GNSS and Geodesy, where he expounded on everything from the history of GPS, accuracy analysis, and modern implementations of

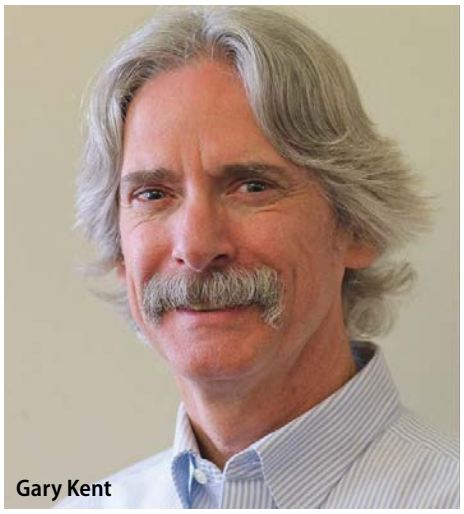
continued on page 8


Jan Van Sickle

advanced Geodesy. Jan is very entertaining, and literally wrote the book on GPS surveying: "GPS for Land Surveyors" (up to its fourth edition now). My fingers are still sore from furiously typing notes during his "Best Practices for GNSS Surveying" presentation.

In addition, I attended presentations on Water Rights, Use of Coordinates as Evidence for Boundary Location, and an Update from NCEES about workforce development and recruitment.

Another speaker was Gary Kent, discussing "The Art of Retracement" and the recent ALTA update. I have seen Mr. Kent speak before, so I look forward to reviewing the recorded presentations of those items soon. The state associations and presenters graciously agreed to record all seminars and presentations, and they are available to any attendee that couldn't attend everything they wanted. That includes me and many of my colleagues that attended, as the four-day conference was packed full with great presentations.


Gary Kent

Thanks to NALS, CLSA, and the other involved states for putting together a great conference and seminar series! I learned a lot, and I hope you did as well.

Jan Van Sickle Classes Review

By Joseph Waltz, PLS

You will certainly recognize the name Jan Van Sickle if you have ever researched GNSS, or if you have taken a surveying focused GNSS class at the college level. He literally "wrote the book" on this topic, *GPS for Surveyors*, now in its fourth edition.

I had the pleasure of meeting Mr. Van Sickle in person at the 2018 ESRI User Conference in San Diego while walking the hallways between classes. He was so friendly and happy to hear my appreciation of his work for us surveyors ("GPS for Surveyors" is only one of the Land Surveying books he has authored). Naturally, I was very excited to see his name as one of our featured speakers for the 2021 Regional Conference; and committed to attend all the classes he taught.

Below is a short review of each class I took of his, with a summary and reflection at the end. If you missed this excellent series on GNSS and geodesy, I highly recommend that you review the videos that were recorded. The conference app with recordings and notes will be available through August 31 for all attendees at *www.plseducation.org*.

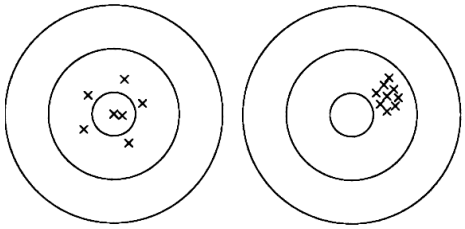
Accuracy, Error Analysis, and Statistics

The concepts and ideas of these Survey 101 level topics are review for anyone that has taken a Survey class with statistics covered, but I was still glad to have that review before jumping into the more complicated GNSS topics. It was also very valuable for the surveyors that have come into the career without any additional education.

This class covered the traditional QA QC concepts elementary to surveying: accuracy vs precision, blunders (mistakes) and their necessary correction, systematic vs random errors, and statistical theory such as bell curves, standard deviation, and basic analysis.

We also went through some real-world examples of jobs gone wrong. This was absolutely essential in applying the things we were learning, and Mr. Van Sickle presented many common mistakes, errors, and some other things that may or may not need correction. These included using the wrong prism constant, a bad rod height, and some funky EDM shots. They all combined to make for interesting discussion about how we do what we do. Collectively, we answered questions about which type of error were blunders (mistakes), which were systematic errors, and which were random. Equally important, we distinguished which errors could be corrected and which types must be fixed before continuing.

I think that this class, as presented, should be absolutely required for every new hire and technician in our field. Jan did an excellent job of succinctly and sufficiently explaining the common topics of survey error theory, some of the complexities, and their corrections.


Accuracy vs Precision

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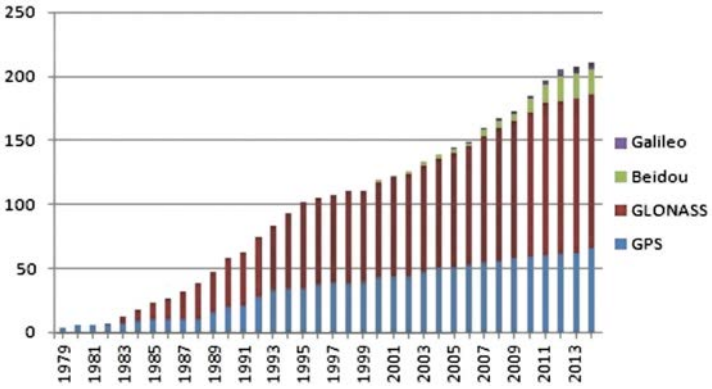
Best Practices for GNSS

Static, RTK, RTN, PPK, VRS, Oh My! GNSS is now a mature tool that has many ways of being used. Often as we train our new staff, we focus on the field issues. What is a monument? Where is the line? When is it safe to set those stakes? How far to search or dig? But when it comes to GNSS, it's easy to say, "connect to the network and press the button" or "Set up the base, connect to the radio, and start shooting" etc.

This class was an overview of the various GNSS methods and procedures in the modern era. We often depend on our dealers and sales-persons to explain how this stuff works, but do we understand the unseen processes? Mr. Van Sickle did a great job of explaining exactly what you're measuring (and how) with a GNSS setup. He also explained the differences between Real-Time Kinematic (RTK), Real-Time Network (RTN), Post-Processed Kinematic (PPK),and Virtual Reference Station (VRS).

Jan also explored the difference between a Base Station and a CORS. He posed and answered questions such as when should we use a static, post-processed solution and when should we choose a kinematic method? Is your network providing the best network correction solution, with as many satellites as possible? All of these are important topics and we discussed many of them together. It tied in nicely with the previous class since many of the answers to those questions depend on your "error budget." Needless to say, we left with a better understanding of why rough topo for stockpile phasing is not equal to property lines in Malibu or anchor bolt layout for a high rise in Downtown San Francisco.

And regarding class questions in the virtual environment, each conference class had a moderator with a "Chat" feature, so individuals could ask questions in real-time, and as appropriate, the moderator would present them to the speaker. Occasionally there would be some discussion on the side, which happens at live conferences as well. The moderators did a great job of keeping the discussions focused and on topic. I would like to give a big thank you to them, as they made this conference an excellent experience for myself and many others. Their work on the side allowed us to ask questions for later while the speaker could focus on the lecture.



History of GNSS Satellite launches

Coordinates and Geodesy

"What are the coordinates of my corners?" Many of us have had this question posed to us as we've worked in the boundary or land development field. There's just not a simple answer to this common layman's question, but we can't blame the questioner. For instance, a person can turn on google earth today and see displayed the latitude and longitude (to nine decimal places), so what's the big deal?

Of course, the answer is: "It depends." But in the era of smartphones and GNSS enabled everything, our customers and taxpayers are getting more knowledgeable about these formerly specialized topics. This course was an excellent overview of what a coordinate is, how it relates to GNSS and the Ellipsoid, and what the heck is a projection? I've got lat/long, can I just start surveying? Perhaps you've heard from your favorite technician, "Civil 3d (and its close companion, Map 3d) handle(s) lat/long fine now, so what's the problem?" Or "Just shoot everything in lat and long, and let's start drawing." Sadly, this won't help our engineering co-workers and clients as they need actual distances to calculate the design, location, or other items.

And the closely related companion to coordinate systems is vertical datums. Why can't I survey on the ellipsoid, and what is "Down?" We have these fancy Earth Centered, Earth Fixed coordinate systems but no one seems to design sites in them. Are we adding unnecessary complexity by using Ellipsoids and Projections?

These and many other questions were all discussed in this class. This was a valuable discussion of these topics, especially in context of the recent NGS presentations about Datum 2022.

Projected map of the Ecumene, the world as the Greeks knew it, Published in 1482.

continued on page 10

In conclusion, Mr. Van Sickle has such an easy and approachable way of teaching. His presentation style is very open and honest. He took questions and allowed for wide ranging discussions of these topics with the entire class. We learned a great deal about the general ideas behind GNSS as well as specific, actionable items to help our day to day surveying.

If you ever get a chance to see Mr. Van Sickle speak on these or related topics, I recommend attendance. He is extremely knowledgeable and distills his intellectual brew into a crisp and refreshing draft appreciated by every parched palette. His easy demeanor combined with advanced knowledge of these topics made for an enjoyable and applicable class.

Thank you, Mr. Van Sickle!

Taking Care of Business with Knud Hermansen

By David Kendall, PLS

Knud Hermansen (pronounced *canoed*) is a very experienced and colorful presenter. He is a university professor who holds doctorates in law and engineering as well as licenses to practice law, civil engineering and land surveying in multiple east coast states including Maine and Maryland. He is a former US Marine. He took on some very unsexy topics with aplomb. I was personally interested in his presentations on contracts, professional communications, ethics and small business management due to my recent experience as a sole proprietor of a land surveying startup. I had not heard of Mr. Hermansen before, but I believe he operates mostly on the East coast. He engaged very personally with the audience.

Several themes ran through all of his four presentations. These were limiting liability (tax and personal e.g. negligence); what to say (and not to say) in proposals, survey reports, plats and contracts; How to communicate effectively with clients and a cornucopia of ethical dilemmas for your philosophical amusement and discussion.

Contracts

The contracts seminar reinforced the value of many of the clauses in the CLSA standard contract which I use and which is available on our website, at *www.californiasurveyors.org* in the "CLSA member resources" under "Downloads." Also noteworthy in the COVID era was the apparent legal standing of electronically signed and transmitted contracts as well as e-mail agreements between parties. Several considerations were discussed regarding format, terms and content of contracts for different types of agreements. A key takeaway here was to put a time limit on proposals, e.g. this proposal expires in 45 days. Another was that contracts are not just for clients; employer/employee relationships are contractual as well and should be considered in a similar manner.

Ethics

The ethics class was certainly one of the highlights of the 2021 conference for me. Knud defines ethics as the practice of acting on your professional values. He refers to some ethical codes (see California Code of Regulations Title 16 Section 476) but most of the lessons appear to be based in common morality and accepted professional practice.

The conversation flowed smoothly from the topics of sharing data with other surveyors to ownership of work product and from copyright law to disclosure of information discovered in the course of your survey which might negatively affect your client (spoiler: consider including the harmful information in a private survey report rather than on the plat). I believe he is generally considering non-recording states but the ethical considerations were intriguing. Especially significant was the idea that an encroachment may not be considered material unless it affects the public health, safety or welfare. I call this a conversation as he was intrepid in fielding a barrage of piercing comments and questions from the gallery.

One of my great revelations from this presentation was the idea of a professional opinion being protected by copyright data. I've recently participated in a great deal of discussion regarding private surveys and how copyright law relates to a compilation of factual data. He touched on ownership of designs by architects and subdivision layout by surveyors which I found slightly irrelevant. However the idea of a copyright on a professional opinion for boundary location calls for further discussion and begs the questions: "At what point does a boundary establishment become a professional opinion? What is the value of your opinion?"

The final word on the subject was that information which the client requests to be confidential must remain confidential (See CCR Title 16 Section 476(d)) except when it is illegal or is a threat to health, safety and welfare of the public.

continued on page 11

Small Business Management

The Small Business Management presentation on Tuesday morning was very helpful to me as I enter my third year of business. Topics covered here included business structure, working relationships, taxes, labor standards and employee compensation. He did not discuss insurance which I feel may have fit nicely into the presentation and is a consideration on which I could use some perspective. However in the Ethics seminar he mentioned that liability insurance generally covers accidents or negligence but not intentional acts.

The first part described types of entities (Sole Proprietor, Partnership, LLC, Corporation, etc.) and the benefits of each including risk, tax liability and bureaucratic headaches. He then moved to ease of operation and transfer of the company when you no longer care to be there (where is the value and how is it distributed among key players?). These are all helpful topics to consider when starting or growing a business.

Next, he described the different working relationships (employee, contractor, agency) and gave some insight into how to use contract labor. While the recent AB5 legislation regarding contract labor in California may have seemed dramatic to us, after hearing his comparisons I did not feel like the differences between our state and the rest of the country were so stark.

The final segment discussed ways to minimize tax liability which is a passion for Hermansen. The employee compensation (overtime, stock options, alternative work schedules) discussion was informative as well as the reasoning on safety precautions as prescribed by OSHA.

Business and Professional Communications

Business and Professional Communications was my final session of what I found to be an excellent online conference. Knud discussed what to say in memoranda and reports and more importantly what not to say. Also important was how these quasi-legal documents (like correspondence and instruments) are signed and certified. Overall the discussions on content, etiquette and format were both informative and worthwhile, and highlighted how much is said between the lines of your professional writing. Hermansen provides general guidelines for business communications and provides examples for several different types of situations.

Several valuable lessons were gained by my attendance in this seminar:

- First and foremost, any professional should strongly consider engaging in a business communications class. The value is indisputable.
- Get a second set of eyes on your work. Peer review is one of our greatest tools as land surveyors and as businesspeople.
- Use a formal letter format for all outside correspondence (as opposed to a memo format).
- When making formal inquiries (including e-mails), list or number your questions clearly and add in a default option (what you will assume as an answer in case no response is received) This technique provides a legally defensible track to advance your project goals.
- Send letters to the adjoiners of the property you are inspecting. This could lead to additional business opportunities as well as more polite interactions with people when you are hopping their fences.
- Unless you are a sole proprietor, do not sign your own name to correspondence. Instead sign for the company or for the principal of the company in some fashion to defer liability.
- When collecting parol evidence in the course of an investigation, restate the testimony and send a copy to the provider. This allows them to correct any misstatements and puts them on notice of what you might be saying on the record.

Finally, a template for a survey report was provided which I found highly relevant. Knud also answers the age-old question of why I can never get an attorney to sign my contracts for services.

I found Hermansen's speaking style entertaining and easy to follow. He will shout at you for emphasis and spin a yarn during his answer to a question. Professor Hermansen is a qualified mentor for any young professional, and I enjoyed his presentations immensely.

More from Knud Hermansen is available on his faculty website at: *https://umaine.edu/svt/faculty/hermansen-articles/*

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In Memoriam

Theodore (Ted) V. Tronoff, Jr.
April 22, 1925 - January 4, 2021

On January 04, 2021, my father, Theodore V. Tronoff, Jr. (Ted) passed away at home at the age of 95. Like his father before him, my father was a civil engineer and land surveyor. My Dad had a long career: 68 years of professional practice that left lasting impressions on the land and shaped those whose lives he touched. I could write volumes, but the following suffices to introduce this great man to those of you who didn't know my father personally.

Ted Tronoff was born in Berkeley, California. He attended school in Berkeley and Albany and graduated from Berkeley High School in 1943. D-Day in World War Two was still a year away when he joined the Army Air Corps. Ted was chosen for Officer's Candidate School and qualified as a navigator/bombardier. He flew over thirty missions in a B-24 Liberator from Cerignola, Italy before being shot down and captured. He survived that incident and while he never spoke much about his war experiences, one story that sticks in my mind foreshadows his later career as a Civil Engineer and Land Surveyor of the highest caliber. On that occasion, Dad's bomber group was flying to Greenland. Although radio navigation was available, he never relied on radio navigation guidance without also confirming his plane's location using astronomical charts. Sure enough, on that mission, the Germans were spoofing the radio guidance. His plane was one of the few that did not go off course, run out of fuel and ditch in the North Sea.

After the war my Dad returned to Berkeley and entered the University of California, graduating in 1948 as a Civil Engineer. He joined his father in business in *Theodore V. Tronoff, Civil Engineers and Land Surveyors*, until being called back to active duty as a navigator on a Convair B-36 strategic bomber during the Korean War.

Ted ended his service career a second time to rejoin his father who was then working with Henry Doelger in the development of the Westlake subdivisions and other developments in Daly City, located just south of San Francisco. He later established his own office in Daly City, from which he retired at the age of 90.

Although my Dad and Henry Doelger were prominent and well-known developers in the Bay area, he was not just interested in Land Development. Ted Tronoff was an innovative and forward-thinking measurement scientist. Dad was one of the early adopters of electronic distance measurement for surveying purposes. He purchased a Geodimeter in the 1960's and used it to establish much of the primary control for the construction of the Bay Area Rapid Transit system, including the tube under the San Francisco Bay. Also, as a part of this work, Dad purchased a Clary computer. The programming on these desk sized monsters was hard wired! Among many other programs to assist in survey computations, Ted developed a program for California Coordinate System conversions. He also created a quantity calculation program for dredging volume computations as a part of his hydrographic survey work for the Army Corps of Engineers and the Western Division of the Navy.

Finally, although my father was always interested in the latest technologies, he never failed to impress upon me that boundary surveying was, first and foremost, a retracement and a matter of "following in the footsteps" of those who came before. A worthy legacy to all surveyors and especially this son. I will be forever in his debt.

— Bruce T. Tronoff, PLS

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GEO SQUAD

CHAPTER 2

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CHAPTER TWO

THE GEOSQUAD WASTES NO TIME PUTTING ALL THE SUPER SURVEYING EQUIPMENT THAT'S BEEN FITTED TO THEIR MIGHTY MECHS TO GOOD USE. ALL AROUND THE CITY, THEY FIND AND FIX HAZARDS -- FROM PESKY PROBLEMS TO DEADLY DANGERS...

... STRAIGHTENING SKYSCRAPERS...

YOU THINK THEY WROTE THE PLANS FOR THIS BUILDING IN *ITALICS!?*

WRENCH!

... PATCHING UP PASSAGEWAYS...

HAPPY MOTORING! ENJOY NOT BEING TERRIFIED ALL THE TIME!

... BRINGING BACK BUS STOPS...

BUS

A BUS STOP... ON A *PAVEMENT!* OOH, THIS TAKES ME BACK!

... PLUGGING POTHOLES...

myFace

Not A Bot

These mystery mechs have no trouble with the rubble! #GeoSquadGoals #TheStreetsAreFixed'.

... STACKING STRUCTURES...

TEAMWORK MAKES THE DREAM WORK, AND COUNTERWEIGHT MAKES THE TOWER STRAIGHT!

SCRAPE!

...AMENDING ART...

NEWS

KNOW HOPE!

FAUX NEWS

BREAKING: MIDDLETOWN GOES MAD FOR MARVELLOUS MECHS!

... DISENTANGLING DRAINS...

I FIXED THE SEWER SYSTEM! AND I SAW THINGS NO CHILD, OR ROBOT, SHOULD EVER SEE...

...CAJOLING CATS...

LET'S GET YOU BACK ON FIRMER GROUND, KITTY! NO *CAT*-ASTROPHES TODAY!

...FIXING THE FUTURE.

GEO GINGER -- CAN YOU START SCANNING THE ROADS? WE GOTTA DO SOMETHING ABOUT THIS SPAGHETTI HIGHWAY!

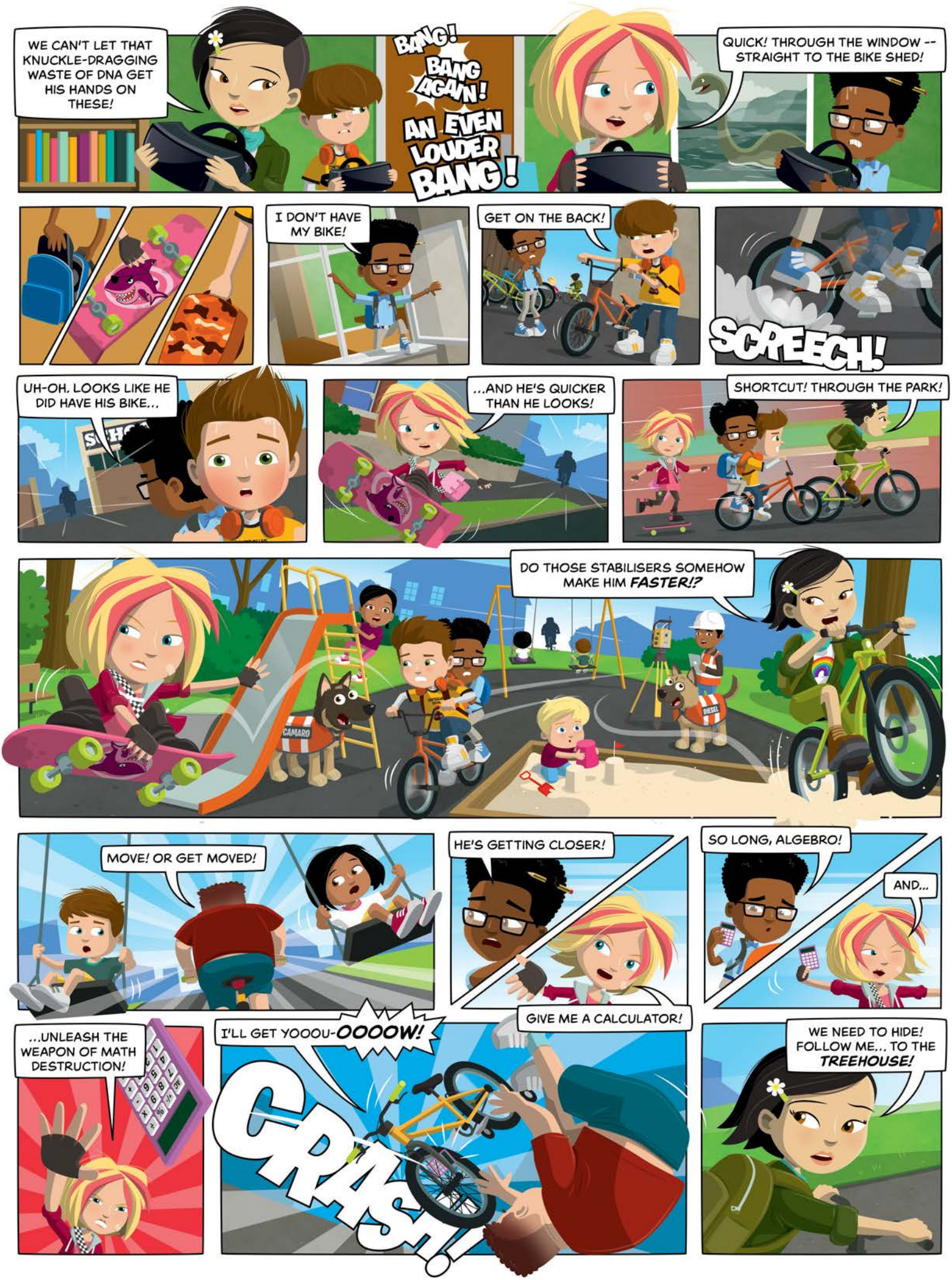
BACK IN THE PRESENT, HOWEVER, SOMEONE IS ABOUT TO INTRUDE ON THE GEOSQUAD'S PROGRESS...

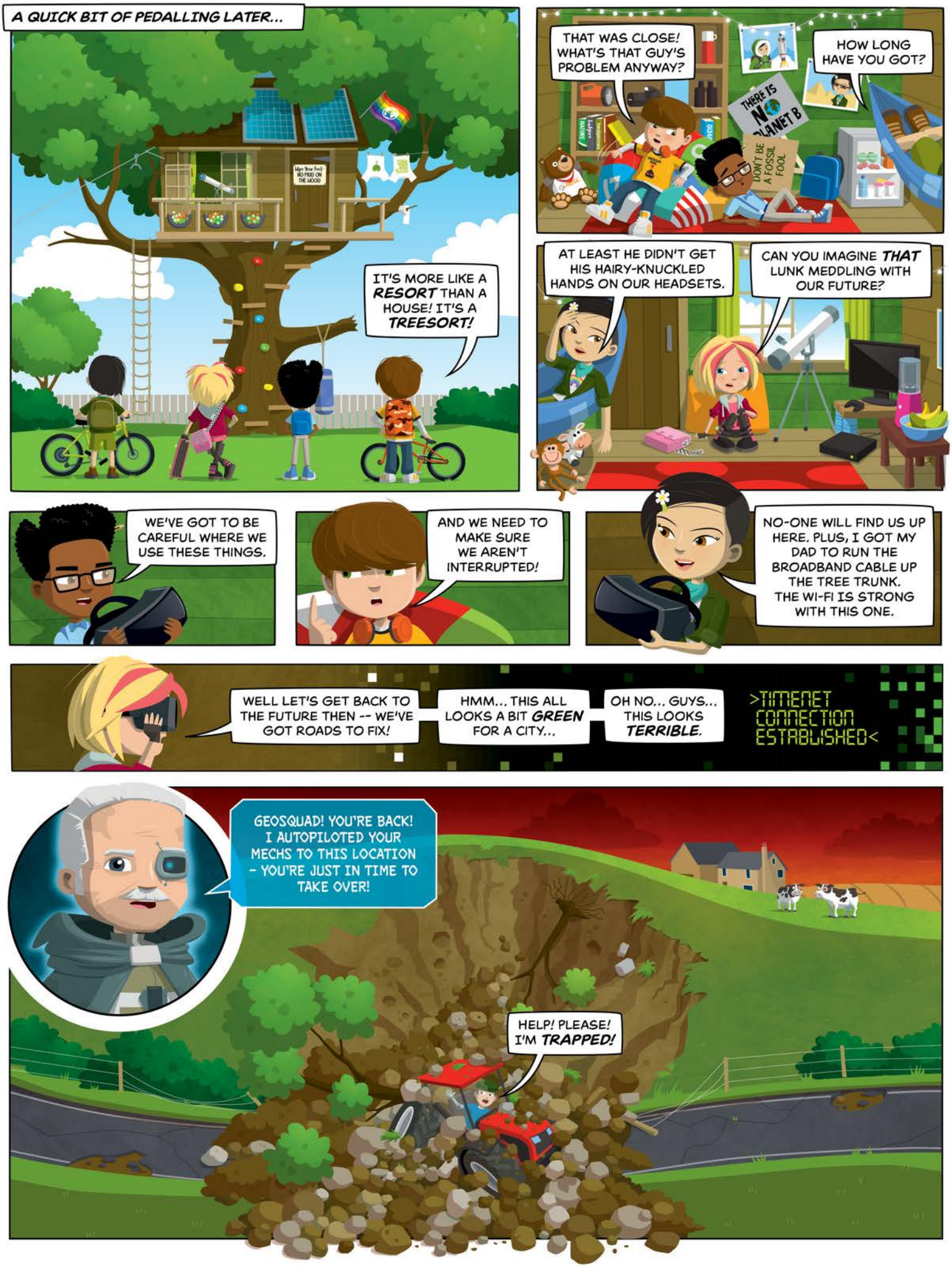
CLASS 7

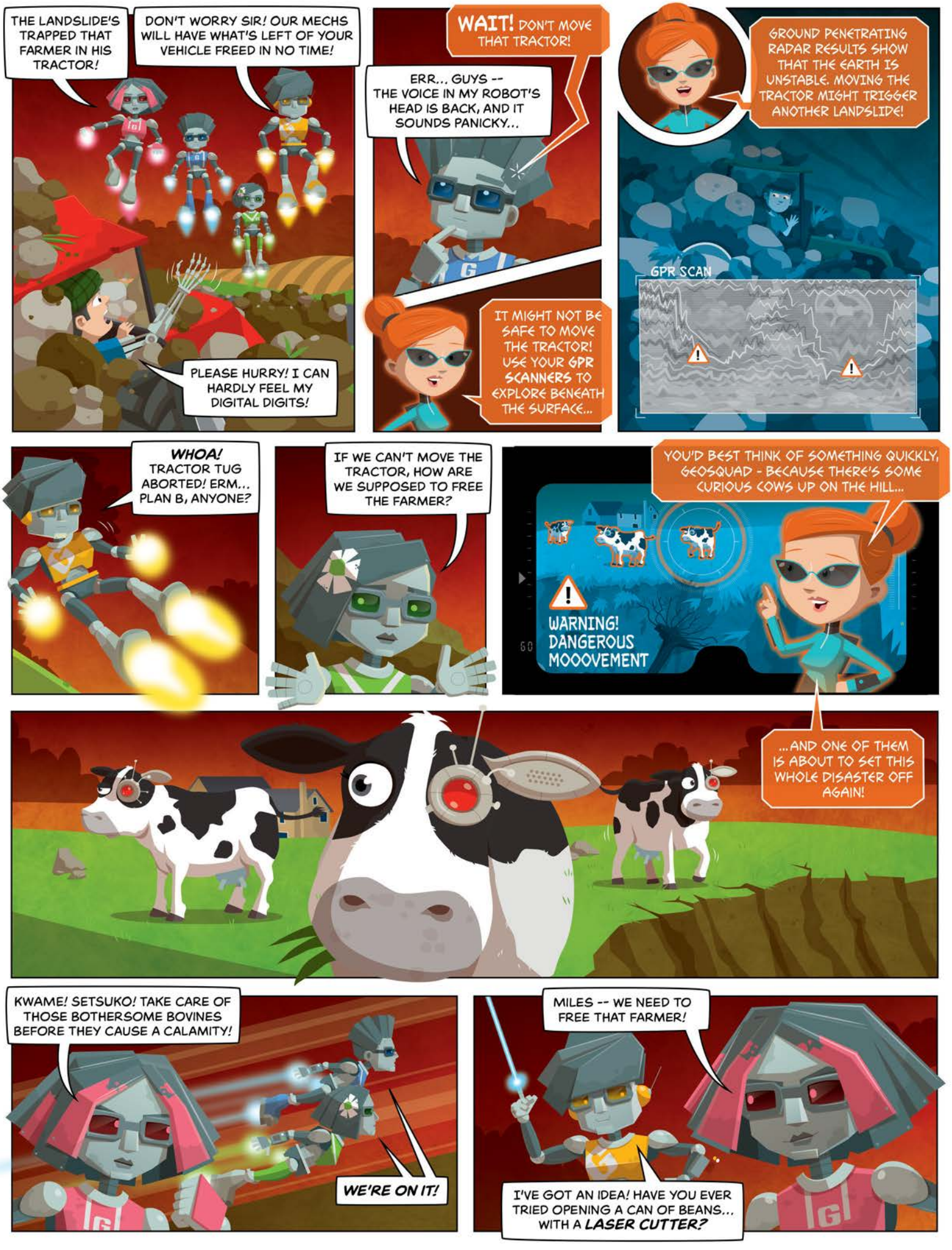
PLEASE NOTE: MR EVANS WILL BE BACK ON THURSDAY – UNLESS HIS LOTTERY NUMBERS COME UP.

OI! OPEN UP! I KNOW YOU FOUR *DWEEBS* ARE IN THERE... I WANT THOSE *HEADSETS!*

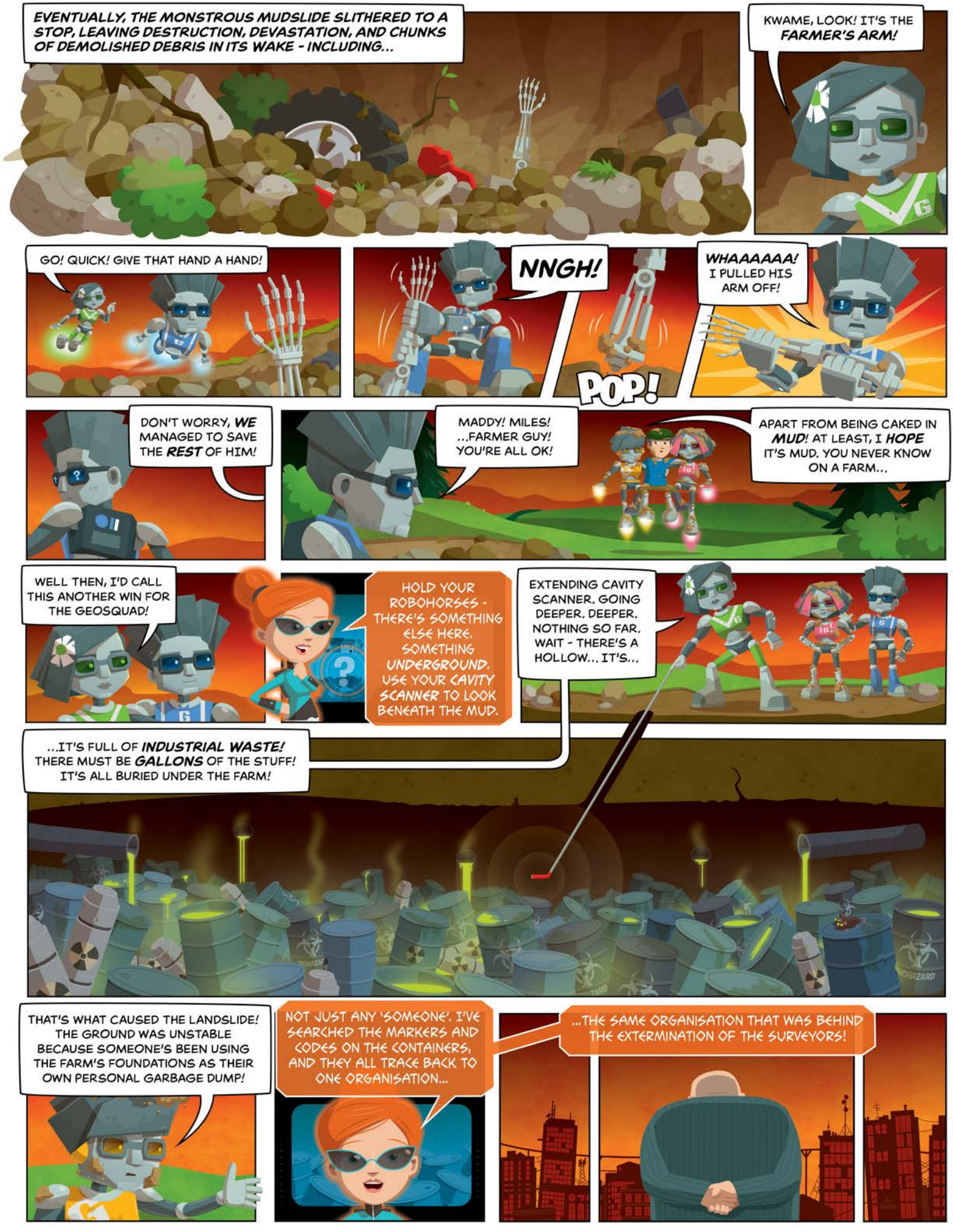
BANG! BANG!


WE CAN'T LET THAT KNUCKLE-DRAGGING WASTE OF DNA GET HIS HANDS ON THESE!
BANG!
BANG AGAIN!
AN EVEN LOUDER BANG!
QUICK! THROUGH THE WINDOW -- STRAIGHT TO THE BIKE SHED!
I DON'T HAVE MY BIKE!
GET ON THE BACK!
SCREECH!
UH-OH. LOOKS LIKE HE DID HAVE HIS BIKE...
...AND HE'S QUICKER THAN HE LOOKS!
SHORTCUT! THROUGH THE PARK!
DO THOSE STABILISERS SOMEHOW MAKE HIM FASTER!?
CAMARO
DIESEL
MOVE! OR GET MOVED!
HE'S GETTING CLOSER!
SO LONG, ALGEBRO!
AND...
...UNLEASH THE WEAPON OF MATH DESTRUCTION!
I'LL GET YOOOU-OOOOW!
GIVE ME A CALCULATOR!
CRASH!
WE NEED TO HIDE! FOLLOW ME... TO THE TREEHOUSE!


A QUICK BIT OF PEDALLING LATER...
IT'S MORE LIKE A RESORT THAN A HOUSE! IT'S A TREESORT!
THAT WAS CLOSE! WHAT'S THAT GUY'S PROBLEM ANYWAY?
HOW LONG HAVE YOU GOT?
THERE IS NO PLANET B
DON'T BE A FOSSIL FOOL
AT LEAST HE DIDN'T GET HIS HAIRY-KNUCKLED HANDS ON OUR HEADSETS.
CAN YOU IMAGINE THAT LUNK MEDDLING WITH OUR FUTURE?
WE'VE GOT TO BE CAREFUL WHERE WE USE THESE THINGS.
AND WE NEED TO MAKE SURE WE AREN'T INTERRUPTED!
NO-ONE WILL FIND US UP HERE. PLUS, I GOT MY DAD TO RUN THE BROADBAND CABLE UP THE TREE TRUNK. THE WI-FI IS STRONG WITH THIS ONE.
WELL LET'S GET BACK TO THE FUTURE THEN -- WE'VE GOT ROADS TO FIX!
HMM... THIS ALL LOOKS A BIT GREEN FOR A CITY...
OH NO... GUYS... THIS LOOKS TERRIBLE.
>TIMENET CONNECTION ESTABLISHED<
GEOSQUAD! YOU'RE BACK! I AUTOPILOTED YOUR MECHS TO THIS LOCATION - YOU'RE JUST IN TIME TO TAKE OVER!
HELP! PLEASE! I'M TRAPPED!


THE LANDSLIDE'S TRAPPED THAT FARMER IN HIS TRACTOR!
DON'T WORRY SIR! OUR MECHS WILL HAVE WHAT'S LEFT OF YOUR VEHICLE FREED IN NO TIME!
PLEASE HURRY! I CAN HARDLY FEEL MY DIGITAL DIGITS!
WAIT! DON'T MOVE THAT TRACTOR!
ERR... GUYS -- THE VOICE IN MY ROBOT'S HEAD IS BACK, AND IT SOUNDS PANICKY...
IT MIGHT NOT BE SAFE TO MOVE THE TRACTOR! USE YOUR GPR SCANNERS TO EXPLORE BENEATH THE SURFACE...
GROUND PENETRATING RADAR RESULTS SHOW THAT THE EARTH IS UNSTABLE. MOVING THE TRACTOR MIGHT TRIGGER ANOTHER LANDSLIDE!
GPR SCAN
WHOA! TRACTOR TUG ABORTED! ERM... PLAN B, ANYONE?
IF WE CAN'T MOVE THE TRACTOR, HOW ARE WE SUPPOSED TO FREE THE FARMER?
YOU'D BEST THINK OF SOMETHING QUICKLY, GEOSQUAD - BECAUSE THERE'S SOME CURIOUS COWS UP ON THE HILL...
WARNING! DANGEROUS MOOOVEMENT
...AND ONE OF THEM IS ABOUT TO SET THIS WHOLE DISASTER OFF AGAIN!
KWAME! SETSUKO! TAKE CARE OF THOSE BOTHERSOME BOVINES BEFORE THEY CAUSE A CALAMITY!
WE'RE ON IT!
MILES -- WE NEED TO FREE THAT FARMER!
I'VE GOT AN IDEA! HAVE YOU EVER TRIED OPENING A CAN OF BEANS... WITH A LASER CUTTER?


VOOM!
LAST ONE THERE'S A COW-HERD!
LOOK! I'M SUPERMAN -- AND THIS IS MOOIS LANE!
NNGH! YOUR TERRIBLE COW PUNS AREN'T MAKING THIS JOB ANY EASIER, SETSUKO!
PUT ME DOWN FOR TWO MORE ON YOUR COW-CULATOR!
...SERIOUSLY, I'VE GOT TONS OF THESE. I FIND THEM SO... AMOOSING!
DUCK DOWN! AND HOLD ON TO THAT RATHER FETCHING CAP...
...WE DON'T WANT TO SAVE ALL YOUR COWS, JUST FOR YOU TO END UP AS ROAST BEEF!
VZZZ!
IS THAT ALL OF THEM?
YOU ARE CORRECT - ALL THE ROBOCOWS ARE CLEAR OF THE SLIDE HAZARD... BUT WHAT ABOUT THAT CYBERSHEEP?
I THINK SO!
CLUNK! CLACK!
OMINOUS SOUNDS!
NO! WE NEED MORE TIME!
INCOMING!!
RUMBLE!
KA-BAM!


EVENTUALLY, THE MONSTROUS MUDSLIDE SLITHERED TO A STOP, LEAVING DESTRUCTION, DEVASTATION, AND CHUNKS OF DEMOLISHED DEBRIS IN ITS WAKE - INCLUDING...
KWAME, LOOK! IT'S THE FARMER'S ARM!
GO! QUICK! GIVE THAT HAND A HAND!
NNGH!
POP!
WHAAAAAA! I PULLED HIS ARM OFF!
DON'T WORRY, WE MANAGED TO SAVE THE REST OF HIM!
MADDY! MILES! ...FARMER GUY! YOU'RE ALL OK!
APART FROM BEING CAKED IN MUD! AT LEAST, I HOPE IT'S MUD. YOU NEVER KNOW ON A FARM...
WELL THEN, I'D CALL THIS ANOTHER WIN FOR THE GEOSQUAD!
HOLD YOUR ROBOHORSES - THERE'S SOMETHING ELSE HERE. SOMETHING UNDERGROUND. USE YOUR CAVITY SCANNER TO LOOK BENEATH THE MUD.
EXTENDING CAVITY SCANNER. GOING DEEPER. DEEPER. NOTHING SO FAR. WAIT - THERE'S A HOLLOW... IT'S...
...IT'S FULL OF INDUSTRIAL WASTE! THERE MUST BE GALLONS OF THE STUFF! IT'S ALL BURIED UNDER THE FARM!
THAT'S WHAT CAUSED THE LANDSLIDE! THE GROUND WAS UNSTABLE BECAUSE SOMEONE'S BEEN USING THE FARM'S FOUNDATIONS AS THEIR OWN PERSONAL GARBAGE DUMP!
NOT JUST ANY 'SOMEONE'. I'VE SEARCHED THE MARKERS AND CODES ON THE CONTAINERS, AND THEY ALL TRACE BACK TO ONE ORGANISATION...
...THE SAME ORGANISATION THAT WAS BEHIND THE EXTERMINATION OF THE SURVEYORS!

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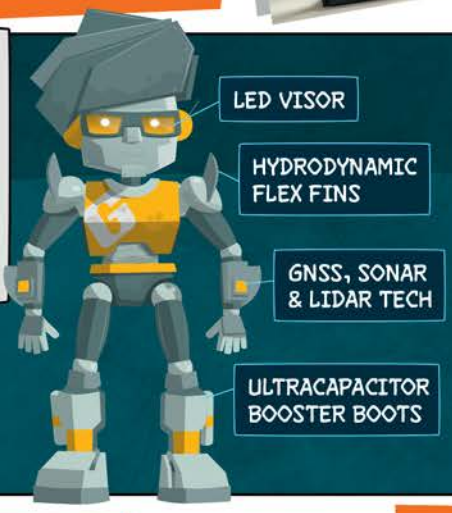
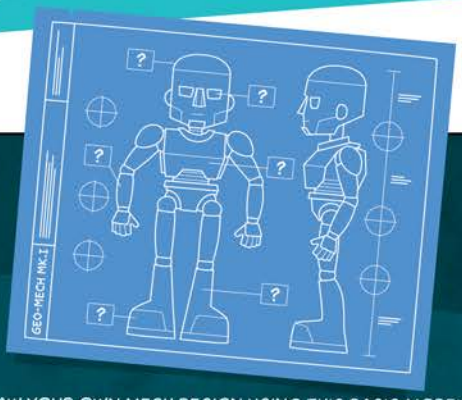
WIN A REALLY COOL TRIMBLE SX-10 BUILDING KIT!

1: DESIGN YOUR OWN MECH

HI! I'M ***THE LAST SURVEYOR***, AND I BUILT THE GEOSQUAD'S MECHS! HERE'S ONE OF MY LATEST ROBOT MODELS -- I ADDED SOME NEW FEATURES FOR A MISSION TO THE ANTARCTIC OCEAN! NOW, I NEED YOUR HELP. USING MY ORIGINAL BLUEPRINT, CAN YOU DESIGN YOUR VERY OWN MECH? AND ONCE YOU HAVE, CAN YOU LABEL AND EXPLAIN ITS COOLEST FEATURES? THE BEST ONE WILL BE TURNED INTO ***A REAL GEOSQUAD ROBOT!***





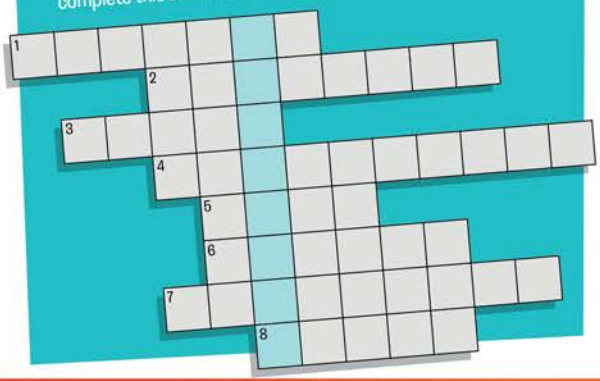
DRAW YOUR OWN MECH DESIGN USING THIS BASIC MODEL, AND ADD AS MUCH COOL SURVEYOR TECH AS YOU LIKE! USE THE GET KIDS INTO SURVEY WEBSITE AND THE GEOSQUAD COMICS TO GIVE YOU SOME IDEAS:

www.getkidsintosurvey.com/comic

ONCE YOUR DESIGN IS COMPLETE, READ BELOW TO FIND OUT HOW TO SUBMIT IT FOR THE COMPETITION!

2: SECRET CROSSWORD

Use the numbered clues below to work out this geo-based word puzzle! Find the secret word, highlighted in blue, to complete this section of the GeoSquad challenge!

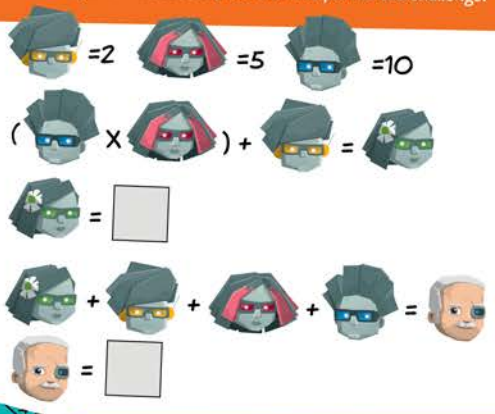


CLUES:

1. An instrument that uses a magnet to help with navigation. 2. A line which marks the limit of an area. 3. The method of echolocation used by animals like bats. 4. The process of planning and following a route. 5. Another word for 'robot', used by the Last Surveyor! 6. The final 'S' in the abbreviation GNSS 7. The subject you study in school where you learn all about the world! 8. Where grown-ups drive their cars.

3: CRACK THE CODE

Use your number skills to find the solutions to these tricky coded problems. Work out both missing amounts to complete the final part of the challenge!



To enter, you must be under 12 years old. Ask an adult to take a picture of your completed Secret Crossword and Crack the Code puzzles, along with your finished mech design, and email them to **learn@getkidsintosurvey.com** Closing date for entries: May 31st 2021. Please include your name and age in the email. You can read our Privacy Policy at **www.getkidsintosurvey.com/privacy-policy**

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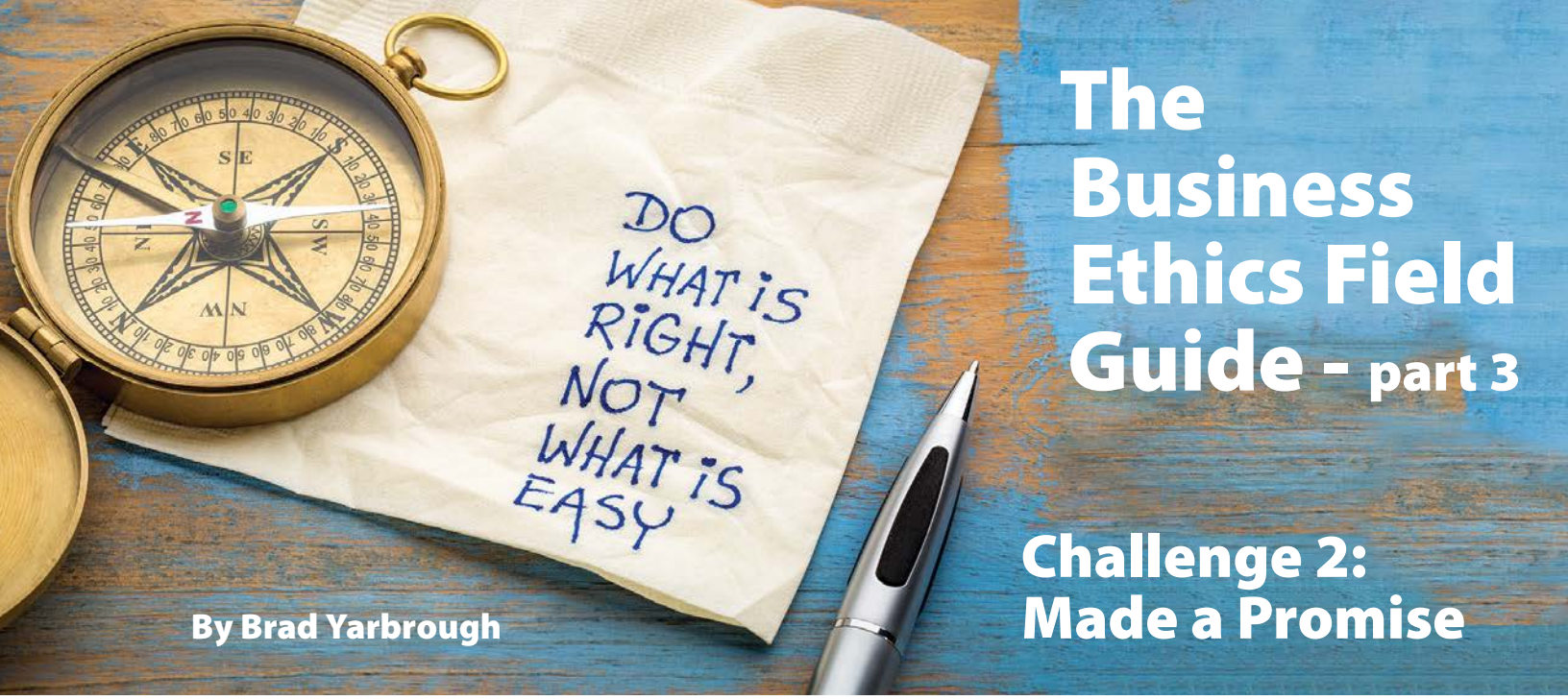


The Business Ethics Field Guide - part 3

Challenge 2: Made a Promise

By Brad Yarbrough

This series features 13 articles from Brad Agle, Aaron Miller and Bill O'Rourke, co-authors of *The Business Ethics Field Guide*. Each article focuses on a common work dilemma, provides real life examples and insightful solutions.

This article addresses the oft-faced ethical challenge of keeping promises. Indeed, establishing expectations and keeping our word is at the heart of the right of way profession. Many difficulties arise when the bonds of trust between parties are broken. I vividly remember when I assigned an agent to a client's maintenance project involving a short pipeline and a handful of landowners. The agent faced unexpected resistance from owners who recounted the numerous promises broken years earlier during the initial pipeline construction. Though eventually successful in regaining their trust, the outcome could have been reached more quickly and less costly if the pipeline operator had been better about managing obligations in the past. Had they listened to the following advice I believe they would have succeeded.

We all make lots of promises. Some are small and casual, while others are formal. Some are even long term, personal commitments such as the promise to love, honor and respect a spouse for a lifetime. No matter what the promise is, many involve a degree of uncertainty.

Think about a small commitment like promising to take someone to the ball game, but then it rains. At the time the promise was made, there was little known of the future, yet the commitment was made anyway.

A basic moral principle is that we will live up to our promises. We like to think that our word is our bond. However, in a world of uncertainty, conflicts are sure to arise. Keep in mind that:

- Breaking some promises will be necessary to live a moral life.
- People remember when promises are kept or broken.

Unrelenting Circumstances

Sometimes the choice is straightforward. You had promised to mow your neighbor's lawn, but then you receive a phone call that your spouse was in a traffic accident. Most people will agree that the unforeseen event warrants breaking the promise to satisfy a higher priority. Most of the time, however, the choice is not so clear.

In business, we can oftentime predict changes and plan for them. For instance, if there is a possibility that the price of a commodity can fluctuate, then the contract to supply that commodity should provide for price fluctuations.

Communication helps establish new expectations when the world changes.

Alternate Solutions

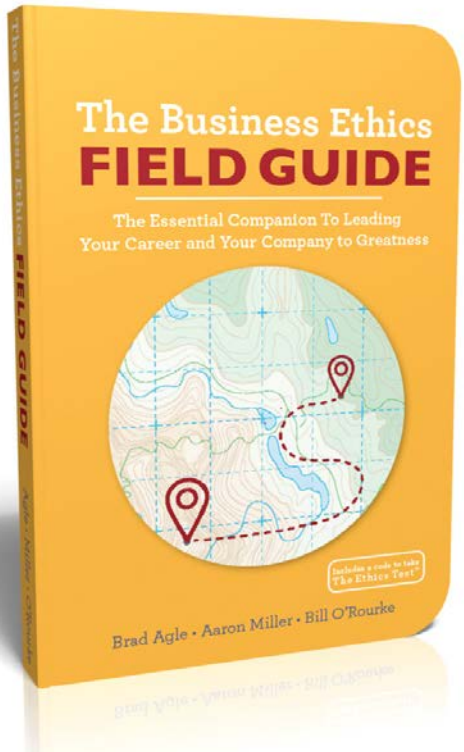
Perhaps the other party may not even want you to keep the promise. If an economic panic makes it impossible for you to fulfill an order, then perhaps a customer who is facing the same circumstances no longer wants the product. Communication helps establish new expectations when the world changes.

There may be an alternative course of action that would fulfill the original intent of the promise. You promised to provide financial support for a local youth group and the group is forced to disband because of a crisis at the group's national level. Perhaps giving to another organization will achieve helping the community.

Communication is Key

Don't decide alone. The foreman of a plant shipped a large product order on the day it was promised. The order specified that the shipment be inspected. However, the inspection equipment was broken. The foreman decided to ship the items on the promised date, rationalizing that no

continued on page 24



product defects had been found in the previous five years.

When his supervisor learned of this, he insisted on calling the customer and explaining what happened. The boss gave the customer the option of shipping the product back or accepting it. If something happened with the product later, the boss promised to fix it. The customer accepted the product, but the foreman should have contacted the customer before unilaterally deciding on the action. Communication is valuable.

In Summary

Here's some guidelines for avoiding or mitigating these issues:

- **Be careful of the promises you make**

  Try to predict and plan for potential changes. The majority of contract discussions don't merely deal with the straightforward aspects of the contract (quality, delivery and price), but also the impact of potential future changes. It's critical to address where responsibility will fall in the event those changes happen.

- **Don't overbook yourself**

  It's difficult to estimate the time required to meet promises. Ensure there is time for unpredictable developments. Being too busy is seldom accepted as an excuse for breaking a promise.

- **Build good relationships**

  By honoring your commitments as a matter of course and often going above and beyond the expectations, you will build social capital. That social capital will serve you well when you are faced with breaking or modifying a promise.

> **"Communication helps establish new expectations when the world changes."**

- **Moral Imagination**

  Moral decisions must not consist of just two alternatives. Instead, using your imagination can result in developing a creative solution that satisfies the moral obligations of all the involved parties. While moral imagination doesn't always produce such solutions, you might be surprised at how often thinking through alternatives will lead you to a creative solution.

Brad Yarbrough

Brad Yarbrough is the Owner and CEO of Pilgrim Land Services, a right of way services company in Oklahoma City. With over 35 years experience in oil and gas, he has clients nationwide and an extensive network of landmen and agents.

13 ETHICAL DILEMMAS

Upcoming articles in this series will take a closer look at each dilemma.

1. **STANDING UP TO POWER**
   Someone in power is asking you to do something unethical.
2. **MADE A PROMISE**
   Conflicting commitments force you to choose.
3. **INTERVENTION**
   You see something wrong. How do you proceed?
4. **CONFLICTS OF INTEREST**
   Multiple roles put you at cross purposes.
5. **SUSPICIONS WITHOUT ENOUGH EVIDENCE**
   You believe something is going on, but you're not sure.
6. **PLAYING DIRTY**
   Achieving justice but by doing something unethical.
7. **SKIRTING THE RULES**
   Bending a rule for a better outcome.
8. **DISSEMBLANCE**
   Misrepresenting the truth for better outcome.
9. **LOYALTY**
   Giving up ethical stance to protect valued relationship.
10. **SACRIFICING PERSONAL VALUES**
    Living ethically might put burden on others.
11. **UNFAIR ADVANTAGE**
    When opportunity exists to wield an unfair upper hand.
12. **REPAIR**
    When you are responsible for a mistake.
13. **SHOWING MERCY**
    You could grant forgiveness, but you don't know if you should.

Software Tips and Tricks

— part 2

By Joseph Waltz, PLS

WINDOWS KEYBOARD COMMANDS

If you use Microsoft Windows as your operating system, you have access to powerful keyboard shortcuts. To operate these, *hold* the first or first and second key below, and *press* the last key. Mastering the keyboard shortcuts will save you lots of time.

Control Key: "CTRL"

CTRL+A: Select All:
Selects entire contents of an open page, file, or file folder.

CTRL+S: Quick Save:
Saves the current file.

CTRL+Z: Undo:
Un-does the previous action, can be stacked.

CTRL+Y: Redo:
For when you push undo too many times.

CTRL+Tab:
Switch tabs within a window.

The three keys, XCV (all in a row on bottom left of your keyboard) control the clipboard.

CTRL+X: Cut:
Cuts out the text that is highlighted and puts it on the clipboard.

CTRL+C: Copy:
Copies the text that is highlighted and puts a copy on the clipboard.

CTRL+V: Paste:
Pastes clipboard contents to cursor position.

CTRL+arrow: Jump cursor:
Jumps cursor word by word instead of letter by letter.

Alternate Key: "ALT"

ALT+Tab: Switch Windows:
Switches between open windows. Hold ALT and press tab to cycle through all open programs.

ALT+S: Show "ALT" Shortcut hotkeys:
When pressed, floating letters will appear in the ribbon, indicating the ALT + letter command that will execute that button command.

"Windows" Key (often shown as a little Windows logo between CTRL & ALT):

These combinations are different in different versions. But here are a few for Windows 10:

WIN+Shift+S: Snip Screen:
Gives you a crosshair to select a portion of the screen to capture and copies that image into your clipboard.

WIN+D: Display desktop:
Minimizes all open windows and displays desktop.

WIN+L: Lock Computer:
Logs user out to login screen. This is a good habit to cultivate when leaving your desk in a large office with public access. Just like you lock your door when leaving the house, this "locks" the computer when leaving your desk.

There are hundreds more, in various CTRL, ALT, SHIFT, and WIN combinations.

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KIETHWSPENCER.NET

Keith Spencer, PLS, CFedS, and CLSA immediate past president, hosts one of the most valuable websites available to California Surveyors at *http://keithwspencer.net*.

The "Library" section at *http://keithwspencer.net/Library/Library.shtml* has links to 44 counties' "Map and Survey Records" databases, and 23 Cities' records in the Central Valley. It also has PDF's of hundreds of books dating back to 1616, with many surveying manuals, mathematical texts, Hydrographic and Railway surveying treatises, and BLM publications including Manuals.

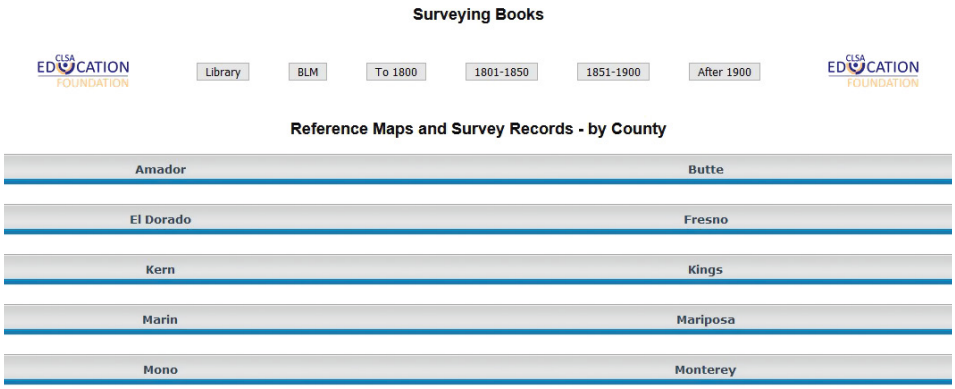
This library has links to over 700,000 individual files and is a public service free of charge.

The "LS review" section at *http://keithwspencer.net/LSReview/Topics/Topics.shtml* has 13 sub-pages with topics like Construction Surveys, Legal Descriptions, and the Subdivision Map Act.

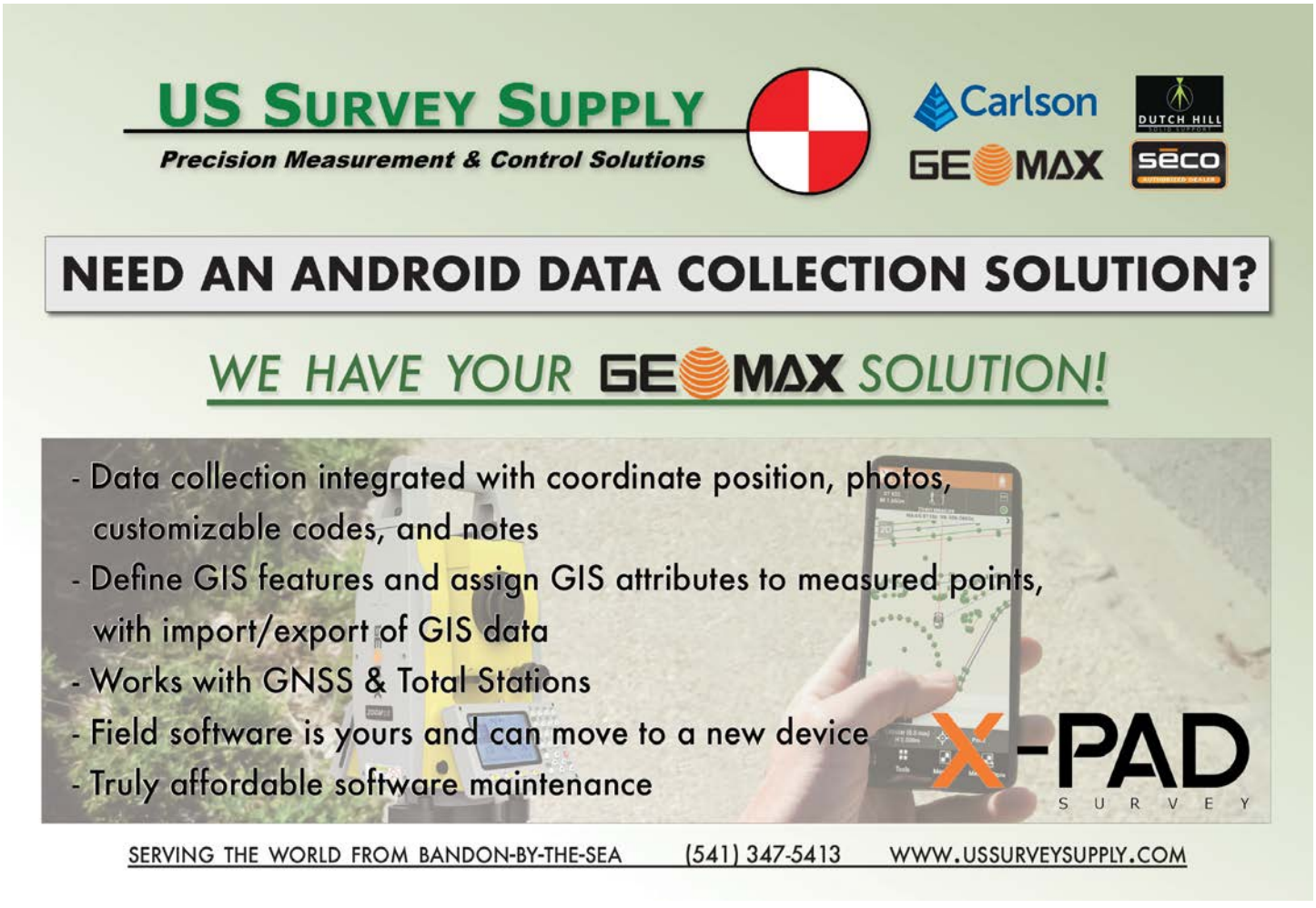
Keith has put his heart and soul into preparing a great resource for us. Take a look! He also is always looking for more contributions, and they can be sent to: *keith@keithwspencer.net*.

If you find Keith's service useful, consider making a donation to the CLSA Education Foundation. If you have map collections that you would like to add he appreciates donations of digital files. A link to donate to the foundation can be found at *http://californiasurveyors.org/educationfoundation.aspx* and thank you Keith for such a great site!

continued on page 27



Portion of counties available on Keith's site, as well as book sections.



EXCEL MACROS

Excel is a very popular Microsoft Office spreadsheet program. It has so many powerful mathematical and graphing functions built in, but there is one function that is not very popular that I discovered years ago – Macros.

A Macro is a pre-recorded set of Visual Basic program interactions that you create for repeated workflows. If you find yourself doing a similar set of tasks over and over, a Macro may be your ticket. Think of them as "Filming" your work. Then you can "Play back" the film and excel does the same key presses or keyboard commands that you recorded. You don't have to know any VBA or C#/.NET code, it creates the code by "watching" you work.

For example, let's say you have a contract with a certain Aerial Lidar company. You know that their "point data" deliverable is always in metric and is always a "P E N Z D Lat Long" text file. For each map, you have to have your staff do the work of converting and messing with columns before you can start your in-house mapping process. That work on one file maybe takes three minutes. What do you care? That's nothing!

And now you just got off the phone closing out a huge contract with a nationwide developer. He wants to work with you exclusively, and just sent you an FTP link to 100 CSV files from the same aerial lidar company. Now that three minutes is adding up. It's Macro time!

Let's clarify what we want to do.

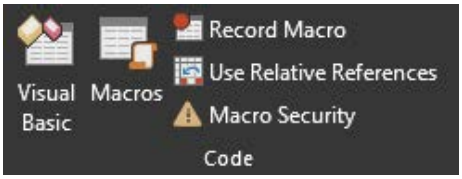
1. Keep the deliverables clean.
    a. So, we will create a new sheet in our Excel workbook of each point file called "Conversion"
2. Copy the raw deliverable to the new sheet.
3. Switch the places of the Easting and Northing Columns.
    a. Our drafters are used to PNEZD file format.
4. Convert all metric measurements to feet (Survey feet for the sake of this article).
    a. Two step process, create "math" columns with conversions, and apply to new Metric N, E, columns,
    b. Replace Metric N, E, Columns with new converted Feet #'s
5. Remove the Latitude and Longitude columns.
    a. As these are unnecessary for our normal drafting process.

With a macro, you can do that all of that work once, while recording it as a new macro, and have access to that workflow at the push of a button. Not only are we saving tremendous amounts of time, but we don't have to worry about accidently typing "3937/2100" instead of "3937/1200" 100 times.

Macros can be a powerful way to have access to repetitive workflows, and as long as the recording of the Macro is carefully done, they can eliminate the simple fat finger errors that we have all made from time to time.

YouTube has a great intro to macros in a video titled "Learn Macros in seven Minutes (Microsoft Excel)" at: *https://www.youtube.com/watch?v=33Ej8DPsdvA*.

Note – A warning for Windows 10 users: For some reason the latest version of Office 365 has macros moved to a tab that is now hidden by default. For you to access the Macro Menu, you may need to go to File -> Options -> Customize Ribbon -> and Check the box next to "Developer Tab" in the Main Tabs column.



Leftmost portion of Developer tab in excel. Use "Record Macro" to record a new one, and "Macros" to access your list of created ones.

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Telling the Stories of Our Land:

William Minto, Modoc County's Own Gentleman Surveyor

by Laurie Pearce Price

Modoc County, like most other counties in the western United States is a product of the Public Land Survey System (PLSS).[1]

It is quite likely, in Modoc County, that some of the PLSS land markers a resident might come across were built under the direction of William Minto, County Surveyor during the 1860s (when Modoc was still part of Siskiyou County) and a Deputy Surveyor for the United States General Land Office (GLO) in the 1870s and 1880s. Modoc County is blessed to have had Mr. Minto's remarkably conscientious contribution to the measuring and describing of the land we call home.

William Minto
(photo courtesy of Minto Family)

This article gives a background of the early land surveys of the West, sharing some of the specific contributions of Mr. Minto, and explores more of his presence in our northeast corner of the state, as well as his contributions to determining the eastern boundary of California. The Minto family (descendants of William's brother Robert) still reside in Modoc County and have carefully tended to the preservation of his memory. As a land surveyor in training, I very much appreciate the quality of William Minto's work as I learn how to measure and describe the land to the people who care for it.

The General Land Office Surveys: Marking Out the "Face of the Country"

Up until 1785, land surveyors in the colonies and new states utilized an old English method to measure and describe property boundaries, called "metes and bounds" description. This highly localized method produces "records of boundaries that describe a parcel according to monuments (trees, rocks, stakes, or other markers) along its outskirts or by reference to neighbors' lands and other nearby features" as well as the directional bearings (such as North 89° 26′ East) and distances between those features.[2]

However colorful and engaging, land description by metes and bounds was not a method that could be applied in a uniform way across a great breadth of land. The new United States government was interested in raising money and encouraging Americans to move westward, requiring a clear-cut way of describing land to potential homesteaders who would need to locate their promised land, sight unseen.

In 1785, the United States had already viewed itself an independent nation for nine years (even though the Revolutionary War had not yet ended) with a new government that was eager to expand. Under the Land Ordinance of 1785, Congress established a systematic grid system for laying out undeveloped land west of the new States, based on practices in the Down Survey of Ireland (1656-1658).[3,4] In 1796, the office of the United States Surveyor-General was created, and the General Land Office (GLO) came into being in 1812, both with the purpose of marking out "the face of the country."[5] The intent of the GLO was to survey new lands of the United States to be sold to settlers moving west, making it easier for these newcomers to locate their lands and increasing the federal tax base.

California was carved out of Mexico's holdings after the end of the Mexican-American War in 1848 by the Treaty of Guadalupe-Hidalgo. In a stroke of excellent timing, gold was discovered along the American River the same year, and emigrants began flooding the West. By 1850, California had fast-tracked itself to statehood, skipping the usual Western step of becoming a Territory first.[6] In 1851, the Mount Diablo initial point was placed (more about this monument to follow),

continued on page 30

and the state was ready to be measured and described.

Suddenly, there was an urgency in California about preparing homesteads and lands ahead of the settlers whose arrival the new state anticipated. In 1862, the Homestead Act was passed by Congress, encouraging eastern U.S. residents to stake claims on 160-acre (quarter-section) plots; if a homesteader could "prove up" his or her claim of 160 acres over a period of years – proving that they were able to establish a home and agricultural presence there – then the U.S. government would cede that public land to the settler.[7]

The GLO contracted with land surveyors to lead crews out into the mountains, deserts, and forests of the West to measure and describe what they found, following the "rectangular grid" system of Section, Township, and Range.[8] The contractors were required to follow the specific instructions, eventually compiled and published as the *Manual of Surveying Instructions* by the GLO.

These contract deputy surveyors, including William Minto, were masters of many skills: astronomy (to make measurements based on celestial readings), geology, botany, and soil science (to report on the nature of the land and the potential of the soils for mining and agriculture), engineering, mathematics, marksmanship, and, above all, leadership. Each GLO Deputy Surveyor was responsible for hiring a crew and obtaining materials needed for weeks to months in the field. Surveying each township required a crew to hike about 120 miles, often in treacherous country.[9]

Land surveyors today utilize advanced technology, from levels and tapes to Global Positioning Satellites (GPS) and drones, to locate positions on the Earth. During the early GLO surveys, however, there were far more basic and challenging, procedures. A typical survey crew included: the lead surveyor (using a compass or compass/transit), "chainmen," flagmen who marked the end of a 66' Gunter's chain, axe men who blazed posts along the way for the surveyor to use as sighting points,

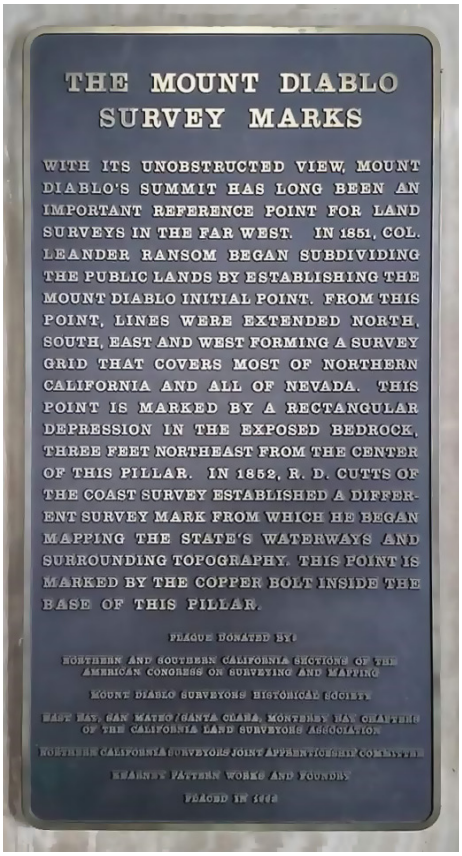
Gunter's Chain,
Smithsonian Museum of American History

mound builders for erecting stone or post monuments as directed in the *Manual*, a teamster in charge of the wagons and horses, and sometimes a cook.

The chainmen's job was to haul and apply the 66'-long Gunter's chain to measure distance as the surveyor sighted the line. As he walked, the surveyor made meticulous field notes along the way about the distances between corners and noted the number of chains at which he encountered various features such as streams, homesteaders' cabins, and roads. The surveyor was also charged with giving a general description of the potential of the soils for farming and any agricultural and settlement activity in the Township.[10] The field notes and maps based on the survey had to be filed with the General Land Office when the survey was complete. Surveyors were paid $3 per mile of line run, adjusted according to the type of terrain involved. All corners set in these original surveys remain valid, even today, as the original and true corners intended to be set, even if the surveyor made mistakes.[11]

GLO surveys were based on the system of Townships (running north and south) and Ranges (running east and west) from an "initial point." The GLO established initial points for laying out and numbering the townships at prominent locations. The plots in much of northern California, including Modoc County, and all of Nevada are based on the Mount Diablo Base and Meridian, which was located in 1851 on the top of Mount Diablo, northeast of San José.

In November 2017, I had the good fortune to visit Mount Diablo State Park to view the initial point for most of the historic surveys (including all of William Minto's work) that I have encountered in my professional work in the field of land surveying.



Plaque marking the location of the initial point, Mount Diablo State Park
(Photo courtesy of the author)

The peak of Mount Diablo, around which the Mount Diablo State Park Visitors' Center was built. The depression in the rock is the actual "initial point" of all surveys in Nevada and most of northern California.
(Photo courtesy of the author)

From the initial point at Mount Diablo, William Minto established sections and quarter section corners throughout Modoc County. The standard monument

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recommended for quarter section corners was a large stone, placed a short way from a specifically built rock mound. William Minto left many beautifully scribed stones as quarter section corner monuments, many of which have stood undisturbed for nearly 150 years. I found the following stone marker in the field during the process of retracing an original GLO survey in Modoc County, performed by William Minto in 1879:

Quarter section corner monument, stone scribed "1/4" in the top center, set in July 1879 by William Minto, Modoc County.
(Photo courtesy of the author)

In Minto's field notes, he describes his placing of this monument in the following fashion:

> At "40.31 chains [approximately ½ mile from the section corner to the east], set a sand stone, 18 x 10 x 3 inches, for quarter section corner; made [rock] mound 24 inches high, pits 24 x 12 inches, as per instructions."[12]

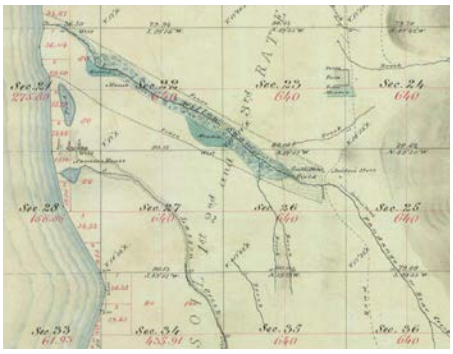
William Minto's quarter section corner monument (to the left) with identifying rock mound to the right of the corner.
(Photo courtesy of the author)

Both the scribed standing stone and the rock mound are evident in these photos. The purpose of the rock mound was to make the corner more visible from a distance.

Coming across a monument such as this in the field, with the "1/" apparent and the "4" as clear as day scribed on a stone, leaves a modern surveyor in awe of and grateful to the original surveyor's fidelity in carrying out his instructions. While these monumentation practices were standard to the GLO's surveying instructions, it is uncommon to find such a well-built monument that has weathered the test of time in Modoc County.

Since our responsibility is to "follow in the footsteps of the original surveyor"[13] when retracing original surveys, field work and documentation such as that of William Minto are invaluable and benefit all parties involved with a plot of land.

The following photographs show the hand-drawn map resulting from a different original GLO survey, performed by William Minto in 1871 and 1872 (listed in the chart



Close up of Minto's map, showing Sections, acreages, chain distances, natural features (Lassen and Fandango Creeks, meadows, ponds, swamps, and brooks) and evidence of settlement (roads, fences, and houses)
(Photo courtesy of Bureau of Land Management)

at the bottom of the plat), of Township 47 North, Range 14 East, in Siskiyou County (from which Modoc County was formed), including part of the eastern shoreline of Goose Lake. Based on our knowledge of the initial point on Mount Diablo, we know that this rectangular grid is located 47 townships (or 282 miles, as the crow flies) north, and 14 ranges (or 84 miles) east, of the Mount Diablo Base and Meridian.

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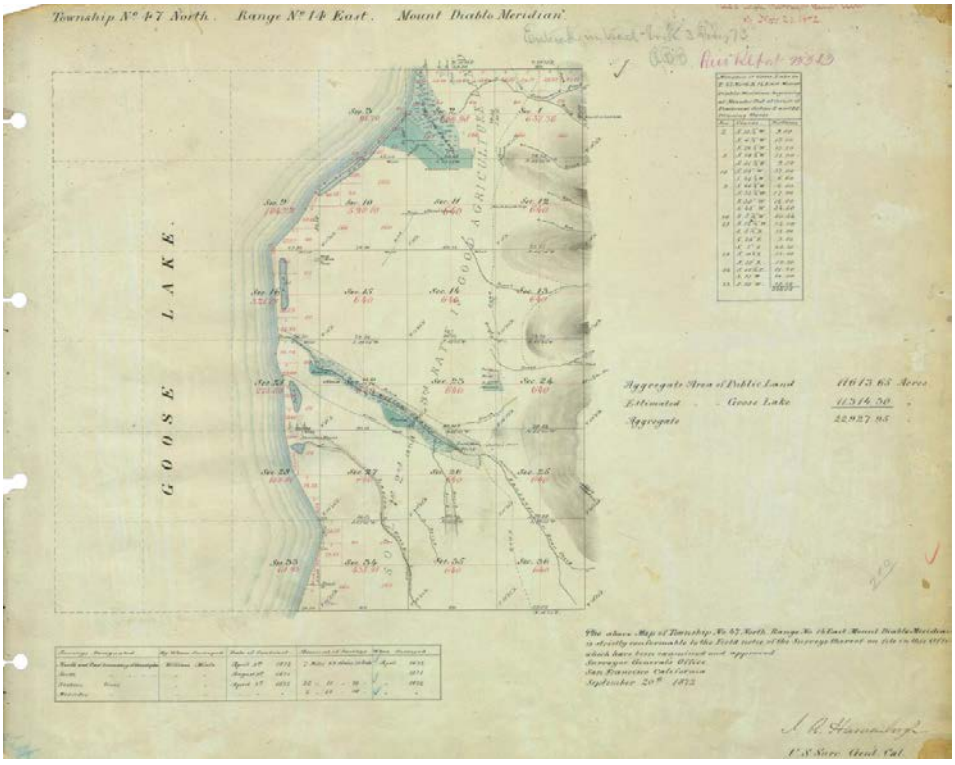

Official Plat of Township 47 North, Range 14 East, M.D.M,
Surveyed by William Minto and his GLO survey crew in 1871 and 1872
(Photo courtesy of Bureau of Land Management)

William Minto and the Shaping of the New County of Modoc

William Minto's life was as interesting, well-considered and full as the monuments he constructed and records he made. The United States Census, immigration records, Congressional records of his later survey work, and the mindful family history of the Minto family have provided a wealth of information about Mr. Minto, lending a deeper understanding of the man behind his remarkable work.

William Minto was born on May 6, 1837 in Annan, Scotland to David Minto and Jane Johnstone Minto.[14] The passenger manifest of the ship *Fairfield*, sailing from Liverpool, England shows that Minto (age three), his parents and brothers Robert (age one) and John (age four) arrived in New York harbor on May 16, 1840 (Passenger and Crew Lists, *Fairfield*, 1840). The family migrated to Illinois in 1843 and established Maple Hill farm near Antioch, Illinois.

Minto Family, c. 1850s, Lake County, Illinois. (From left): Jannet, Robert, Jane Johnstone Minto, William, and David. Not pictured: David Minto, Sr. (who died in 1849) and eldest brother John.

Minto attended the University of Michigan at Ann Arbor and earned a degree in Civil Engineering in 1860.[15] He was enumerated in the U.S Census of 1860 in his family's home in Antioch, with his mother, sister and three brothers.[16] The War between the States began soon after Minto graduated. He decided to join a train of four wagons and five men, heading west in 1861 to make his way in the world. According to his diary of the trip, as documented in the *Minto Family Collection of History*, Minto and a fellow emigrant detached from the party and found work constructing stage stations along the U.S. Stage Line. He stopped in the Comstock mining district in 1862, working until sometime in 1864 as an engineer in the silver mines at Virginia City and Gold Hill, Nevada Territory. In a letter of March 4, 1863 to her son in Gold Hill, Jane Johnstone Minto, expressed her concern about his health and well-being in "such a place": "William, I am afraid you are living, as it were, a careless life in this world." William's brother David was fighting in the Civil War at the time, and their mother pleaded for William to "not think of going to the war as I think it is enough for me to have your dear brother David there."[14]

We do not have a clear idea about exactly when William Minto arrived in Surprise Valley, but the Minto family's anecdotes state that by 1866, he was "so entrenched in Eagle Creek [modern-day Eagleville], Siskiyou County, California ... he is pretty much Mr. Eagle Creek," owning "160 acres with a house located at the point of the School House Hill."[17] In the same year, he plotted the corners of "Tri Lake City" and was appointed County Surveyor for Siskiyou County on November 11, 1866.

William Minto encouraged his brother Robert to join him in Surprise Valley, and Robert arrived in 1867. The pair filed homestead claims in Fandango Valley, which became the Minto ranch's summer cow camp in the North Warners.[17] William and Robert Minto were enumerated on July 17, 1870 in the federal census of that year as landowning farmers, living in the Lake City post office district[18] Robert Minto established the "Sagebrush Ranch" in Eagleville, building a house there in 1867 which later burned down and was rebuilt. An irrigation ditch coming out of Cottonwood Creek is still referred to as "Minto Ditch."[19] Robert Minto's descendants reside in Surprise Valley today.

Being an educated and adaptable man, it is no surprise that William Minto threw himself into the activity of the burgeoning community of Surprise Valley and the development of Modoc County. He served as a schoolteacher in Deep Creek for the school year 1869-1870,[17] while also serving as the County Surveyor and maintaining a farm in Lake City. Minto was also named as a Deputy Surveyor for the GLO in 1871. He began his contract surveys of Surprise Valley and other present-day Modoc County townships that year, producing survey monuments and plats of the high quality that has been illustrated in this article.

As discussion mounted in the North State about dividing the very large county of Siskiyou into smaller counties, William Minto as the County Surveyor was the sounding board for conflicting opinions about where the new boundaries should be for a new county. An 1872 letter from Lake City resident W.B. Swearinger pleaded with Minto to lend his "kind assistance in defeating the Bill" before the California legislature, which would have taken land from Lassen or Shasta Counties to form a new county. Swearinger declared that

> I with a large majority want the lines petitioned for two years. Since, 'To Wit," on the West Range lines 6 & 7, to lines 41 & 42 on the South, East to Range lines 9 & 10 then along said line South to T.S. line 38 & 39 or if Lassen will give us to T.S.line 37 & 38 so as to include all of Surprise Valley we will be glad to have it.[17]

The current southwest corner of Modoc County is the southwest corner of Township 39 North, Range 5 East, Mount Diablo Meridian, including Day, California – further west than Mr. Swearinger had dared to hope, but still clipping off the south end of Surprise Valley, which still resides in Lassen County.

This letter from Minto's Surprise Valley neighbor relays the worry and uncertainty in the community about the possible creation of a new county. Swearinger's letter also demonstrates the confidence that local residents had in Minto's ability to influence the legislature's decisions. The first proposal before the State Assembly involved taking land from Lassen and Siskiyou Counties to form a new county; this bill was defeated due to heavy protests from Lassen County. A second proposal was more successful, and in 1874, a new county was formed from Siskiyou County alone. It was to be called "Summit County,"

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but the name was changed to "Modoc" in an amendment to the bill[20] Modoc County was born, with William Minto living, ranching, teaching, and surveying for both the County and the U.S. government, all the while.

William Minto and the Controvery of the Eastern Boundary of California

While the new county of Modoc was being negotiated,another controversy was brewing in the background over locating the eastern boundary of California.

When California was approved for statehood in 1850, in response to the demands of the Gold Rush, the new state boundary was hastily accepted, with the eastern boundary described as follows: "commencing at the point of intersection of the 42nd degree of north latitude with the 120th degree of longitude west from Greenwich [England], and running south on the line of said 120th degree of west longitude until it intersects the 39th degree of west latitude."[21] The land that became Nevada Territory in March 1861 and then the State of Nevada in October 1864 was part of the larger Utah Territory when California gained statehood in 1850. The 1849 California Constitutional Convention was in such a hurry to establish statehood, that it did not even require a survey or physical monuments on the ground to mark the new state's boundaries, leaving people living near the 120th meridian in doubt as to whether they lived in California or Utah Territory.[21]

In 1861 when Nevada Territory was formed, the Nevada legislature set the western boundary of Nevada as "the dividing range separating the waters of Carson Valley from those that flow into the Pacific" – i.e., the crest of the Sierra Nevada mountains.[22] In Modoc (then Siskiyou) County, this meant that the crest of the Warner Mountains, which are considered a spur of the Sierra, would be the border between Nevada and California. California had always defined its eastern border as the 120th meridian, several miles further east than the crest of the Sierra Nevada.

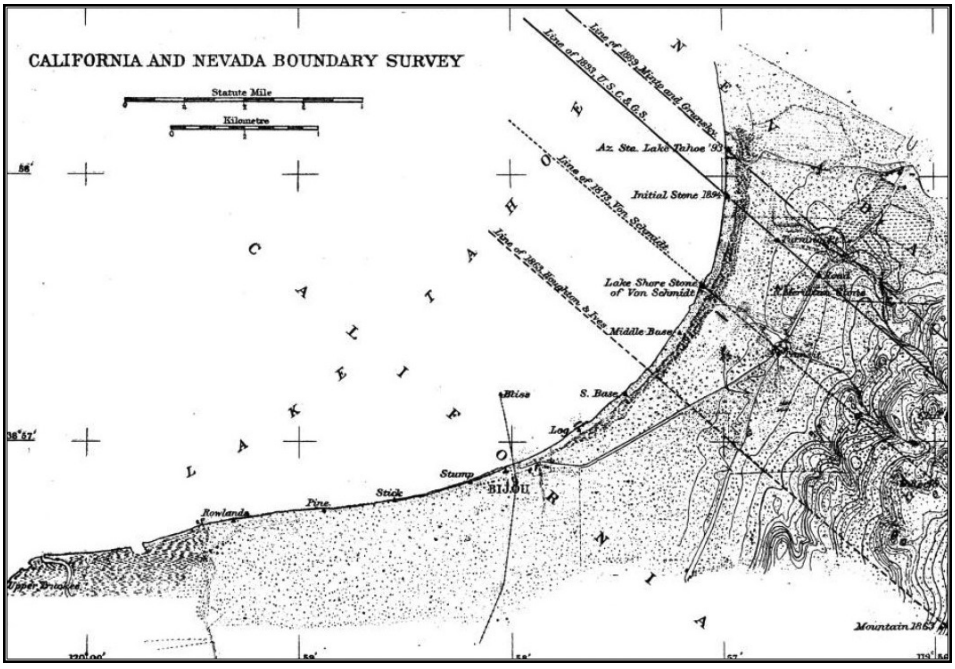
Map of the "disputed area" east of the Sierra Nevada mountains that was claimed by both California and the Nevada Territory between 1861 and 1864 (WP:NFCC#4), Fair use, *https://en.wikipedia.org/w/index.php?curid=62428213*

Conflict along the disputed eastern boundary was rife. Honey Lake Valley, now in Lassen County, was claimed by both Lake (later known as Roop) County in the Nevada Territory and by Plumas County, California. In fact, several miles of present-day California was once considered part of Nevada Territory, including Surprise Valley and the Susanville area, since both regions lay east of the crest of the Sierra. The map below shows the area under question, shaded gray.

Isaac Roop, who had been the Governor of the Provisional Nevada Territory from 1859 to 1861 and was elected to the new Territorial Senate in 1862, supported the Nevada border extending to the Sierra Nevada mountains[23] (Bruce, 1870). The dispute culminated in the "Sagebrush War" of 1863 in Susanville. The Plumas County sheriff led a 100-man posse to lay siege to Senator Roop's cabin, injuring one man. The skirmish was brief and ended with a round of drinks in town and a mutual decision to turn the dispute over to the Governors of the Nevada Territory and California to settle.[22]

Why was California's land description, based solely on the lines of longitude and latitude as the boundary lines for the state, so problematic? The answer is found in the discrepancies involved in measuring 42° North latitude and 120° West longitude. Longitude, the lines running north and south in great circles around the globe, was more difficult to measure with astronomical survey instruments, because the measurement relies on chronological time in the measurement of the angle between the Greenwich Meridian and the observer's

continued on page 34



Map showing four different state boundaries at the angle point in Lake Tahoe. The "Line of 1889 of Minto and Grunsky" is shown to be the farthest east of all of the surveyed lines. *(Wilusz, 2002, p. 2)*

location; an error of just one second of timing could lead to error in staking that point on the Earth up to one-quarter of a mile off (Wilusz, 2002, p.2). Between 1855 and 1869, several conflicting points were surveyed as the northeast corner of California, due to these tricky measurements.

To put an end to the confusion over the location of the 120th meridian on the ground, the United States Congress authorized another border survey in 1872. The GLO hired Allexy Von Schmidt, a Latvian immigrant who enjoyed a "prosperous dredging business" and had participated in the survey to lay out the San Francisco cable car system.[24] Von Schmidt was convinced that surveyor Daniel Major had placed the 120th meridian 3 ¼ miles too far west when he located the northeast corner of California in 1869.[25] The Commissioner of the GLO asked Von Schmidt to run the north-south part of the eastern boundary from Major's northeast corner monument, south to Lake Tahoe (called Lake Bigler at the time).

Von Schmidt accepted the government contract job, but was nonetheless a free thinker. He happened to be visiting Verdi, Nevada, at the time he was to begin the survey, and observed the U.S. Coast and Geodetic Survey scientist George Davidson using telegraphic signals to assist in making the astronomical calculations needed to identify the 120° line of longitude. Von Schmidt agreed with Davidson's finding, began to survey this line north from Lake Tahoe to the northeast corner of California, and sent word to the GLO Commissioner about his change of plans. After surveying north about 100 miles along what he gauged to be the 120th meridian, Von Schmidt received an admonishing letter from the Commissioner ordering him to stop work, proceed directly to the northeast corner, and run the line south, according to the original plan. Von Schmidt and his crew complied, but when they met up with the latitude of the location where they had stopped when working north, they found themselves to be three miles west of their abandoned line. Von Schmidt completed his survey to Lake Tahoe, went home for the winter to San Francisco, and returned in 1873 to take up the survey of the eastern boundary of the state, now along the oblique line from Lake Tahoe southeast to the Colorado River.[26]

The GLO accepted Von Schmidt's survey, but there were still questions, especially about the lower portion of the state boundary. In 1889, a government body commissioned yet another survey of the eastern boundary, but with a couple of differences: this time, the survey was to be only of the oblique southeasterly portion of the boundary, south of Lake Tahoe, and also this time, it was the state of California who authorized the survey.

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C.E. Grunsky and William Minto were hired to "correct and establish" the oblique line and were directed to "tie in" their survey to the recently developed triangulation net established during the construction of the Transcontinental Railroad.[24]

By the time William Minto was appointed to this corrective survey of the state boundary in 1889, he had left Surprise Valley to marry Josephine Miller and settle in Alameda County (1880 Census). William Minto had achieved the professional esteem that would enable him to perform such a momentous survey of the eastern border of his adopted state. From the report that he and his colleague Grunsky made to the Surveyor-General of the State of California in 1890, it is clear that Minto and his colleagues conscientiously went about first setting a control network of known locations on mountaintops surrounding Lake Tahoe, then to "determin[ing] error, if any there be, in the position of the state boundary line at lake Tahoe." The line that Minto and Grunsky were to correct and mark was to be considered the "legally established eastern boundary line of the State of California" with field notes and copies of maps to be filed within 60 days of completing the survey with the office of Theodore Reichert, the California Surveyor-General (Report of the Surveyor-General, 1890, p. 12).

Grunsky and Minto agreed with Von Schmidt's 1872 decision to hold the 120th meridian at the location observed at Verdi, but that the line that Von Schmidt had marked at the north shore of Lake Tahoe was 1609 feet too far to the west.[27] Minto and Grunsky had difficulty measuring the angles necessary to gain their control points on Round Top Mountain and Mount Lola, around Lake Tahoe, due to the "haze and smoke" of the summer months. They decided to "await the purification of the atmosphere before the first storm of October to accomplish what could not be done" in June.[25] The team was further thwarted by a "great depth of snow in the Sierra Nevada" in January 1890, causing a delay in their work. Grunsky and Minto submitted their final report in July 1890, rather than in May, as they had been instructed to do.[25]

In the end, William Minto and C.E. Grunsky reported to their Surveyor-General that Von Schmidt had "not properly mark[ed] the boundary between California and Nevada."[25] The following map shows the discrepancy between Minto's and Grunsky's 1889 line and that of Von Schmidt in 1872, as well as two other boundary surveys. The State of California decided to honor Von Schmidt's 1872 boundary as the true boundary from the northeastern corner of the state (northeast of Fort Bidwell) to Lake Tahoe, but held Minto's and Grunsky's new line of 1889 and 1890 from Lake Tahoe to the Colorado River.

Conclusion

William with brothers Robert, David, and John, 1907.
(Photo courtesy of the Minto family)

After his exciting and important work on the state boundary, William Minto returned to Alameda County, where he and his wife Josephine raised their children, Josephine Edson Minto (born in 1881) and William Harold Minto (born in 1888). He remained close to his siblings throughout his life. His mother Jane Minto died in Antioch, Illinois in 1893, having lived a full life and raised interesting, adventurous children – quite an honor for any mother! William died at the age of 82 in 1919, within months of the deaths of both his wife and daughter of influenza. His son, William Harold Minto, died in 1924, but had two children, one of whom lived a long life and gave William Minto four great-grandchildren.[28] William's brother Robert, who made Surprise Valley his home, has descendants still living and contributing their gifts to their community, walking in the footsteps of their creative, brave, and intrepid ancestors. The following photograph of William Minto and his brothers Robert, David, and John was taken in 1907.

The history of the American West is a tapestry of stories of cultures, geography, cooperation and conflict. The expansion of the United States into the territories now known as the states of California and Nevada was made possible by the profession of land surveying, the ancient human practice of measuring and describing the Earth.

Many times, during a real estate transaction, debates about property lines arise, and landowners may have occasion to seek the services of a professional land surveyor to identify the true lines of possession. Surveyors today still seek out the original maps and notes made by General Land Office surveyors like William Minto as part of our work.

In examining the professional work of William Minto, the circumstances and requirements with which he worked, his life from his immigration from Scotland through his pivotal determinization of the boundary of our state, we revive the life context of this great surveyor beyond those few stone monuments and artistic renderings of the land around us. Because of the care of the Minto family in preserving their predecessors' loving words and conscientious, well-lived impact on the communities of Surprise Valley, Modoc County, the State of California, and beyond, we also have the benefit of learning about the man behind the maps. William Minto was truly a gentleman surveyor, and residents of Modoc County benefit from his meticulous work, just as modern surveyors can appreciate his footsteps and landmarks, and lovers of adventure and

continued on page 36

family may be touched by the care he gave to his community and to his own family.

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About the Author

Laurie Pearce Price is a student in Great Basin College's Bachelor of Applied Science program in Land Surveying/Geomatics. She recently passed the Fundamentals of Surveying exam and is qualified as an LSIT in California and Nevada. She is a Modoc County resident and member of the Modoc County Historical Society. She also has a Bachelor of Arts degree in History from the College of William and Mary in Virginia, and a Master of Arts degree in Applied Anthropology from Oregon State University. She works with her husband, Professional Land Surveyor William Price, as a historic researcher and survey assistant in their land and water rights surveying company, Black Rock Resource Services LLC.

Endnotes

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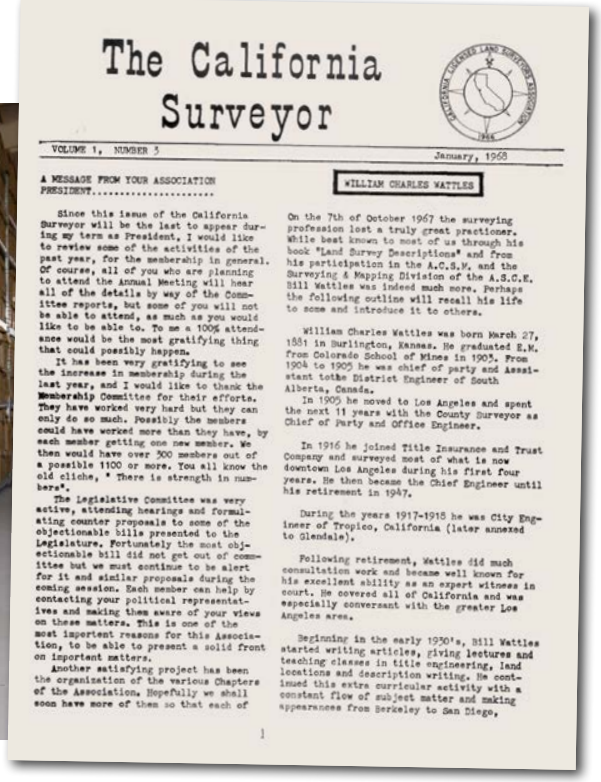


The California Surveyor

VOLUME 1, NUMBER 3 — January, 1968

A MESSAGE FROM YOUR ASSOCIATION PRESIDENT.....

Since this issue of the California Surveyor will be the last to appear during my term as President, I would like to review some of the activities of the past year, for the membership in general. Of course, all of you who are planning to attend the Annual Meeting will hear all of the details by way of the Committee reports, but some of you will not be able to attend, as much as you would like to be able to. To me a 100% attendance would be the most gratifying thing that could possibly happen.

It has been very gratifying to see the increase in membership during the last year, and I would like to thank the Membership Committee for their efforts. They have worked very hard but they can only do so much. Possibly the members could have worked more than they have, by each member getting one new member. We then would have over 300 members out of a possible 1100 or more. You all know the old cliche, " There is strength in numbers".

The Legislative Committee was very active, attending hearings and formulating counter proposals to some of the objectionable bills presented to the Legislature. Fortunately the most objectionable bill did not get out of committee but we must continue to be alert for it and similar proposals during the coming session. Each member can help by contacting your political representatives and making them aware of your views on these matters. This is one of the most important reasons for this Association, to be able to present a solid front on important matters.

Another satisfying project has been the organization of the various Chapters of the Association. Hopefully we shall soon have more of them so that each of

WILLIAM CHARLES WATTLES

On the 7th of October 1967 the surveying profession lost a truly great practioner. While best known to most of us through his book "Land Survey Descriptions" and from his participation in the A.C.S.M. and the Surveying & Mapping Division of the A.S.C.E. Bill Wattles was indeed much more. Perhaps the following outline will recall his life to some and introduce it to others.

William Charles Wattles was born March 27, 1881 in Burlington, Kansas. He graduated E.M. from Colorado School of Mines in 1903. From 1904 to 1905 he was chief of party and Assistant to the District Engineer of South Alberta, Canada.

In 1905 he moved to Los Angeles and spent the next 11 years with the County Surveyor as Chief of Party and Office Engineer.

In 1916 he joined Title Insurance and Trust Company and surveyed most of what is now downtown Los Angeles during his first four years. He then became the Chief Engineer until his retirement in 1947.

During the years 1917-1918 he was City Engineer of Tropico, California (later annexed to Glendale).

Following retirement, Wattles did much consultation work and became well known for his excellent ability as an expert witness in court. He covered all of California and was especially conversant with the greater Los Angeles area.

Beginning in the early 1930's, Bill Wattles started writing articles, giving lectures and teaching classes in title engineering, land locations and description writing. He continued this extra curricular activity with a constant flow of subject matter and making appearances from Berkeley to San Diego,

1

An excerpt from issue #3 of *California Surveyor*, published January 1968

EDITOR'S NOTE: All past issues of *California Surveyor* are available on our website by clicking on the current issue's cover: *www.californiasurveyors.org*

Surveying Education

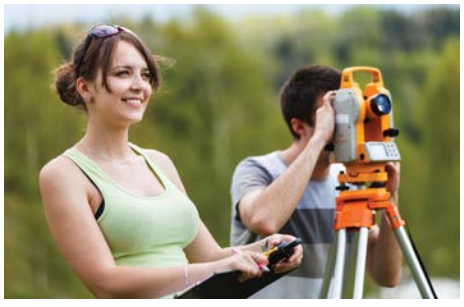
by Richard Stephan, PLS

The formal education of the Land Surveyor, or the lack of it, is a much-discussed subject and has been for many years. One can read material written on this subject 20 years ago and the ideas expressed are basically the same as those being written today.

The progress made over the past 20 years has been almost nil. The time for offering excuses and explanations has expired. Today we are interested in what can be done to correct an unacceptable situation. Our concern must be action, not interminable discussion.

Our rapidly expanding technology now requires the teaching of subjects which did not even exist 20 or 30 years ago. Within the Civil engineering curriculum these subjects have been added at the expense of surveying, but the civil engineers certainly have the right to decide what is proper training for their graduates.

Any further attempt to build an adequate land surveying curriculum within or around a civil engineering program is futile. The many curriculums which have been proposed in the past were merely modified civil engineering programs and they are much too scientifically oriented. The futility of this approach is quite evident by their general lack of success.



The program that we need must be oriented towards the arts with an adequate scientific background to assure proficiency in boundary location, law, land planning and photogrammetry. The liberal education of the student must be stressed to enable him to fully appreciate and discharge his responsibility to society.

There is little student demand for a land surveying curriculum and there will not be until the profession enhances its own image and until all land surveying work is done only by the Licensed Land Surveyor.

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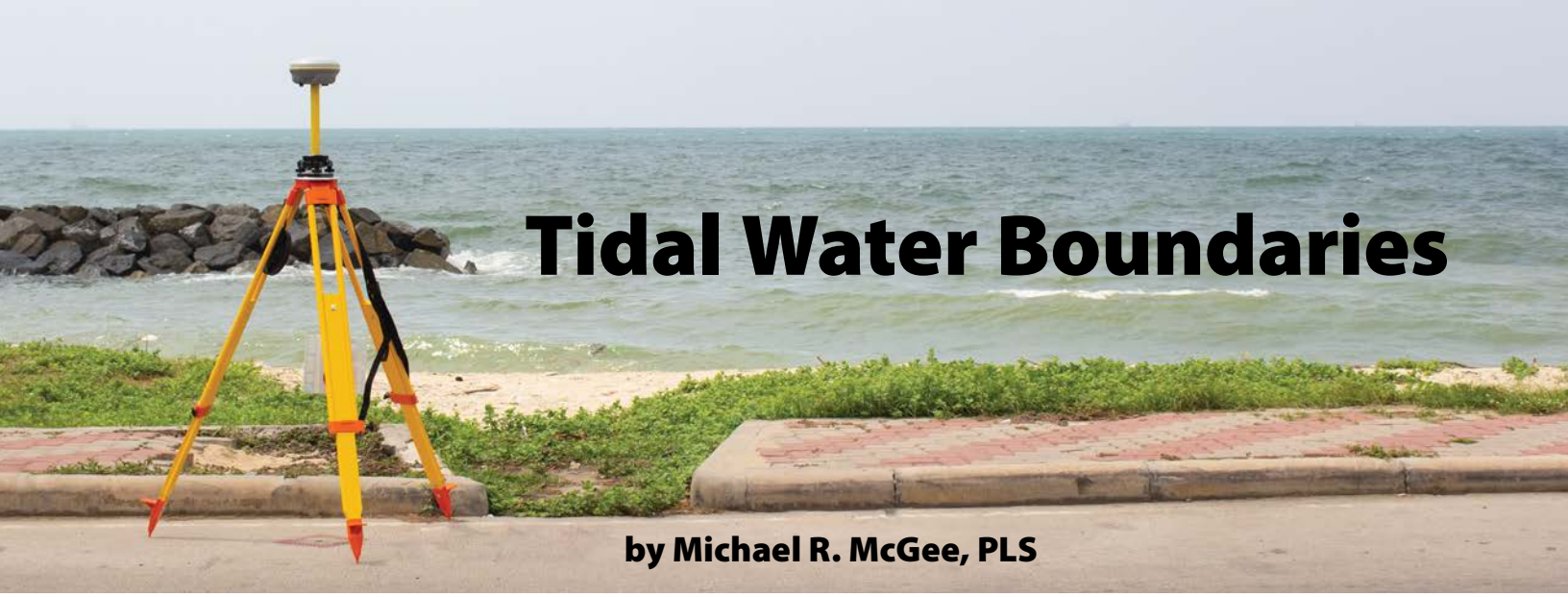

Tidal Water Boundaries

by Michael R. McGee, PLS

TITLE BOUNDARY

At statehood in 1850, California acquired from the Federal Government, ownership of the beds of navigable waters and waters under tidal influence. This included 1,000 miles of coastline, and many more miles of inland waterways affected by the rise and fall of the tide. California, therefore, claims the ownership of the beds of all navigable and tidal waters up to the ordinary high-water mark and a public trust easement up to the line of high water. This claim is clearly stated in the statutory laws of California at Civil Code Section 670 "The State is the owner of all land below tide water, and below ordinary high water mark," at Civil Code Section 830 "Except where the grant under which the land is held indicates a different intent, the owner of the upland, when it borders on tidewater, takes to ordinary high water mark" and at Code of Civil Procedure Section 2077(5) "When tide water is the boundary, the rights of the grantor to the ordinary high water mark are included in the grant." The littoral boundary between the state and an upland owner is therefore the ordinary high-water mark with the exception noted above "where the grant under which the land is held indicates a different intent." The court has addressed the claim in *Marks v. Whitney* (1971) 6 Cal3d 251 and *People v. Calif. Fish Co.*, (1913) 166 Cal 576.

TIDES

Tides are the result of gravitational forces primarily of the moon, to a lesser extent the Sun, the rotation of the earth (the Coriolis Force), and meteorological forces interacting with the physical configuration of the shoreline and seabed. As a result, the high tide level can vary along a shoreline. The tides along the Pacific Coast are mixed semidiurnal, meaning that two unequal highs and two unequal lows occur daily. The ebb and flow of the tide and the varying heights are distinguished by periodic variations related to the phases of the Moon as it orbits the Earth and to a lesser extent as the earth orbits the Sun.

California courts have defined the ordinary high-water mark as the limit reached by the Neap Tides in *Teschemacher v. Thompson*, (1861) 18 Cal. 11, 21 and *People v. William Kent Estate Co.*, (1966) 242 Cal. App. 2d 156 to name a few. Tides occurring during the second and fourth phases (the moon and sun are in conjunction or opposition) have a larger range due to the reenforcing gravitational forces of the sun, and the moon when it is new or full. These tides are called the perigean "Spring Tides," King tide being another non-scientific name used. Tides occurring during the first and third stages of the Moon (the moon and sun are in quadrature) are more moderate and referred to as "Neap Tides." The average level of the Neap high tide may be half a foot lower than the mean of all high tides.

TIDAL BOUNDARY RULE IN CALIFORNIA

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

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

A 1992 California case, *Antoine v. California Coastal Commission*, (1992) 8 Cal. App. 4th 641, 10 Cal. Rptr. 2d 471, 479-81 presented a very informative and complete discussion of the "Mean High Tide Line" and ended with "we conclude that today the Rule in California is the same as the Federal Rule." This case was de-published by the Supreme Court October 29, 1992.

In a 1997 California case, *Lechuza Villas West v. CA*, (1997) 60 Cal.App.4th 235, the Court stated regarding the Ordinary High Tide in a Footnote "2. The terms "mean" and "ordinary" will be used interchangeably throughout this opinion." In a 2011 California case, Thomas *Bollay Et Al., v. California Office Of Administrative*

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Law and State Lands Commission, (2011) 193 Cal. App. 4th 103, 122 Cal. Rptr. 490, the Court asserted the application in Borax Consolidated, Ltd. v. Los Angeles 296 U.S. 10 (1935) of the term Mean High Tide as follows "The mean high tide is determined by averaging the height of the high tides over roughly 19 years."

ARTIFICIAL ACCRETION

The natural location of the Mean High Tide Line is the usual criterion for boundary determination of tidal waters. If artificial accretion or erosion has occurred, then the location of the Mean High-Water Line in its last natural condition would generally control. Accretion is defined as the slow and imperceptible accumulation of material along a shore or bank. Artificial accretion caused by man made improvements, such as jetties or fills, belong to the State or its municipal tideland grantee as addressed in *Carpenter v. City of Santa Monica*, (1944) 63 Cal. App. 2d 772, 783-94 and numerous subsequent cases as recent as *SLPR, LLC v. San Diego Unified Port Dist.* (2020) 49 Cal. App.5th 284. The area between the last natural condition location and the present Mean High-Water Line may become the subject of litigation or an agreement with the State. Historical information can often identify the past locations of the Mean High-Water Line. See also *People v. Hecker*, (1960) 179 Cal. App. 2d 823, 832-35, 837-39.

TIDAL DATUMS

The elevation of the plane of Mean High Water, and all tidal datum planes are local in nature and vary along the shoreline by the physical configuration and time. If the slope of a shore or beach is gradual, then the vertical determination of a tidal plane may need to be accurate to 0.1 feet to limit the horizontal error in its location. An accurate determination of the elevation of Mean High-Water Line at a specific location requires observations of the tide for 18.6 years (taken as 19 years to round out seasonal events). Continuous observations for 6 months can yield an accuracy of less than 0.1 feet, and observations for 30 days can yield an elevation within 0.2 feet when reference to a control station according to NOAA Technical Report NOS-64 "Variability of Tidal datums and Accuracy in Determining Datums from Short Series of Observations."

The National Ocean Survey of the Federal Government monitors the tides at 26 primary and numerous secondary and tertiary tide stations around North America. Local water heights are determined for Mean Higher Water (MHHW), Mean High Water (MHW), Mean Sea Level (MSL), Mean Low Water (MLW), Mean Lower Low Water (MLLW). The heights at these stations are published based on a 19-year epoch with the present Tidal Datum Epoch being 1983-2001 soon to be updated to 2002-2020. Mean Lower Low Water is taken as a local reference datum of zero at each tide station. This local datum is referenced to permanent benchmarks in the vicinity called Tidal Benchmarks which are usually connected and equated to the North American Vertical Datum of 1988 (NAVD88).

DETERMINING LOCAL MEAN HIGH WATER

An accurate height of mean high water can be determined in a practical manner by observing a predicted high tide as it rises to the level of Mean High Water at a known tide station and simultaneously at a local site. For a detailed explanation of these type of methods, see "Water Boundaries" by George M. Cole, 1997. This procedure has been adopted by the Florida State Legislation. An often more practical procedure involves the determination of the height of the Mean High Water on the NAVD88 Datum at the nearest NOAA Tide Stations on both sides of a site, interpolating the MHW at the site, and then leveling from the nearest benchmarks to the shoreline to locate where the elevation of the MHW intersects the ground along the shore.

RESEARCH SOURCES:

State Lands Division (responsible for state boundaries including water boundaries);

State Department of Water Resources (river gauges);

National Ocean Survey (tide stations, sea level datums, hydrographic surveys over 100 years old), publications such as the annual "Tide Tables of the West Coast of North and South America," Special Publication 135 "Tidal Datum Planes" by H. A. Marmer, and "Shore & Sea Boundaries" by Shalowitz, 1962 ;

National Geodetic Survey (horizontal and vertical survey control both historical and present for tidal benchmarks);

US Army Corps of Engineers;

United States Geological Survey;

Bureau of Land Management;

National Information Center;

Farm Bureau (old aerial photos);

County Assessor (aerial photos and old maps);

County Recorder (record of surveys, deeds, land patents, Swamp & Overflow Patents and Surveys, Tideland Patents and Surveys).

This is an update of an article published in the California Surveyor *in 1993 with contributions by Neil King, PLS; Paul Mabry, PLS and Robert Reese, PLS.*

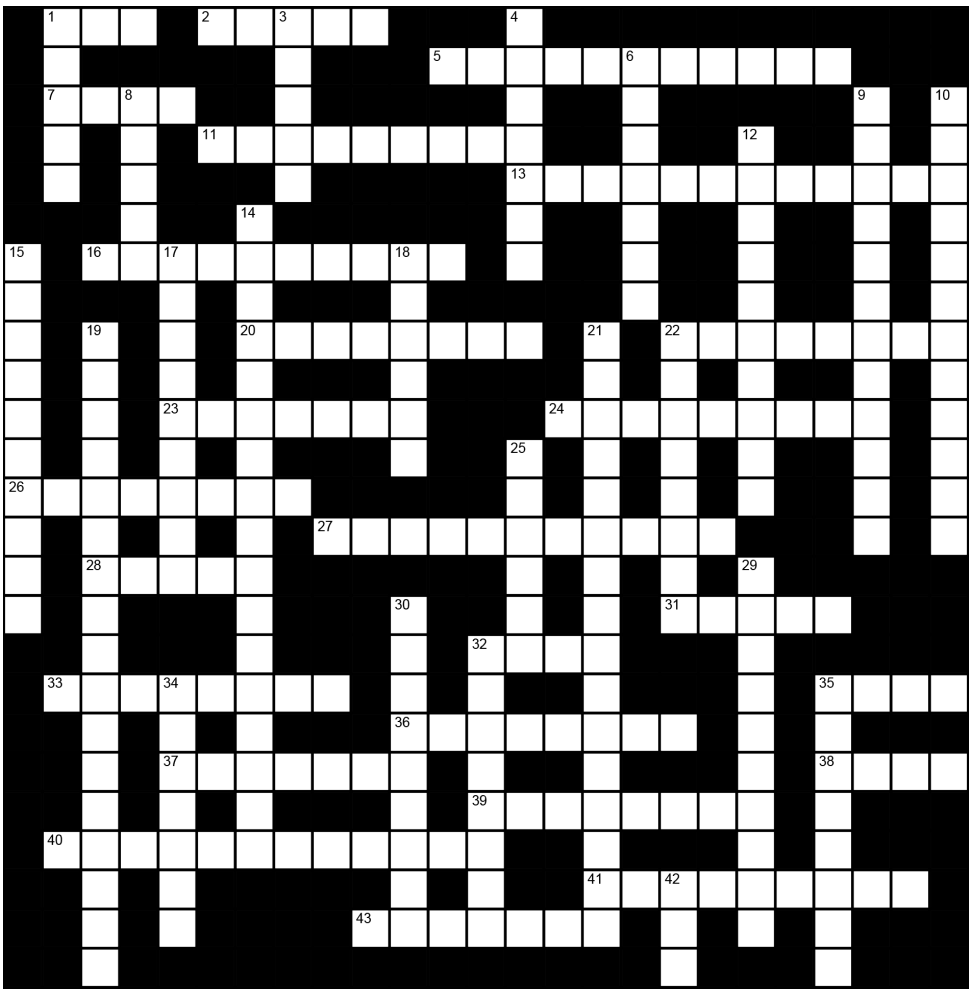
Zoom Meeting Bingo!

Since Land Surveying has been deemed essential, many of us attend ZOOM meetings now instead of the typical in-person meetings at work.

"In quotes" = statement made by attendee. *Italics = action happening.*

Dog barking in the background.	"Abe isn't here, but let's meet anyway." *Proceed to discuss something totally unrelated to topic at hand.*	*Audio cuts out just as you were about to get cruical info and the main reason you're there.*	"OK, we're going to give it five minutes before we start. This is totally new to some people."	*Person obviously working on real work on another computer.*
"Sorry. I was just in another meeting and it went over."	*Completely unrelated discussion happening in the Chat Box.*	"OK, let's introduce ourselves by going down the list." *Total chaos ensues.*	*Baby crying in the background.*	"Haha, sorry! I'm used to Slack / MS Teams / Google Meet."
Feeling of intense jealousy seeing someone else's amazing home office.	*Nervous laughter from everyone while boss talks but they're on mute.*	FREE SPACE "Can you hear me?"	*Lawnmower / leafblower noises in the background.*	*Person obviously texting.*
Shared screen of ZOOM meeting instead of intended screen.	"Can you all see this?"	*Attendee present that nobody really knows and is probably in the wrong meeting.*	"My Bluetooth has been acting up."	*Someone picks up another call but forgets to mute and broadcasts another conversation.*
"Oh, I was on mute."	*Cat walks by on desk or across keyboard.*	*Entire meeting could easily have been a group e-mail.*	*Unsure if you can log off yet since you're done but the boss is still there.*	"See ya!" "Have a good one." "Great, thanks." "Okaythanksbye." "Bye-bye." *All at once.*

Pallamary Crossword Puzzle



DOWN

1 A cut in a tree
3 Even with the Earth
4 A mistake
6 To determine size
8 Below or under
9 Where two or more lines meet
10 Property subject to inheritance
12 Great author
14 Specialist
15 The locus of all points on the Earth's surface at which the magnetic north coincides with astronomical north
17 Author of world renown
18 Location in a stream
19 It is gone now
21 A lens corrected for curvature of field
22 A scale line furnished to a camera operator
25 A period of, or occurring in a day
29 A precise location
30 To distribute a measurement
32 Lying in the same plane
34 A piece of equipment
35 To establish a new meander line
42 A metric unit of area

ACROSS

1 Tribal authority
2 Not the moon measurement
5 To adjust some equipment
7 A horizontal excavation to a mine
11 To be right where things should be
13 Device used to measure the average grey-tone density of images in a piece of film
16 Home of legislation
20 A stereogram in which two views are printed in complementary colors, red and blue or red and green
22 To mark out
23 A marine term, used to denote a bottom of sand, stone or rock mixed together and rising toward the surface of the water
24 Not forward looking
26 Having to do with water
27 In law, the force of the water
28 Part of a township
31 A small island
32 Organization
33 The line on a map or boundary of the mapped area
35 A square equal to ¼ acre
36 Sort of littoral
37 A ditch used in irrigation
38 A level place
39 A quick removal of land
40 A way to acquire rights in another's land
41 Water Measurement Event
43 A way in

Answers will be printed in *California Surveyor* issue #194

CLSA
CALIFORNIA LAND SURVEYORS ASSOCIATION

Membership Application

2520 Venture Oaks Way, Suite 150 | Sacramento, CA 95833
Phone: (916) 239-4083 | Fax: (916) 924-7323

☐ **Corporate** **$260**
Shall have a valid California Professional Land Surveyor or Photogrammetric license.

☐ **CE Corporate** **$260**
Any California registered Civil Engineer who is authorized to practice land surveying pursuant to Article 3, Section 8731 of the PLS Act, and must be actively practicing land surveying.

☐ **Affiliate** **$130**
Any person who, in their profession or vocation, relies upon the fundamentals of land surveying. Has no voting rights.

☐ **Associate** **$130**
Any person who holds a valid certificate as a Land Surveyor in Training. Has no voting rights.

☐ **Out-of-State** **$130**
Any person who resides in a state other than California, who is a member of the other state's Association, and meets the requirements of a Regular Corporate Member. Has no voting rights.

☐ **Student** **$26**
A student enrolled in a college or university actively pursuing a surveying education. Has no voting rights.

☐ **Sustaining** **$520**
Any individual, company, or corporation who, by their interest in the land surveying profession, is desirous of supporting the purposes and objectives of this corporation. Has no voting rights.

First time members must pay a $25 entrance fee, lapsed members must pay a $15 reinstatement fee. First year dues are pro-rated from the month of application.

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Membership in the California Land Surveyors Association, Inc. as a Sustaining Member is open to any individual, company, or corporation who, by their interest in the land surveying profession, is desirous of supporting the purposes and objectives of this Association. For information regarding Sustaining Membership, contact:

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