

the American Surveyor

SEPTEMBER 2018

WEST FROM WASHINGTON

Hemisphere GNSS

A visit to headquarters

Thought Leader

Bloomberg out of touch

Flood Info

Ensure it's correct



Your work is your **reputation.**



Make Your Mark.

Everything you do in the world leaves a mark. There's no room for errors or inefficiencies. You want accurate, reliable, and intelligent solutions. You need the most progressive tools in precision technology, so you can turn your ideas into a reality.

That's why we're committed to providing you with proven solutions—so you can make your mark with permanence.

geospatial.trimble.com

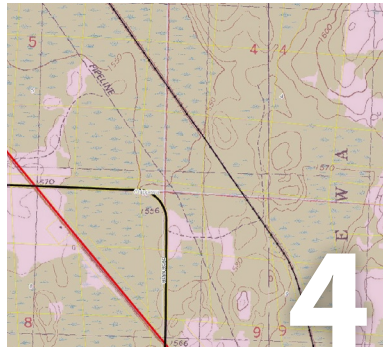


contents

ON THE COVER



The corner common to the states of Colorado, Nebraska, and Wyoming.



features

10 West from Washington

Twelve states have meridional boundaries that are referenced from the Washington Meridian. In 1912, the Greenwich Meridian became the standard.

JERRY PENRY, PS

30 A Visit to Hemisphere GNSS

Hemisphere envisions exciting industrial changes rapidly redefining the scenery of the ultra-competitive GNSS positioning market.

JASON E. FOOSE, PS

departments

4 Decided Guidance: Boerst v. Opperman Part 2

"The record supports...the centerline of Henn Road has been relied upon by the government and private owners alike as the boundary line between sections 8 and 9..."

JASON E. FOOSE, PS

16 Points & Pixels

A compendium of industry news.

36 Test Yourself 55: X Marks the Spot

Exercising geometry and trigonometry skills.

DAVE LINDELL, PS

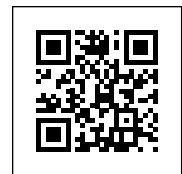
38 FeedBack

Thoughts from our readers.

40 Vantage Point: Is That Flood Information Correct?

Bottom line? Check what data you rely upon and how you use it.

WENDY LATHROP, PS, CFM



AmeriSurv To Go!
Get the most from this magazine on your tablet or laptop.

in this issue

2 Thought Leader: Land Surveyors are Paying the Price of Progress
A Bloomberg article by Stephen L. Carter is hopelessly out of touch with reality.

MICHAEL PALLAMARY, PS

34 MarketPlace

thought leader

“Land Surveyors are Paying the Price of Progress”

by Stephen L. Carter

Stephen Carter is a writer of fiction and a professor of law at Yale University. He has taught courses on law, religion, the ethics of war, contracts, evidence, and professional responsibility. He blogs about professional football for the *Washington Post*.

It is unfortunate he has not studied real property law.

His recent article in *Bloomberg* is yet another reminder of the disconnect associated with ivory tower academia—hopelessly out of touch with reality.

Carter's dismissive discourse about “drawing lines on a map” is possibly one of the greatest examples of intellectual ignorance I have ever encountered. Equating Land Surveyors with Uber drivers is akin to comparing a back-country seamstress with a surgeon at John Hopkins Hospital.

After all, both use thread.

Mr. Carter's perception about the needs of a real estate professional are not surprising, given his expertise in such things as *The Etiquette of Democracy*, *Cleaning up the Federal Appointments Process*, and *How American Law and Politics Trivialize Religious Devotion*.

Notwithstanding Mr. Carter's unfamiliarity with the laws of the land, he would have to agree that real estate is the foundation of the world economy. Indeed, the single greatest asset of all Americans is their home and, it is for this reason, that Land Surveyors are licensed to define the limits of real property. Land is expensive: The median price of currently listed homes in San Francisco is \$1.3 million. In Manhattan, the median is \$1.4 million.

According to Carter, “The major disruption will come when the big banks move. When those who finance big projects and big houses decide that a report that relies on GPS mapping is sufficient to mark the metes and bounds of a property, the rising tide of demand will swamp local regulatory resistance.”

This is the same kind of thinking that led to the savings and loss crisis in the eighties and nineties when, more than 1,600 federally insured banks were closed or received FDIC financial assistance and the number of federally insured savings and loans in the United States declined from 3,234 to 1,645 due, primarily due to unsound real estate lending. In many instances, these failed loans were associated with fast and fraudulent real estate lending; banks and lending institutions failed to obtain properly certified surveys and far too many loans were issued on properties with encroachments and questionable ownership, all of which would have been disclosed with a properly certified survey. According to the U.S. General Accounting Office, the estimated cost of the crisis amounted to \$160 billion. Clearly, to dismiss the importance of Land Surveyors is sort of like consulting with a seamstress about such things as vascular surgery, ardiothoracic surgery, and neurological surgery. After all, she works with thread. ■

Michael Pallamary is a Professional Land Surveyor with offices in La Jolla, California. He has been surveying real property since 1971 and he is the author of numerous treatises and books on land surveying and land planning issues. He has testified in more than 100 cases on land surveying matters. He can be reached at mpallamary@pipeline.com. He did not graduate from Yale.

the American Surveyor

amerisurv.com

September 2018 / Vol. 15 No. 9
© Cheves Media LLC

PUBLISHER Allen E. Cheves
allen.cheves@chevesmedia.com

EDITOR Marc S. Cheves, PS
marc.cheves@chevesmedia.com

ASSOCIATE EDITOR Jason E. Foose, PS
ASSISTANT EDITOR Jacalyn Cheves

CONTRIBUTING WRITERS

C. Barton Crattie, PS	Lee Lovell, PS
James J. Demma, PS, Esq.	Wendy Lathrop, PS
Dr. Richard L. Elgin, PS, PE	John Matonich, PS
Chad Erickson, PS	Michael J. Pallamary, PS
Linda Erickson	Jerry Penry, PS
Gary Kent, PS	Walt Robillard, Esq., PS
Joel Leininger, PS	Fred Roeder, PS

The staff and contributing writers may be reached via the online Message Center at amerisurv.com

GRAPHIC DESIGN LTD Creative, LLC

WEBMASTER Joel Cheves

OFFICE ADMINISTRATOR Becky Sadler

AUDIENCE DEVELOPMENT Edward Duff

ACCOUNT EXECUTIVE Richard Bremer

The American Surveyor (ISSN 1548-2669) is published monthly by Cheves Media LLC. Editorial mailing address: 7820-B Wormans Mill Road, #236 • Frederick, MD 21701. Tel: (301) 620-0784.

The American Surveyor is a publication of Cheves Media LLC, 7820-B Wormans Mill Road, #236 • Frederick, MD 21701. No part of this publication may be reproduced in any form without the express written permission of the publisher. Opinions and statements made by the writers and contributors do not necessarily express the views of Cheves Media LLC.

Subscriptions prices in the U.S.: Free for qualified professionals. Canada: 1 year \$56.00 US; international subscriptions \$72.00 per year (Airmail), U.S. funds prepaid. Back issues (subject to sufficient stock) are available for \$4.95 + S/H.

New subscription inquiries and all other address changes should be sent to *The American Surveyor*, P.O. Box 4162, Frederick, MD 21705-4162. Fax: 301-695-1538. Subscribe online @ www.amerisurv.com



ION GNSS+ 2018

Visit us in booth #416

INTERGEO 2018

Visit us in booth #12.0D.089



**Under heavy canopy?
Spotty cell coverage?
Need guaranteed precision every time?**

Flexible SCALABILITY + Full TRACKING

Meet your application needs with our scalable multi-frequency, multi-GNSS positioning solutions

Advanced TECHNOLOGY FEATURES

Athena™ RTK engine offers world-class performance

Atlas® delivers scalable global L-band corrections

aRTK™ works when RTK corrections fail

SureFix™ verifies the fix with virtually 100% reliability

AutoSeed™ rapidly re-converges to high-accuracy position

Experience World-Class RTK Performance

+1 (480) 348-6380 | Precision@HGNSS.com | www.HGNSS.com

decided **guidance:** case examinations

Boerst v. Opperman Part 2

Wisconsin Supreme Court 2010 • 325 Wis. 2d 445, 784 N.W.2d 736

Last month we waltzed through the evidence and touched on the findings of fact established by the circuit court. Let's review the arguments and refresh those findings:

"the Boersts sued, seeking a declaration they owned the land between the new section line and Henn Road, land the parties previously believed belonged to the Oppermans. The Oppermans responded that the 1912 survey was inaccurate and that Henn Road actually does lie on the section line. They also

argued that even if Henn Road was not on the true section line, all relevant property owners nevertheless treated the road as a boundary line for several decades. For support, they pointed to a 1917 lawsuit concerning Henn Road, in which the parties there stipulated: "the common corner of sections 4, 5, 8 and 9 in township 41 north, range 1 west, Ashland County, Wisconsin, is at the intersection, or meeting point, of the centerline of the highway between sections 8 and 9 as said highway has been used for more than twenty years..." They therefore argued they were entitled

to the disputed land under the doctrine of acquiescence."

The resulting findings of fact revealed the following:

- The original section corner monument between Sections 4, 5, 8, and 9 in Township 41 North, Range 1 West, Ashland County, Wisconsin no longer exists.
- No competent evidence is before the court to determine where the original section corner monument was originally placed.



Dave White's

SitePro™

**SURVEYOR'S
PREFERRED
CHOICE**

FOR TOOLS AND ACCESSORIES



- Optical Instruments
- Laser Instruments
- Measuring Devices
- Magnetic Locator
- Instrument Tripods
- Leveling Rods
- Prisms & Poles
- Bipods & Tripods
- GNSS Accessories
- SiteGear™
- Bags & Cases
- Field Supplies

Contact Us or Your Local SitePro Dealer Today for More Information.

(855) 354-9881 | info@dwsitepro.com | www.dwsitepro.com

© 2017 copyright Dave White's SitePro LLC. All rights reserved.

“The record supports...the centerline of Henn Road has been relied upon by the government and private owners alike as the boundary line between sections 8 and 9...”

- No clear and convincing evidence exists that the resetting of the corners in the 1912 Parker survey (upon which the 2005 tie sheet is based) was correct.
- Neither party has shown by clear and convincing evidence where the actual boundary line exists.

The circuit court further concluded that the original boundary line between Sections 8 and 9 cannot be determined solely by the descriptions in the deeds.”

Let's review the decision and appeals.

1. “The circuit court found the road was most likely not on the original section lines. However, it concluded that for nearly a century, the property owners adjacent to Henn Road believed it was and acquiesced to the road as the boundary. In a written decision, the court declared Henn Road is the boundary line between the property owners in this case...Northrop (co-plaintiff)

requested the court determine whether the corner was lost or obliterated...the court ultimately ruled on the matter concluding that if you're going to treat the line as being acquiesced to, you have to treat the corner as being acquiesced to. And, therefore, the only way to do that is to treat it as obliterated...”

2. The appellate court concluded “the circuit court correctly determined the parties acquiesced to the boundary line, but that it erred when it found the section corner obliterated.”
3. The Supreme Court affirms the circuit and appellate court's rulings that the property line is the centerline of Henn Road but that's apparently it. “Boerst seek review of that part of the court of appeals decision affirming the circuit court's determination that the boundary line between their property and the

THE SMART CHOICE

FOR LOCATING UNDERGROUND

LIMITED TIME
**Special
Value
\$125 Offer***

FREE PS301 Wheel

with Purchase of a
Smart-TRAK ST-Series
Magnetic Locator.

*Offer available only in USA.

PS 301
Reg. \$125**
Compare to
Keson MF301



ST 102
Reg. \$699**

- ✓ **Smart-Search Technology™** indicates polarity and eliminates Interference for faster locating with pin-point accuracy
- ✓ **1.5x Greater Sensitivity** for more depth range than other locators
- ✓ **Large Display** with graphic interface provides hi-res visual search results
- ✓ **IP67-Waterproof** tip & tube; rugged, rubberized water/dust resistant housing

SmartTRAK

Visit your local SitePro Dealer, or Contact us toll-free for more details

(855) 354-9881 | www.dwsitepro.com

© 2017 copyright Dave White's SitePro LLC. All rights



Dave White's
SitePro™



MADE IN
USA
OF GLOBAL COMPONENTS

7
YEAR
WARRANTY
SitePro

property of Betty and Floyd Opperman is the center line of Henn Road. We affirm this part of the decision of the court of appeals."

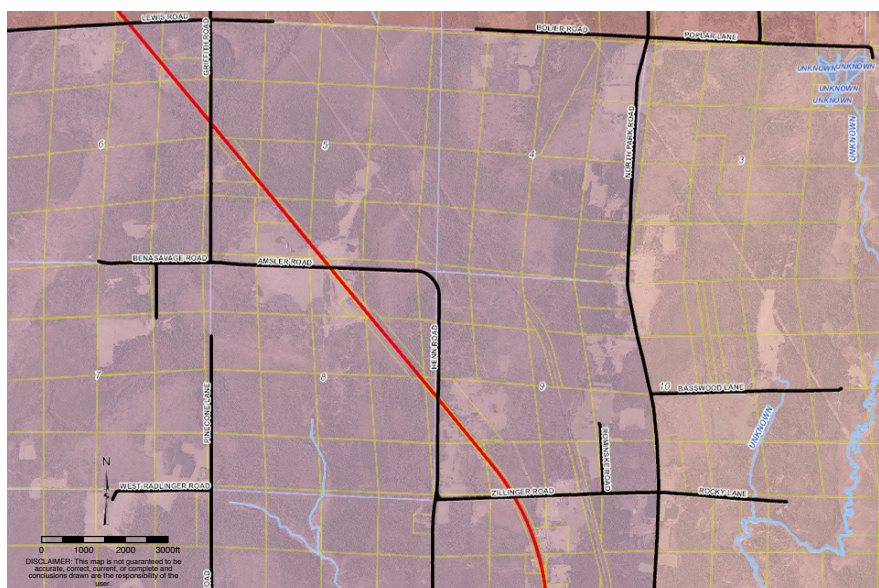
Okay, so there we have it. Apparently the only question that made it all the way through the Supreme Court was "where is their common property line?" The question of "obliterated" was only presented in front of the appellate court.

I can't quite get the checkbook to balance here with a notion that the appellate court may have delaminated the PLSS from the property ownership. I follow the circuit court's logic leading to an obliterated corner although I get there by different means. I might be advancing the spark just a fuzz by assuming that the 1886 survey of Henn Road actually matched the section line and I'll get to that in a minute. Regardless, if it did match, then it is evidence of the original line and the corner is merely obliterated. However, if it did not match then the corner is lost, right? At least according to the evidence and findings of fact. Okay but the circuit court says something really logical but different. "...if you're going to treat the line as being acquiesced to, you have to treat the corner as being acquiesced to." This is profound and maintains the stability of the property on the ground as well as the title description and furthermore the PLSS itself. Stability of boundaries is after all the point of the PLSS and by acquiescing, the owners are performing their legal equivalent of double proportioning under their own will. Now, I agree with the circuit court's line of thinking but unfortunately I've already put all my chips on the 1886 road proceedings and the 1917 court decision both declaring the road as being on the true section line and jumped on that as evidence of the original line.

There are eight synonymous and interdependent elements here 1.) The actual center line of Henn Road on the ground, 2.) The record centerline of Henn Road, 3.) The west line of section 9 on the ground, 4.) The west line of section 9 of record, 5.) The east line of section 8 on the ground, 6.) The east line of section 8 of record, 7.) Opperman's deed line dependent on the described aliquot line, 8.) Boerst's deed line dependent on the described aliquot line. I'm not sure how the appellate court reasoned otherwise or could divorce any from the others? Being that I'm a surveyor and not an appellate



Butternut was all tidy and square in the 1850's according to the G.L.O. boys.

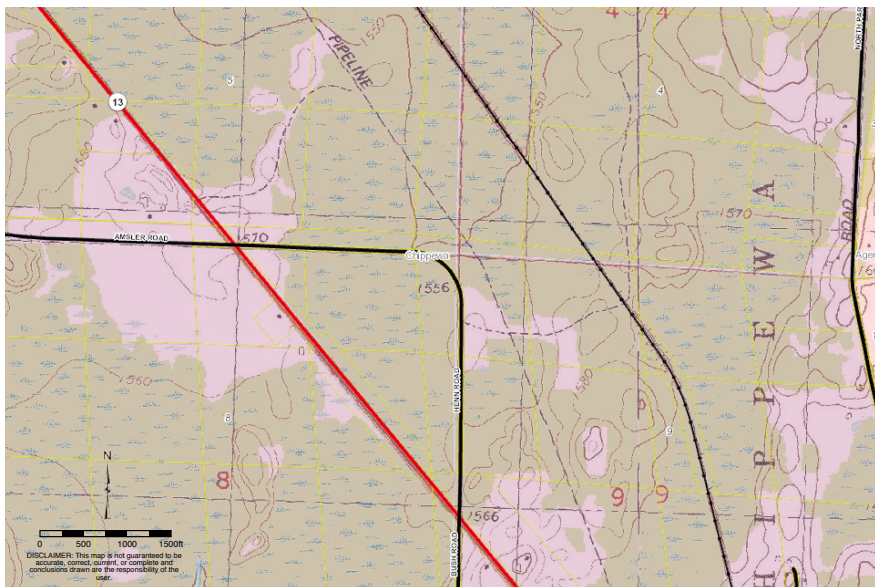


Yellow lines are the parcel fabric. White lines are the PLSS layer square with the G.L.O. plat. Notice how the black road and white record G.L.O. harmonize together.

judge, generally my next step after a whiff of bewilderment is to grab the shovel and keep digging. So that's what we're gonna do.

Okay, let's Stop, Drop, and Roll here. Our SDR this month is sponsored by the good folks at the Ashland County, Wisconsin GIS Department. Let's give a shout out to Brittany at Ashland County for her assistance in the matter! I took a gander at Ashland County's awesome GIS to get a

lay of the land and started to see how the circuit court might arrive at our similar "obliterated" conclusion but through a different path, namely acquiescence. Well, for starters, the aerial view shows Henn Road is pretty much cardinal and matches the PLSS Cadastral layer, the GLO plat, and the USGS Quad sheet's cadastral line work. (see photo). Remember, other than the roadbed itself these items are "record" evidence and



Federal records superimposed over the local cadastre reveal significant differences. Maybe the 1886 road survey was a wing ding job based on really square and cardinal record info?

most likely are just reverberations of the GLO plat and this probably explains why they match and feel equally cardinal. On the other hand the parcel/aliquot fabric layer resembles drunken dominoes in the galley of the Edmund Fitzgerald. It becomes apparent that something in the ground work may have severely deviated from the original G.L.O. record and maybe Henn Road wasn't quite where Butternut's 1886 surveyor thought it was. Okay, that doesn't really resolve any boundary questions but it shows us things aren't so certain in this neck of the woods and perhaps why the circuit court was unable to muster competent evidence of the original position of the section corner. Regarding me placing all my chips on double zeros, I quote that old hippy turned hillbilly Kenny Rogers "you gotta know when to hold 'em, when ta hold em, know when ta fold 'em, when ta fold um"... looks like Foose is foldin' on that call.

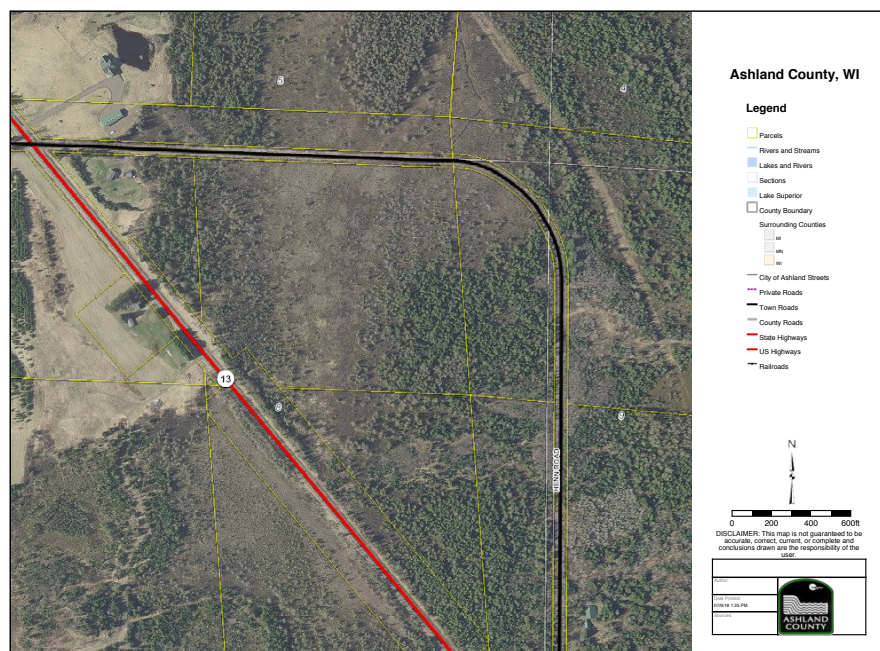
One last thing about the 1886 road survey. If it was fact that the road was surveyed on the true section line in 1886 then wouldn't that support Opperman's obvious first response that the road is competent evidence? There's an 1886 survey and a 1917 court stipulation supporting that response yet the finding of fact was "No competent evidence is before the court to determine where the original section corner monument was originally placed." These are big ticket items for a court and to the best of my knowledge extremely strong evidence because they are sworn or certified by

presumably competent people, especially the 1917 court. Things are not jiving here and I'm starting to think we're working off of a 2 legged tripod. Let's keep pokin' and stokin' with the shovel.

Have any of you cheeseheads ever heard of Wis. Stat. § 893.24? Well the appellate court sure did and justly applied it...or did they? The law reads:

"(1) A written instrument or judgment that declares the boundaries of real estate

adversely possessed under s. 893.29, 1995 stats., or s. 893.25, 893.26 or 893.27 does not affect any section line or any section subdivision line established by the United States public land survey or any section or section subdivision line based upon it. (2) Occupation lines that the court declares to be property lines by adverse possession under s. 893.29, 1995 stats., or s. 893.25, 893.26 or 893.27 shall, by order of the court, be described by a retracable description providing definite and unequivocal identification of the lines or boundaries. The description shall contain data of dimensions sufficient to enable the description to be mapped and retraced and shall describe the land by government lot, recorded private claim, quarter-quarter section, section, township, range and county, and by metes and bounds commencing with a corner marked and established by the United States public land survey or a corner of the private claim." Quite frankly I wonder how the appellate court even got here. This case is a question of the location of the common line between two deeds describing a common PLSS line where evidence might place it at either along the road or at the 2005/1912 monument. The appellate court somehow arrived at the following: "(the circuit court's decision) appears to suggest the Boerst's and the Oppermans' property boundary and the boundary between sections eight



Notice the catawampus cadastral lines (yellow) pointing to the swamp corner and the physical road intersection pointing near the record corner (white) are several hundred feet apart.

the American Surveyor



Your comments and suggestions are valuable to us—feel free to let us know what you think.

You can reach our staff and contributing writers through the online message center at: www.amerisurv.com

OR

The American Surveyor
7820-B Wormans Mill Road, #236
Frederick, MD 21701

and nine are one in the same. Such a conclusion would be at odds with the court's conclusion the road is the boundary because the relevant property owners acquiesced to it, not because it lies on the true section line. We therefore reverse that part of the judgement suggesting Henn Road is the section boundary..." I'm simply hung up on the appellate court's apparent lack of respect toward the legal descriptions in the deeds. There was no finding of fact that upset the expected behavior of the operational section line. Namely it's the line between 8 and 9 as described by the deeds, patent, and plat. There was no finding that the deeds describing the aliquot lines were bunco either. The evidence of title deeds, town minutes, road survey, both 1900's court decisions, and state highway survey all showed the section line and property line common with the road. Actually, the findings of fact point in the direction of a lost corner and beg for some restorative support like acquiescence. It seems like the appellate court omitted the fact "No competent evidence is before the court to determine where the original section corner monument was originally placed." I really think I'm missing something here and need to dig deeper.

I reiterate, the circuit court declared "No competent evidence is before the court to determine where the original section corner monument was originally placed." and "No clear and convincing evidence exists that the resetting of the corners in the 1912 Parker survey (upon which the 2005 tie sheet is based) was correct." Having no original monuments, the circuit court resorted to extrinsic evidence to place the legal descriptions on the ground. Best I can tell is that the legal descriptions were not broken but they were dependent on missing monuments and the extrinsic evidence was used to fill that gap. I personally relate this as the owners' legal equivalent to G.L.O. double bubbling but across private domains. Instead of pure math controlling a "no-damages" solution within the singular title of the public domain, the court relies on the common behavior of the owners as an equitable solution to control the position of the replacement corner. Hmmm... This is starting to sound like a state court might have to address a beast that lives and breathes in the purgatory between "obliterated" and "lost", doesn't it?

So here it is folks, the pig flying around the 800 pound gorilla dancing with the

elephant in the room. The Supreme Court stated that "The record supports the circuit court's determination that the centerline of Henn Road has been relied upon by the government and private owners alike as the boundary line between sections 8 and 9 in Township 41 North, Range 1 West, Ashland County, Wisconsin. The evidence in the record prior to the events leading to this litigation supports a finding of longtime undisturbed possession of property based upon the center line of Henn Road as the boundary line." Sounds great, right? The circuit court got it and the appellate court blew it. Here's the twist. I don't think the "obliterated" question was directly offered to the Supreme Court through appeal so I'm not sure what the weight of that statement is. We need to keep digging!

Okay, this month's totals are:

- Foose bit the dust on the road being laid out from original monumentation.
- The property line and the road match.
- The section line matched the road in the circuit court.
- The section line did not match the road in appellate court.
- The section line matched the road in the Supreme Court but the appeal only referred to the question of the location of the property line.
- Butternut's cadaster is worse off now than before the case.
- Thomas Jefferson is ready to pack up and move to Canada.

I feel like I'm open in the end zone but Favre is running a different play. I'm still convinced we don't have the whole story or maybe I'm just not readin' this right, but my shovel hand is itchin' to keep digging. Any of you cheeseheads got anything on this case? Feel free to contact me at rls43185@gmail.com. ■

Jason Foose is the County Surveyor of Mohave County Arizona. He originally hails from the Connecticut Western Reserve Township 3, range XIV West of Ellcott's Line Surveyed in 1785 but now resides in Township 21 North, Range 17 West of the Gila & Salt River Base Line and Meridian.



The Barbershop Barrister

Right now the Ashland County GIS clearly depicts confusion, mayhem, disorder that would have old T-Jeff boycotting the last election and leaving the country. How is it that the integrity of these chains of title can be legally upset beyond a point of recognition? The simple answer is that they should not be. This case was clearly a question of "where does the line fall on the ground?" rather than "what are the legal limits of these adjoining land titles?" The deeds were not broken. From my perch,

Boerst's original declaration that they owned the Oppermans' land between the new section line and Henn Road does not seem to fit an adverse possession argument. Oppermans' apparently occupied that chunk and it doesn't seem that Boerst was able to scrape together any satisfactory evidence of adverse possession otherwise. Regardless, if the "new" section line was in fact the true or the accepted section line then Boerst would have rightfully owned that land in the first place and maybe a trespass declaration would have been more appropriate? I don't really know and will call that nothing more than a strong dose of good old fashioned barracks lawyerin' on my part.

I'm stuck on how the appellate court could undo the pedigree of a functioning legal description. In this worst case scenario of "lost corners" the strength of the PLSS is the equity afforded to owners by the original simultaneous conveyance. I don't think in this case that either owner has superior title per deed until occupation is disengaged from the section line by the appellate court. I also don't see where facts proved disengagement regardless of proving that the original mark was lost or obliterated. There is a set of restoration instructions that suggests exhausting every scrap of evidence and following state law before resorting to double bubbling as an arbitrary redistribution of dirt among unsuspecting owners. Even after the last resort of double trouble is employed, the integrity of the aliquot descriptions is maintained, right? All of the sections still have the same legal description; they just are not as square on the ground as they were on the original plat. The circuit court reviewed the facts and arrived at a place where the title descriptions were unmolested and the evidence revealed the position in which line naturally settled under a century of human interaction. Everything worked!

So the appellate court inherits a bonus question asking if the corner is lost or obliterated. IT IS OBLITERATED! Why and why the yelling Foose? Because the circuit court found more than a scintilla of evidence in the 1886 town minutes and road survey, and the two previous court cases laminating the road, the property and the section line as one. This is the written legacy of the section line and it was backed up by everyone that touched or used it. I get the feeling that back in 1912 Parker might have tried to right a ship that set sail without him by pulling a double whammy out in the swamp. If so, he probably did everything technically correct and pissed everybody off to the point of just respecting the improvements on the ground. After all, it was their property, not his or the G.L.O.'s to reconfigure and that's my two cent speculation so let's leave it at that.

But not so fast on the "obliterated" dealio here folks. The findings of fact lean more toward the definition of lost. That's giving me a little heartburn but I think it gets washed out by the circuit court's final conclusion supporting the acquiescence line. It's hard for me to imagine a place where corners are truly lost after a patent is issued but this swampy glacial plain is one of them. So hats off to these badgers for keeping the PLSS afloat regardless of the catawampus appearance on a map. Wisconsin is rich in boundary

case law and influential nationally. That's why I'm concerned when it looks like a series of decisions working in concert with an interpretation of state statute ends up undermining the PLSS. Sure there's gonna be bumps, bruises, and wear & tear on T-Jeff's grid that naturally add flavor but this case ends up nullifying the PLSS or at least deeming it irrelevant. If dependent property descriptions are going to be delaminated from the grid then the grid becomes nothing more than a ceremonial old locust shell stuck in the tree bark. Useless, hollow, and dead.

If a corner is lost it can neither be proven nor disproven where it actually existed because nobody really knows at that time. This also means that nobody can prove or disprove that a replacement corner fell in the same spot as the original. It's simple, we just honestly don't know and that's my supplement to the written definition of a lost corner. Best I can tell, the only evidence of a corner in the active federal arena is the monument placed by surveyors or perhaps some authorized activity like a lease or right-of-way. Most everything else is a permitted use or trespass but immune from any adverse claim however don't bank on that notion until you fully understand the federal hoohaw. However, something different happens outside of the sterilized walls of the federal arena. Human intervention excited by the psychology of human want, familiarity, greed, protection, defense, peacefulness, aggressiveness, industry, productivity, good manners and just plain old bad behavior among every other human condition is captured in title. As sure as some knothead has thrown fast food wrappers and diapers along the road, we can count on mankind to leave some scrap of evidence pointing to an original line.

Knowing how double proration works I'm inclined to say that it is highly unlikely if not impossible that a replacement corner would fall back in the original spot. I also question the use of the technique from "found" non-original corners but that's another topic. The bottom line is that there is a need for a court to employ some evidentiary method to restore a PLSS corner. Outside of the federal arena there is a realistic condition between the definitions of obliterated and lost. I think this beast is related to "title" or maybe better called "competing titles"? Where human interaction supplements deed descriptions, we might be well served to adopt operational section lines as the true section line when the evidence and facts put all else to rest. There's a form of acquiescence that is the equivalent of a silent double bubbling in the private domain and I think the circuit court found it in Boerst. It's not the familiar argument of the doctrine being employed as a remedy to fix uncertain title. Probably just the opposite. It establishes the place that the healthy title line has naturally landed. From a title perspective the PLSS is pretty bulletproof or at least as much as any other simultaneous conveyance is. A court realizing the natural placement of a line by a series of events offered in evidence and supported by fact is about as good as it gets in lieu of original monuments.

The purpose of the PLSS is to provide stability and it did that in Butternut for 119 years. The duct tape and bailing wire that held the 1886 road action and 1917 court decision together matured and bonded itself to the land like roman concrete, at least to the adjoining owners and the folks enjoying the public road which are indeed the consumers, end users, clientele, constituents, and reason for the exercise. I get the feeling that legislation may have inadvertently overburdened the function of common law at the appellate level and created a legal vortex upsetting these chains of title in Butternut. Before I get too crazy here, I must declare that I do not know the local standards of practice nor the way the Wisconsin laws roll out on the ground. I really do think I'm missing some things here, so my hope is to turn up solid answers and get us all some discount knowledge.

WEST —from— WASHINGTON

Establishing the 25th and 27th Meridians

The completion of the first transcontinental railroad on May 10, 1869, greatly changed the way Americans traveled and communicated between distant points. While the railroad transferred people and products, the telegraph alongside transferred information.

Nineteen days after the completion of the railroad, Oliver N. Chaffee, a 34-year-old surveyor and astronomer from Detroit,

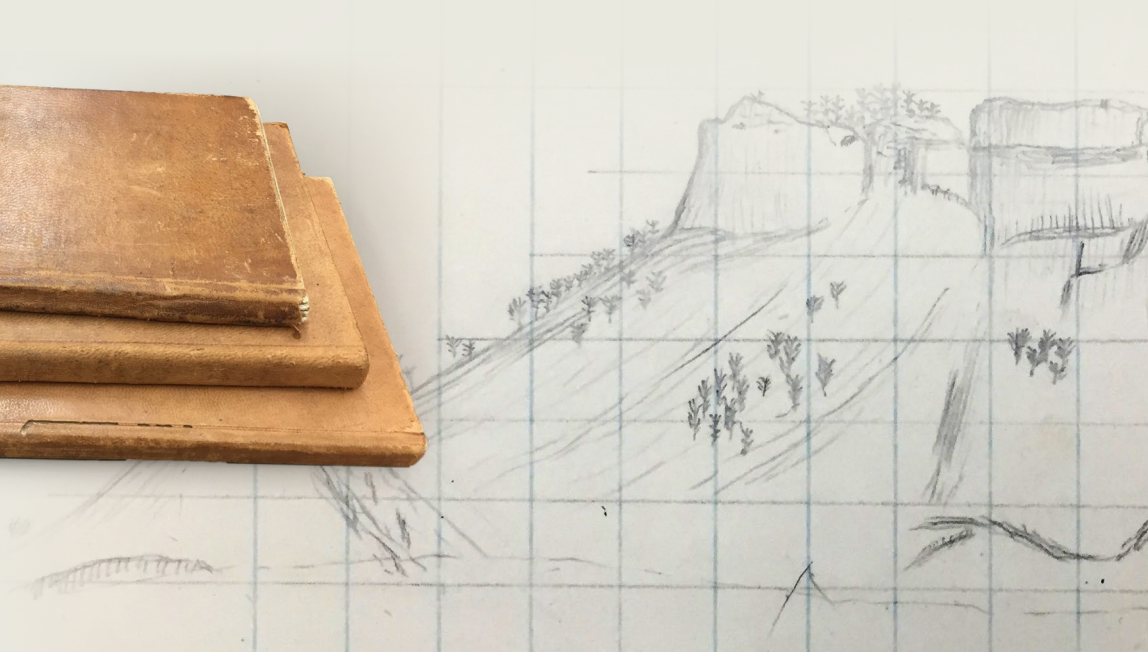
Michigan, entered into a contract with the Iowa and Nebraska Surveyor General, Robert R. Livingston, to survey the 25th and 27th meridians west from Washington D. C. Both the railroad and the telegraph were instrumental in establishing these lines.

The Act of September 28, 1850, (9 Stat. 515), provided that the meridian through the observatory at Washington would be adopted and used as the American meridian for all astronomic purposes. The

» JERRY PENRY, PS



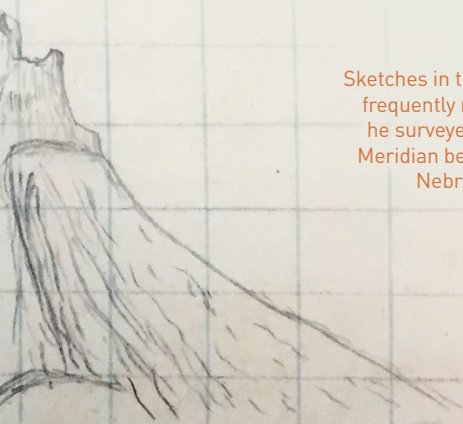
Chaffee's original field books that he carried in the field were preserved and are now located at the Nebraska State Historical Society.





Cattle frequently visit Chaffee's south end of the 25th Meridian. This monument was later discovered to be over 600' south of the 40th Parallel where the states of Colorado, Kansas and Nebraska meet.

JERRY PENRY PHOTO



Sketches in the field books were frequently made by Chaffee as he surveyed north on the 27th Meridian between the states of Nebraska and Wyoming.

meridian at Greenwich, England, however, would continue to be used for nautical purposes. The difference between the two meridians was 5 hours, 8 minutes, 12.15 seconds, or $77^{\circ}03'02.3''$ of longitude.

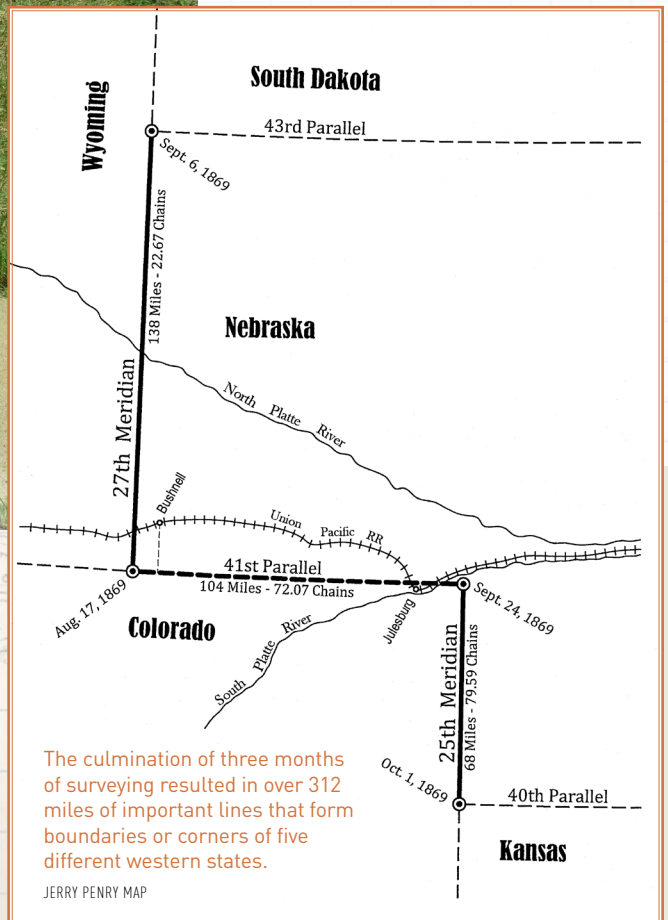
Chaffee wasted little time in assembling his crew to begin his work and endeavor to complete it by the end of the season. His main assistant was Professor S. W. Robinson whose expertise was making astronomical observations. Arriving at the eastern terminus of the Union Pacific Railroad at Omaha, Chaffee met with Edward Goodfellow who was in charge of newly created astronomical station that had been placed by the U. S. Coast Survey. The Omaha astronomical station was connected to the railroad by telegraph which Chaffee would need to determine the longitudes for his meridians on the western frontier.

Traveling by train to the last station in Nebraska, 463 miles west of Omaha, Chaffee arrived at Bushnell on July 8, 1869. The new



Chaffee's white limestone monument of 1869 marks the northern end of his 27th Meridian. The quartzite monument alongside was placed in 1893 by a surveyor who established the 43rd Parallel between Nebraska and South Dakota.

JERRY PENRY PHOTO



town had little more than a water tank, windmill, and a boxcar for the railroad station. A monument was placed near the station where a series of astronomical readings were taken for two days while connected with the telegraph to coordinate with Omaha. Bushnell is about 8 miles east of the 27th Meridian and 16 miles north of the 41st Parallel, a line which Chaffee would also establish to connect the 25th and 27th meridians together.

Traveling 90 miles back east, Chaffee then stopped at Julesburg, Colorado, where he placed a second astronomical station near the railroad station to communicate with Omaha and determine its longitude west from Washington. This location could not have been a more ideal site for the astronomical station. It was only about one mile south of the 41st Parallel, and about 16 miles west of where Chaffee would establish the 25th Meridian. By the time Chaffee arrived at

Julesburg, it had already seen its share of excitement. The town was an important Pony Express station in 1860-61 and had been burned by a large band of Lakota Sioux, Cheyenne, and Arapaho Indians on February 2, 1865. (The site of the original Julesburg townsite was approximately 5 miles west of where the town is located today.)

After completing the necessary readings at Julesburg, Chaffee established a meridian and measured 89.65 chains north to place a temporary point at its intersection with the 41st Parallel. By knowing the longitude of his meridian at Julesburg, the exact distance west from the 25th Meridian was determined to be 16 miles 10.47 chains. Chaffee then began measuring east on the 41st Parallel setting square wood posts at the full milepost locations until he reached milepost 9 which is just west of the South Platte River. For unknown reasons, possibly because of continuing hostilities of the Indians near the 25th Meridian, Chaffee returned to his meridian at Julesburg and then began surveying west to place the mile markers on the 41st Parallel until reaching milepost 95.

Knowing he was close to being due south of Bushnell, Chaffee left the 41st Parallel and traveled north to the town. The crew then measured south on the Bushnell Meridian a distance of 16 miles



The corner common to the states of Colorado, Nebraska, and Wyoming was the first of four terminal monuments that Chaffee placed on the two meridians.

JERRY PENRY PHOTO

which crossed over the 41st Parallel. Chaffee returned to milepost 95 and continued west on the parallel until he intersected the meridian at 96 miles 22.62 chains. His latitude at this intersection was determined to be $41^{\circ}00'06.2''$ which was evidently within the tolerance to not require correcting his line to be 628' further south. With the known longitude of the Bushnell Meridian, the remaining distance to the 27th Meridian was determined to be 8 miles 49.45 chains. Chaffee extended the 41st Parallel west and placed the intersection of the parallel with the 27th Meridian at a total distance of 104 miles 72.07 chains on August 17, 1869. This monument became the common point to Colorado-Nebraska-Wyoming.

The surveyors then began measuring north on the 27th Meridian across the barren terrain where few white men had previously traveled. The topography along and near this line presented many spectacular scenes that captivated the crew as they progressed. Chaffee frequently sketched the colorful bluffs in his field book by making grid lines so the images were spatially correct. Between the 68th and 69th miles, the North Platte River was crossed on August 27.

The four monuments needed for the end points of the 25th and 27th meridians were large square limestone monoliths. The sides were smoothed and lettered at an eastern quarry except for the final distances that Chaffee would be required to inscribe. The heavy monuments were shipped by rail to the nearest practical location where the surveyors then transported them by wagon to their points.

As the surveyors neared the northern end of the 27th Meridian, which was the intersection with the 43rd Parallel, a high bluff prevented any possibility of continuing with wagons. At the 128th mile, a final astronomical reading was made in order to determine the latitude and the final distance of 10 miles 22.67 chains needed to complete the line. The crew abandoned the wagons and continued

with only the necessary equipment needed to measure. Without a wagon, the heavy terminal monument had to be painstakingly pulled with ropes across the prairie.

At the beginning of his survey, Chaffee noted that he was utilizing two sets of chainmen. One crew used a 66-foot Gunter's chain while the other used a 50-foot engineer's chain to prevent collusion in measuring. As Chaffee neared the northern end of the 27th Meridian, he indicated in his field book that he was also obtaining distances by stadia. The terminal monument was placed on September 6, 1869, at a distance of 138 miles 22.67 chains. This monument became the common point to Nebraska-South Dakota-Wyoming.

Chaffee returned to milepost 9 on to the 41st Parallel and surveyed east to the intersection of the 25th Meridian where he placed a monument on September 24, 1869. This point became the northeast corner of Colorado and the southeast corner of the Nebraska panhandle. From this location, a line was run south on the 25th Meridian setting temporary stakes at each mile. Chaffee had hoped to intersect his meridian with the 40th Parallel that had been established in 1859 as the baseline for the 6th Principal Meridian, but no monuments could be found. The meridian was extended another 2 miles south and the prairie was searched east and west for monuments on the parallel without success. Chaffee then made 101 stellar observations and placed his monument on October 1, 1869, where he determined the 40th Parallel should intersect his 25th Meridian. This monument became the common point to Colorado-Kansas-Nebraska.

Chaffee then surveyed north on the 25th Meridian to adjust the temporary stakes and place permanent monuments at each mile



The northern end of the 25th Meridian marks the northeast corner of Colorado and the southeast corner of the Nebraska panhandle.

JERRY PENRY PHOTO

beginning from the southern end so the mileposts would increase from south to north. The intersection of the 25th Meridian with the 41st Parallel was achieved on October 7, 1869, to complete the work. The distance of the 25th Meridian was 68 miles 79.59 chains. Chaffee was paid \$7,804.48 for his entire work of 312 miles 14.33 chains on the three lines.

In 1872, the 25th Meridian was extended south from Chaffee's monument to mark the division between Colorado and Kansas. One year later, monuments were found on the 40th Parallel which prompted the establishment of a new monument at the true intersection with the 25th Meridian. This new monument was 621.7 feet north of Chaffee's monument.

In 1877, the 27th Meridian was extended north to mark the division between Dakota Territory and Wyoming which established the Black Hills Meridian and its Initial Point 69 miles north of Chaffee's monument. This meridian extends north to the common point for Montana and Wyoming on the western boundary of South Dakota.

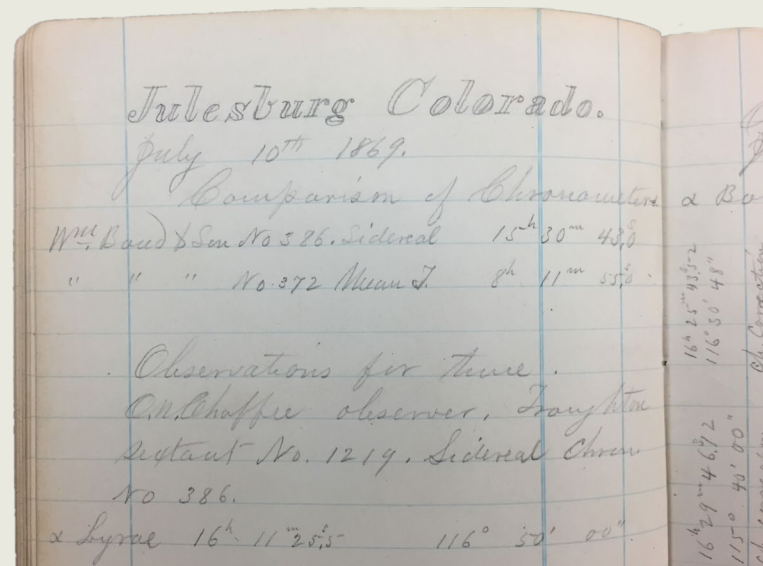
In 1893, a survey of the 43rd Parallel between Nebraska and South Dakota that was originally performed in 1874 was resurveyed and a large pink quartzite monument was placed next to Chaffee's limestone 27th Meridian monument at the Nebraska-South Dakota-Wyoming location.

Jasper stone posts replaced the wooden mileposts going north from the 43rd Parallel on the 27th Meridian in 1904 between South Dakota and Wyoming. In 1908, granite posts were likewise placed

at the original mileposts of the 27th Meridian between the 41st and 43rd parallels along the Nebraska and Wyoming boundary.

Twelve states have meridional boundaries that are referenced from the Washington Meridian. On August 12, 1912, the act established in 1850 to use the Washington Meridian for meridians and astronomical purposes was repealed and the Greenwich Meridian became the standard. All four monuments placed during the 1869 Chaffee survey have been restored by surveying associations working together from the neighboring states. ■

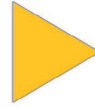
Jerry Penry has been surveying for 34 years, is licensed in Nebraska and South Dakota, and has been employed with Lancaster County Engineering for 21 years. He is also serving his second term on the Board for the Professional Surveyors Association of Nebraska.





Trimble

DIMENSIONS



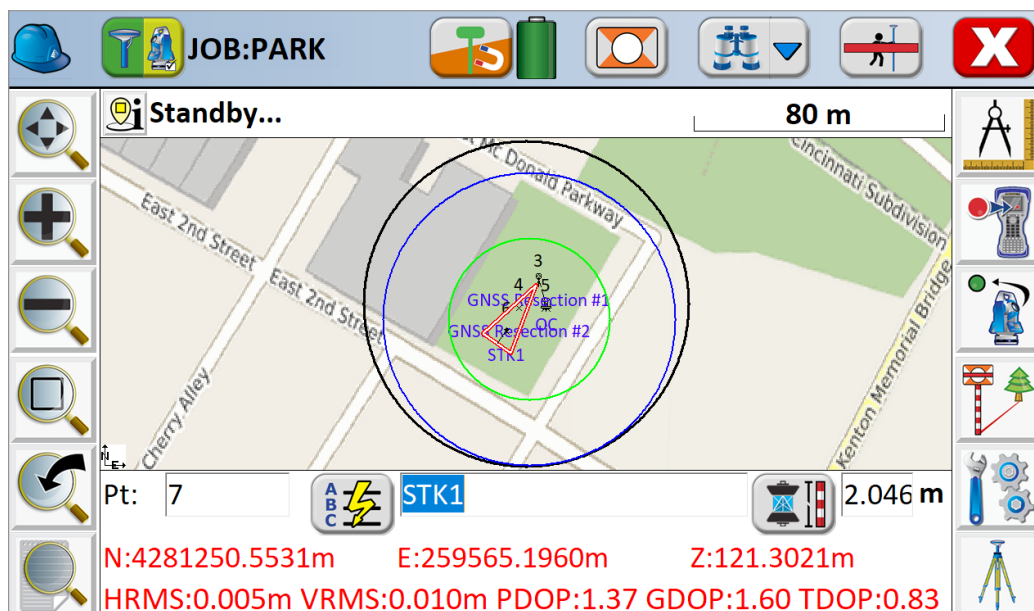
LEAD YOUR BUSINESS INTO TOMORROW

Experience the 2018 Trimble Dimensions User Conference—three action-packed days to witness how technology is transforming the way we work. Be inspired by visionary speakers. Take part in useful hands-on workshops and breakout sessions. Get excited with game-changing innovations at our interactive expo made to move you and your business forward. Network with thousands of your professional peers.

November 5-7, 2018 at The Venetian in Las Vegas, Nevada.

TrimbleDimensions.com

points&pixels



» Carlson SurvCE and SurvPC 6.0 Available Now

// MAYSVILLE, KENTUCKY, U.S.A. // Carlson Software's popular and versatile in-the-field land surveying software, Carlson SurvCE 6.0 for data collectors and Carlson SurvPC 6.0 for ruggedized tablets and laptops is now available.

The newly released software features several new features, improvements, and introduces the optional paid *Hybrid+* module, allowing users to survey with both GPS and total station at the same time.

"SurvCE 6.0 really focuses on efficiency," said Sarah Winter, Director of SurvCE Programming Division. "The beauty of Hybrid+ is that it puts all

of the surveyors' tools at their immediate disposal so that they are always ready to get the shot they need when they need it. We know that when our customers are out in the field, they need to collect accurate data as quickly as possible. Time is money."

New 6.0 features include:

- **GIS Inspector**—Allows easy viewing of GIS attributes when selecting points in the map, and prompts for attributes when storing points from the map view.
- **Surface Inspector**—Allows easy comparison of plan versus as-built in elevation difference, making it more simple

to store and stake any point in elevation difference.

- **Obstructed Point Stakeout**—An enhanced stakeout method to stake a point that is obstructed by marking azimuth and distance on two points.
- **Automatic Backsite Check**—A button to turn to the backsite, measure the position, and report the error at any time.

For a full list of improvements and technical changes, please see the Release Notes.

The new voice prompting for stakeout and instrument status is

exclusive to SurvPC 6.0 and allows users to keep focus on a point.

SurvCE 6.0 provides the option to use Google, Open Street, or Esri map backgrounds and presents enhanced icons in survey screens like the Laser Pointer icon, which will allow users to toggle their laser pointer from any screen. The Instrument Status icon is now available on all screens, indicating a connected and fixed position, and the Search icon now offers all available search options.

Newest instrument drivers added to the list compatible with SurvCE/SurvPC can be

found at survce.com/supportedHardware.

SurvCE 6.0 is available in more than two dozen languages: English, Spanish, German, French, French (Canadian), Russian, Portuguese, Czech, Dutch, Chinese, Korean, Greek, Italian, Polish, Hungarian, Swedish, Latvian and more.

Contact your Carlson Software Representative or Certified Dealer for SurvCE and SurvPC sales assistance, as well as complete Hardware and Financing options.

For more information visit carlsonsw.com.

LIVE at www.javad.com

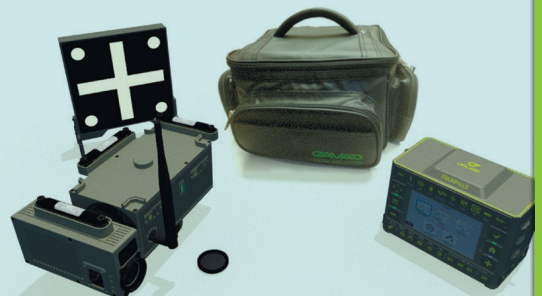


G'day, Mate!

Redefining Total Stations and GNSS workflow. The **“Total Solution”**

From the company who brought you the best GNSS receiver on the planet, our latest innovation will allow you to break away from decades-old methods of measurement and positioning. Why employ a workflow designed for yesterday's gear?

And all
components
fit in this small
carrying case.



*We plan to ship by
September 2018.*

See the video at www.javad.com for proof!

JAVAD

www.javad.com

Front



Introducing J-Mate

Why follow a workflow designed for yesterday's equipment?

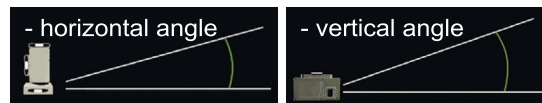
This is J-Mate

J-Mate features a **camera** that can also find targets automatically, and a **laser module** for accurate distance measurements. It scans and examines the area around the intended target to ensure reliable identification. Two **precision encoders** measure vertical and horizontal angles to the target. Three **precision vials** allow a visual check on levelness of the instrument.



Take control with J-Mate + TRIUMPH-LS

Similar to using conventional total stations, to use the J-Mate you need first to establish its accurate position and calibrate its vertical and horizontal encoders. Then proceed to shoot the unknown points. This is similar to using any total station, but we have improved and automated the process.



Motors

Vials

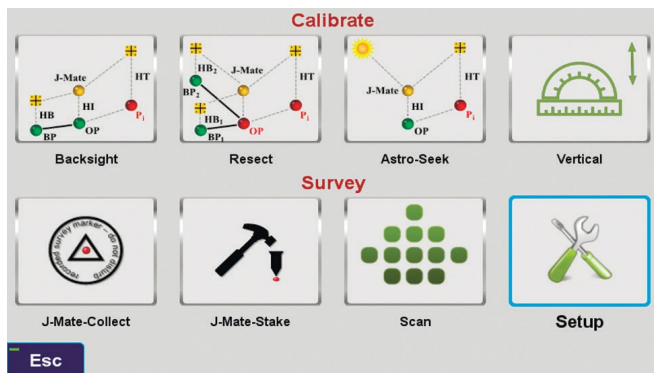
Laser

- scanning
- distance measurements
- examine area around targets

Camera

- find targets automatically

Let us first explain some details of J-Mate operation.



With J-Mate you can establish your occupied position via three different ways: 1) **Backsight**; 2) **Resection**; or 3) our new **Astro-Seek** (more of that later).

When you click the **Setup** icon of the J-Mate screen you get access to parameters that tunes J-Mate to your desire.

The J-Mate Settings screen displays the following parameters:

- Scan Step:** 5°
- Edge Depth (Snap):** 10 cm
- Target Size:** 20 mm
- How Many:** 3
- ☒ **Min Distance To Target:** 1 m
- Max Distance To Target:** 100 m
- Astro:** Sun
- Horizontal Scan Range:** ± 5°
- Vertical Scan Range:** ± 10°

At the bottom, there is a 'J-Mate Modules Setup' button with a right arrow, and 'Esc' and 'OK' buttons.

“**Scan Step**” defines the angular resolution for scanning around the target (according to the target size parameter below). These measurements are examined and averaged to get reliable and more accurate measurement. It is also used as resolution for the scanning operation.

“**Edge Depth (snap)**” value is used in Snap operation. In Snap mode of the camera screen, the move in the direction of the navigation arrow continues until the range measurement jumps by this value. The snap mode is particularly helpful in automatic identification and measurement of

narrow items like poles.

“**Target Size**” defines the size of the target that you want to be scanned and averaged with the resolution specified in the the Scan Step.

“**How Many**” defines the number of times you want the target area to be scanned and averaged according to the “Scan Step” and “Target Size”.

The optional **Min and Max to Target**, when selected, causes the objects outside this range to be ignored and skipped in navigating towards the target and in snap mode.

“**Astro**” selects the astronomical object to be automatically sought for calibration.

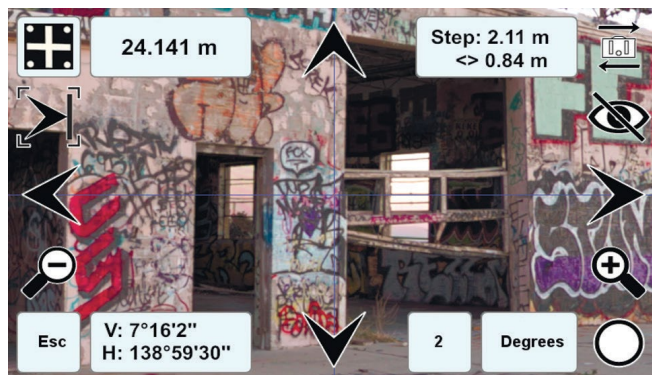
“**Horizontal and Vertical Scan Range**” defines the angles on both sides of the current center to be scanned in Scanning operation.

When you want to shoot a point click the J-Mate-Collect icon and then click the “**Capture Target Point**”.

The J-Mate-Collect screen displays the following information:

- HT:** 0.0 m
- Capture Target Point:** 0° 0' 0" B, 0° 0' 0" VA, 0.000m SD
- TP DSN:** C1
- ±:** 0.001 m
- Page:** Page0
- Save Target Point** button
- WGS84(ITRF2008)**

An 'Esc' button is located at the bottom left.



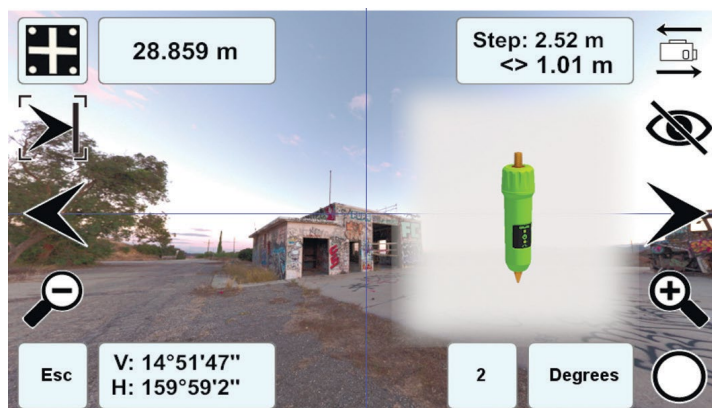
This screen appears which is the camera view of the target. **Target** is the item that is exactly on the center of the screen on the cross bar.

The **range** to the target is shown on the box on the top left of the screen and the **horizontal and vertical angles** on the bottom left.

You can click any point on the screen and the J-Mate will target it by bringing it to the crossbar.

Click the **camera icon** on the top right of the screen to select between the **wide angle of the TRIUMPH-LS camera (60 degrees)** and the **narrow angle of the accurate side camera (5 degrees)**. Select the **TRIUMPH-LS camera only for bringing the target close to the center** and then switch to the side camera for accurate positioning of the target.

You can also lift the TRIUMPH-LS from the J-Tip and aim it at the direction of the target and the J-Mate will follow. You can also use the J-Tip to point to the target and the J-Mate will follow. Then use the navigation arrows for accurate targeting.



Each click of the navigation arrows move the cross bar according the angle that is selected on the bottom right of the screen (**Navigation Step**). Select the **unit** (Minutes, degrees, or seconds) and the **number**.

The numbers on the top right of the screen show the **linear distance values of the “Navigation Step” and the “Scan Step” at the target point**. It is simply the measured range multiplied by the sine of “Navigation Step” and “Scan Step” angles.

To select the **Snap mode** click the icon above the left arrow. In snap mode the J-Mate moves in the direction of the clicked navigation button until the range is jumped by the **Edge Depth** value.

Use the **zoom buttons** for zooming.

If you want the target to be automatically selected by the **“+” target sign**, click the icon on the top left.

When your target is selected, click the **“Take” icon** on the bottom right of the screen to measure it according to the **“Target Size”**, **“Scan Step”**, and **“How Many” parameters**. The result of the measurement and the statistics are shown next. Then you can reject or save and assign attributes like a normal RTK point.

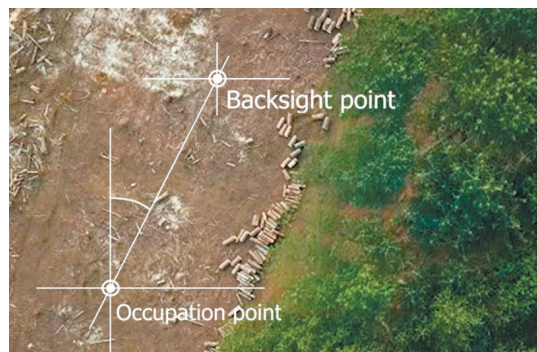
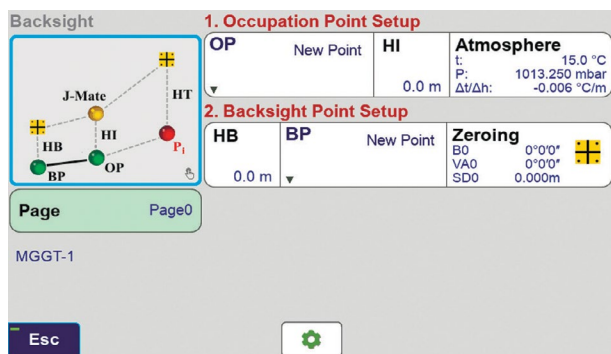
The **“View” icon** shows/hides some icons when you want to focus only on navigation arrows and take measurement.



After the J-Mate is calibrated, you can proceed with your work as normal via the Collect or Stake icon.

Backsight icon

If GNSS signals are available at the job site, click the J-Mate Backsight icon.



This screen appears which guides you to determine the accurate positions of the Occupation Point and the Backsight Point, to establish an azimuth and calibrate the J-Mate angular encoders.

- The tripod is setup at the “Occupation Point” (OP).
- The J-Mate is secured on the tripod.
- Next, TRIUMPH-LS is placed on top of the J-Mate with its legs registered to the matching features on the J-Mate.
- Next, Use the RTK Survey feature of the TRIUMPH-LS to quickly determine the accurate location of the Occupation Point. You can use your own base station or any public RTN.
- Next, slide the Plus sign target on top of the TRIUMPH-LS, lift it from the J-Mate and move to the “Backsight Point” (BP). The camera of the J-Mate will robotically follow the plus sign target. The camera’s view is visible from the TRIUMPH-LS screen, which mostly focuses on the plus sign. When at the Backsight Point, its accurate position is determined by the TRIUMPH-LS, and the Azimuth from the Occupation Point to the Backsight Point is established, and the J-Mate is calibrated and ready to shoot other points.
- After this calibration is complete, if the tripod is disturbed, the red LED on the front of the J-Mate will blink to show that recalibration is required.
- We can now replace the TRIUMPH-LS on top of the J-Mate at the Occupation Point and proceed to shoot as many “Target Points” as the job requires. From now on the TRIUMPH-LS is used as a controller and you can hold in your hand too, but it is more convenient to put it on its place on top of the J-Mate to have free hands.



Resect icon

If GNSS signals are not available at the Occupation Point, click the “J-Mate-Resect” icon

Resect

1. First Backsight Points Setup

HB1	BP 1	New Point	Zeroing
0.0 m			B0 0°0'0" VA0 0°0'0" SD0 0.000m

2. Second Backsight Points Setup

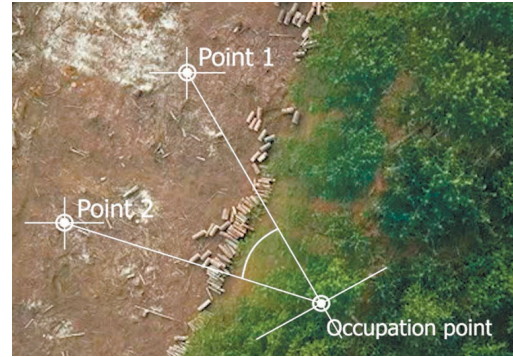
HB2	BP 2	New Point	Zeroing
0.0 m			B0 0°0'0" VA0 0°0'0" SD0 0.000m

3. Occupation Point

OP	New Point	Atmosphere
		t: 15.0 °C P: 1013.250 mbar Δt/Δh: -0.006 °C/m

Page Page0
MGGT-1

Esc



Shoot two or more known points to establish an accurate position and calibrate the encoders. Then continue to shoot the unknown points.



The “J-Mate Resect” automatically finds the plus sign “+” that you carry to two, or more, known points, and shoots them to determine the accurate position of the J-Mate and the azimuth to calibrate the encoders of the J-Mate and then you can proceed to shoot other points.



Astro-Seek icon

And now our new feature!

Astro-Seek

1. Occupation Point Setup

OP	New Point	HI	Atmosphere
0.0 m			t: 15.0 °C P: 1013.250 mbar Δt/Δh: -0.006 °C/m

2. Backsight Point Setup

Sun Tracking

Astronomical Azimuth 0°0'0"
Astronomical Elevation Angle 0°0'0"

Page Page0
MGGT-1

Esc

We have added a new innovative feature

to the J-Mate that it can automatically calibrate itself via its automatic Sun or other astronomical objects-Seeking feature.



If doing a sun-shot, attach the Sun filter to the J-Mate

Click the “J-Mate-Astro-Seek” icon



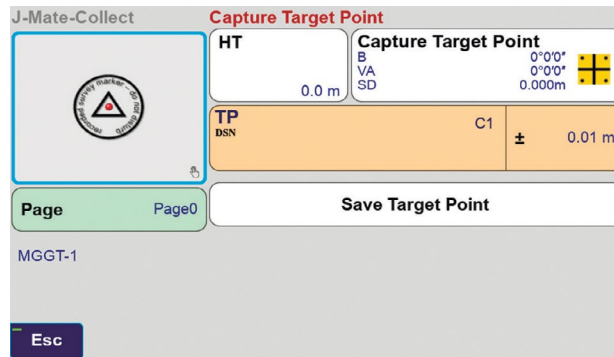
Then click the “Sun” icon in the screen which appears



J-Mate will automatically find the Sun, and use its position to calibrate the angular encoders automatically.

J-Mate-Collect

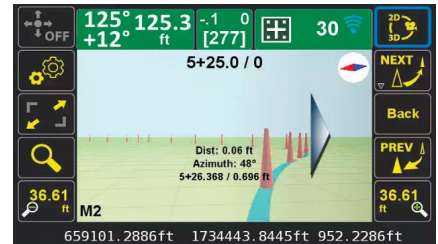
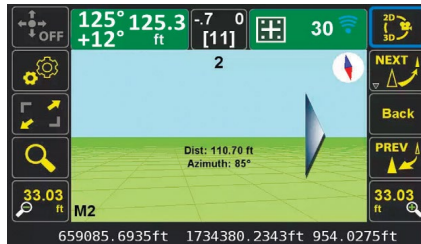
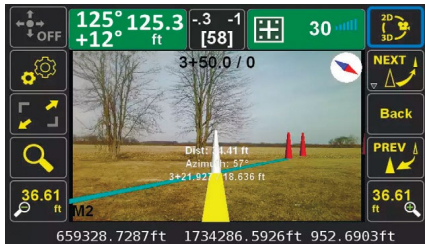
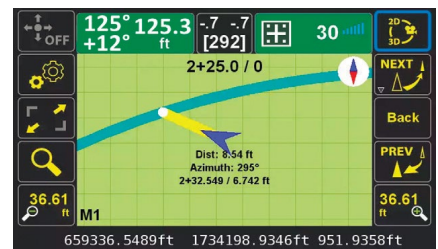
After calibration is performed, click the J-Mate Collect icon to shoot the unknown points.



J-Mate-Stake

Click the J-Mate Stake icon to use the J-Mate for stakeout.

The functions and features of the J-Mate stakeout are very similar to our conventional GNSS stakeout: RTK solutions guide you to the stake points. But with the J-Mate the camera follows the “+” sign that you carry and then the encoders and laser measurements (shown on screenshots) provide guidance to the stakeout features. This is similar to Visual Stakeout and other useful and innovative features of our TRIUMPH-LS GNSS RTK stakeout.

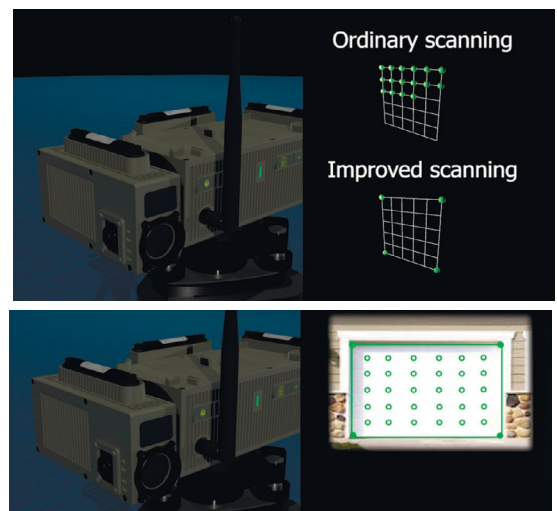


Seize the day with J-Mate + TRIUMPH-LS

Smart laser scanner

J-Mate is also a camera-aided, smart laser scanner. The camera identifies redundant points that do not need to be scanned, but instead can be copied or interpolated from other readings without loss of information. That is, if the camera identifies a completely uniform flat area, it only scans the four corners of that area and interpolates in between. This feature can increase the effective speed of the scanner to much higher than its native 10-points-per-second speed.

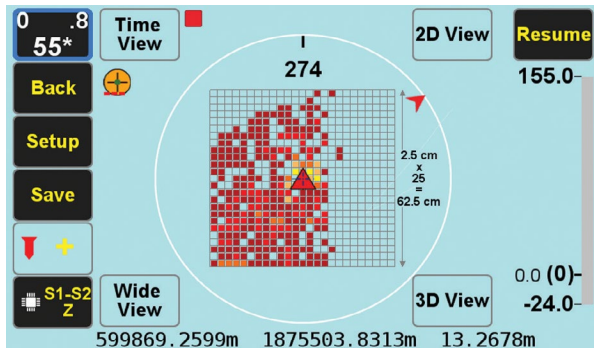
The scanning feature can also be used to find items like wires and poles and “closest-in-view” items and shoot them automatically.



So we have a “**Total GNSS**” with a “**Robotic Total Station**” and a “**Smart Laser Scanner**”. We call it our “**Total Solution**” and it can be operated by one person to perform jobs.

J-Tip

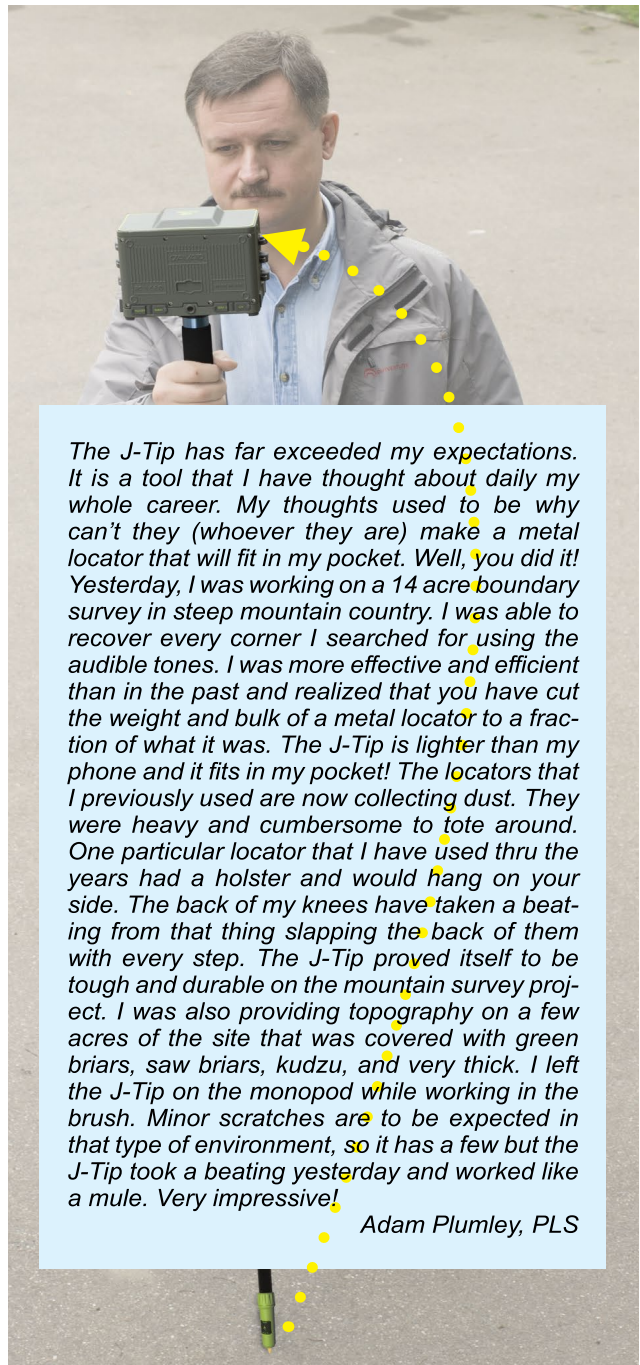
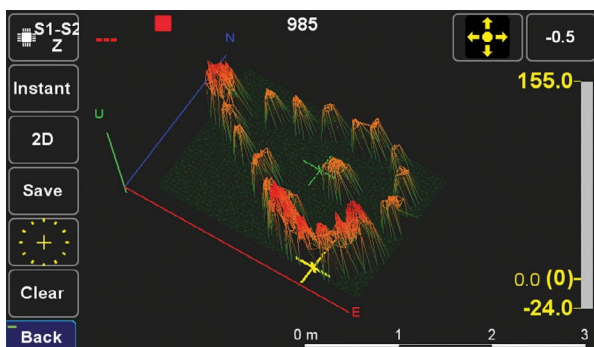
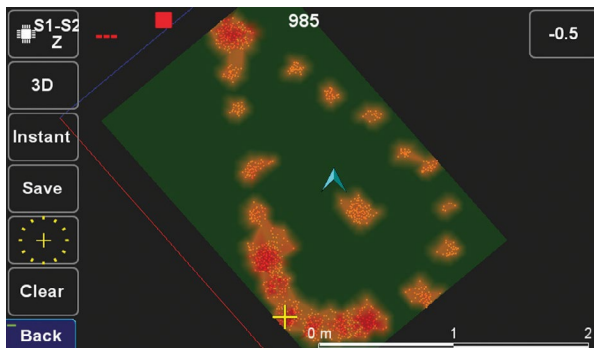
TRIUMPH-LS tags coordinates with magnetic values, It also guides you to top of the item to survey it.



The Mag View focuses only on the mag object with the highest mag value.

The audio and graphical bar on the right side show the magnitude of the magnetic object.

In "Setup" you can select the cell size and the size of the field you want to scan.



The J-Tip has far exceeded my expectations. It is a tool that I have thought about daily my whole career. My thoughts used to be why can't they (whoever they are) make a metal locator that will fit in my pocket. Well, you did it! Yesterday, I was working on a 14 acre boundary survey in steep mountain country. I was able to recover every corner I searched for using the audible tones. I was more effective and efficient than in the past and realized that you have cut the weight and bulk of a metal locator to a fraction of what it was. The J-Tip is lighter than my phone and it fits in my pocket! The locators that I previously used are now collecting dust. They were heavy and cumbersome to tote around. One particular locator that I have used thru the years had a holster and would hang on your side. The back of my knees have taken a beating from that thing slapping the back of them with every step. The J-Tip proved itself to be tough and durable on the mountain survey project. I was also providing topography on a few acres of the site that was covered with green briars, saw briars, kudzu, and very thick. I left the J-Tip on the monopod while working in the brush. Minor scratches are to be expected in that type of environment, so it has a few but the J-Tip took a beating yesterday and worked like a mule. Very impressive!

Adam Plumley, PLS

2D and 3D views of the field show the magnetic objects that have been scanned.

Zooming the 2D and 3D screens can show the shape of the magnetic objects under the ground.

For many sophisticated features of the J-Tip see its Users Manual in www.javad.com

» Geneq Introduces Net20 Pro GNSS CORS-Reference Receiver

// MONTREAL, QC //

Geneq Inc. is pleased to introduce the Net20 Pro, a robust and easy to use system designed for CORS networks. Its efficiency and flexibility will provide you with many years of high quality data for your projects. This product will be useful to any user interested in the proximity and reliability of a reference station while eliminating RTK corrections service charges.

The Net20 Pro uses multi-frequency, 555



channel technologies in a rugged casing that will deliver accurate and effective positioning data even in a harsh environment. This product can be configured for correction data reception

in client mode to calculate a fixed RTK position and to monitor the antenna position while continuing to work as a GNSS reference server.

With its NTRIP Caster software, the Net20 Pro

provides superior connectivity with an unlimited number of mount points. Users will appreciate the permanent transmission of RTK corrections with a simple local internet connection from your (LAN) working network.

Equipped with an internal memory of 32GB with an additional 32GB external memory, the Net20 Pro provides enough storage space for permanent recording even for a 100Hz high data sampling rate.

The Net20 Pro comes with an ergonomic and easy to manage Web UI that features software upgrade, status and settings management, data downloading, etc. via smart phone, tablet or other internet-enabled electronic devices.

For more information visit the *SXblue GPS* website at sxbluegps.com.

» Construction Adds 19,000 Jobs as Unemployment Plummets in July, Says ABC

// WASHINGTON, AUG. 3 //

The U.S. construction industry added 19,000 net new jobs in July after adding 13,000 net new jobs in June, according to an Associated Builders and Contractors analysis of data supplied by the U.S. Bureau of Labor Statistics. The industry has added 308,000 net new jobs since the first of the year, a robust increase of 4.4 percent.

The construction industry unemployment rate dove to 3.4 percent in July, recording its lowest level in the 18-year history of the series. The national unemployment rate for all industries inched down to 3.9 percent.

Nonresidential construction employment increased by 13,200 net jobs in July. Nonresidential specialty trade contractors added 8,600 net new jobs in July and have collectively added 60,300 net new jobs through the first seven months of the year. To put this in perspective, this is nearly double the amount added through the first seven months of 2017 (+32,200).

"While many observers will focus intensely on the headline employment growth number of 157,000, which was below expectations, today's employment numbers provide more

evidence that demand for workers remains elevated," said ABC Chief Economist Anirban Basu. "Employment growth estimates for both May and June were revised higher. The official rate of unemployment fell to 3.9 percent. Nominal wage growth remains steady. Both construction and manufacturing continue to add jobs in America.

"The issue, therefore, is not really about demand for human capital, but supply," said Basu. "There may well have been times during the nation's history when construction industry unemployment was

even lower, but relevant statistics characterizing those periods do not exist. What we know for sure is that contractors will continue to scramble for workers in the context of aggressive spending on structures and other forms of construction.

"The real mystery is how the construction industry has managed to find 308,000 net new workers over the past year given all the narratives regarding a lack of available carpenters, electricians, welders, glass installers, etc.," said Basu. "One hope is that more workers are gravitating

toward construction, which offers increasingly rare opportunities for people to enter the middle class without taking on student debt. The other hope—and there is evidence to suggest this is already occurring—is that companies will invest heavily in the capabilities of these people inducing more of them to stay in the industry even during the next downturn."

For more information visit abc.org

» Frontier Precision Helps Map Kilauea Lava Flow

"I had to help out. It was tearing at my soul." When Kilauea started erupting on the Big Island of Hawaii on May 3, Brennan O'Neill knew he had to do something. As the Hawaiian branch manager of Frontier Precision, he was in a unique position to offer support. Frontier Precision has been at the forefront of geospatial measurement technology for 30 years and was ready to provide free access to technology and expertise to assist in mapping the lava flow.

"I'm a resident of Hawaii," said Brennan. "For a geologist, it's even more powerful than that. The lava flow is like a living mass that has a mind of its own, creeping, glowing—an upside-down conveyor belt surging forward and burning everything in its path."

While the lava can't be stopped, it can be mapped. Through Frontier Precision, Brennan offered high-tech mapping equipment, his own expertise, and the

assistance of Nathan Stephenson, an applied geospatial engineer currently working in the company's Denver office.

"We used a combination of Trimble R10s and Trimble R8s to gather accurate data points on the ground," said Nathan. The mapping team flew UAS drones over the flow to gather visual imagery data, matched it to the ground reference points, stitched the photos together and draped it over county maps. The process was repeated as often as needed – daily, and sometimes even hourly—to show the speed and direction of the flow.

Nathan isn't new to mapping lava flows. As a graduate student at the University of Hawaii – Hilo, he worked on collecting data on the Pahoehoe eruption in 2014, and he's seen advances in technology in just a few years. "One thing we have now that we didn't have in 2014 was a thermal radiometric camera that helps us map more accurately at night and enables us to capture large heat signatures."

The collected data helps Hawaii Civil Defense and other agencies keep the public informed and safe, and in the long term it also contributes to the store of scientific knowledge about eruptions and lava flow behavior.

The lava flow has formed a channel that now extends out to the ocean. It poses no immediate threat to structures or people aside from gas emissions but could change at any time. Nathan has returned to his home in Denver, but if the situation changes, he would come back to Hawaii. "It was a great experience and I was glad to offer my support. If they need me again, I'll be there."

Frontier Precision would be glad to offer assistance as well if needed in the future, whether that be with equipment or with personnel. "Scientific measurement is what we do, and when we can help out on a project like this, it's the right thing to do and we have the equipment and expertise to get the job done."



» Leica Geosystems, GeoPal Partner to Add High Accuracy to Mobile Operations

// HEERBRUGG, SWITZERLAND, 26 JULY 2018 //

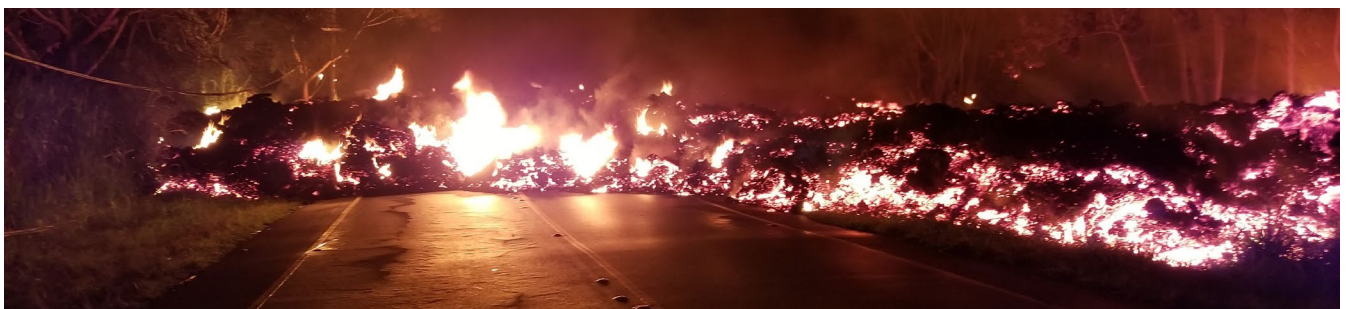
Leica Geosystems, part of Hexagon, industry leader in measurement technology, today announced its new partnership with GeoPal to support high accuracy asset data capture for utility professionals within the GeoPal mobile workforce management solution.

Leica Geosystems and GeoPal have partnered to support high accuracy asset data capture within the GeoPal mobile workforce management solution.

With increased regulatory pressure on utility

organisations to provide more accurate location data and asset records, the Leica Zeno GG04 Plus smart antenna is now seamlessly supported by GeoPal to provide high accuracy positions within GeoPal's Android and iOS mobile applications.

Alan Grady, contracts manager COFFEY GROUP commented; "We utilise the Leica GG04 plus as part of the GeoPal application for our utility construction workflows. The Leica GG04 plus is simple to use and enables the field team to



capture the accurate location of assets as they are installed in real time. This enables us to validate jobs for our clients more quickly and ultimately improves the ongoing efficiency and productivity of Coffey group."

Moving from paper to digital

The Zeno GG04 Plus brings advanced GNSS technology and industry-leading 555 channel tracking power to Geographic Information System (GIS) asset collection. The smart antenna uses RTK technology and applies Precise Point Positioning (PPP). With an open interface, the technology combines with GeoPal for accurate results and efficient operations.

GeoPal has established a wide base of customers across Europe and North America with its consultative implementation process and easy to-use-platform. GeoPal has engineered the core software infrastructure companies need to go from using paper-based forms to complete digital transformation in the field within just a number of weeks.

GeoPal Director and Co-Founder Paul Coyle commented; "The Leica Geosystems smart antenna is easy to use, and we recognised its value as an ideal tool for non-surveying field operatives using GeoPal, who simply need to capture asset locations as part of their job. The GG04 Plus is simple, reliable and provides accurate location data in the demanding work environments GeoPal's clients work in."

Leica Geosystems Regional GIS Segment Manager Mike Cooper commented; "We immediately saw the benefits of the GeoPal workflow for organisations looking to improve the quality of their asset records using their own field resources. This is a more efficient way of working; it improves productivity while delivering key safety and financial benefits. It also ensures contractors can quickly validate jobs within the GeoPal application and ensure their clients have access to that information in real time."

A hand holding a Spectra Precision SP20 handheld GNSS receiver. The device has a large screen displaying a surveying application with a grid and a green crosshair. The background shows a city skyline at dusk.

REALITY IN YOUR HAND

SPECTRA PRECISION SP20 FIELDWORK FACILITATOR FOR GIS & SURVEY

The SP20 handheld GNSS receiver offers innovative camera-enabled centimeter accurate logging in an everyday GIS and Survey tool. Rugged, lightweight and versatile, the SP20 delivers high-end performance. Yet it's an easy-to-use, time-saver tool that delivers the accuracy (meter to centimeter) you choose, that's just right for the job. With Android based ease and versatility it's the optimal tool for cadastral, construction, or topo surveys; a range of GIS jobs from data collection to inspection and maintenance; as well as for non-traditional geospatial professionals. The 5.3" screen neatly displays the new workflow using a camera to ensure 2D centimeter accuracy handheld and 3D centimeter accuracy with monopole setup.

©2018 Trimble Inc. All rights reserved. Spectra Precision is a Division of Trimble Inc. Spectra Precision and the Spectra Precision logo are trademarks of Trimble Inc.

Learn more at www.spectraprecision.com

» Woolpert Receives 2017 Google Cloud Partner Award for Customer Success in Google Maps

// DAYTON, OHIO JULY 23, 2018 //

Woolpert has received the 2017 Google Cloud Global Partner Award for Customer Success in Google Maps. This year's award was presented today in San Francisco at the Google Cloud Next Partner Summit, an event that showcases Google Cloud partners spanning G Suite, GCP, Maps, Devices and Education.

Woolpert was honored for its demonstrated sales, marketing, technical and support excellence to help customers of all sizes take advantage of the Google Cloud product suite to transform and elevate their businesses.

Jon Downey, Woolpert Vice President and Market Director for Google Cloud Platform, said Woolpert was thrilled to receive this award.

"It's inspiring to see how we were able to start with our firm's extensive mapping roots and grow a partnership with a nontraditional mapping company to the degree that we have in four years,"

Downey said. "Coming from the public sector and expanding our geospatial mapping expertise into the private sector is a real accomplishment, and I am proud of my team for all they've done to achieve this incredible honor."

Downey added that this strong partnership will be even more important moving forward, as Woolpert incorporates Google Cloud solutions into more of its services.

"There's literally no end to what we can do with this technology," he said.

"Our partners are fundamental to providing a great product to customers, particularly as demand for Google Cloud innovations grows," said Nina Harding, Global Channel Chief, Partner Strategy and Program, Google Cloud. "We are proud to provide this recognition to Woolpert, who has consistently demonstrated customer success across Google Maps. We're delighted to continue building together with Woolpert on behalf of customers."



The RIEGL team receiving the 3D Impact award from Esri.

From left to right: Lawrie Jordan (Director of Imagery and Remote Sensing with Esri), James Van Rens (Senior Vice President with RIEGL USA), Christian Sevcik (Manager-Strategic Software Alliances with RIEGL), Kurt Schwoppe (Business Development Manager for Imagery with Esri)

» RIEGL Wins 2018 Esri 3D Impact Award

RIEGL is pleased to be the recipient of the 2018 Esri 3D Impact Award last week during the annual Esri User Conference!

The award was presented to the company during the Esri Imagery Summit in San Diego, California on Sunday, July 8, 2018 in recognition of a joint initiative that RIEGL and Esri have been working on: the LMAP initiative.

"RIEGL understands what's required to make 3D GIS come alive. Their sensors are revolutionizing the notion of a 3D image, and as a trusted Esri Partner, we are working together to ensure our common customers are able to create the map of the future," stated Lawrie Jordan, Director of Imagery with Esri.

The LMAP, or LiDAR Management Analytical Processing, initiative was designed to leverage Esri's

ArcGIS Platform to store, manage, acquire, analyze and visualize RIEGL LiDAR data. By leveraging Esri's most advanced 3D technologies for desktop and web environments, new opportunities exist enabling better utilization of LiDAR collections in collaboration with an organization's existing geospatial data.

"RIEGL's offerings meet the demanding needs of 3D GIS. In addition to incredible resolution, they also are focusing their work to miniaturize their LiDAR collection systems to support terrestrial and drone-based platforms" said Kurt Schwoppe, Business Development Manager for Remote Sensing with Esri. "The new RIEGL miniVUX-1 UAV LiDAR sensor integrated with the DJI M600 opens an entirely new market for 3D GIS users who are

interested in the precision mapping of micro-geographies", he added.

Esri's 3D Impact Award is a special award that provides recognition to an individual or organization that has made outstanding contributions within the field of 3D GIS through remote sensing. Recipients are selected based on their efforts to discover and implement new methods or technologies for the collection or creation of content capable of powering 3D GIS.

"We are honored and proud to be the recipient of this prestigious Esri 3D Impact Award, which demonstrates our continuing commitment to deliver a customer-oriented workflow of RIEGL LiDAR data into Esri's market leading GIS environment. We have had a long-standing relationship with Esri and look forward to growing our partnership to the next level!" said Johannes Riegl Jr., President of RIEGL USA.

INTERGEO®

GLOBAL HUB OF THE
GEOSPATIAL COMMUNITY

FRANKFURT 2018

16 – 18 OCTOBER



DIGITALIZATION

BIM

INTERAERIAL

SOLUTIONS

SMART CITIES



GET YOUR FREE TICKET NOW!

VOUCHER CODE: AMSURV



Host: DVW e.V.
Conference organiser: DVW GmbH
Trade fair organiser: HINTE GmbH

WWW.INTERGEO.DE

SPONSORS:



HEXAGON



Trimble

A VISIT TO Hemisphere GNSS

Every time I hear the term “OEM” I think of Michael Stipe and Mike Mills, or the 80’s hit “If you leave”, and even sometimes that shock invoking SMS “initialism” that has evolved from the archaic days of flip phones. Yes, because keying in “666.6.4.” was almost as easy as just dialing the number and verbally announcing “Oooohhh myyyyyy gaaaaawd, you won’t believe what just happened...” So that’s how far we’ve come as a society and **OMG**, Hemisphere GNSS has darn near teleported through eight years of corporate development in some sort of record breaking two year span. How did they make such

a giant leap? As the saying goes, opportunity shows up at the door in work boots and overalls.

An interview with Randy Noland VP of Global Sales and Miles Ware Director of Marketing revealed how the team at Hemisphere embraced an opportunity and put the pedal to the metal! The opportunity was presented when Beijing UniStrong Science & Technology Co., Ltd. pulled Hemisphere into their global manufacturing and supply chain. Hemisphere has been manufacturing quality positioning systems for over 25 years. Although a few surveyors might not quite recognize a brand without a yellow box or “T” in the name, the Hemisphere GNSS product line has enjoyed a

» JASON FOOSE, PS



Dr. Michael Whitehead, Chief Technology Officer, Hemisphere GNSS



The S321+ GNSS Smart Antenna provides robust performance and high precision in a compact and rugged package. Powered by Hemisphere's Athena RTK engine, S321+ provides state-of-art RTK performance when receiving corrections from a static base station or network RTK correction system.

loyal following and great success in agriculture, marine, land survey, machine control, and, omg wait for it... the OEM market. Yes kids, there's a good chance Hemisphere GNSS may have quietly impacted your life in some other aspect as much as your trusty RTK rig does out on the jobsite. Actually, there's a chance that your RTK rig was designed or built by Hemisphere. Ever heard of the Carlson Survey Brx6 GNSS survey receiver or the Stonex S10A GNSS Receiver?

So what's the big whoop about this OEM business and what does it really mean anyway?

OEM of course stands for Original Equipment Manufacturer.

In the pure sense this refers to an outfit that brings raw materials into the plant and pushes some final consumer ready product out the front doors. The term has also been adapted to scenarios involving some pre-existing components hammered into something then repacked into something else that is shipped to another place and bundled with all the hardware, wires, and software that fit your market niche. The latter scenario is more likely the contemporary realization of the term. I mean let's



Hemisphere's C321+ multi-GNSS, multi-frequency receiver paired with a Windows based handheld device and Hemisphere's SiteMetrix™ field software platform is the ultimate tool to manage all of your jobsite activities.

face it, manufacturing anything is complicated, right?

It's more efficient to get the right amount of parts made to spec by somebody else and then just bolt them into your system and season to taste, right? That seems to be how it goes, but what if there was some better way?

Hemisphere appears to be offering a better way by harnessing its three decades industrial knowledge, along with their thirty-seven awarded patents and 28 more pending, and sixty-five of the most brilliant minds in GNSS. Now remember what I said about OEM? Well, Hemisphere is and has been an OEM for decades. While we know that the definition of OEM covers a broad spectrum, Hemisphere's needle has traditionally favored the purer sense of the definition. They actually make the guts, brains, nuts, and bolts, then provide them to the folks that shell 'em and sell 'em. The big news is that Hemisphere has

been homogenized into Unistrong's global fabric, a fabric woven with financial will and global industrial might. This industrial household encompasses the minds, the might, and the material to closely demonstrate the pure definition of global OEM, as well as rebranding, integration, and distribution. Quite frankly and from the industrial perspective, Hemisphere might be compared to a kid in a candy store with a world full of resources at its fingertips.

Hemisphere has assembled an independent industrial "vertical" including everything from developing GNSS RTK algorithms, ASIC, and PCB design, to developing and manufacturing receivers and antennas, to integrating systems and software with machines, aircraft, water vessels, and vehicles. Most importantly to us rope stretchers, they are putting

high quality GNSS survey systems and field/office software out on the streets of the world through the brands of Stonex, Hemisphere, and even for those good old folks on the south bank of the Ohio River, Carlson Software. Hemisphere has wrapped up the whole enchilada and is serving it over the counter.

All the kids in the positioning sandbox have their own Tonka trucks and Hemisphere is moving their share of dirt. Hemisphere is a strategic partner with the Swedish outfit CPAC Systems Volva Penta, which is owned by the Volvo Group, and since 2016 is the sole source of GNSS positioning and heading systems to CPAC. Hemisphere's GNSS technology is being used in the Dig Assist, Pave Assist, and Compact Assist solutions available in the Co-Pilot series for Volvo Construction Equipment. Worldwide, the machine control segment is integrating technologies that have captured the interest of huge global investors seeking profits through virtual management of big money construction projects. Global financial leaders and construction behemoths are embracing GNSS automation, remote sensing, and machine control as tools to wrangle out as many of the unwieldy wildcat expenses from their project investment portfolios as possible.

Hemisphere GNSS is headquartered in Scottsdale, AZ, USA with product development, sales, and marketing offices located around the globe.

Miles Ware,
Director of
Marketing,
Hemisphere GNSS





Randy Noland,
VP, Global
Sales & Business
Development,
Hemisphere GNSS

This equates to accurate cost projections which leads to a more stable investment opportunity which ultimately reduces the risk of investing in real estate development and property management.

Being an American surveyor with a bad boundary survey habit to support, I have mentally compartmentalized the major GNSS players in the construction market. We know the names, the colors, and the great products that have resulted from this healthy competitive market.

As far as I know, or have been led to believe by a quarter century's worth of listening to the industry's sales reps, the corporate branding folks pick a color and market their proprietary awesome sauce in some shade of mustard, slate, seafoam, or pistachio, with the windows rolled all the way down and the subwoofer blaring. In Hemisphere's case their color might be best described as Crayola with the volume knob set just a fuzz over a polite Canadian. This goes back to the OEM production and market branding under the Hemisphere siblings like Carlson and Stonex. While Hemisphere has its own tattoo it's often covered up by some partner's shirt sleeve. I suspect Hemisphere may be rolling up that sleeve and flexing their bicep to the world.

I also had the honor of chatting with Hemisphere's Chief Technical Officer Dr.



Hemisphere's GNSS technology is being used in the Dig Assist, Pave Assist, and Compact Assist solutions available in the Co-Pilot series for Volvo Construction Equipment.

Michael Whitehead. He leads the development of advanced GNSS products, including centimeter level positioning and attitude determination systems. Dr. Whitehead gave me the rundown on two different satellite constellations. The Beidou Navigation Satellite System (BDS) is a Chinese satellite navigation system. It consists of two separate satellite constellations and is also known as COMPASS or BeiDou-2. The system became operational in China in December 2011 and has been offering services to customers in the Asia-Pacific region. An updated BeiDou-3 is evolving that will eventually consist of 35 satellites and is expected to provide global services upon completion in 2020. Beidou is ultimately projected to be more robust than the U.S. GPS constellation.

Another system in play is The Quasi-Zenith Satellite System. QZSS is a Japanese system for regions of Asia based on a regional time transfer system and a satellite-based augmentation to the U.S. GPS, with a focus on Japanese coverage. If it takes an intelligent mind to understand and decode the systems,

it further takes a brilliant mind to cook it all down and serve it to a rod jockey like me. Dr. Whitehead truly is that down to earth Einstein and chats about this logic as if it were a bundle of hubs or a roll of flagging. So, putting the constellation in an everyday perspective we can get a glimpse of the past present and future. Twenty years ago every garage only had one American car in it, GPS. Then the Russians sold us a really great tractor, GLONASS and we parked her in there too. The Europeans crafted a fancy motorcycle and we made room for Galileo, the Japanese are pulling in a fuel efficient hybrid sedan with QZSS, and the Chinese are showing up with what appears to be a bad mamba jamba monster truck with Beidou. Yeah, after 25 years we, the consumer, have a four car garage full of the biggest, baddest, best-est, measuring systems the world has ever seen.

So, it's football season and we'll all be glued to the NCAA rankings. I'm not sure how our GNSS product manufacturers get rated but after my chat with the Hemisphere folks I'm starting to think Hemisphere is more like the NCAA itself rather than any particular Big 10 Team. Hemisphere envisions exciting industrial changes rapidly redefining the scenery of the ultra-competitive GNSS positioning market. ■

Jason Foose is a Professional Surveyor licensed in multiple jurisdictions.

iG8

RTK GNSS

Network Rover: \$7,605
Base / Rover Pair: \$14,880
Data Collector + SurvCE + Brackets: \$ 1,798
Same as cash 10% down - 24 month financing
on approved credit

small, lightweight, rugged, reliable

- GPS + GLONASS + Galileo + BeiDou + SBAS · Any-Mix-Fix · fully enabled · 200+ channels · tracks and uses Galileo BeiDou, L2C, L5 today
- Bright sunlight readable OLED panel · keyboard for quick mode selections
- Dual Batteries · hot swappable · 11-hours
- Connected: 3.75 GSM · built-in hotspot · Wi-Fi · http · ftp · Bluetooth · USB · Serial · 403-473 MHz TxRx Satel UHF
- 27 GB high-speed static observation memory · 8-stream · direct to RINEX logging · iGage download and OPUS submittal tool
- IP68 · water and dust proof · cast magnesium case · 2.8 lbs. with batteries · 2-year iGage warranty

www.iG8g.com +1-888-450-4922

ALLEN

Instruments & Supplies

alleninstruments.com

NOW 4 LOCATIONS TO SERVE YOU BETTER!!

AUTHORIZED FACTORY SERVICE
RENTALS • ACCESSORIES • USED EQUIPMENT

Scottsdale, AZ 800-272-0180	Anaheim, CA 800-215-2737	Ventura, CA 805-644-7405	Escondido, CA 760-747-8823
---------------------------------------	------------------------------------	------------------------------------	--------------------------------------

For Sale

Established land surveying and land use consulting firm in Southern California. With principal office in La Jolla, the business includes 50 years of valuable records in San Diego County and a diverse base of clientele. It is an opportunity for a company looking to expand in the lucrative Southern California market or an individual wanting to acquire major client contracts. The owner is retiring and will assist in transition. Send inquiries to pallamary@pallamaryandassociates.com or to Pallamary & Associates, 7755 Fay Avenue, Suite J, La Jolla, CA 92037.

KLAU PPK

The world's most accurate geo-referencing for UAV surveying

- 3cm XYZ ground accuracy
- No GCPs
- Plug&Play for DJI and others
- Camera pre-calibration
- Simple, powerful software
- Global coordinates & geoids
- Local site coordinates
- Solid customer support

www.KlauPPK.com

contact@KlauPPK.com

Cadastral Consulting, LLC

- Consulting and expert witness services in surveying and floodplain management
- In-house training and custom course development
- Technical writing services

Wendy Lathrop, PLS, CFM
President and Owner

800-666-1320
www.cadcon.com



Over 70 years of
Service Excellence

SERVICE/REPAIR

- GPS
- Data Collectors
- Lasers
- Levels
- Robotic and Total Stations

Toll Free:
877-330-6303

Email:
servicedept@seilerinst.com

St. Louis • Kansas City
Indianapolis • Milwaukee • Omaha

<http://solutions.seilerinst.com>



Reflective Targets

- A full range of reflective targets
- 5 sizes, 3 designs and 3 colours available
- Brand with your own company name
- Fast, accurate and cost efficient!

Take advantage of the exchange rate!
US\$1.00 equals approximately AU\$1.30

Order online at:
justretros.com.au

Pay safely with PayPal

Visit our
website to
download our
price list!



Just Retros
SYDNEY AUSTRALIA



DATA COLLECTOR & MAGNETIC LOCATOR REPAIRS



Screen Replacement
TDS Ranger • Carlson
Allegro • Topcon
Starting from \$299

TDS Recon
\$199

Magnetic Locator Repair
Schonstedt • CST Berger
Magnatrak • Dunham & Morrow
Subsurface
Flat Rate \$175

**Battery Charger,
Power Supply &
GPS Unit Repair**

6 Month Warranty 100% Satisfaction Guaranteed
1 Day Turnaround • All Makes and Models Serviced

Ship To: Atlas Electronics, Inc
2737 Irving Blvd Dallas TX 75207
Questions? Call Now 214-631-2901 • www.SurveyRepairs.com



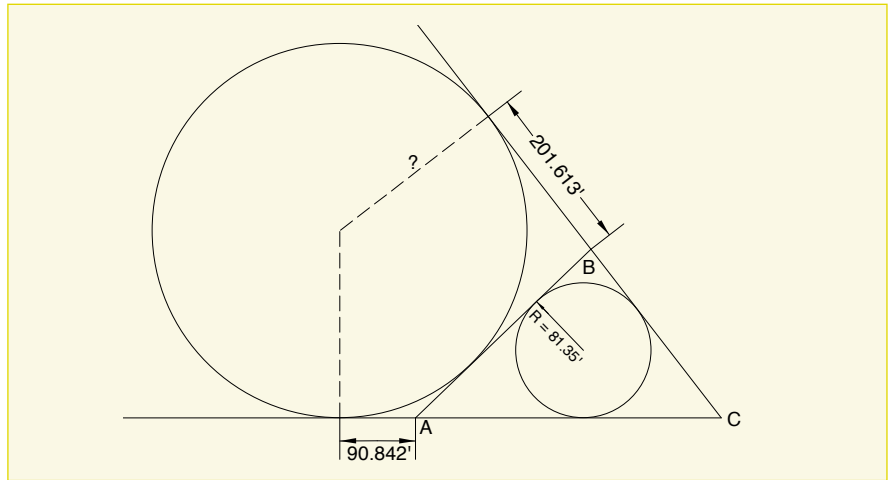
test yourself

X Marks the Spot

What is the radius of the excircle (or escribed circle)? ■

For the solution to this problem (and much more), please visit our website at: www.amerisurv.com. Good luck!

Dave Lindell, PS, retired after 36 1/2 years with the City of Los Angeles. He keeps surveying part time to stay busy and keep out of trouble. Dave can be reached at dlindell@msn.com.



Custom Survey Markers & Monuments • Signs & Witness Posts • Flagging & Targets • Nails & Washers

SURVEY MARKING

Custom Survey Markers & Monuments • Signs & Witness Posts • Flagging & Targets • Nails & Washers



Berntsen®
Marking the Infrastructure of the World™

877-686-8561 | www.berntsen.com

FUTURE PROOF

► **Certify your skills
and abilities with CST**

**No matter what the
future holds, prepare
to meet challenges
head-on.**

Future-proof your resume
by becoming a Certified
Survey Technician (CST).
This unique four-level
program indicates official
recognition by NSPS that a
person can perform tasks at a
specific technical level. Show what
you can do! Decide between the
office or field track.



nsps.us.com

+1 (240) 439-4615 Ext. 112

Level I & II Training Now Available at learnCST.com

feedback

To Seem is to Seem. To Be is to Be.

Dear Mr. Foster, being a young surveyor, I've never before responded to anyone's comments in a newspaper or magazine. Yours is the first for me. I'm referring to your recent editorial musings on Ethics in the "thought leader" column in the excellent magazine *The American Surveyor* (April 2018), which I glanced through while in the office of a friend of mine. There was just something about your views regarding the appearance of conflict of interest that caught my attention, negatively. With some trepidation as I realize my own lack of professional and life experience, but with great respect for your superior age and knowledge, I nevertheless suggest that you have missed the center of this particular professional ethics matter by a country mile.

First though, I had to essentially eliminate from consideration nearly half of your column by striking through the unfair and biased political references to the current President of the United States. Why you chose to comment on the President and his family in a professional magazine is beyond me, unless you are so predisposed against them personally that you couldn't think of another example. Why would you think that a father giving his son or a father-in-law giving his son-in-law advice is the same as "using the White House"? If you insist on being political about this, it would have been a far better choice if you had referred to examples of the immediate-past White House denizens' and their families outrageous, arrogant and egregious conducts, breaches of ethics, breakings of the law and actual conflicts of interest (all at taxpayers' expense).

Re-reading your column after I had scratched out the distracting parts, it appeared to me that your real point was: "A perceived appearance of a professional conflict of interest is the same as an actual professional conflict of interest." More succinctly, your premise seemed to be, "If anyone thinks something is wrong, then it is wrong". Or, how about another expression of moral bankruptcy, "Right is whatever I think it is today?" Did I condense your remarks

too much? Honestly now, Mr. Foster, do you believe that nonsense is correct, or did you just toss remarks out randomly in an experiment to see if people like me would respond?

Two of the things that can be said about our world and people's actions, reactions and perceptions to a particular professional situation are: (1) the truth is right; and (2) an infinite number of people's actions, reactions and perceptions are wrong. Life can be very unfair. A moral, right-thinking Surveyor can be [falsely] accused of and have to defend him- or herself against the charge of a nonexistent breach of conduct by morally destitute and emotionally-guided persons (there seems to be an astonishing number of them out in the open these days). Bystanders must guard themselves against giving these people credence, from falling into the trap of believing your "Ms. Green".

Being empirical people almost by definition, we Land Surveyors mostly base our decisions upon mathematical and demonstrative evidence. Even if we do not happen to have the highest degree of probability with which to structure our professional decisions and actions, we can also employ moral evidence, e.g., the law of conscience and common sense, by which we reveal how much we personally have conformed to the laws and intentions of our Creator. This is our best defense against claims of bias.

A conflict of interest doesn't exist if there isn't one. An unstable person's voicing an imagined concern over the appearance of a conflict of interest debases a legitimate concern into the will-o-the-wisp realm of impressions and emotions, debasing an innocent and legitimate professional as well. The inmates must not be allowed to run the asylum.

While I've got you "on the line", so to speak, and continuing with the subject of conflict of interest, please share with me your thoughts about this scenario:

Several years ago, the Surveyor established and marked Ms. Brown's property lines. The Surveyor did a typically thorough and professional job. The Surveyor obtained permission from each of the

neighbors to "tie in to" boundary evidence on their properties and put extra effort into Ms. Brown's job to "make sure that it was right". The plat and descriptions were recorded among public records. Now, years later, the Surveyor has just finished surveying the lands of Ms. Green, one of the adjoining owners. This Ms. Green had been contacted by the Surveyor during the first survey and was impressed then by the Surveyor's conscientiousness and objectivity. This Ms. Green, though she doesn't particularly like Ms. Brown, rightly keeps her emotions in check (where they belong) and realizes that employing Ms. Brown's Surveyor might be an advantage to her. Naturally, in this latest survey, the Surveyor builds upon the previous survey work for Ms. Brown and, armed now with additional property line evidence from Ms. Green's survey and from her neighbors, finds that this new data conflicts somewhat with the Surveyor's own previous decision as to the location of the common Brown/Green property line. The Surveyor has essentially created his/her own "appearance of" a conflict of interest.

Questions:

- Ethically speaking, should the Surveyor now contact Ms. Brown, explain to her the new situation and offer to revise the previous survey work and products?
- Should the Surveyor hold his/her own previous Brown/Green line decision, thus conceivably denying one of his two clients (the current one and the previous one) some use of a small portion of rightful property?
- Should the three of them together seek arbitration?

If another Surveyor had recently surveyed for Ms. Green and found his/her decisions to be in conflict with the Ms. Brown survey, then the whole thing might end up in court or in arbitration where everybody except the attorneys or the arbiter loses, with Ms. Brown, Ms. Green and the poor (no pun

intended) Surveyor being unhappy and worse off than before the experience.

Roland Edward
Cumberland, MD

Foster responds:

In response to the (young) writer who objected to my commentary, “To Seem is to Be” in this publication, I offer the following:

I included President Trump in my discussion of an appearance of a conflict of interest because he has presented us with so many examples in his own life and actions. For instance, his refusal to disclose his Federal income tax returns has created an obvious *appearance* of a conflict. It may well be that there is nothing in those returns that would be damaging to the President, but the mere fact of his refusal to divulge, as his predecessors have done, gives people the impression of something to hide—in other words an appearance of a conflict of interest—or worse.

The writer says that I have missed the center of this particular professional ethics matter by a country mile and goes on to conclude that my point was “(a) perceived appearance of a ... conflict of interest is the same as an actual ... conflict of interest.”

No. The writer has missed the point by a country mile.

My point is that an *appearance* of a conflict of interest can be, not the same as but as damaging as, a *real* conflict of interest. The distinction may be subtle but a careful reading of the article would have made it clear. My Ms. Green/Ms. Brown example demonstrates the difficult position of the surveyor who, though faithful to the interests of both neighbors, is by nature of his contract with one of them perceived by the other as having a bias in favor of his client. It is not an unusual situation for the surveyor in private practice. Ms. Green need not be “morally destitute and emotionally guided,” in the writer’s words. Property line arguments between rational neighbors are a fact of life for the surveyor in private practice.

To argue that a conflict doesn’t exist “if there isn’t one,” as the writer does, is to deny that perception can be as convincing as

reality. Perhaps the writer is too young to have discovered this sad truth.

The writer presents us with his case in which the surveyor has surveyed the properties of first one, then the other of adjoining neighbors. In the second survey the surveyor discovers a “conflict” in his earlier work for neighbor #1. The writer suggests that the surveyor has created his own appearance of a conflict of interest. I would suggest that this is less an appearance of a conflict than a discovery of his own judgement error, probably due to inadequate document research. The writer wants to know what the surveyor should do.

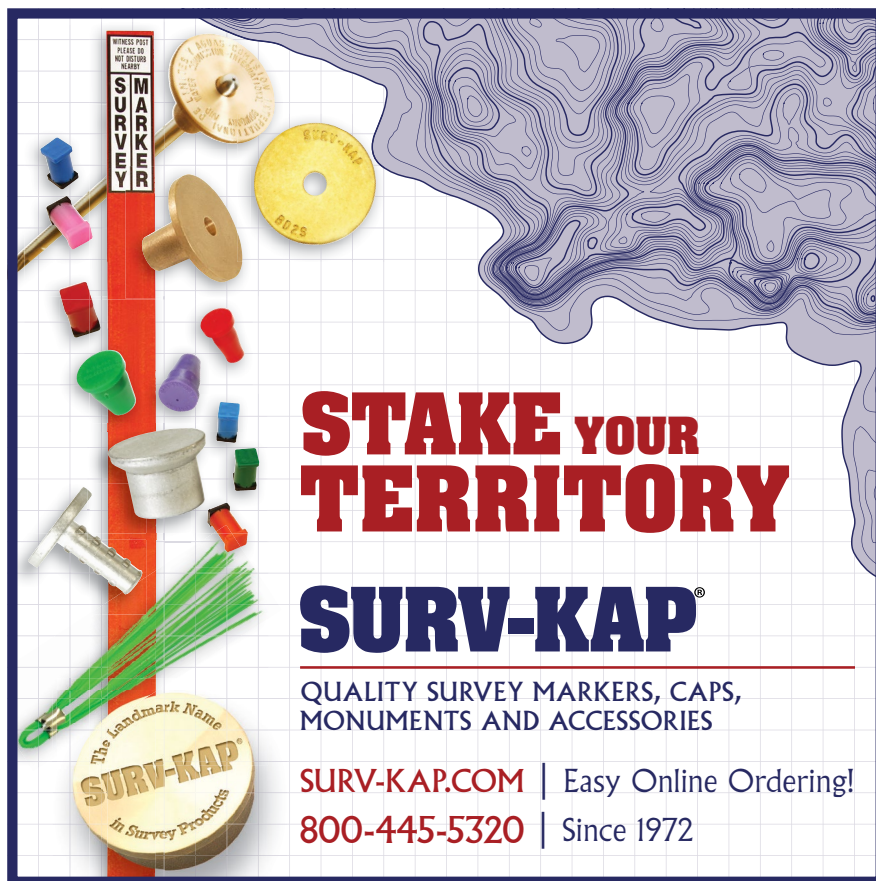
We are not told whether the surveyor prepared a plan for recording purposes of his survey for client #1. If so, and if he has discovered an error in his work while performing survey #2 he is ethically and professionally obligated to correct the record. If there was no

plan but the surveyor set points memorializing his opinion of property corners that now seem to be in error, then again he must correct his earlier, erroneous work. In either case the surveyor must make client #1 aware of the situation. (He ought, also, to notify his professional liability insurance provider if there is a possibility of litigation.)

If, in this example, the surveyor is still in some doubt concerning his decisions, or if one or the other of the two neighbors refuse to accept his final opinion, resolution may require a third survey be performed by a neutral surveyor.

Got some feedback?

Contact us via www.amerisurv.com, or send a letter to: The American Surveyor, 7820-B Wormans Mill Road, #236 Frederick, MD 21701. ■



STAKE YOUR TERRITORY

SURV-KAP®

QUALITY SURVEY MARKERS, CAPS, MONUMENTS AND ACCESSORIES

SURV-KAP.COM | Easy Online Ordering!
800-445-5320 | Since 1972

vantage point



Is That Flood Information Correct?

At the annual conference of the Association of State Flood Plain Managers in June, one session I attended (“Why is my flood zone determination wrong?”) reminded me of the many problems we encounter when trying to find good flood data. Rather than air my own frustrations with FEMA’s Map Service Center (MSC, msc.fema.gov), I’ll focus on making sure we examine the data and use it correctly.

A feature many people rely upon from the MSC is the ability to look up an address to find the flood zone and relevant Flood Insurance Rate Map (FIRM). The brightly colored image bearing a red pin presumably indicating the requested address, however, should not be taken at face value. This imagery is the National Flood Hazard Layer (NFHL) and is not the same imagery as the Flood Insurance Rate Map (FIRM). This means that the angle of the base photography is not the same. Differences in angles of the plane mean that a building can appear to be “leaning” to the right on the NFHL but to the left in the FIRM, or vice versa. So I recommend comparing the two for a better idea of where the building’s foundation really is.

There is also the matter of geocoding, another human influence on what appears to be a straight forward flood zone determination. I have seen addresses displayed at the wrong end of the street and therefore in the wrong flood zone. I have seen addresses displayed on the wrong street. I have seen panel lines misdrawn on the NFHL so that the wrong panel information is reported. I always check the FIRM after finding what I consider general location on the NFHL. While it is possible to print out what the

Map Service Center refers to as a FIRMette from either the NFHL or from the FIRM, it is only the extract from the regulatory FIRM that contains a paragraph stating that it is an official and legally acceptable depiction of the FIRM and the data shown on that FIRM. Check the text below the FIRM’s FIRMette title block for that notification. The lower right of the NFHL FIRMette informs us that data shown on that image derives from different sources.

The process of checking for any Letters of Map Change that might affect a site is considerably easier than it was before the MSC started providing a drop down list for each panel listing all of the Amendments, Revisions, and Revisions based on Fill affecting that panel. While this is light years of technological advancement beyond earlier “paper only” and heavily redacted Letter of Map Change (LOMC) copies that were so hard to find out even existed, much less obtain copies of, I must admit to being spoiled by the ease of viewing and obtaining digital copies of the FIRM and Flood Insurance Study Reports (FIS). This means that I find myself feeling irritated when confronted by a list of more than ten LOMCs for a single panel (we still call them “maps” and “panels” even though everything is digital these days rather than cartographic). Recognizing if a LOMC is pertinent by its listed Case Number is not particularly intuitive for anyone other than those who made the application for it. (I have commented to FEMA’s MSC contractors about better searching/listing options; time will tell if anyone will listen and improve this situation.)

Just because there is a LOMC listed for the property in which you are interested

(hurray! jackpot!) doesn’t mean the diligence part is over. First, read the full header of the document, just below the Case Number and date issued. This tells us the kind of LOMC this is, and parenthetically also tells us either “(REMOVAL)” or less joyfully “(NON REMOVAL)”. This reminds us that the process of applying for LOMCs is just that—a process for review, and some reviews don’t go as well as we would like. But even when the header says “(REMOVAL)”, it does not necessarily mean that everything is cleared from the Special Flood Hazard Area and related regulations, restrictions, and requirements. Just below the determination section that tells us what has been removed by a successful LOMC application (parcel, part of a lot, structure) is additional information that could be important to the landowner. Here you may see that portions of the property remain in the 1% annual chance floodplain (when the LOMC has been for a specific building or described portion of a lot) or even that portions remain in the floodway. Both conditions affect planned land use, particularly the latter, as the floodway is meant to remain unobstructed by fill or structures so that it can accommodate the full volume of a 1% annual chance flood even when the flood fringes are no longer flood-worthy.

Bottom line? Check what data you rely upon and how you use it. ■

Wendy Lathrop is licensed as a Professional Land Surveyor in NJ, PA, DE, and MD, and has been involved since 1974 in surveying projects ranging from construction to boundary to environmental land use disputes. She is a Professional Planner in NJ, and a Certified Floodplain Manager through ASFP.

WE'VE GOT SMARTER MARKING ON TAP.™



QUIK-TAP™

Reusable Spray Device for
QUIK-MARK™ Paints

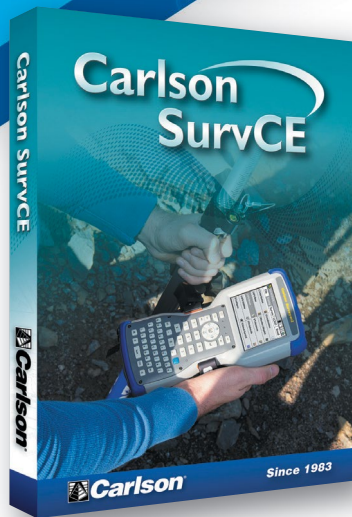
- Less waste
- Reduced disposal costs
- Ready to use in seconds



Call 800-777-2966
for more information

Exclusive to Carlson Software

Carlson Surveyor2



Powered with Carlson SurvCE

Rugged, reliable and powerful field computer with QWERTY keyboard and touch screen. IP68, Industrial Temperature Range, Class 1 Bluetooth, and 20-hour Battery. Only available through Carlson Software and their authorized dealers.

Carlson Software Inc.
33 East 2nd Street ■ Maysville, KY 41056, USA
800-989-5028 ■ 606-564-5028 ■ www.carlsonsw.com

© Copyright 2017 Carlson Software, Inc. All rights reserved. Carlson Software is a registered trademark of Carlson Software, Inc. All other product names or trademarks belong to their respective holders.

