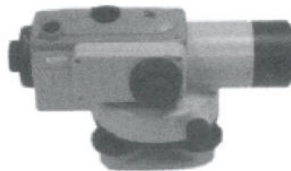


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VOLUME 15, NO. 3

OCTOBER 2003



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A (Very) Short History of RTK GPS

by

Dr. Lon G. Toody, Geodesist

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We were toting around an RTK rover backpack that weighed 36 pounds - not including the rover GPS antenna which weighed another three pounds.

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2003 PLSW MEMBERSHIP APPLICATION PROFESSIONAL LAND SURVEYORS OF WYOMING

AFFILIATE — AMERICAN CONGRESS ON SURVEYING AND MAPPING
MEMBER — WESTERN FEDERATION OF PROFESSIONAL SURVEYORS



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YOUR TITLE: _____

States other than Wyoming in which you are registered: _____

Additional information or comments (optional): _____

CLASS OF MEMBERSHIP APPLIED FOR: (check one only and please submit dues with application, prorated for the remainder of the calendar year)

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☐ **Special Member**, annual dues \$50. (Not meeting above qualifications but with a particular interest in, or association with, the profession of land surveying.)

☐ **Special Member**, Student, annual dues \$15. (Pursuing a post secondary academic course of study, and currently enrolled.)

☐ **Sustaining Member**, annual dues \$100. (Persons, institutions or corporations desiring to assist PLSW financially.)

I AGREE TO OBSERVE THE CONSTITUTION AND BY-LAWS OF THE PROFESSIONAL LAND SURVEYORS OF WYOMING AND THE CHAPTER THEREOF TO WHICH I WILL BELONG AND TO SUPPORT SAID ORGANIZATIONS IN THEIR ENDEAVORS.

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(For Affiliate Member applicants only.)

NOTE: All portions of the state have chapters. Chapter dues or assessments may vary in amount. Applications are considered by the board of Directors at quarterly meetings. Send completed application to PLSW, c/o Herbert W. Stoughton, Sec./

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REPRINTED MAP

SOURCES OF SNAKE RIVER

SNAKE RIVER EXPEDITION – JAMES STEVENSON, DIRECTOR

The Northwest Chapter has reprinted, from an old (perhaps first printing) lithograph found in a cabin west of Cody, the map of the Hayden - Stevenson expedition and survey of Jackson Hole, Yellowstone National Park and surrounding vicinity. The map shows the campsites of the expedition, from July 12th, 1872, at Fort Hall, Idaho Territory, up the Snake River, into Yellowstone, and returning to Fort Hall on October 11th.

The reprint measures approximately 28 inches by 29 inches overall, black printing on white background, and is printed on heavy photographic paper.

The map is representative of the cartographic style of the time and uses shading to depict mountain ranges, water lining on lakes and artistic profiles of various ranges including the Tetons.

A 39-page excerpt from "Great Surveys of the American West", by Richard A. Bartlett, published by University of Oklahoma Press, is to be included with the map (reprint permission pending) and details the progress of the expedition.

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EDITORIAL POTPOURRI

- **NEW MEMBERS OF PLSW** - At the August meeting, the PLSW Board of Directors approved the following new members:
James Jacob Student Member
Lyle Casciato Student Member
CONGRATULATIONS AND WELCOME
- **BOARD OF DIRECTORS MEETING** - The last Board of Directors meeting of the year will be held in Casper on November 14, 2003. Contact your Director for additional information.
- **FALL TECHNICAL SESSION** - The fall technical session will be on November 13 and 14, 2003 at the Parkway Plaza Hotel in Casper, Wyoming. Please see the registration form in this issue for additional information.
- **LINES AND POINTS FAX AND E-MAIL** - Our fax number is 307-235-5604 and our E-mail address are dond@wlcwyo.com or johnhh@trib.com.
- **PLSW KEY RINGS AND PINS** - The South Central Chapter has key rings and pins for sale. Contact *Lines and Points*.
- **NOTE TO ADVERTISERS** - After 15 years our advertising rates finally had to be increased!

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PLSW (Professional Land Surveyors of Wyoming) is a statewide organization of Registered Land Surveyors licensed to practice in the Equality State of Wyoming. PLSW is dedicated to improving the technical, legal, and business aspects of surveying in the State of Wyoming. PLSW is affiliated with the American Congress on Surveying and Mapping and the Western Federation of Professional Land Surveyors.

Editorial Staff: John Hibsman, Steve Strang, Don Davis.

Lines and Points subscription \$50/year

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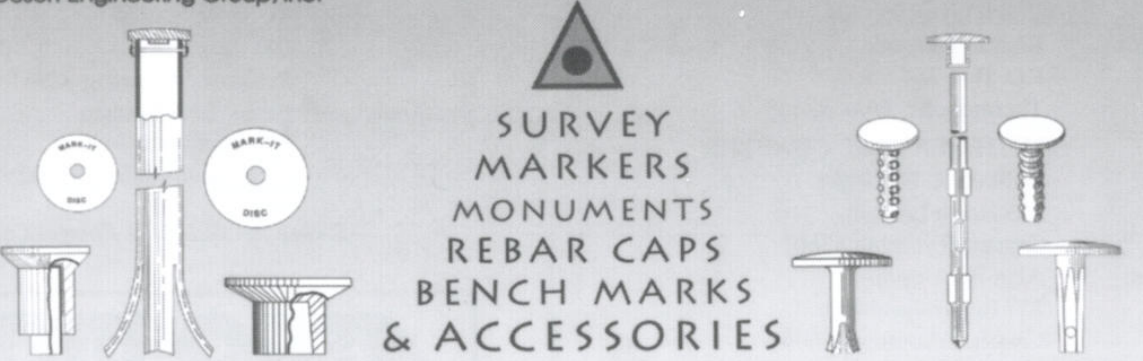
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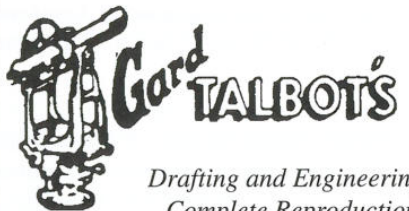
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President's Message

I am very happy to see two chapter projects in this issue. Scheduling kept me from the South-Central Chapter's project to monument corner of Natrona County. This was the second of four planned events and like the first was not big news to the media in



Casper. The southwest corner of Natrona is near Muddy Gap, is accessible by truck and is a truly striking monument. Talk about perpetuation! As it takes a couple of years to muster the funds to support this effort, we may not be able to proceed until 2005 or 2006 without fund raisers and donations. You will also find in this issue a related article regarding a historic rock, recovered by the Upper Platte Chapter. These articles are important to the newsletter and the membership and are under reported. If you, your company, chapter or acquaintances have like articles, please submit them to the newsletter staff. These stories, pictures, observations and efforts are what make this newsletter distinctly Wyoming.

The Board of Directors met by teleconference on the 23rd of August. The meeting was short and to the point which makes the teleconferencing valuable. We spent most of the time discussing the investment and scholarship committees. The scholarship committee submitted three applicants, who were all granted \$500.00 scholarships. These three men are Hans Pedersen, son of Martin and a student at Metro State; Karl Scherbel, son of Scott and a student at Idaho State University; and Lyle Casciato, a student at the University of Wyoming. Our congratulations go out to these young men and best of luck to each in this most wonderful profession.

The Northwest Chapter suggested more money to the approved and accepted applicants and much discussion followed. Their suggestion was for annual scholarships in the amount of \$1,200.00. Others suggested a tiered program from \$500 initially to \$1,000, \$1,500 and finally \$2,000. With so many options and ideas on the table it was decided to assign an ad hoc committee under the direction of the Scholarship committee to assemble the options and allow the membership the opportunity to voice their opinion. There is a lot of money in our accounts and we should use it. Scott Scherbel asked for assistance in this labor and each chapter was asked to volunteer one member to the committee. Please consider this if asked, your profession and it's future is calling.

The Fall Technical Session is fast approaching and chairman Joel Ebner says everything is coming together. The dates are November 13 and 14 and the topic is in regards to Railroad surveying and safety. The speakers are Gary Gable and Charlie Tucker. PLSW will hold it's quarterly board of directors meeting after lunch on Friday the 14th of November. Also fast approaching is the 84th Annual WES Convention. This year to be held in friendly Casper, Wyoming, with yours truly as the general chair. We are working on all aspects of the convention and hope it will satisfy everyone's needs for professional development hours as well as socializing credits necessary for ongoing relationships.

As the summer comes to an end and we clean up our corner records and prepare for winter, remember that the effort and sweat you give the profession paves the way for our young surveyors and mappers and is only as good as the aggregate. We control their future. VOLUNTEER! Don A. Davis, President

Professional Land Surveyors of Wyoming, Inc. Board of Directors' Meeting Minutes. August 23, 2003

1. The Board of Directors' Meeting of the Professional Land Surveyors of Wyoming.
 - a. Teleconference at telephone of individual's choice.
 - b. Date & Time: Saturday, August 23, 2003. Meeting convened at 10:01 A.M.
 - c. Presiding Officer: President Don A. Davis.
2. Agenda: The final agenda was E-Mailed to the President and forwarded by the President to the Directors.
3. Board of Directors Minutes: Motion by Roger Krum/Richard Muscio to approve the minutes of the last Board of Directors meeting held at the Parkway Plaza, Casper, Wyoming, on Saturday May 10, 2003.
4. Secretary's Report: No report.
5. Treasurer's Report: As of July 31 there was \$35,741.86 in the Hilltop National Bank checking account, \$4,065.97 in the Hilltop National Bank savings account and \$37,185.30 in the RBC Dam Rauscher Investment account. Beginning July 1 the interest rate for the checking account was reduced from 0.50% to 0.25% (APR) and the interest rate for the savings account was reduced from 0.75% to 0.45% (APR).
6. President's Report: Executive decision to set up an investment committee requesting Dr. Herb Stoughton and Kevin Jones to be members. No action items.

7. Committee Reports:
 - a. Audit-Finance Committee: No report.
 - b. Bylaws Committee - No report.
 - c. Convention Committee - No report.
 - d. Education Committee - No report however President Don Davis noted that there was some urgency for the committee members to communicate with each other to move along with plans for the Fall Technical Session.
 - e. History Committee - No report.
 - f. Legislative Committee - No report.
 - g. Lines & Points - President Davis reported that a Scholarship Application form was in the last issue of *Lines and Points* also Paul Reid's WESTFED BOD report along with several more interesting items.
 - h. Manual of Professional Practice - No report.
 - i. Membership Committee: Motion by Bill Febringer/Roger Krum to approve James E. Jacob as student member and Motion by Richard Muscio and Tom Johnson to approve Lyle Casciato as student member. Both win unanimous approval by the Board.
 - j. Nóninations & Elections Committee - No report.
 - k. Professional Awards Committee - No report.
 1. Public Relations Committee - No report.

(Continued on Page 5)

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-BOD MINUTES

(Continued from Page 4)

- m. S.O.S. Committee - No report.
- n. Scholarship Committee - The Board acted on 3 scholarship fund requests and approved \$500 awards each to Hans Pederson, Lyle Casciato and Karl Scherbel. A general discussion of the NW Chapter's request that future scholarship awards be increased to \$1,200 followed, with Paul Scherbel proposing that a tiered plan be adopted, starting at \$500 the first year, \$1,000 the second year, \$1,500 the third and \$2,000 the fourth. After some discussion President Davis decided that a committee should be formed to study the proposal. Don Schramm offered to chair the committee if he could get help from each chapter.
- o. Standards, Ethics & Professional Practice Committee - No report.
- p. Trig Star Competition - No report.
- 8. Delegate Reports.
- a. WFPS - presented in Lines and Points, by Paul A. Reid, PLS.
- 9. State Board of Registration for Professional Engineers and Professional Land Surveyors. Presented in Lines and Points, by Martin Pedersen, PLS.
New Draft Regulations are out and surveyors should contact the Board of Registration for a copy.
- 10. Old Business: None

11. New Business:

- a. President Don Davis noted that the corner common to Natrona and Fremont Counties was recently rehabilitated by the South-Central Chapter.
- b. Don Schramm wants comments and approval of a "Manual For Safety" prepared by the Southwest Chapter. Copies not ready yet for general distribution. Hope to have CD's available soon to sell as fund raiser.
- c. Next meeting of PLSW BOD will be at the Fall Technical Session at the Casper Parkway Plaza at 12:30 P.M., November 14, 2003.
- 12. Miscellaneous:
 - a. There were no action items. President Davis and Board members in attendance were pleased with Teleconference meeting.
 - b. Don Schramm reported that BLM surveys in Township 29 North, Range 108 West are finished. The entire Township is Lotted. Also part of Township 27 North, Range 112 West is finished with extensive lotting.
- 13. Announcements: Next meeting, see Item 12.
- 14. Adjournment. Motion by Paul Scherbel/Roger Krum to adjourn. Meeting adjourned at 11:25 A.M.
Respectfully submitted,
James E. Greer
Secretary/Treasurer

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NATRONA COUNTY / SOUTHWEST CORNER MONUMENTATION PROJECT SOUTH CENTRAL CHAPTER / PLSW

By Michael W. Blum, Chapter Sec./Treas.

In the November 2000 (Volume 12, No. 3) issue of **"Lines & Points"** Don A. Davis reported on our efforts in the rehabilitation of the southeast corner of Natrona County. Please refer to his narrative as to the establishment of the State of Wyoming and its counties. This is the further adventures of our chapter to rehabilitate the corners of our home county.



The legal description for Natrona County (18-1-101, Wyoming Statutes 1977) states that the southwest corner is *"the southwest corner of section thirty-one (31), township twenty-nine (29) north, range eighty-nine (89) west"*. A surveyor from the Southcentral Chapter PLSW recovered the 1940 G.L.O. brass cap at said southwest corner of section 31 during January 2000. The original corner, a 27"x16"x8" granite stone, was set by Charles W. Brown, Deputy Surveyor, in 1882. The brass cap was set in a dependent resurvey by Russell C. MacDonald, Public Land Surveyor, in 1940 as stated in the official field notes *"Set an iron post, 3 ft. long, 3 ins. diam., 30 ins. in the ground and deposit the original stone at post, for the remonumented standard cor. of secs. 31 and 36, Tps. 29 N., Rs. 89 and 90 W., with brass cap"*



Preliminary scheduling for the rehabilitation project was for late summer- early fall of 2002. Due to workload and the failure of the chapter to round up volunteers, the project was put aside

for a year. At our December of 2002 meeting we elected our officers for 2003 and set the dates for the upcoming year's meetings. We decided on the last Saturday of July 2003 for the try at the rehabilitation project hoping that would garner enough volunteers for the endeavor.



Members, Associates and Volunteers for this project were: Alan "The Claw" Cormier, Paul "The Chainer" Svenson, Cory "The Waterman" DeClue, Jim "The Mixer" Jones, Mike "The Photoman" Blum, Steve "The Scribner" Castle, Brad "The Checker" Neumiller, Todd "The Finisher" Jones, Jason "The Digger" Vreeland and Alden "The Carrier" Cormier. Others contributing but not being able to attend the field exercise were: Dan "The Plaque Provider" McClenahan, Artie "The Form Maker" Schubert and last but of primary importance Chris "The Lunch Provider" Asbury.



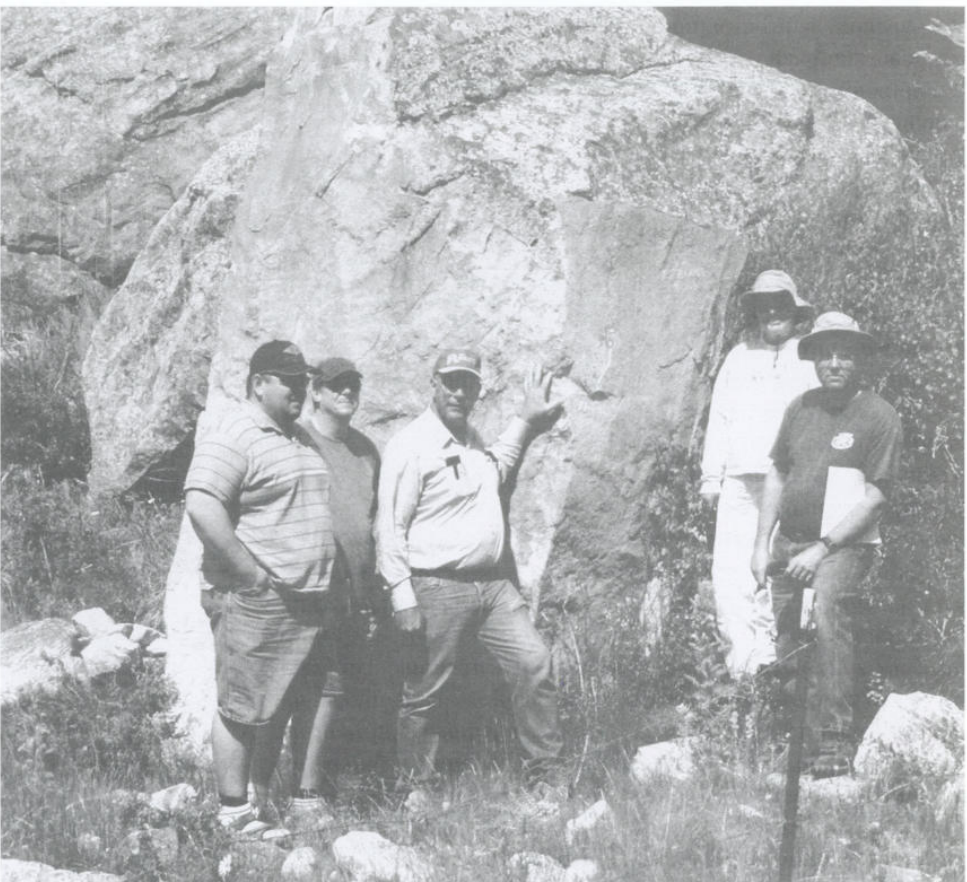
On Thursday, July 24, 2003 at about 7:00 P.M. we met at WLC with all concerned parties to go over personal, equipment and any last minute additions or changes. At that time we were to give it a go / no-go assessment for Saturday. On the afternoon of Friday, July 25, 2003 we readied the survey vehicles as to 65 gallon water supply, 40-60lb. bags of quickcrete (we ended up

A TRIP TO HISTORY

"Sometime around the first of September of 1881, a group of U S Surveyors stopped at Whiskey Gap, near the intersection of Wyoming 220 and 287 in Carbon County, and spent some time carving their names in a large stone on the North side of the Gap. On July 19, 2003, members of the Upper Platte Chapter of the PLSW took a field trip to view this monument.

The rock falls on what appears to be private land belonging to the 47 ranch, and permission was obtained from the owner for the group to visit this site. Lynn Forbes, a member of the Upper Platte Chapter, and BLM cadastral surveyor, said he found mention of the stone in his records at the Rawlins BLM office. Martin Pedersen was told of the stone by a local Dentist who is also very involved in archeology. After taking the names on the stone from the dentist, Pedersen contacted the BLM records section and did some preliminary work in trying to find any background on the stone. At least two of the names show up on field notes of exterior surveys further north, but from the limited amount of research Pedersen was able to do, no party of the exact makeup of these names was found.

It is very hard to distinguish all of the lettering on the stone, and later visitors have added their carving to it, but the US Surveyors all put the date of Sept 4, 1881 on the South and East sides of the stone. The name "W F Haines Sept. 4, 1881" appears on the South face, and 5 or 6 more on the East face. Members taking the field trip were Ralph Tarango and children, Mr. and Mrs. Lynn Forbes and children, Mike and Anita Morris, Jon Anderson, and Martin and Shelly Pedersen. The accompanying picture shows the chapter members standing in front of the marked stone. From left to right, Ralph Tarango, Jon Anderson, Martin Pedersen, Anita Morris, and Lynn Forbes.



FALL TECHNICAL SESSION
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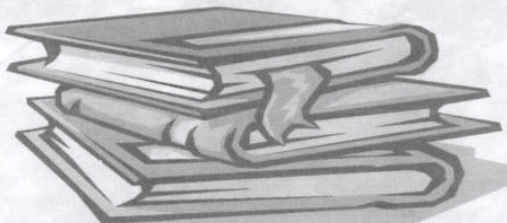
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CST EXAM GOES ONLINE

by Trish Milburn

ACSM Office Administrator

You can now take the NSPS/ACSM CST exam through web-based testing administered by Vincennes University (VU) in Vincennes, Indiana. Did you know that the very first online CST exam was conducted at Seminole Community College near Orlando, Florida? The first exam was given to Level 1 examinees in February of 2003. Six brave exam takers rode the shakedown cruise and helped identify problems with the new system. The second online CST exam was given to twentyfour freshman survey students at Vincennes which ran flawlessly. The VU students commented that one of the best features was that they could log out after the first hour and take a break or log back into the exam to continue with the next hour-long session.

The test is administered electronically by VU who provides Internet-based testing for many other programs. They have multiple web servers dedicated to online testing and instruction backed by a center staffed with experienced personnel. VU already uses over 700 online course sites and has a database of 24,000 users for online course access. CST exams are larger and more complex than the typical online exam due to graphics and more questions. VU has done a terrific job of programming and capturing the diagrams built into the exam.

Online tests will be prearranged by CST staff for individuals or groups desiring to take an exam. The exam can be taken at any supervised workstation with high speed Internet access and meeting minimum hardware requirements. This technology makes it possible to give the test to one person at a time from a remote location. The greatest benefit to exam takers is the extended availability of the CST Program to locations in their community, including survey offices (other than your own). Other benefits are: immediate exam results at the end of your test and ease of use.

The Survey Technician Certification Board (STCB) sees the need to move to online testing as costs rise and examinees request test locations closer to their homes. Another responsibility of the STCB is to make the test easy to understand and current with technology. With the VU online system, the STCB will have greater ability to make changes and add new questions.

Currently, paper exams are still administered and conducted through NICET. We will continue our arrangement with NICET as we add online testing centers and "specials". A "special" is a prearranged location having work stations sufficient to deliver the exam, in an environment suitable for testing and a proctor to supervise the testing. In order for the CST program to expand in this direction, we need the help of proctors and companies or community colleges to serve as testing centers. To offer the widest available CST testing, we are looking for help from technicians and professionals. We need to develop a network of coordinators, proctors and testing centers with computer labs at high schools, colleges and local business offices.

Having a proctor and location will help speed up the application process. A proctor is required by NSPS/ ACSM to oversee the delivery of the exam and protect its integrity. Any college instructor, professional engineer, or registered land surveyor can be a proctor for a CST exam. Applicants requesting a paper exam can still take their exam at an existing NICET testing center on the regular schedule. However, if an applicant can suggest

exam, an online exam can be administered at a proposed location at a time chosen by the applicant and his/her proctor.

This is significant to the surveying industry. Here's why. Managers can use this program to help survey technicians with their career development. People familiar with the CST Program know that it becomes more than a test by training and development conducted by organizations in preparation for the exam. In studying for the exam, surveying technicians become familiar with the academic knowledge behind the field procedures they follow every day. By using the stairstep CST Program, the technician moves progressively into more responsible positions. Some hit the books even harder and go after the Fundamentals of Land Surveying Exam. This grass roots movement can be a way to help technicians become professionals.

Now we need help from the surveying profession. Your help will benefit your business and our profession, be it private or government. To help, offer to be a proctor or arrange for your office to serve as a testing center for others. Volunteer to coordinate testing or help with a training program.

Questions can be directed to ACSM staff Trish Milburn or Susan Frank at (240) 632-9716 or you may call the CST coordinator in your state or your NSPS Governor.

For Information:

CERTIFIED SURVEY TECHNICIAN ONLINE PROGRAM
6 Montgomery Village Avenue, Suite 403
Gaithersburg, MD 20879
240-632-9716, ext. 103 or 105
240-632-1321 (fax) sfrank@acsm.net
tmilburn@acsm.net www.acsm.net

Survey Video Tapes Available

TAPE ONE

1. *Professional Land Surveyors & GIS; Mapping the Future*; New Jersey Society of Professional Land Surveyors.
2. *Professional Land Surveying: A Career Without Boundaries*; New Jersey Society of Professional Land Surveyors.
3. *A Matter of Degrees*; American Congress on Surveying and Mapping, National Society of Professional Surveyors (1986).
4. *Surveyors of the Sixth Principal Meridian*; Bureau of Land Management

TAPE TWO

1. Wyoming T2 Center: *Surveying Crew Orientation: Surveying Options, Part I.*
1. Wyoming T2 Center: *Surveying Crew Orientation: Surveying Options, Part II.*

TAPE THREE

1. *Introduction to Legal Research*; by West Publishing (nine chapters).

All PLSW chapters should have copies available.

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bringing back 19 bags, its better to have to much than to run back the 75 miles to Casper for a few bags of cement) and all the digging implements the trucks could take. At 7:00 A.M. on Saturday, July 26, 2003 we met at WLC for any last minute details. Jim Jones provided the mixer (which he and his son had loaded the night before). We then checked out our small, easy to carry generator. At first it appeared marginal, but we all had faith it would work OK with a little help, as opposed to a much larger and hard to load generator we had used on our first corner project. We then departed on our journey by 7:30 A.M. for the corner through the wonderful Muddy Gap Junction construction. The corner is located on BLM land about a mile off of US Highway 287 on fairly easy terrain, so we were able to get all vehicles right next to the site. After taking pictures of the area of the corner before being disturbed, the digging and leveling began. The form was set, the concrete mixed, poured and finished. Corey set up the GPS and started taking observations at 11:57 A.M. We let the GPS do its thing as we ate an outstanding lunch provided by Chris and Marsha Asbury's First Street Bakers. By the time the GPS was done collecting the data we had the area cleaned and were ready to head for home. I was back in town and had the extra concrete mix returned by 3:00 P.M. We had learned a lot from our first corner rehabilitation project, so this endeavor went a lot more smoothly. A highly efficient and fun experience was had by all involved.



90W. Our measured distance was 78.86 feet with the GLO record distance being 79.20 feet. A static GPS position was collected at the corner with the data being processed from the CORS station "Casper" and CORS station "Medicine Bow" for the final "Lat &

Long". The WGS84 values are 42°26'04".5369"N., and 107°32'31.6062"W. North American Datum of 83/93, (HARN), Wyoming East Central Zone State Plane Coordinates are N.1,033,033.98 usft, E.1,255,974.28 usft.



corner of the county. It is approximately 17 miles north of Lysite. This corner is common to Fremont County and on the south line of Washakie County, being the northwest corner of section twenty-seven (27), T.41N., R.89W. Hopefully we can have it accomplished by late summer of 2004. STAY TUNED!



Notice "Split Rock" in the background. It was an historical experience also!

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Board of Registration News

The Wyoming Board of Registration for Professional Engineers and Professional Land Surveyors met Sept. 15, 2003, at the Plaza Hotel in Thermopolis for their quarterly meeting. Guests at the meeting included Mr. Don Davis and Mr. Rick Hudson. A presentation was made by Mr. Daryl Danalyk and Mr. Neil Windsor of APEGGA (Association of Professional Engineers, Geologists and Geophysicists of Alberta) the Alberta, Canada, licensing body, on their method of licensing Engineers. The Canadian group are hoping to get bi-lateral agreements with US states to allow Canadian Engineers to become licensed in the states without having to take a technical exam. Currently, the Canadian system allows licensure after graduation from an accredited university plus 4 years of acceptable experience, and taking an professional practice exam on business practices, ethics, etc. Current Wyoming State Regulations require an applicant from Canada to take both the FE (fundamentals of engineering) exam and the PE (professional engineer) exam, unless they have more than 20 years experience, in which case they can petition to the board to be excused from the FE exam.

Comments were accepted on the proposed changes to the Board rules, discussed and then either incorporated into the changes or not. After the discussion on the comments and the modifications made by the accepted one, the rule changes were adopted. After the final proofing, the new rules can be found on the Board Website at www.wrds.uwyo.edu/wrds/borpe/borpe.html. Response letters are being sent to all persons who commented on the proposed rules. Questions on the rules can be addressed to the Executive Director at the Board office in Cheyenne, Christine Turk at 307-777-6155.

The Board discussed the Survey Program at LCCC in Cheyenne, after hearing from one source that it had been

discontinued. Further investigation will be done to determine the exact status of the Land Survey program.

The Board discussed the upcoming ABET (Accreditation Board of Engineering and Technology) visit to Metro State. Herb Stoughton is hoping that this visit will accredit the program at Metro, which is a big plus to students and school. Stan Abells is going to go as the Board rep on this visit.

The remainder of the day was spent discussing applications and enforcement actions in closed session.

Proposal: Near-Real-Time OPUS

It is proposed that NGS enable OPUS users to submit their GPS data within a few seconds of completing an observing session and to receive corresponding positional coordinates—computed relative to three CORS—within a few minutes.

Currently, NGS receives GPS data in near real time from more than 100 CORS. These CORS include the NDGPS/MDGPS sites operated by the U.S. Coast Guard and the WAAS sites operated by the FAA. Moreover, NGS may be able to obtain GPS data in near real time from several additional CORS including those contained in certain statewide networks (eg., Ohio, Michigan, and Florida) and those contained in the National Satellite Test Bed (NSTB) network operated by the FAA.

NGS could store data from the “near-real-time” CORS in dynamic files that grow to include all data collected since the beginning of the most recent hour. Copies of these files could then be applied when NGS receives an OPUS request that involves data observed within the current hour.

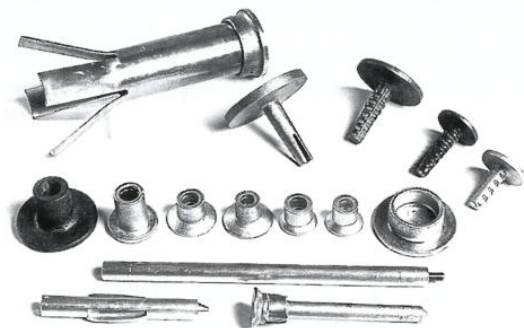
This OPUS feature would enable users to obtain a preliminary check on the quality of their data while they are still onsite, provided they have Internet access. Such access is becoming more plausible every day with the growth of the wireless Internet. If the OPUS results reveal that the collected GPS data is deficient, then the user may be able to take corrective actions while still onsite, possibly saving the significant cost of traveling to the site at another time to obtain additional data.

Results generated by OPUS within a few hours of observation time rely on using predicted satellite orbits such as the IGS “ultra-rapid” orbits. Hence, these results will normally be less accurate than those obtained using the post-fit satellite orbits that become available after several hours. Also, in addition to the data from the “near-real-time” stations in the CORS network, OPUS has access to data from many more stations about 10 minutes after the turn of the hour. Hence, users should obtain more reliable results by waiting until 10 minutes after the hour following the completion of their observing session to submit their data to OPUS rather than submitting their data earlier.

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General Information

PRE-REGISTRATION:

FEE: \$100 PLSW Members,
\$50 PLSW Associate Members
\$175 Non-Members

A \$20 late registration fee will be added to all registration received after November 7, 2003.

Agenda:

November 13th	7:00 a.m. - 8:00 a.m.	Registration Seminar
	8:00 a.m.-12:00 p.m.	Luncheon
	12:00 p.m.-1:00 p.m.	Seminar
	1:00 p.m. - 5:00 p.m.	Social Hour
	5:00 p.m. - 9:00 p.m.	Breakfast Buffet
November 14th	7:00 a.m. - 7:45 a.m.	Seminar
	8:00 a.m.-12:00 p.m.	

Location & Lodging:

A block of rooms has been reserved at the Parkway Plaza Hotel, 123 West “E” Street, Casper, Wyoming. Rate: \$54.00 per night. Telephone: 1-800-270-7829

Professional Development Hours

12 Professional Development Hours will be awarded for the entire seminar.

For More Information, Contact:

Joel Ebner 307-686-6750

NSPS Map/Plat Competition

The Wyoming Land Surveyors NSPS Map/Plat Design Competition will be held in conjunction with the seminar. Send your entries to Jeff Jones or bring them to the seminar.

“Railroad Surveying”

This is a 12-hour course on railroad surveying taught by Charlie Tucker with Farnsworth Group and Gary D. Gable, PLS with Washington Group International. The course will cover many aspects of surveying on or around railroads including the surveying history of railroads, how railroads acquired right of way, records research, right of entry on railroad property, railroad contact information, methods and types of data collection when surveying on a railroad, types of railroad maps, permit acquisition with railroads, and Federal Government required railroad On-Track Safety Training.

Many perceive railroads as hard to deal with. This course will disclose the “mystery” of working on or around railroad property. The combined experience of both of the instructors will enlighten all the students with the knowledge needed to make the railroad environment a “user friendly” situation.

CHARLES M. TUCKER, LS(I), Railway Project Manager

- Acting Chief Engineer (heavy on the acting) Iowa Northwest Railroad
- BS Surveying, The Ohio State University, Columbus, Ohio (1980)
- American Railway Engineering & Maintenance Association (AREMA)

Charlie Tucker is well known to the Colorado Surveying community from his stint(s) as surveyor, field engineer, office engineer and roadmaster at La Junta, Colorado for the Santa Fe Railway (now BNSF). He also served in California as Roadmaster-Los Angeles Terminal, Tunnel Construction Roadmaster-Martinez/Pinole, CA and Assistant Roadmaster-San Bernadino, CA. With the Santa Fe, Charlie worked extensively with the survey community in Colorado, New Mexico, Kansas, Oklahoma, Texas and California for 15 years on a variety of unique and interesting projects. He has the rare unique experience of having worked in the design, construction, maintenance and public works disciplines within the railroad industry.

Since joining the consulting community in 1996 with Benchmark Surveying/Farnsworth Group, Charlie has worked extensively in Colorado and other states (Washington to Maine, Illinois to Texas) working with the railroad industry, state agencies and as a railroad expert for other consultants.

GARY D. GABLE, P.L.S.

Mr. Gary D. Gable, PLS is the Manager of Right of Way and Surveys for Washington Group International in the Denver Operations Center. He has 32 years of experience in the surveying and engineering professions. Mr. Gable has experience in route surveys, right of way surveys, record research, design surveys, control surveys, and topographic surveys. He currently is managing the surveying group in Washington Group's Denver Operations Center.

Mr. Gable has vast knowledge of the existing and historic railroad lines in Western United States. He is a member of the American railway Engineering and Maintenance of Way Association (AREMA) and serves on Committee 24 with deals with education and training. He also is a member of the Colorado Railroad Historical Foundation, Inc. headquartered in Golden, Colorado. Mr. Gable has the Burlington Northern Santa Fe Railway and the Union Pacific Railroad as clients and has worked throughout the State of Wyoming on engineering projects for both lines.

Mr. Gable is Vice-President of the Central Colorado Professional Surveyor Association and is on the Legislative Committee of the Professional Land Surveyors of Colorado.

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