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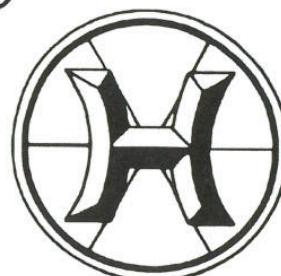
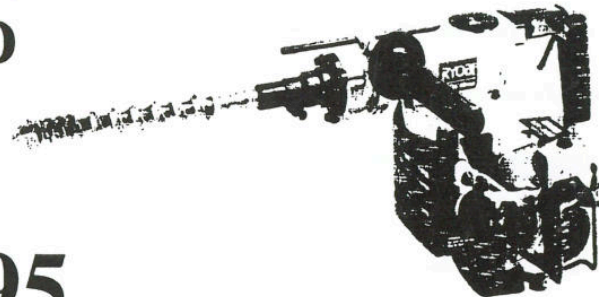
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VOLUME 8, NO. 1

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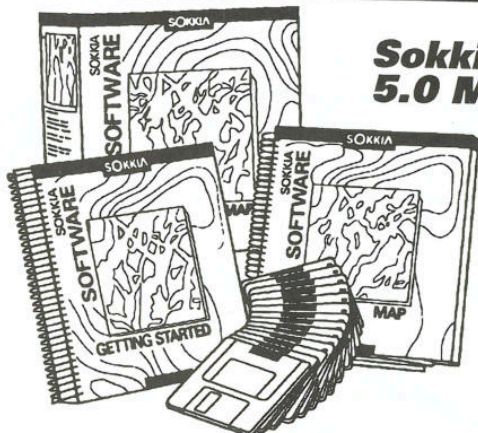
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Additional information or comments (optional): _____

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

☐ **MEMBER**, ANNUAL DUES \$75 (Persons duly registered, PLS or PE&LS in Wyoming.)

AFFILIATE MEMBERSHIPS

☐ **Associate Member**, annual dues \$50. (Persons employed under the direction of a PLS and working toward PLS registration in Wyoming.)

☐ **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.

APPLICANT'S SIGNATURE

SPONSOR'S SIGNATURE
(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 R. L. Hudson, Sec./Treas., P.O. Box 784, Thermopolis, Wvoming 82443.

NOAA Corps to be Eliminated in 1996

Acting on the recommendations of the President's National Performance Review, the administrator of the National oceanic and Atmospheric Administration has announced that the NOAA Corps, the agency's commissioned service that helps carry out NOAA's environmental mission, will begin its transition to civilian status beginning Oct. 1, 1996.

"Our first priority is to ensure that the dedicated men and women of the NOAA Corps are given every opportunity to continue their careers at NOAA," said D. James Baker, NOAA administrator and Department of Commerce under secretary for oceans and atmosphere. "They represent an outstanding human resource and I believe it is critical to NOAA that we retain their talent and corporate knowledge within our work force."

NOAA Corps officers — all scientists or engineers — operate and manage NOAA's fleet of scientific research ships and aircraft, as well as support the nautical and aeronautical charting, geodetic and other shoreside missions of NOAA. Operating under the Corps' separate personnel system, most officers rotate between assignments, bringing a blend of operational, technical and management skills, gained through a broad spectrum of experiences, to each new mission.

The transition from commissioned to civil service is to be completed within six months, Baker said. New positions will be created within the General Schedule professional series into which the 360 active duty NOAA Corps officers will be transferred. A draft of a detailed implementation plan to accomplish this, development of necessary administrative procedures, and identification of legislative or regulatory actions needed to effect the transition are expected to be completed by the end of February.

Baker said that he will fully support any legislative action necessary to ensure that the transition to civilian service will not jeopardize the earned benefits and entitlements of active duty and retired personnel.

The NOAA Corps, the nation's smallest uniformed service, traces its roots back to the Coast Survey established by Thomas Jefferson in 1807, and is the direct descendant of the commissioned corps of the U.S. Coast and Geodetic Survey. This will be the first time in history that a full uniformed service is eliminated.

"We are all well aware of the outstanding contributions the NOAA Corps has made to NOAA and the many critical functions Corps officers are performing and will continue to perform within our programs. We must work together now on the challenging task of achieving the president's NPR directive — retaining the program support essential to NOAA's function while providing the equitable treatment these dedicated career employees fully deserve," Baker said.

PLSW Key Rings are for sale.

Send \$5 to:

P.O. Box 904 Casper, WY 82602

NOTICE for October 1995 North Central Region CD-ROM Users

The National Geodetic Survey has discovered an error on this CD-ROM which results in incorrect State Plane Coordinate (SPC) Northing values for the state of Indiana and parts of Wyoming. All other states are not affected by this error.

If you use SPC data from one of these areas on the 1995 North Central CD, you can request a free copy of DSX version 5.0 on diskette which will correct these values at extraction time. When you receive DSX 5.0, please copy this to your hard drive and use it rather than the version provided on the CD-ROM. If DSX makes a correction to the SPC values at extraction time, the program will generate the message shown below after the extraction is complete.

DSX MESSAGE:

NOTE

DSX detected incorrect State Plane Coordinate Northing for one of the following zones:

SPC IN E

SPC IN W

SPC WYEC

SPC WY w

DSX corrected the incorrect Northing for the extracted data.

Any questions, call Craig Larrimore - (301) 713-3257.

To obtain a free -copy of DSX 5.0, please contact the NGS Information Center at 301-713-3242, or fax a message to 301-713-4172.

We are sorry for any inconvenience this may have caused.

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EDITORIAL POTPOURRI

O NEW PLSW MEMBER - The newest members of PLSW, approved by the Board of Directors are as follows:

*Lynn A. Forbes	Member	Newcastle, WY
Clayton W. Schwartz	Member	Victor, WY
Darrell T. White	Member	Billings, MT
S. Dennis Dawson	Member	Cheyenne, WY
*Patricia S. Factor	Member	Wilson, WY
Bob Westerfield	Member	Encampment, WY
William R. McJunkin	Member	Cody, WY
Timmy A. Kaumo	Associate	Rock Springs, WY

* = Former associate members

Congratulations and welcome to PLSW.

O PLSW MEMBERSHIP - JOIN PLSW TODAY! We need your support. An application is included in this issue. If you are a member, recruit a new member.

O SUPPORT OUR ADVERTISERS - As evidenced by the exhibitors at the annual convention, our advertisers support us. We should support them.

O LOCAL PLSW NEWS - We need news of your chapter's activities. Send us a summary of your chapters activities or other related activities for publication. Summaries need not be typed. The deadline for the next issue of *Lines and Points* is presented on this page.

O PLSW BOARD MEETINGS - 1996 Board of Directors meetings are scheduled as follow:

May 4	Laramie
September 7	Rock Springs
December 7	Casper (Winter Tech Session)

O LINES AND POINTS FAX - The *Lines and Points* fax number is 307-235-5604 or 307-235-8184.

O ELECTION OF STATE OFFICERS - The nomination committee presents the results of the PLSW election as follows:

President	Peter Hutchison
Vice-president	D. R. Griffin
Secretary-Treasurer	R. L. Hudson

O NSPS AREA 7 DIRECTOR RE-ELECTED - John Steil was re-elected as Area 7 Director of NSPS according to the ACSM Tellers Committee's published results of 15 MAR 96. Congratulations and thanks John.

Front Cover Artwork by

Larry T. Perry, P.L.S.

Cheyenne, Wyoming

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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

Advertising Information

Camera ready advertisements with payment should be mailed to *Lines & Points*, PLSW, Box 904, Casper, WY 82602

Advertising rates are as follows:

	Year	Issue
Full page	\$300	\$80
Half page	\$175	\$50
Quarter page	\$100	\$30
Business card	\$ 30	\$10
Classified	40¢ per word/issue	
Employment	Free	

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Deadline for next issue — 15 JUN 1996

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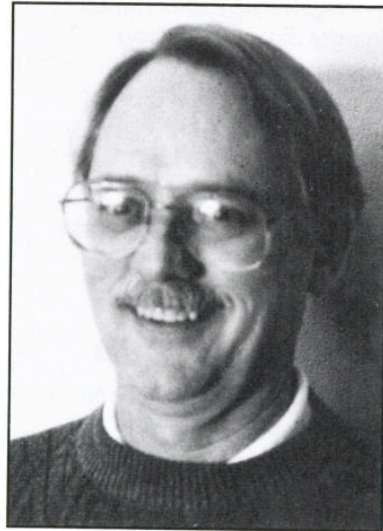
800 East "A" Street

Casper, WY

237-9523 or 800-372-3837 In State

PRESIDENT'S MESSAGE

I feel we had a successful convention in Casper in February. Even though Dave Doyle could not attend to be the "headliner", we still had a quality substitute in Dr. Herb. Attendance was up from previous years. Probably one of the major reasons was the pending mandatory requirements for continuing education. Subsequent to the February meeting, and as many of you may



know Governor Geringer did sign the new rules and regulations. Of major interest to surveyors is the requirement of a specified number of contact hours for continuing education or continued professional competency.

With the future in mind, the December PLSW Board of Directors meeting discussed offering a technical session. Although there was not a formal action taken, the consensus was, for PLSW to put on a December technical session in Casper.

The intent of the technical session will be to offer from 12 to 16 contact hours. Jim Claflin has volunteered to chair the technical session. He will be in charge of site selection, advertising, registration, social functions, etc. This first go around is going to be a major undertaking. Jim has suggested to have Ann and Don Brady help with the seminar. I'm sure that's not all the help he is going to need. I would request that anyone desiring to help Jim put on a successful session, to contact him at the BLM office in Gillette.

The questionnaire was not returned in the numbers that were expected. We think that the reason was the confusion about where to turn it in. The questionnaire does provide a desired direction the membership wishes to proceed. Again, the Guidelines for Surveying Procedures is deemed to be important. We are presently using the WACES version. Additional detail is necessary for the Guidelines to be of significant value to the surveying community.

The Board of Directors meeting on the 2nd of February approved 8 new members. Past President, Jim Claflin's membership program is continuing as we successfully expand our professional membership. When you have the opportunity, please take the time to welcome our new members and invite their participation into the chapter functions as well as the state programs and committees.

The general membership of the Wyoming Engineering Society approved a scholarship for a traditional student at the February 3 meeting. The amount of the scholarship is \$1,000.00. The WES scholarship committee is currently working on an acceptable application form to be submitted for acceptance. More information will be passed on as it becomes available.

Two items of professional practice are proposed to be adopted at the May 4, Board of Directors meeting in Laramie. The first one is a policy on control surveys for utilities. The second and in my view more important, is the adoption of a Code of Ethics for Professional Land Surveyors. The code of ethics, in whatever form is ultimately adopted, will be submitted to the State Board of Registration for Professional Engineers and Professional Land

Surveyors for their review and future inclusion in the rules and regulations. See your chapter director for copies, and please take the time to review and make any comments or modifications you may have. Give them to your Chapter Director prior to the May 4 Board of Directors meeting.

On March 1, I attended the state Board for Registration for Professional Engineers and Professional Land Surveyors regular meeting. PLSW members will be interested in the tentative adoption of a Criteria for Surveying Education. There were some editorial adjustments made to the criteria, and it will be available soon from the Registration Board Office at \$10.00 per copy. A section of the criteria is the formulation of an advisory commission to recommend the approval and adoption of individual institution surveying curriculum to the Board of Registration. Ralph Goodson, President for the Board of Registration has requested that PLSW members interested in the criteria advisory board to volunteer for participation on the committee. This is an excellent opportunity to get involved. With a few minor adjustments to the L.C.C.C. curriculum Herb has prepared, the program will be acceptable to the Registration Board. It's pretty exciting that any institution of higher learning in Wyoming can prepare a surveying curriculum under the adopted Criteria. The opportunities for survey education are increasing all the time.

This brings to mind another item which in my view is extremely important to the members of the PLSW. The number of Professional Land Surveyors admitted to practice in the State were only 12 new surveyors licenses issued in Wyoming in 1995. Although the complete equation for this low number of registrants is unknown, one reason could be the image that the profession projects of itself to the public. The younger public in particular. If we are to perpetuate ourselves, we have to be much more aggressive to recruit new members into the profession. One of the ways that we can do this is to be much more involved in the Trig Star program. For example Southeast Chapter has collected 5 school Trig Stars to be tested as our chapter winner. At Albin, there are a total of 5 students in the trigonometry class. All of them took the test. They did ask some very significant questions. Prior to involvement at the Albin High School, one young man wanted to know from his teacher why he needed to learn trigonometry in the first place. I had given the math instructor the sample question and to show the use of trigonometry in pretty ordinary situations. The set of sample questions was also an opportunity to instill a little of her enthusiasm in this young man. The day of the test, he wanted to know what purpose a sinusoidal wave served. If you stop to think about it, a sine plays a significant operation without us ever thinking it. For example, as we progress through the seasons, the length of the day changes significantly at this time of the year since it is on a very fast rate of change on the steeper slope of a sine wave. As we get to the summer solstice at the top of the curve, the changes of the length of the day slows down. After the top of the wave the rate of change begins to reverse and go the other direction. Think about any other opportunities to use trigonometry as an everyday function.

I will have hopefully been to three chapter meetings by the time you read this. I have been to the Southeast Chapter, my home chapter, and on the 4th of April, I attended the Northeast Chapter meeting which was held in Newcastle, and on the 8th of April, I attended the Northwest Chapter held in Cody.

Good news! Wyoming has an NSPS map winner. It was entered in the Miscellaneous Category and was a plat map drafted

(Continued on Page 5)

1996 Annual Report to the Board

ROBERT G. MOYNIHAN, CHAIR

March 12, 1996

I. NARRATIVE

Program now in full operation. Four levels of testing:

- I. Entry Level
 - II. Instrument Person, or Computer Operator/Drafter
 - III. Party Chief, or Chief Computer Operator/Drafter
 - IV. Chief of Parties, or Office Manager
- Level I, II, III testing four times per year, 46 States, 115 Test Centers Level IV testing two times a year; "take home" exam format

Some Statistics on the Program:

	1993	1994	1995
Requests for Information about CST Program	388	659	1242
Number of Examinations	121	200	229
Approximately 50% of Examinees Pass			
Total Number of Certificates Issued (in 5 years)	658		
Current Number of Renewed Certificates	300		

- Use of testing program by two-year schools and by State affiliates still being explored. A workshop on preparing for the tests is planned for the Baltimore convention. *Continuing to explore possibility of discount on liability insurance premiums for firms with Certified Technicians.

- Continuing, to explore possibility of local, state, and federal agencies requiring, consultants to have Certified Survey Technicians on staff for quality assurance (Washington, DC Metro current requires this).

- Continuing to inform and educate State Department of Transportation about the existence and value of CST Program.

- Board Goals for 1996:

- Begin task analysis to evaluate currency of program and to ensure exam questions reflect tasks performed by Survey Technicians at different levels (I through IV)

- Revise and update question banks (over 2580 questions)

- Review CST program costs to minimize expenditure and increase income

- Continue and increase advertisements and program promotion.

The CST Board members are particularly interested in suggestions for improvement of the program from all interested ACSM members. Please contact any Board member.

List of Board Members

Name	Location	Phone
Becky J. Braman	Cheyenne, Wyoming	(307) 632-3138
M. Patricia Hutchison	Asheville, No. Carolina	(704) 255-8698
Robert G. Moynihan (Chair)	Durham, New Hampshire	(603) 862-1059
Ronald J. Torrence	Puyallup, Washington	(206) 840-9847
Stephen L. Wright	Syracuse, New York	(315) 492-1752
Patricia S. Canfield (NSPS Coord)	Bethesda, Maryland	(301) 493-0200

II. RECOMMENDATIONS

The Board asks all ACSM/NSPS members to please spread the word about the Certified Survey Technician Program. Recognizing and encouraging our technicians to improve themselves and their work only serves to improve the entire profession of surveying and mapping.

Ellipsoid, Geoid, and Orthometric Heights Published in the NGS Data Base

While working with the NGS documentation for the Wyoming HARN stations I noticed that if the orthometric height was known the published geoid height did not agree with the formula:

Orthometric height = ellipsoid height - geoid height

Because the HARN stations have good values of ellipsoid height, a geoid height can be directly calculated when precise geodetic leveling is executed to the station. NGS has not followed this procedure. In all cases the geoid height is computed employing a mathematical model of the geoid. The uncertainty of the numerical value is about one meter.

At those HARN stations where an orthometric height has not been determined by differential geodetic leveling, then an orthometric height has been interpolated (VERTCON). This interpolated value was not computed from the ellipsoid height and the interpolated geoid height. There will be an associated uncertainty in the interpolated orthometric height of about one meter.

Users of the NGS geodetic data sheet must read carefully the remarks concerning the published heights.

SBRPEPLS Policy Book

HERBERT W. STOUGHTON

In the minutes of the PLSW Board of Directors of 11 May 1991, President Becky E.J. Braman announced that the SBRPEPLS had a "policy book." "At the 8 December 1995 meeting of SBRPEPLS, which I attended, I asked President Goodson about the existence of such a book. The "book" is not an official publication of the SBRPEPLS. It is a compilation of policies passed at various Board meetings. It is a "cut and paste" of those items as they were published in the approved Board minutes. The "book" is simply a 'mind jogger' of these Board's previous actions.

SBRPEPLS members were quite surprised that I was aware of the document. It was stated by several members that the document is not an "official" publication, and is not available to the general public. I viewed the document, and agree with their statements. There is no value to have a copy of this document, because it is continually updated when Board actions warrant it.

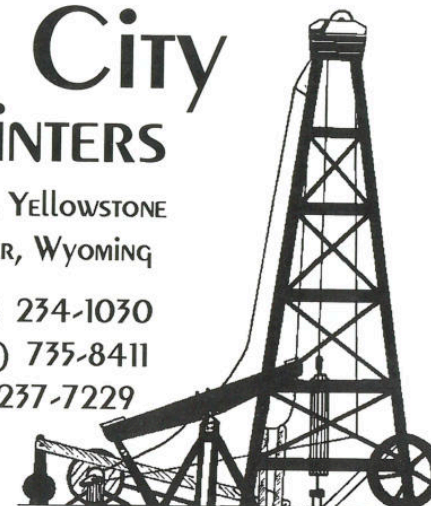
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—WESTERN FEDERATION

(Continued from Page 19)

(702) 798-4336. The Nevada Legislature mandated the Board of Registration to adopt regulations requiring continuing professional competency for engineers and surveyors. Also, the creation of the Land Surveyor Intern (L.S.I.) replaces the old Land Surveyor-In-Training (L.S.I.T.) classification and the straight eight years of experience requirement has been increased to ten years. The Association is at work updating the Standards of Practice for Surveys for Nevada. Included will be standards for GPS surveys. The role of the surveyors in GIS is being considered for possible legislation.

New Mexico - February 1-3, 1996 is the date for the New Mexico Professional Surveyors annual convention in Albuquerque. Two seminars will be held in conjunction with the meeting. "Contemporary Boundary Analysis and Unwritten Property Rights" by James Dorsey and "Evidence and Retracement" by Steve Parrish are the seminars to be presented. John Abenroth will be the keynote speaker. The requirement of "PDU's" in New Mexico has made quite an impact on the annual meeting.

Oregon - It was announced by Chuck Pearson that Brian Weigart had become a Fellow member in ACSM. Professional Land Surveyors of Oregon held their Annual Meeting and Convention in Seaside on the Oregon coast, December 6-9, 1995. There were 275 members registered with a pre-conference seminar on "Ever Changing Water Boundaries" with 80 participants. The silent Scholarship auction raised \$7,200. One member donated a old mountain transit to be used as a raffle item with the winner being able to display it at their home or office for one year and then return it for next years raffle. This raised about \$875 for scholarships. PLSO has retained their lobbyist on a full time basis with the hope that they can get more surveying orientated legislation introduced and passed in the 1997 legislative year. They have come up with a "A" and "B" list of objectives. The three items on the "A" list were as follows: 1. Legal property descriptions to be written only by registered land surveyors. 2. Professional development/continuing education requirement mandatory for all licensed land surveyors. 3. Stiffer penalties for destruction of property boundary corners.

On a sad note from the conference was that one of the attendees was killed on the way home. Steve Reeder was 28, married with two children. He was riding home with three other fellows from the same firm. There had been an accident and traffic was backed up. While waiting Steve stepped out of the truck and fell about 75 feet to the river below. Steve was a LSIT and graduated from OIT in 1993. He was also one of the student helpers at the WFPS 93 Conference held in Lake Tahoe.

Utah - Utah Council of Land Surveyors will be having their annual state convention in St. George, Utah on February 1, 2 and 3 of 1996. The theme for the convention is "Measuring Up For The Future In Surveying". Topics of discussion are Surveyor's Liability, Corner Restoration, Easements and the Law, Ethics, Historical Background of Land Title, Conveyances, ALTA/ACSM Survey Value to Title Insurer, Applications of GPS, GPS/GIS Relationship, Private Land Owner and BLM and US Forest Service boundary lines. A new chapter was organized at the end of 1995 which covers the eastern portion of the State and consist of the area from Vernal to Blanding. UCLS's biggest challenge

is the ongoing battle with their State Division of Professional Licensing. The actions of the division and their support of some legislation has been a step backward for the profession and professional status in Utah.

Washington - The Land Surveyor in Training (LSIT) legislation will take affect in June of 1996 and is currently being worked on by a panel of Land Surveyors and Board of Registration members to work out the details. The Land Surveyors' Association of Washington has allied itself with a legislative watch dog called the A.E.L.C.; the Architects and Engineers Legislative Council. They have found the organization extremely useful in pursuing LSAW legislative needs. The council hires a lobbyist to assist in tracking legislation that is of concern to LSAW and meets once a week while the Legislature is in session. LSAW is the only member of the group that has introduce legislation and have been successful in passing three new bills within the last 10 years. The North Central Chapter will be hosting the 1996 State convention in Wenatchee at the West Coast Wenatchee Center Hotel and Convention Center on Feb. 21 - 24. There will be three days packed full of technical class along with informative exhibits. Contact Pete Kowatsch, PLS Registration Chair @ (509) 886-1918 for more information. The Career Development Program is going strong. LSAW will be pushing to reach Level IV testing this year with the Party Chief equivalent exam and is pursuing acceptance for the testing with the Board of Registration as acceptable experience or at least proof of proficiency at the different developmental levels. The testing for Level II and Level III will be available Saturday, Feb. 24 at the annual convention. GLIS/GPS committee is still collecting data from other states developing standards of practice, for the use of development of GLIS systems.

The next Board of Directors meeting of WFPS is scheduled for June 1, 1996 in Reno, Nevada.

Meeting was adjourned @ 1:15 p.m.



I wonder where that stone is that is called for the S.E. Corner of Section 5?

©Dec. 1995, Larry T. Perry, L.S.

—PRESIDENT'S MESSAGE

(Continued from Page 4)

by Jack Porter at John Steil's office. Jack is a Certified Survey Tech, Level II. As a winner, he got an engraved plaque plus \$100.00. See, this thing can work if we go for it.

A recent conversation with John Lee at the Cheyenne office, indicates that the future looks pretty dim for the Bureau of Land Management. There are substantiated rumors that there will be some major reductions in force, probably in the next 3 to 5 years. During the R.I.F. process there has been a proposal to put the records into a digital format for a possible on-line distribution and/or sale. Because of the federal cutbacks, there will be some need for financing to make this program work. We may be able to get some financing from the state. BLM will also need backing from the PLSW to get the digital format to a reality. More information will be forthcoming at a later date.

Remember! the next Board of Directors meeting is in Laramie on the 4th of May. If you intend to be there call your chapter director for particulars.

PETE HUTCHISON
PRESIDENT PLSW

Geographic Info System May Be Boon to State, Public, Officials Say

BY LEE COLONY
Wyoming Tribune-Eagle

Every level of government and the public could benefit from a state office to oversee a central repository of geographic information systems data, state officials say.

At the Herschler Building on Thursday afternoon, more than a dozen public and private groups gave demonstrations on how the system is used in their office or agency.

The displays were an apparent attempt to sway lawmakers into funding a \$525,000, five-position statewide GIS office where all information would be stored and made available to the public. That funding is not part of the current budget proposal being worked on by legislators.

Secretary of State Diana Ohman's office has set up a basic system to help with reapportionment, voting districts, census blocks and other election-orientated work. Her office has joined with county clerks across the state in a five-part phase of the system which includes locating streets, roads, rivers, electrical lines, zip codes, voting blocks, subdivisions and many other items onto the system.

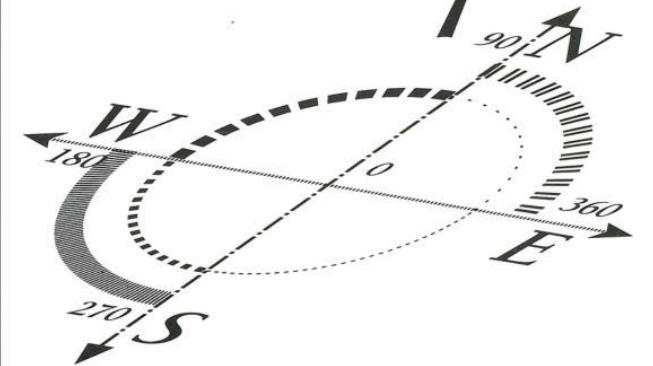
But what started out as an election-oriented tool could rapidly become one used by all public offices, and the public as well.

"You can put it all on here, to help you out with whatever management decision you need - where to put a water purification plant to where to drill a well," said Richard Memmel, GIS coordinator with Wyoming's Computer Technology Division.

The basic system offers a map showing streets, rivers and resident locations. From there, other layers can be applied to tailor the program to the management decision needing to be made - such as which areas of town seem to be having the most burglaries, zoning, development, where city bike paths can be placed, elk migration paths in the county, and so forth.

The city of Cheyenne already has 120 overlays, says city civil engineering technician Kenneth Flack. He says the system

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1996 ANNUAL STATE MEETING SUMMARY

The 1996 annual state meeting of the Professional Land Surveyors of Wyoming [PLSW] was held in Casper on Thursday, February 1, 1996. The meeting was in conjunction with the 75th annual Wyoming Engineering Society convention at Parkway Plaza Hotel and Convention Center.

President Jim Claflin called the meeting to order at 1:17 P.M., asked for agenda revisions and adopted the agenda. The signed attendance list indicates 59 members and affiliates present.

Jim asked attendees to rise for a period of remembrance for recently deceased members Allen Mace, Sylvan Smith and Harold O'Malley.

Introductions were made and included Honorary Members Wes Reed and Joe Popp; ACSM Board of Direction member Herb Stoughton and NSPS Area 7 Director John Steil, both also members of PLSW; new members; board members and guest Milbert Krohn.

Jim announced the last call for sealed ballots and stated they were to be given to Teller Bob St. Claire.

Secretary / Treasurer Rick Hudson reviewed the minutes of the 1995 annual meeting held in Cheyenne last February. He stated these minutes, labelled "draft" had been printed in the latest issue of our publication "Lines & Points" and trusted all members had taken the opportunity to review said minutes before the meeting. The minutes were approved as presented.

Rick continued by presenting the treasurer's report which was distributed at the beginning of the meeting. The report consisted of the 1995 expenses and balance sheet as well as the current balances in our accounts at Hilltop National Bank here in Casper. He also reported the board had authorized purchase of a 24-month certificate of deposit, in the amount of \$7,500, at the April meeting. Questions were answered and the report was accepted as presented.

The next item of business was the presentation of the 1996 budget. Copies had been distributed at the beginning of the meeting and Rick reviewed each item to some extent. He stated that the budget had been approved at the December board meeting and amended during January; indicated that, in past years, actual expenses have been less than anticipated by the budget; and projected an ending balance of approximately \$13,000. Following a general discussion, the budget was approved as presented.

Committee reports followed and included reports from Audit - Finance, Membership, Nominations & Elections, Professional Practice, Education / Convention, Legislative, Professional Awards, Scholarship, History, Corner Record, Manual of Practice, "S.O.S."-/ NSPS Map and "Lines & Points". As in the past, the oral reports were summarized versions of the written reports which were available at the side table.

Bob St. Claire's audit brought relief to an apprehensive Rick Hudson. Stan Abell indicated membership at the end of 1995 totalled 110 members, including 9 active Honorary Members and 37 affiliates.

Herb Stoughton reported on the activities of the three committees he chaired in the past - Standards, Ethics & Professional Practice, Education / Convention and Manual of Professional Practice. He reminded members to complete the 1996 Attendee Questionnaire which had been distributed and to return them to Vice President Pete Hutchison or himself. Jim Claflin reported on the proposed "Winter Technical Session" tentatively planned for the first weekend in December, here in Casper.

John Steil presented his Legislative Committee's report, specifically mentioning SF 0016 - Municipal Annexation. The membership voted for John to testify, on behalf of PLSW, at the committee hearing. We believe it is in the best interest of the public that annexation maps be prepared by a Professional Land Surveyor.

Regarding Professional Awards, Jim Claflin acknowledged the more recent projects by Dr. Herbert Stoughton which have directly benefitted the membership of PLSW. He announced that an appropriate certificate of appreciation will be presented later. Thank you Herb !

Martin Pedersen's Scholarship Committee reported four recipients at the state level and two in cooperation with the Northeast Chapter.

Becky Braman reported for Bill Braman's History Committee; stating that Herb has completed the updated "PLSW - A History" and that the work will be printed for insertion into the "PLSW Handbook".

Harvey Copeland reported on the activities of his Corner Record Committee; stating that the guide lines for preparation of said forms has been printed in the current edition of "Lines & Points". Herb stated that, as an ad hoc committee whose mission appears to have been completed, the president could take action to disband same. Jim agreed; the committee is dissolved; future activities will be the responsibility of the Standards, Ethics & Professional Practice Committee.

Regarding the PLSW Handbook, members were reminded that printing and distribution of same has been assumed by the Upper Platte Chapter and that roster, history and projection tables inserts will be printed for distribution, through your director, by the May board meeting.

Pete Hutchison reported that his Save Our Surveyors {S.O.S.} and NSPS Map Competition Committee has received several entries with voting to take place during the convention.

Don Davis stated that our newsletter "Lines & Points" reported a slight loss last year. When queried, he stated that the level of funding in the budget would be adequate.

Delegate reports were presented by Becky Braman, our Governor to National Society of Professional Surveyors, and Paul Reid, delegate to Western Federation of Professional Surveyors.

Becky mentioned her written reports and stated that she had represented us at two meetings during the past year - Charlotte in February, and Nashville in November. She also mentioned the upcoming 1996 convention to be held this fall in Denver. She mentioned her involvement on the Certified Survey Technician Committee and solicited inquiries regarding the program.

Paul referred to his reports which have been printed in "Lines & Points" and reported on the activities of various other state societies who are members of "Westfed". Of particular interest are the accomplishments in Oregon regarding new legislation for right of entry and statute of limitations for surveyors.

Old business consisted of two items carried over from the 1994 annual state meeting and placed on this meeting's agenda by President Jim Claflin. Both originated within the Professional Practice Committee, chaired by Herb Stoughton.

Members were reminded of the Code of Ethics for Professional Land Surveyors, draft version dated 10 January 1994, and the need to submit comments by the May 4th board meeting.

(Continued on Page 7)

—WESTERN FEDERATION

(Continued from Page 18)

will be subject to the same restrictions and conditions of the chairman and delegates. WFPS Immediate Past Chairman John Abenroth also wanted it noted that Jerry Tippin has been the Treasurer for WFPS for approximately 17 years and has paid his own way in his attendance at WFPS activities and meetings during that period. John very eloquently and succinctly expressed WFPS appreciation and gratitude for the many years of dedicated work and services Jerry has provided as Treasurer for WFPS.

Conference committee reported on the 1995 conference which showed an approximate \$13,000 net profit. A long discussion was held as to the 1997 conference. In summary Salt Lake City appeared to be out as the 1997 conference site due to the ski season, upcoming Winter Olympics and convention site expenses. It was decided that Chuck Pearson, WFPS Convention Committee Chairman, James Stacey, Nevada Association Of Land Surveyors 1997 Conference Committee Chairman and Fred W. Kett, CLSA President would work on the possibility of having a joint Nevada, California and WFPS Conference in 1997. The 1999 Conference will be in Portland, Oregon and is moving towards a joint Oregon, Washington and ACSM conference.

Scholarship committee reported two scholarships were issued this year. Lillian Lesay a student of California State University at Fresno and Christine Oaks a student at the University of New Mexico, Las Cruces were the recipients.

WFPS records were to be reviewed by Chuck Pearson, Jerry Tippin and John Abenroth. The records that were considered as essential and necessary were to be sent to the Secretary.

Brief written and/or verbal reports were given by the Continuing Education, Legislative, By-Laws, NCEES-Liasion, Professional Society Liaison committees.

The 1995-1996 WFPS budget was amended and approved.

Blair Meggitt gave a verbal report on the NSPS Foundation. The Texas Association of Registered Professional Land Surveyors gave a one lump sum donation of \$5,000 towards the foundation as a founding member organization. The Arizona Professional Land Surveyors Association has also donated \$1,000 a year for five years as a founding member organization. Blair said he



Now, what do you suppose he means by that hand signal?

©Dec. 1995, Larry T. Perry, L.S.

would like to see each state organization give a donation as it would really get the foundation off the ground. He would also like to see all WFPS delegates name on the founding member list.

Discussion was held with no action taken on various states laws and regulations concerning Statute of Limitations and Right of Entry.

Discussion was held on the objectives, goals and where WFPS should be headed.

Review of written State Reports along with any verbal updates was done with some of the highlights as follows:

Alaska - University of Alaska, Anchorage Surveying program has obtained ABET certification and is now in operation as the Department of Geomatics. The Alaska Society of Professional Land Surveyors contributed \$8,000 towards this effort. A.S.P.L.S. has developed an informational brochure for its members to try to educate the public on the surveying profession, and the different types of surveys. A copy of the brochure was provided to all delegates. A.S.P.L.S. chapters have undertaken the project of remonumentation and dedication of the Seward Initial Point which is located near the city of Seward and the Seward Astronomic Station which was set on the Meridian at the Fourth Standard Parallel. No physical survey connection has been made between these points so it may prove interesting when the results of simultaneous GPS positions are performed. Sam Best has resigned after 17 years as WFPS Alaska delegate with Criag Savage taking his place. Also Bud Campbell stated there is a possibility there will be a new delegate for his position. If it turns out that this meeting is Bud's last one he will close by saying it has been a pleasure to serve as a delegate for the past 17 years and offers his best wishes for continuing success of WFPS.

California - Fred W. Kett, California Land Surveyors Association gave a verbal report on what has been going on in California. Presently CLSA has been going through organizational changes in operation and there is presently a battle going on about continuing education. The California Land Surveyors Examination had over 600 applicants taking the exam with only 62 passing. The Advanced Technology Committee is working on educating the public agencies sold on GPS systems without understanding or knowledgeability in the inherent possible misfortunes of the system, i.e. garbage in/garbage out. CLSA is also working on legislation to consider or put the surveyor as the lead professional with GIS/GPS projects.

Colorado - Professional Land Surveyors of Colorado has been concentrating its efforts on their Partnership Agreement with Metro State College, planning for its Annual Meeting in February, preparing advertising for their publishing agreement for Al White's new book "Initial Points" and revamping their By-Laws. PLSC fund raising efforts have raised \$15,000 to date towards their two year \$55,000 Partnership Agreement with Metro State College. Colorado will not be introducing legislation this year to obtain authorization for mandatory continuing education requirements for renewal of licenses due to the "horribly childish attitudes" of the Colorado legislature.

Nevada - March 13 - 16, 1996 is the date for the Joint Nevada Association of Land Surveyors/California Land Surveyors Association Conference at Harvey's, Lake Tahoe. For more information contact Katrina Ekedahl, Executive Secretary, NALS,

(Continued on Page 20)

Western Federation of Professional Surveyors Board of Directors Meeting

Meeting was called to order by Chairman Ron Whitehead @ 9:00 a.m. Members in attendance were: Ron W. Whitehead, WFPS Chairman, Utah Delegate; Charles "Chuck" Paddack, WFPS Secretary, Arizona Delegate; Jerry Tippin, WFPS Treasurer; John Abenroth, WFPS Immediate Past Chairman, Washington Delegate; Harry "Bud" Campbell and Craig Savage, Alaska Delegates; Blair Meggitt, Arizona Delegate; Robert "Chic" Chichester and Dave Difulvio, Colorado Delegates; Eslyn "Babe" Brenner and James Stacey, Nevada Delegates; Jim Botsford, New Mexico Delegate; Charles Pearson and Brian Weigart, Oregon Delegates; Keith Russell, Utah Delegate; Kenneth Frazier, Washington Delegate.

Guest in attendance: Fred W. Kett, President, California Land Surveyors Association

The minutes of the September 30, 1995, Board of Directors Meeting were discussed and approved.

Jerry Tippin presented a financial report for the first four months of the fiscal year 1995/1996. In summary, as of January 5, 1996, WFPS has current assets of \$75,204.34, of which \$20,068.36 is restricted for the Scholarship Fund. Discussion was held as to Jerry's previous attempt to quit as Treasurer of WFPS. Jerry stated that there were some events that have occurred in the last few months that makes the future a little brighter financially for him and that he was willing to stay on as Treasurer for awhile longer. After discussion and review of WFPS bylaws, it was motioned and approved to make travel expenses reimbursable to the WFPS Treasurer. The reimbursable expenses

(Continued on Page 19)

Definition of the practice of land surveying.

With the proposed recodification of Title 33, Chapter 29 [33-29-114 through 33-29-1391, it might be appropriate that the Professional Land Surveyors consider the possibility of redefining/expanding the definition of what constitutes the practice of land surveying and who is a land surveyor. There has been considerable debate on this subject.

2. On 4 October 1995, the governor of California signed into law a statute which redefined the scope of professional practice of land surveying. A copy of that portion of the revised statute is appended to this MFR.

3. The undersigned does not necessarily endorse the California statute. This information is presented to assist the PLSW Legislative Committee in their deliberations and recommendations to the PLSW Board of Directors

Herbert W. Stoughton, P. E. I P. L. S.

PLSW Member

Definition of the Practice of Land Surveying

In 1995, the State of California revised the definition of the practice of land surveying. The act was signed by the Governor on 4 October 1995. Following is the new definition.

8726. A person, including any person by the state or by a city, county, or city and county within the state, practices land surveying within the meaning of this chapter who, either in a public or private capacity, does or offers to do any one or more of the following:

(a) Locates, relocates, establishes, reestablishes, or retraces the alignment or elevation for any of the fixed works embraced within the practice of civil engineering as described in Section 673 1.

(b) Determines the configuration or contour of the earth's surface, or the position of fixed objects thereon or related thereto, by means of measuring lines and angles, and applying the principles of mathematics or photogrammetry.

(c) Locates, relocates, establishes, reestablishes, or retraces any property line or boundary of any parcel of land, right-of-way, easement, or alignment of those lines or boundaries.

(d) Makes any survey for the subdivision or resubdivision of any tract of land. For the purposes of this subdivision, the term "subdivision" or "resubdivision" shall be defined to include,

but not be limited to, the definition in the Subdivision Map Act (Division 2 (commencing with Section 66410) of Title 7 of the Government Code) or the Subdivided Lands Law (Chapter 1 (commencing with Section 1100) of Part 2 of Division 4 of this code).

(e) By the use of the principles of land surveying determines the position from any monument or reference point which marks a property line, boundary, or corner, or sets, resets, or replaces any monument or reference point.

(f) Geodetic or cadastral surveying. As used in this chapter, geodetic surveying means performing surveys, in which account is taken of the figure of the earth to determine or predetermine the horizontal or vertical positions of points, monuments, or stations for use in the practice of land surveying or for stating the position of geodetic control points, monuments, or stations by California Coordinate System coordinates.

(g) Determines the information shown or to be shown on any map or document prepared or furnished in connection with any one or more of the functions described in subdivisions (a), (b), (c), (d), (e), and (f).

(h) Indicates in any capacity or in any manner, by the use of the title "land surveyor" or by any other title or by any other representation that he or she practices or offers to practice land surveying in any of its branches.

(i) Procures or offers to procure land surveying work for himself, herself, or others.

(j) Manages, or conducts as manager, proprietor, or agent, any place of business from which land surveying work is solicited, performed, or practiced.

(k) Coordinates the work of professional, technical, or special consultants in connection with the activities authorized by this chapter.

Determines the information shown or to be shown within the description of any deed, trust deed, or other title document prepared for the purpose of describing the limit of real property in connection with any one or more of the functions described in subdivisions (a) to (t), inclusive.

Creates, prepares, or modifies electronic or computerized data in the performance of the activities described in subdivisions (a), (b), (c), (d), (e), (f), (k), and (l).

—1996 STATE MEETING

(Continued from Page 6)

A general discussion revealed particular concern should be given to any hint of "price fixing" after the experiences of our fellow land surveyors in Arkansas and the need to take the initiative before mandates are imposed by the state board of registration.

Herb provided background information concerning the Policy On Control Surveys For Utilities In Wyoming and the draft version dated 21 January 1994. Jim informed members that the deadline for comments is also the May 4th board meeting in Laramie.

Past President Chris Hamilton acknowledged the members of the now defunct Corner Record Committee and stated that the certificates of appreciation would be mailed out shortly.

At this point, Jim announced a recess of 15 - 20 minutes. Members dispersed, commingled or otherwise socialized for approximately 37 minutes after which time members settled back in for more PLSWing.

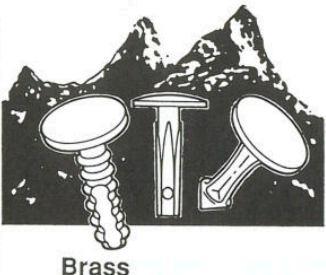
Teller Bob St. Claire presented the election results; firstly stating that approximately 70% of the membership had voted and secondly that the three unopposed candidates won the election. Your 1996 officers are President Pete Hutchison, Vice President Dick Griffin and Secretary / Treasurer Rick Hudson.

John Steil, NSPS Area 7 Director, called all members of the board of direction to the front of the meeting and administered the oath of office and affirmation, as he has done in the past. Now President Pete Hutchison acknowledged the service of Jim as president this past year, and presented him with the traditional plaque.

Pete then presented his inaugural address; wherein he expressed his desire to visit each chapter during the coming year,

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solicited input for committee assignments and stressed the importance of the Trig-Star program and surveying education in general. He informed the membership that only 12 new PLS registrants were confirmed by the board of registration during 1995.

New business began with John Steil's report on the status of the "Mapping the Frontier" bronze raffle. John stated that he had money for 220 tickets at the present time with four chapters not yet reporting. It was stated that the drawing will be held Saturday night at the WES awards banquet, regardless of the number of unsold tickets.

Rick Hudson led a general discussion concerning the two-page Guide For Preparation of Corner Records, mentioned earlier by Harvey Copeland. He indicated the committee had relied almost exclusively upon it's members experiences, observations and opinions in drafting the guide.

Herb Stoughton distributed an handout outlining the (read his) recently completed Projection Tables For State Plane and UTM Systems for NAD27 and NAD83. He said the work is intended as a part of our Manual of Practice and should be submitted to the State Board of Registration of Professional Engineers and Professional Land Surveyors. He concluded by stating that the approximately 150-page work will be published for inclusion in the "PLSW Handbook" for distribution at the May 4th board meeting in Laramie.

Martin Pedersen presented a report concerning the conversion of USGS BM levelling to NAVD 1988; giving members background into the need for, and requirements of, the proposed project; and asking for assistance with funding requests to large corporate firms and counties. He stated that the projected cost of the project is approximately \$160,000.

Since he was not present earlier for his Scholarship Committee report he added that non-traditional scholarships are available and mentioned the Laramie County Community College program for Land Surveyors In Training. He also reported as a member of the SBRPEPLS; informing the members that the new rules and regulations have been submitted to Governor Geringer who has 60 days to take action regarding same.

Returning to the agenda Martin, now as a member of the Upper Platte Chapter, discussed a proposed chapter project to compile a list of deceased or retired surveyors. He stated that a request for funding has been made to the board of directors, outlined the need for such a listing, and solicited information through a display at the WES registration desk.

John Steil substituted for Rod Skaggs with a report concerning surveying courses at the University of Wyoming. He stated a total of 30 hours are presently available, including teleconferencing and video tapes. Questions led to a general

(Continued on Page 8)



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BOARD OF DIRECTORS' MEETING SUMMARY

The first meeting of the Board of Directors during 1996 was held at the Parkway Plaza Convention Center in Casper on Friday, February 2, 1996, after the annual state meeting, as required by our By-Laws.

Both the annual state meeting and this board meeting were in conjunction with the 76th annual Wyoming Engineering Society convention.

The meeting was called to order by newly elected President Pete Hutchison at 7:15 A.M. with seven board members and one former board member present and began with revisions to the agenda.

The minutes of the December 9th board meeting, held here in Casper, were presented by Secretary Rick Hudson, discussed and approved.

Since most of our business and reporting took place at the annual state meeting, there was no treasurer's, delegates' or committee reports to be presented at this meeting.

The one item of old business carried over from the December meeting was the presentation of a petition concerning a new classification of membership. Former Upper Platte Director Martin Pedersen presented the petition which requests a new classification of affiliate membership, that of Corresponding Member. He said the classification would apply to non-residents, set forth yearly dues of \$20, and provide for the mailing of the proceedings of the annual state meeting and subscription to "Lines & Points". A copy of the "PLSW Handbook" would not be included. All members present signed the petition and it will be circulated during the convention.

New business began with a request, by the Upper Platte Chapter, for funding of a project to compile and print a list of "Past And Present Registrants". Martin explained the need to maintain a listing of deceased and retired surveyors with such information as registration number, last known address and date and locality of practice. The board voted to allow up to \$400 for this project.

Applications for membership were presented by Rick Hudson. Seven new members and one new affiliate were approved by unanimous vote: Members - Lynn A. Forbes, Clay Schwartz, Darrell T. White, Dennis Dawson, Patricia S. Factor, Robert H. Westerfield and William R. McJunkin; Associate Member - Timmy A. Kaumo. Forbes and Factor were formerly affiliates. Welcome to PLSW !

A general discussion of the annual state meeting followed with particular attention being given to the proposed USGS levelling conversion project, the proposed Code of Ethics and the greater than usual attendance.

Also mentioned were the remaining board meetings this year: May 4th in Laramie, September 7th in Rock Springs and

December 7th in Casper.

Pete announced a special committee will soon be selected to make arrangements for our "Winter Technical Session", tentatively planned for early December back here in Casper.

Documents for the nomination of an Honorary Member, received from the Northwest Chapter, were distributed to the board members for consideration at the next meeting.

Upper Platte Director Marshall Lindeen, who is also our state "Trig-Star" Program Coordinator, led a general discussion concerning the status of that program. He asked that the name of one "chapter chair", from each of the seven chapters, be submitted at the next board meeting.

The meeting was adjourned at 8:30 A.M.

Dated this 14th day of March, 1996.

R.L. Hudson,
Secretary / Treasurer

—1996 STATE MEETING

(Continued from Page 7)

discussion dealing with all manner of educational availability, acceptability and accreditation. Most members agreed that it can be very difficult to obtain traditional education.

Jim Claflin mentioned a letter regarding a NAFTA resolution pertaining to the "temporary authorization for the practice of engineering". Becky and Herb both commented - Herb is of the opinion that it pertains to engineering but not to land surveying.

Herb Stoughton referred to handouts on the side table regarding the History of GLO Surveys he has compiled and updated members on the project. He stated the series will contain eight, perhaps nine, volumes and cover the period up to 1910. Copies are available, from him, for printing costs, approximately \$25 - \$35 per volume.

Marshall Lindeen, state Trig-Star program coordinator, updated members on this year's competition. He stated the Southeast and Northeast Chapters each give \$50 awards; that the competition must be completed by May 29th and that one contestant from each chapter area will be eligible for the state competition.

Announcements included mention of a board meeting later during the convention; John Lee mentioned C.L. White's latest book on initial points; and Kevin Jones discovery of defective data within the CD-ROM from NGS, 200,000 meters in the northings, for stations in the East Central and West Zones, 4902 and 4904.

The meeting was adjourned at 5:05 P.M.

Dated this 15th day of March, 1996.

R.L. Hudson
Secretary / Treasurer

PLSW Membership Legislative Committee

JOHN A. STEIL, CHAIRMAN

The State of Wyoming Legislative Budget session ended on schedule Friday, March 15, 1996.

The status of a few of the bills that effect our profession is as follows-

SFOO16 - Municipal Annexations - passed the Senate, but failed to make it out of the House Committee the bill was assigned to, therefore failed. The PLSW Legislative Committee will work with the appropriate agencies during the year to protect our interests.

HBO125 - Boards and commissions fees and interest. This bill was passed which provides for the return of one-half of the interest earned by the various State Boards and Commissions to be retained by the respective Board/Commission. Currently these interest monies are returned to the State General Fund. The State Board for PE and PLS's is very interested in this bill to keep registration fees from possible substantial increases.

SFOO13 - Underground facilities notification center. This bill passed both houses. As of this date (3-18-96) the governor has not signed the bill (he has 15 days to sign or veto). The governor said he has received more calls on this bill than any other during the session. WDOT, WAM, WCA and WACES, among others, want him to veto the bill.

The existing W.S. 37-12-302(b) is as follows:

(b) Architects, engineers, or other persons designing or requiring excavation shall obtain information from persons with underground facilities, as to the nature and location of underground facilities and then make such information and location a part of the plan by which the contractors operate.

Legislators, who had stated publicly that they wanted to place responsibility on someone in this bill, felt that they had amended (b) so that architects and engineers (surveyors) were not responsible or liable. The legislators broke the subparagraph down from a complex compound sentence to 3 simple sentences and added one more sentence as follows:

(b) Any person requiring excavation or design for excavation shall obtain information from persons with underground facilities, as to the nature, location and elevation, if known, of underground facilities. If the information is not available, the person requiring excavation shall determine at their expense the nature, location and elevation of the underground facilities. The person requiring excavation shall make the information and location a part of the plan by which the excavators operate. This subsection shall not apply to underground facility owners performing excavation on their own underground facilities.

The way I interpolate this section is that when surveyors or engineers do topographic surveys for design of a project, we shall determine at our expense the notice, location and underground facilities if the information is not available. Could get quite costly.

The Legislative Committee will acquire a copy of the complete bill if the governor signs it and distribute to the membership.

Attn: National Society of Professional Surveyors, Inc. (NSPS)

Hello fellow surveying professionals,

I would like to take this opportunity to introduce you to SurveyNet. SurveyNet is a collection of electronic bulletin board systems echoing SurveyNet message conferences, which are available to the public through your computer modem via a dial-up connection. Some of your members may already be familiar with SurveyNet.

SurveyNet can trace its roots back to 1986 when Paul Durgin began operating a bulletin board called Leased Squares, in Rochester, NH. One thing or another happened and Leased Squares went by the wayside. But not before George Fergusson, PLS, of Whitefield, Maine, got the bug. In 1991, George started a BBS for -he membership of the Maine Society of Land Surveyors. The name of the board was MSLSBBS. Before long, there were more callers from around the country and world than there were within the state of Maine. Several other BBSs started to echo the message conferences and the name MSLSBBS was changed to SurveyNet BBS, reflecting its position as the hub of message conferencing for surveyors.

In October of 1995, George went on to pursue other interests and Total Station BBS became the hub of SurveyNet. Currently Total Station BBS and SurveyNet are operated solely by donations and are open for all to participate. We invite your membership to participate in SurveyNet, and if your association already operates a BBS for your members, we invite you to echo SurveyNet conferences.

Our settings are 8-data bits, no parity and I-stop bit, and support speeds up to 28.8kbs, 24 hours a day. Our BBS line is 603-859-2361. If you need help in negotiating a connection, or would like to speak with me further about SurveyNet, feel free to call on our voice line at 603-859-2367, or leave a message through the internet at: sysop@totalstation.biddeford.com.

Thank you for letting me introduce you to SurveyNet, and I hope to see your participation.

Randy R. Orvis, LLS
Sysop



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—RELATION OF NAD 83

(Continued from Page 15)

Doppler observations were used to extend the datum outside of the contiguous survey networks to isolated areas such as Greenland, Puerto Rico, and Hawaii.

Extending the Datum Offshore

The case of a ship navigating offshore is of particular interest to the hydrographic and bathymetric surveying activities of the National Ocean Service. If the ship navigates with a radio navigation system using shore-based transmitters, and if the coordinates of the transmitters are known in NAD 83 coordinates, then the navigated position will also be in NAD 83. The ship may also 'navigate with a satellite-based system which yields coordinates in the WGS 84 system. We expect both navigation systems to provide the same coordinates at each instant of time; but due to unavoidable measurement errors we may find small differences. The existence of such differences should not be interpreted to mean that there is a difference in the two datums. Unless there is some reason to suspect that one or the other navigation system is producing serious errors, the differences between the coordinates produced by the two systems should be attributed simply to measurement error. The navigator may choose to use either set of coordinates. Only the navigator with extraordinarily demanding accuracy requirements will need to worry about computing some combination of the two sets of coordinates.

Computational Differences

There are some differences between NAD 83 and WGS 84 which may arise because of approximations made in a particular method of computing coordinates. For most applications, the effect of these approximations is considerably smaller than the effect of observational errors. These differences are important only 'if one is testing the accuracy of a set of equations or a method of computing coordinates.

One such set of approximations concerns the different ellipsoids used for NAD 83 and WGS 84. This difference has no effect on the three-dimensional coordinates of a point computed by satellite surveying. If such a set of three-dimensional Cartesian coordinates is converted to latitude and longitude using the two coordinate systems, there would be no difference in the longitudes, and the latitude difference would be

$$\Delta \approx f \sin 2\phi / \sin 1''$$

which reaches a maximum value of 0.000003 second of arc (or 0.0001 meter) at a latitude of 45 degrees. It is assumed that most users will ignore this very small difference.

Another approximation concerns the datum shifts computed for map sheets. The National Geodetic Survey has computed a latitude and longitude shift for every map sheet published by the U.S. Geological Survey. These pairs of numbers were computed by meaning the actual shifts from NAD 27 to NAD 83 at all points failing on the map sheet. These mean shifts are then assumed to be correct for the entire map sheet. Thus a very small error, amounting to the difference between the actual datum shift and the mean datum shift for the map sheet, is committed at each point. This error is everywhere much smaller than the observational errors committed when coordinates are scaled from maps.

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1996 ACSM/NSPS Map/Plat Design Competition

BY JAMES H. GRANGER, NSPS PRESIDENT

The National Society of Professional Surveyors (NSPS) is happy to announce the winners of the 1996 ACSM/NSPS Map/Plat Design Competition:

• Subdivision Plats

First Place - Scott Ham, Guntersville, AL
Second Place - Dean Scott, Rapid City, SD
Third Place - Alan Sowar, Marietta, GA

• Boundary/Cadastral Maps

First Place - David Prowse, Northville, MI
Second Place - Michael R. Dwyer, Northville, MI
Third Place - Sharon L. Flader, Elk River, MN

• Topographical Maps

First Place - Paul E. Fairchild
Second Place - Robert B. Todd, LLS
Third Place - Dean Scott
• *ALTA/NSPS Survey Maps*
First Place - Renana Gross
Second Place - Jack Pendergrass
Third Place - Donald E. Bowen, Jr., P.L.S.

• Miscellaneous Maps

First Place - Jack Porter, Wyoming
Second Place - Donald A. Voltz, LLS
Third Place - Robert M. Stalls

I wish to thank all of you who applied for the different NSPS Map/Plat categories.

Surveying Within the Withdrawal Area Located on The Wind River Indian Reservation

The purpose of this paper is to describe methods of surveying and aid in researching for survey projects within the withdrawal area located on the Wind River Indian Reservation, Fremont County, Wyoming.

The Wind River Indian Reservation is located in the center west portion of the state of Wyoming, presently consisting of 1,890,070 acres, more or less.

The reservation was created July 2, 1863 by the first treaty at Fort Bridger consisting of 44,672,000 acres, more or less. It was amended July 3, 1868 by the second treaty at Fort Bridger consisting of 3,054,182 acres, more or less.

Under the 2nd McLaughlin Agreement of April 21, 1904, ratified and amended by Congress under the act of March 3, 1905 (33 Stat. 1016) lands were ceded north and east of the Big Wind River which became commonly known as the "ceded" area. Within this area lands were withdrawn from entry and set aside as a reclamation project, then known as the Wind River Project. This later became the Riverton Project. The Riverton Project Act of August 15, 1953 (67 Stat. 592) revised the project boundary as it is today and is called the Withdrawal Area. The Withdrawal Area is located in the approximate center of the reservation consisting of 254,627 acres, more or less.

The purpose of the Withdrawal Area was to provide irrigated land for farm units. This would be done under the direction of the United States Department of the Interior by the Bureau of Reclamation located in Riverton, Wyoming.

A general location of the Withdrawal Area is bounded on the east by Boysen Reservoir, T.3 & 4 N., R.6 E., the south by the Riverton airport, T.1 N., R.4 E., the west by Wind River diversion dam located on the Big Wind river, %3 N., R.2 W., and on the north at Muddy Creek, T.5 N., R.2 E. Wind River Meridian, Fremont County, Wyoming.

February 5, 1906, E. A. Hitchcock, Secretary of the Department of the Interior, granted permission to the state engineer of Wyoming to perform surveys on federal reservation lands in preparation for the opening of the area north of the big Wind River to homesteading under the Land Disposition Laws of the United States General Land Office. Those disposition laws, according to the 1905 act, consisted of the "Homestead Act; Townsite, Coal and Mineral Land Laws". Those surveys were primarily for canals and laterals. This is when the first surveys commenced excluding the original G.L.O. surveys.

The Bureau came in 1916 and 1917 to investigate after Wyoming Congressman Mondell introduced a bill in the U.S. Congress to have the U.S. Reclamation Service take over the unconstructed Wyoming canal portion of the development project.

In the earlier homesteading of the project, the lands were homesteaded by quarter sections. Therefore, it was possible for some of the units to contain only a few acres of irrigable land. Later, farm units were laid out according to land classification and proposed irrigated acres and given tract numbers. These were usually shown on supplemental survey maps approved by the B.L.M.

One of the many functions of the Bureau was to located all

three of the Bureau employees who actually carried out these functions, Karl M. Johnson, Robert M. Seipt and John B. Rossi. Johnson and Seipt went on to become registered land surveyors.

Survey crews were usually made up of four men, a party chief, instrumentman, rodman and note keeper. Often times there were college students working as summer help. There were young engineers starting out with the Bureau who worked as rodmen for the first year, then were promoted to instrumentman and on to party chiefs. The procedure that the Bureau employees followed was to start at an existing corner, run on a compass bearing using the G.L.O. plat information, and locate all the existing monuments. Although they found a good percentage of the original monuments, lost corners were reestablished according to the B.L.M. manual.

Existing section and quarter corner sandstone monuments that were checked and accepted were usually replaced with a 2" diameter pipe set in a concrete block. The apex of the existing stone was referenced then removed. In some cases, the stone was set alongside the concrete monument, but this was not always the case. Some were tossed off to the side, some were brought back to the office. After all the exterior section and quarter corners were set, the next step was to set the center quarter corner. This was done by wiggling in between quarter corners or running a random line. Then the center quarter was set by intersection, not calculation.

Most all distances were measured with a 100 foot chain using plumb-bobs and breaking chain. If in rough terrain, distances were measured twice. Chainmen were kept on line with a transit. There was very little triangulation used. Rebar monuments were set at most of the 1/16 corners, although there were some wooden stakes set.

The Bureau had a method of turning horizontal angles which should be mentioned. Some were recorded on the farm unit plats which I will talk about later. For an example, they occupied the southeast section corner, backsighted the southwest section corner, turned on the northeast section corner, bypassing the quarter corner, but showing the offset distance to the quarter corner bypassed. The reason for this was they could turn 360 degrees and pick up four sections. Angles could be calculated at the quarter corners because all the distances were shown on the farm unit plats. In resurveying, this could create a real problem if one is not familiar with this method. One would think they

(Continued on Page 10)

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Southwest Corner Monument Slated for Restoration

BY SHAWN HUBBELL
Herald Editor

A historic monument marking the southwest corner of the State of Wyoming will get a facelift from members of a professional surveyors group.

Representatives of the Professional Surveyors of the 6th Principal Meridian approached Uinta County Commissioners Tuesday to request permission to rehabilitate the corner monument, which was set by General Land Office surveyors on Friday, Nov. 14, 1873, marking the southwestern corner of the Territory of Wyoming.

Commissioners approved a resolution in support of the rehabilitation at no cost to the county. The monument is located about 20 miles south of Evanston on Yellow Creek Road.

According to Paul Scherbel of the Professional Surveyors of the 6th Principal Meridian, the group has been instrumental in restoring many significant and historical monuments within the area of the 6th Principal Meridian, including the initial point itself, which is located in Kansas, 120 miles west of the Missouri River.

Most recently, the group restored the corner monument common to the states of Utah, Wyoming and Idaho near Bear Lake.

The original surveyor's field notes describes the southwest corner monument as: "set a red sandstone shaft at intersection of 41st parallel with 34° West Longitude 8 ft. deep marked with letters 3 in. square deeply groven, on East side, "WYO - 367 ms. 48 chs. 81 links: Northside - "MING. 34° W.L. "West" UTAH. 41° N.L. 1872 South" "UTAH. A.V. Richards U.S. Astronomer and Surveyor." Raise conical mound of stone and earth 12 ft. in dia. 3 ft. high with pits 3 ft. square 2 ft. deep E.W.N. and S. 6 ft. distant from post as per instructions, for 7th Astronomical Monument marking the South Western corner of the Territory of Wyoming." Scherbel said up until now no effort has been made to preserve the historic monument, which has suffered graffiti, initial etching into the stone and the disgrace of having the property line fence attached to the monument. With the cooperation of the Uinta County Commissioners, county commissioners of Summit County, Utah, the Golden Spike Chapters of the Utah Council of Land Surveyors, the Bureau of Land Management and others, the group will:

- Acquire title to a rectangle of land 30 feet north, south, east and west of the monument with the deed conveyed to the appropriate county.
- Fence the area acquired.

- Remove the graffiti and extraneous carvings from the monument.

- Place an explanatory sign within the enclosure.
- Restore the accessories, i.e. pits and mound of stone.
- Place directional signs for tourists.

A brass benchmark imbedded in the monument remains in place, Scherbel said. In addition to the rehabilitation of the monument, which is slated to be completed by Nov. 14, 1996, the anniversary of the monument's setting, the resolutions calls for increased patrols by the Uinta County Sheriff's Department to prevent vandalism to the monument. A small ceremony commemorating the restoration of the monument is also like, Scherbel said.

Reprinted from the Uinta County Herald, 8 December, 1995.

—WIND RIVER

(Continued from Page 9)

were turn from quarter corner to quarter corner.

Farm unit plats were usually drawn to a scale of 1"=400', showing a full section, interior angles at the four section corners, offset distances at the quarter corners and all distances around the boundary and interior to the nearest half foot. They also show information such as: date plat was drawn, by whom, irrigable lands, soil classification, canal and lateral names. There are maps with as many as 17 sections showing angles and distances. I have never seen a map showing bearings. In the later portion of the project, farm units were laid out by metes and bounds and brass cap monuments were set.

Field notes were kept in hardback covered field books. Information shown included stones found with description of markings, general notes of survey procedures, measured distances, date of survey, names of survey crew members, interior angles at section corners and interior quarter lines which weren't shown on the farm unit plats. Some sheets show latitude and departure calculations with closures. Field books and pages were numbered. There were master indexes of the books.

Copies of the farm unit plats, along with field notes, are on file at the U.S. Bureau of Reclamation office in Cody, Wyoming and can also be found at the Fremont County Court House in Lander, Wyoming. Some of the original farm unit linens are filed at Midvale Irrigations Office in Pavillion, Wyoming.

There were two different fires at the Riverton Bureau office in which some survey information was lost and others had smoke damage.

I have surveyed within the Withdrawal Area for the past 20 years and have found their recorded data to be very accurate in most cases.

If you are planning to survey in the Withdrawal Area you will need to make use of this information. These dependent resurveys utilized existing G.L.O. monuments where they were originally established. For example, the G.L.O. shows the quarter corners to be on line but, in fact, the U.S.B.R. crews found many to be off line. Without this information a surveyor reestablishing the missing quarter corner with only the G.L.O. plat could cause a real problem.

This information was compiled and written by Bruce L. Hughes, P.L.S No. 557, Member of the Professional Land Surveyors of Wyoming and Member of the Central Chapter

—RELATION OF NAD 83

(Continued from Page 14)

added are not. In most geodetic datums, the distinction between fundamental and non-fundamental points has been lost. Typically a new point surveyed to first-order accuracy and adjusted into the network has been treated as equal in usefulness to a fundamental first-order point, and superior to a fundamental second-order point. This common, but incorrect, practice has often misled users as to the accuracy of a point's coordinates.

Some physical points are fundamental to both NAD 83 and WGS 84. The coordinates of these points in the two systems may differ because the two adjustments which produced the coordinates of the two sets of fundamental points were based on two different sets of observations. For instance, a Doppler survey may have been performed at a point by either DMA or NGS, and the data may have been exchanged, so that both agencies had exactly the same data set. Furthermore, so that both agencies determined the same set of Doppler-derived three-dimensional coordinates. Even further, the agencies agreed exactly on how to transform the Doppler-derived NWSC 9Z-2 coordinates into the BIH Terrestrial System. However, in the NAD 83 adjustment these coordinates received corrections due to interactions with other observations (mostly classical triangulation and traverses), while no such corrections were made in the determination of the WGS 84 coordinates. These corrections can amount to a meter or more. However, both adjustments are still thought to be valid. The differences of coordinates are thought to be simply the effect of small random measurement errors in the two sets of observations. Even though differences as large as several meters are found occasionally, the expected value of these differences is zero.

Other physical points are derived, rather than fundamental. For these points, coordinates in the two datums may differ for two reasons:

1. The two coordinate determinations are based on different fundamental points.
2. The observations used to extend the datum may differ.

The method of labeling the datum for derived points is mainly a matter of convention. The actual physical observations (such as angles or distances) are themselves independent of any datum. When a new point is surveyed for the purpose of determining its coordinates, the survey must be tied to one or more old points. If the coordinates of the old point in the NAD 83 system are used in the computations, the coordinates of the new point are also said to be in NAD 83. Similarly, if the coordinates of the old point in WGS 84 are used, the coordinates of the new point are said to be in WGS 84.

USING NAD 83 AND WGS 84 POINTS

NAD 83 and WGS 84 should be thought of as geographically

overlapping datums (in the sense of datum as adopted coordinates). There will be points with coordinates in both datums. The action to take when confronted with two sets of coordinates for a single point is up to the user. If neither position determination contains a blunder, then the differences of coordinates should be small. In fact, the expected size of these differences can be computed from the uncertainties of the two determinations. If the differences are smaller than the accuracy required, then the user may select either determination (or some combination of the two).

"Small" differences must be properly understood here. The actual difference between coordinates may quite possibly be a meter or more. Although this might be disturbing to some, this is actually the magnitude of the uncertainty of the differences that would be computed from the uncertainties of the two coordinate determinations. It reflects the fact that the two coordinate determinations are independent and uncorrelated.

Mixing Coordinates

Surveyors are familiar with the limitations imposed when mixing the results of two independent surveys (or two datums) in a single positioning problem. Within a single survey, the relative coordinates of nearby points are much more accurate than the coordinates of either. This is not the case if the two sets of coordinates come from different surveys.

Suppose that within a local area there is both an NAD 83 point and a WGS 84 point. Suppose also that a survey is run to determine the distance between the points. The measured distance could differ from the value computed from the coordinates by a meter or more. Some might find this difference to be disturbing, but it is only a reflection of the fact that the variance of relative coordinates from two different surveys is much larger than the variance of the relative coordinates of two points from the same survey.

We thus say that the most common reason that we find differences between the NAD 83 and the WGS 84 coordinates of a point is that we are dealing with two independent determinations of the same thing. Both determinations are affected by the small statistical variations which are inherent in any measurement process. Each has its own associated standard deviation, but each is valid in its own way. The user may chose either, but must be careful about mixing coordinates.

Area of Validity

Some investigators have suggested that a difference between NAD 83 and WGS 84 is that NAD 83 is valid only within North America, while WGS 84 is valid worldwide. This is incorrect. If one has an accurate method of extending NAD 83 outside of North America, then there is no reason not to do so, nor is there any reason to think that the resulting coordinates would differ from WGS 84 coordinates. In fact, as part of the NAD 83 adjustment,

(Continued on Page 16)

TABLE 2.—Derived geometrical constants

Parameter	Notation	Units	Ellipsoid	
			GRS 80	WGS 84
Semiminor axis	b	m	6356752.3141	6356752.3142
Eccentricity squared	e^2		0.00669438002290	0.00669437999013
Flattening	f		0.00335281068118	0.00335281066474
Reciprocal flattening	f^{-1}		298.257222101	298.257223563



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RELATION OF NAD 83 TO WGS 84

CHARLES R. SCHWARZ, Ph.D.

National Geodetic Survey

This chapter addresses the differences between the North American Datum of 1983 and the World Geodetic System of 1984 (WGS 84) of the U.S. Defense Mapping Agency (DMA). Both NAD 83 and WGS 84 were defined (in words) to be geocentric, and oriented as the BIH Terrestrial System. In principle, the three dimensional coordinates of a single physical point should therefore be the same in both systems; in practice, small differences are sometimes found. The original intent was that both systems would also use the Geodetic Reference System of 1980 (GRS 80) as a reference ellipsoid. As it happened, the WGS 84 ellipsoid differs very slightly from GRS 80.

THE CONCEPT OF A GEODETIC DATUM

To understand the sources and importance of these differences, it is necessary to take a close look at the concept of a datum and at how the coordinates in a datum are actually computed. The concept of a horizontal geodetic datum actually involves several ideas. A definition almost always begins with some form of specification of a reference surface. This involves the specification of the dimension of a reference ellipsoid, as well as quantities which determine the origin and orientation of the ellipsoid with respect to the Earth. (See, for instance, National Geodetic Survey, 1986.)

A Datum as a Coordinate System

A three-dimensional Cartesian coordinate system is associated with every geodetic datum. This coordinate system must be fixed in the physical earth. This specification of the origin and orientation of the coordinate system can be expressed in several ways. With local horizontal datums, these quantities were fixed by specifying the geodetic coordinates of an initial point and at least one azimuth. With the use of satellite geodesy, the origin and orientation of the coordinate system are determined (usually overdetermined) by specifying the three-dimensional coordinates of a number of points. A coordinate system can also be specified by describing the relationship between it and another coordinate system. This is the case with NAD 83 and WGS 84. Both are defined (in words) *in terms of their relationship to the NWSC 9Z-2 coordinate system. Both transformations are attempts to realize the BIH Terrestrial System (BTS). The two transformations are exactly the same because DMA and NGS coordinated their efforts in this regard. Thus, the NAD 83 and WGS 84 coordinate systems are identical.

A Datum as Ellipsoid

The WGS 84 ellipsoid differs very slightly from the GRS 80 ellipsoid which was used for NAD 83. The differences can be

seen in tables 1 and 2. These differences arise because DMA used the normalized form of the coefficient of the second zonal harmonic of the gravity field as a fundamental constant, while GRS 80 had used the unnormalized form. Furthermore, the normalized value used by DMA was obtained by using the mathematical relationship

$$\frac{C_{2,0}}{C_{2,0}} = -J_2(5)''$$

and rounding the result to eight significant figures (Defense Mapping Agency, 1987). Thus quantities depending directly on the form factor, such as the flattening, generally differ after the eighth significant digit, while linear quantities, such as the semiminor axis, generally differ after the tenth significant digit. These differences, while small, can cause confusion among users who attempt to compare computations in the two systems. Most analysts agree that these differences will be of no significance for practical applications.

A Datum as Coordinates

The specification of a reference surface defines a datum only in an idealized sense. This specification is usually supplemented by a second definition which states that a horizontal geodetic datum is composed of the adopted horizontal coordinates of a set of physical points in that datum. This is the operational definition. It is from this second definition-the adopted coordinates-that we actually determine the origin and orientation of a datum. In this sense, the first definition is more a statement of intention than a statement of reality.

There are other qualities connoted by the concept of a datum. The idea that there are adopted coordinates implies that a datum is stable-the coordinates seldom change. Furthermore, a datum must be *extensible*-there must be some way of computing the coordinates of new points. Often there are preferred or expected ways to determine these new coordinates. For instance, it is expected that new NAD 83 points will be established by running new horizontal surveys using theodolites and distance measuring equipment. It is also expected that if one uses Global Positioning System (GPS) observations in the single point positioning mode, together with a satellite ephemeris given in the WGS 84 coordinate system, then the resulting coordinates will also be in WGS 84.

The idea of extending a datum by adding new points implies that there are some *fundamental* points from which the process is begun. By definition, these are the points that participate in the initial network adjustment, irrespective of accuracy or order. All of the points that participated in the NAD 83 adjustment are thus fundamental points of that datum. New points that will be

(Continued on Page 15)

TABLE 1.—Defining (fundamental) parameters

Parameter	Notation	Units	Ellipsoid	
			GRS 80	WGS 84
Semimajor axis	a	m	6378137	6378137
Angular velocity of the Earth	ω	rad s ⁻¹	7292115 x 10 ⁻¹¹	7292115 x 10 ⁻¹¹
Gravitational constant	GM	m ³ s ⁻²	3986005 x 10 ⁸	3986005 x 10 ⁸
Dynamic form factor unnormalized form	J_2		108263 x 10 ⁻⁸	
normalized form	$\bar{C}_{2,0}$			-484.16685 x 10 ⁻⁶

(t - T) Correction

HERBERT W. STOUGHTON

Recently, I was studying the (t - T) correction, which is applied to plane azimuths for survey line to obtain the geodetic azimuth in state plane coordinate systems. The (t - T) correction is the "second term" correction for converting plane coordinate azimuths to geodetic azimuths for lines longer than a few miles. Oscar S. Adams defined (t - T) as a small angle between the straight line joining two points on the plane and the projected geodetic line on the plane, which is a curve, between the same two points.

For the Lambert conic systems, the (t - T) is:

$$(t - T)_L = \frac{(x_2 - x_1)}{2 \rho_o^2 \text{ arc } 1''} \left[y_1 - y_o + \frac{y_2 - y_1}{3} \right]$$

For the transverse Mercator systems, the (t - T) is:

$$(t - T)_{TM} = \frac{(y_2 - y_1)}{6 \rho_o^2 \text{ arc } 1''} \left[2 x_1' + x_2' \right]$$

These two formulae have some similarity in appearance.

Recall, that in the transverse Mercator systems x' represents the difference between the x-coordinate of the point and the x-coordinate assigned to the central meridian (axis of minimum scale). Or: $x_i' = x_i - x_o'$

Then:

$$(t - T)_{TM} = \frac{(y_2 - y_1)}{6 \rho_o^2 \text{ arc } 1''} \left[2 x_1 - 2 x_o + x_2 - x_o \right]$$

$$= \frac{(y_2 - y_1)}{6 \rho_o^2 \text{ arc } 1''} \left[2 x_1 + x_2 - 3 x_o \right]$$

Rearranging the formula for the Lambert conic systems:

$$(t - T)_L = \frac{(x_2 - x_1)}{2 \rho_o^2 \text{ arc } 1''} \left[3 y_1 - 3 y_o + y_2 - y_o \right]$$

$$= \frac{(x_2 - x_1)}{6 \rho_o^2 \text{ arc } 1''} \left[2 y_1 + y_2 - 3 y_o \right]$$

Where:

$$(t - T) = \frac{A}{6 \rho_o^2 \text{ arc } 1''} B$$

From these algebraic manipulations, the general form of the (t - T) correction formula is:

x_o, y_o = The x-value and y-value assigned to the axis of minimum scale for the projection.
 x_1, y_1 = The coordinates of the point where the azimuth of the line is to be computed.
 x_2, y_2 = The coordinates of the point at the distant end of the line.
 ρ_o = Radius of the reference ellipsoid.

Where, A are the coordinate values parallel to the axis of minimum scale (point 2 minus point 1). And, B are the coordinate values perpendicular to the axis of minimum scale. The quantity "B" is the sum of two times the perpendicular distance of point 1 from the axis of minimum scale and the perpendicular distance of point 2 from the same axis.

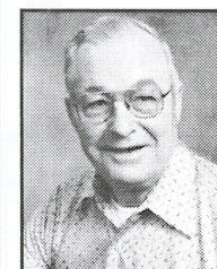
This note demonstrates that the (t - T) correction for the transverse Mercator and Lambert conic systems are not drastically different in form, but identical - with respect to the map projections' axis of minimum scale.

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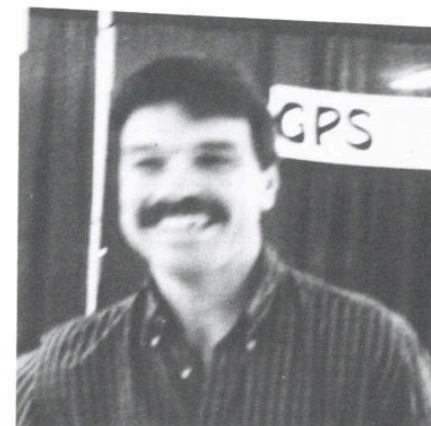
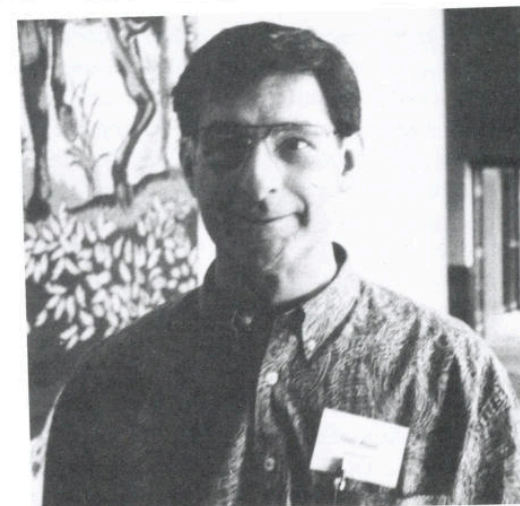
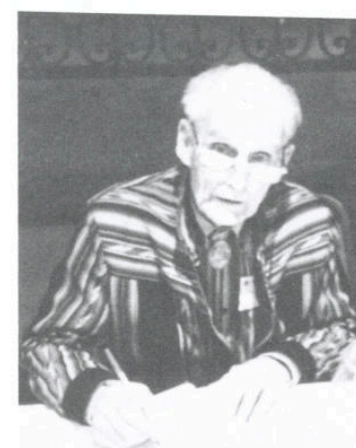
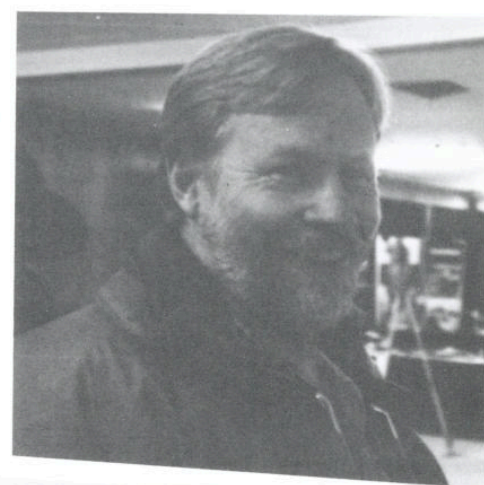
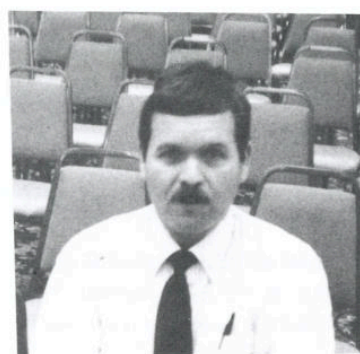
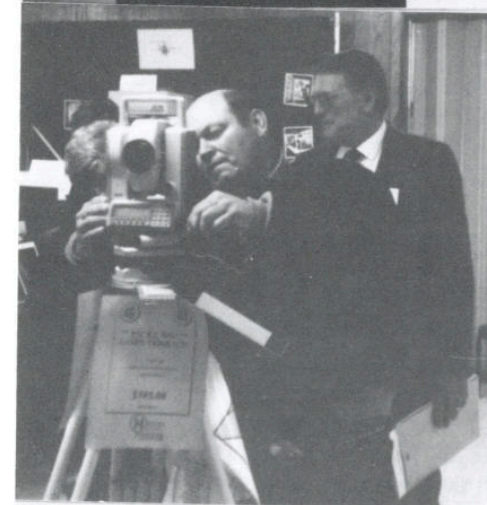
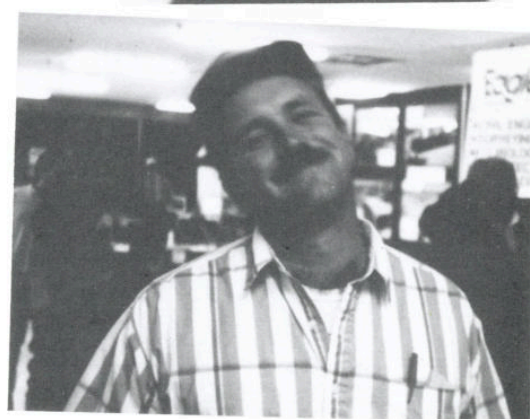
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