

# The Seahorse

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## IMO APPROVES STANDARDS FOR RASTER CHART DISPLAY SYSTEM (RCDS)

### Paper charts will be required for backup

by Douglas Brown, NOAA, Office of Coast Survey

The International Maritime Organization's (IMO) Sub-Committee on Safety of Navigation (NAV 44) met in late July and approved a recommendation to amend the existing performance standards for Electronic Chart Display and Information Systems (ECDIS) to allow their operation in a Raster Chart Display System (RCDS) mode. Under the proposal, national maritime administrations may allow vessels the option of using the RCDS mode of operation until the vector Electronic Navigational Chart (ENC) coverage required for the normal operation is available. While operating in the RCDS mode, vessels will be required to use an appropriate folio of paper charts, as determined by the administration.

Raster nautical charts already cover much of the world oceans and the concept of ECDIS operating in an RCDS mode is seen as a way of letting

mariners maximize the use of the system while ENC coverage expands. This is commonly referred to as the "dual-fuel" mode of operations. The important benefit of the dual-fuel approach is the availability of electronic chart navigation based entirely on *official* and *up-to-date* charts for almost any voyage. Thus mariners will be assured of the operational reliability of their ECDIS equipment when navigating in all waters, even those where ENC's are not available.

The option of operating ECDIS equipment in an RCDS mode offers significant safety and environmental protection benefits more rapidly than would otherwise be possible by waiting for the full portfolio of ENC's required to use ECDIS. In addition, the earliest possible introduction of official electronic charting by way of "dual-fueling" should catalyze shipping companies to invest in ECDIS.

The action taken at NAV 44 is consistent with NOAA's strategy of producing ENC's for the nation's 40 largest ports, and expanding coverage thereafter as resources become avail-

able. For waters not covered by ENC's initially, NOAA Raster Nautical Charts will provide the official electronic chart coverage.

The recommendation to approve the RCDS standard was the culmination of a two-year effort by the raster-producing hydrographic offices in which NOAA's Office of Coast Survey played a major role.

In December, IMO's Maritime Safety Committee, which has final authority on this matter, is expected to formally approve the performance standards. Manufacturers will then have a set of criteria that governs the performance and reliability of ECDIS systems operating in a RCDS mode. ⚙

### NOTICE!

THSOA's web site,  
[www.USAhydrosoc.org](http://www.USAhydrosoc.org)  
is continually being improved. Try it! ⚙



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## A Letter From Pat

by President Pat Sanders,  
THSOA



At a recent hydrographic conference, it amused me to eavesdrop on the conversations between salespeople and hydrographers. Among other interesting things, you can hear how RTK GPS provides centimeter accuracy on all three axes, how multi-beam systems can survey to Class 1 standards with beams out to 75 degrees, and how new echosounders can track through "fluff" and deliver the true bottom. Although I have no personal knowledge on whether or not these new products can meet these claims, my personal experience makes me believe they are possibly exaggerations as to the actual capabilities of the gear.

(The next time a GPS salesman tells you their RTK GPS is accurate to 1 cm, make the following proposition: "Let's put it on a tripod and monitor it for 1 hour. If it wanders more than 3 cm, I get to keep it for free. If it stays within 2 cm, I'll buy it.")



Make sure you aren't standing behind the salesman so you don't get run over, as some backpedaling is about to occur.)

Most hydrographers don't have the necessary equipment, training or time to determine the accuracy of hydrographic survey equipment and whether or not it meets manufacturer's claims. They rely upon past experience and "word of mouth" anecdotes when determining what to buy.

Many times, anecdotal evidence is wrong or influenced by other outside factors, resulting in a poor decision when purchasing gear.

What would be a valuable asset to the hydrographic community is access to accurate, professional, unbiased evaluations of hydrographic equipment. Earlier this year, Karl Kieninger faxed me a copy of House Resolution 3164. It was a piece of legislation which describes the functions of the Administrator of NOAA.

One of the more interesting provisions was a "Quality Assurance Program," which would charge NOAA with the task of certifying any product that displays hydrographic data (e.g., electronic chart programs).

For a fee, ECDIS manufacturers would submit their equipment to NOAA which would then test them to determine if they met certain standards, thereby receiving a "NOAA-Good Housekeeping Seal" (my term) that they could use in the marketing of their product. Hopefully, NOAA would publish their test results, making the information available to everybody.

If such a program is implemented, I would like to see it expanded to include hydrographic hardware and software. Manufacturers who make quality products that live up to their specifications would have nothing to fear. Those who made sub-standard gear would get what they deserve.

If such a program cannot be implemented by NOAA, it may be something that THSOA should consider.



## INSMAP'98 coming soon

by Dr. George A. Maul, Florida Institute of Technology

The fourth international symposium on marine positioning, INSMAP'98, will be held on the

(See **Insmap**, page 3)

### DISCLAIMER

Mention in *The Seahorse* of commercial companies or products does not constitute an endorsement or recommendation by The Hydrographic Society. ⚙

**Insmap** (from page 2)

campus of the Florida Institute of Technology, Nov. 30-Dec. 4, 1998.

The purposes of the INSMAP symposia series are: to focus attention on special problems associated with positioning in the marine environment; to provide a timely forum and the opportunity for in-depth discussions and exchange of ideas; to identify immediate and future requirements and applications; to develop interdisciplinary international and interagency collaboration among numerous users and investigators; to enhance university education and public awareness; and to promote an international partnership in marine positioning.

Attendance at INSMAP'86, '90, and '94 each time was 150-200 persons from North, Central, and South America, Europe, Australia, Africa, and Asia. Conference proceedings have been published in a hardbound book format and can be found in many libraries and on the shelves of oceanographers, marine geodesists, hydrographers, navigators, geophysicists, instrument manufacturers and educators. Manufactures have brought displays and have interacted with symposium attendees during each event, and are invited to do so again.

INSMAP'98 will have sessions on the following topics: Marine Positioning Policy, Plans, Trends, and Requirements; Measurement and Instrumentation; Marine and Seafloor Positioning; Oceanic Gravity Models and the Marine Geoid; Absolute and Mean Sea Level; Height Systems; Acoustics and Bathymetry; Ocean Mapping and Seafloor Modeling; Shoreline Mapping; Standards for Marine Positioning; Marine Positioning Education; Marine Positioning in Geophysics; Outer Limits of the Continental Shelf according to UNCLOS; Tides, Currents, World Ocean Circulation; Tsunami Prediction (with a special emphasis this year on the

Caribbean), and Monitoring Global Change.

For further information please write to:

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**SPEED BUMP** DAVE COVERLY



## International Federation of Surveyors (FIG) XXI Congress

by Captain Donald Suloff, NOAA

**H**ydrographers of the world joined in celebrating the 30th anniversary of Commission 4, "Hydrography," during the XXI Congress of the International Federation of Surveyors (FIG) held in Brighton, England, during the week of July 19-26, 1998. The hydrographers' week included a strong technical program, a working meeting, a technical tour, and a social event which proved to be the highlight of the conference, while also enjoying the open forums and other social events of the congress.

Technical sessions covered such diverse topics as "Hydrography in Developing Countries," "Electronic

Charting," "Multibeam Sounding Systems," "Hydrographic and Tidal Systems," and "Hydrography and Education". Attendees were, as observed by a long-time attendee of these meetings, treated to some of the highest quality presentations ever assembled, both in content and in presentation.

We learned of the great need for hydrographic surveying by developing nations and what they are doing to help themselves. The session on electronic charting was particularly timely given the concurrent events at the IMO. We were updated on charting progress and unique difficulties experienced in Hong Kong while assembling and implementing a multibeam system. And we learned that Indonesia has a larger national hydrographic surveying fleet for surveying its coastal holdings than does the United States.

Commission 4's Wednesday working meeting was very well attended and promises to "kick off" an active four years. Proposed activities include three new working groups (all previous groups have been either completed or terminated), continuing participation in two FIG/IHO standing committees (the Technical Assistance and Cooperation Coordination Committee and the International Advisory Board on Standards of Competence for Hydrographic Surveyors), and the development and maintenance of the Commission's Internet home page.

Adam Greenland (new Commission 4 vice chairman) will head a working group focused on identifying new and emerging technologies to be tracked, preparing and distributing brief summaries of new developments, and identifying issues that may require further analysis by dedicated working groups.

Dennis St. Jacques (new Commission 4 chairman) will head a working group to identify hydrographic activi-

(See **FIG**, page 4)

**FIG** (from page 3)

ties that contribute to sustainable development with emphasis on the coastal zone and develop associated guidelines for hydrographers.

A final working group (as of yet without a chair) will address the preparation of guidelines for the collection of hydrographic data that is compliant with the S57 data standard and guidelines for the transformation of existing data sets to the S57 data sets.



On Thursday, 34 delegates toured the Port of London Authority facility at Gravesend, England. The Port of London Authority is responsible for surveying, providing pilotage, supporting the vessel traffic separation system, and spill control and cleanup for the Port of London. Although the Port of London has decreased substantially in traffic, it still is a major port, including 95 miles of waterway from the mouth of the Thames River to above London. The attendees were able observe many of these operations and interactions, and went out on PLA boats to actually survey a small portion of the river.

Following this tour, these delegates were joined at the historic Trafalgar Tavern by an additional 90 guests for a cruise from Greenwich to the House of Parliament and back on the finest dinner boat on the

Thames—the Silver Barracuda. Among the guests were many of the founding fathers and former chairmen of Commission 4, including Tony O'Connor, Steve Ritchie, David Haslam, and Keith Millen.

The cruise included unique views of the Thames Barrier, the Tower Bridge, the Tower of London, the HMS BELFAST, St. Paul's Cathedral, the Globe Theatre, Big Ben, Westminster Abbey, and the House of Parliament. Attendees were served a sumptuous meal and then regaled by Steve Ritchie on earlier days, events, and anecdotes associated with Commission 4. ✧

## The world's shortest books

from the Internet

- "My Plan to Find the Real Killers," by O.J. Simpson
- "To All the Men I've Loved Before," by Ellen DeGeneres
- "The Book of Virtues," by Bill Clinton
- "The Difference Between Reality and Dilbert"
- "Human Rights Advances in China"
- "Things I Wouldn't Do for Money," by Dennis Rodman
- "Al Gore: The Wild Years"
- "Amelia Earhart's Guide to the Pacific Ocean"
- "America's Most Popular Lawyers"
- "Career Opportunities for Liberal Arts Majors"
- "Detroit—A Travel Guide"
- "Different Ways to Spell 'Bob'"
- "Dr. Kevorkian's Collection of Motivational Speeches"
- "Everything Men Know About Women"
- "French Hospitality"
- "George Foreman's Big Book of Baby Names"
- "How to Sustain a Musical Career," by Art Garfunkel
- "Mike Tyson's Guide to Dating Etiquette"

- "101 Spotted Owl Recipes," by the EPA
- "The Amish Phone Directory"
- "The Engineer's Guide to Fashion"

✧

## Advances in Hydrographic System Display Information

by Pat Sanders, President, Coastal Oceanographics

When hydrographers examine hydrographic survey system it is almost taken for granted that all systems will accurately read and time-correlate data from positioning systems, echosounders and other hydrographic systems. What most hydrographers notice about new systems is the upgraded capability to display background information in real time.

Since the late 1980s, many hydrographic packages have allowed users to import vector-based information in DXF (AutoCAD's Drawing Exchange Format). The DXF format was an ASCII format, where map features were described as a series of points, lines, polylines, curves, arcs and other drawing elements. These elements could be saved in either 2-D (X-Y) or 3-D (X-Y-Z) formats. (Figure 1.)

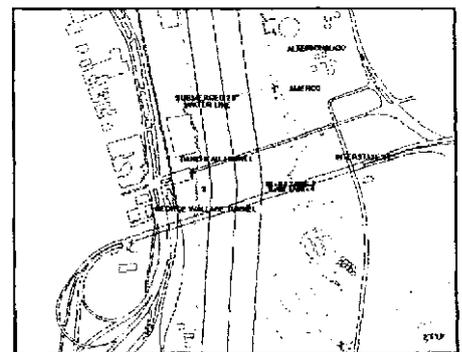


Figure 1. — DXF background file of Mobile, Alabama

Most DXF elements were registered using a state plane coordinate

(See **Advances**, page 5)

**Advances** (from page 4)

system. This allowed programmers to translate the elements to the screen. The problem with DXF is that it was a huge format and required many megabytes of data to describe complex areas.

The U.S. Army Corps of Engineers (USACE) was one of the early users of Microstation. In fact, many USACE districts were required to develop their hydrographic end products in Microstation.

In 1993, Coastal Oceanographics became the first to offer real-time hydrographic data collection with a Microstation DGN file in the background. See figure 2.

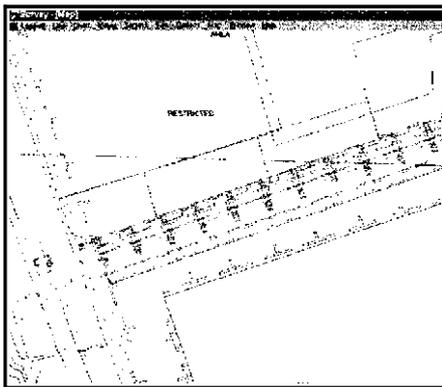


Figure 2. — DGN background file of lock and dam on the Ohio River

Microstation DGN files are binary files. They contain the same basic elements you find in a DXF file, but can store them in a smaller file. Information is encoded which allows users to re-calculate the 3-D position of each element on a state plane or other projection.

Many hydrographers want to see depth information displayed in real time. This allows them to make real-time comparisons of depth. It can also be used by those towing side scan or ROVs to anticipate the need to raise or lower the ROV based on the changing bottom.

The first implementations in hydrographic packages allowed users to

import depth contours or text information using DXF or DGN background files.

A more graphical approach was used by Coastal Oceanographics and others by allowing the import of color-coded depth matrices. This development also provided the opportunity to "fill" the matrix in real time. This can be used now for real-time coverage diagrams or for remapping the bottom based on the depth of a dredge cutter head. (Figure 3.)

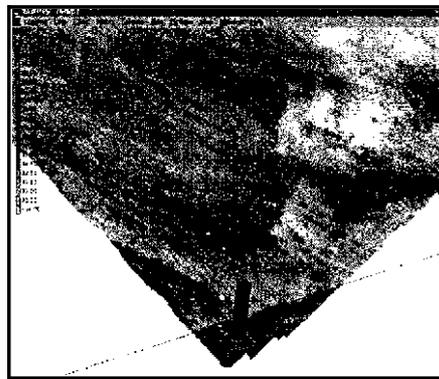


Figure 3. — Color coded depth matrix (No color shown here.)

Many hydrographic agencies operate offshore or in congested harbors. These agencies have been the driving force in the incorporation of real-time electronic chart data in hydrographic survey packages.

Many packages are now being upgraded to allow the display of electronic chart data in real time. Electronic chart data comes in vector for-

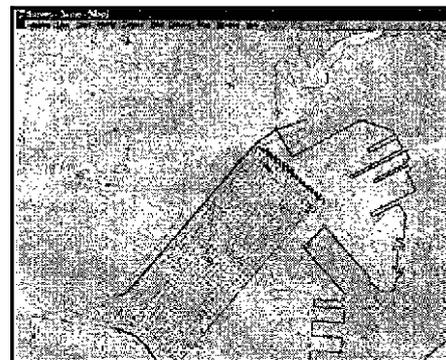


Figure 4. — S-57 electronic chart data displayed in HYPACK. (No color shown here.)

mat (C-Map, S-57, VPF), raster formats (BMP, TIF), or some combination of the two. (Figure 4.)

With raster formats, users are pasting a picture of the chart in the active chart window. As the user zooms in on an area, buoys continue to grow in size. The user has no control over what objects are displayed.

With vector-based formats, buoys and other symbols remain the same size as the user zooms in or out. The user may also be able to control which objects are displayed and what types of symbols (International vs. USA) are used.

One of the more interesting developments in background information is the import of aerial photographs. Primarily used on construction projects, HYPACK is one of the few packages which allow users to import orthophoto data in TIF format. See figure 5.

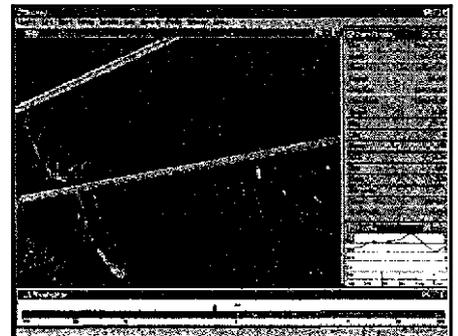


Figure 5. — Orthophoto data real-time survey display (TIF). (No color shown here.)

These TIF files normally are accompanied by registration data, which provides a real-world coordinate for the corner of the photo and a 11 scale per pixel" of the photo.

What is unique is that these photos can be rotated to any orientation (rather than just "north up"). HYPACK also allows users to combine background formats. This allows

(See **Advances**, page 6)

## Advances *(from page 5)*

users to display an engineering drawing in DXF/DGN over the top of an orthophoto picture.

As hardware continues to improve, the information displayed in the background of your hydrographic survey package will continue to allow the import of more information. ✪

## VERY PUNNY!

*source unknown, forwarded by e-mail*

A man went into a cafe. The waitress asked him what he wanted. "A quickie," the man replied. The waitress gave him a dirty look and asked him again.

"I want a quickie," the man repeated. The waitress slapped his face and ordered him out. As he was leaving, another diner said to him, "I think it's pronounced quiche." ✪

## Mail Bag

[This was received as a letter to the editor, but it is also more like an article because of its length. Perhaps one or more readers would like to comment on it. Also, the letter from Pat Sanders in this issue seems to be pertinent to the discussion-Ed.]

**MULTIBEAM ECHO SOUNDERS** — An accurate depth measuring tool or merely a modern wire sweep?

Saudi Aramco took delivery of a hull-mounted Kongsberg Simrad EM 1000 multibeam echo sounder in 1994, and the following year we purchased a portable Reson Seabat 9002 for our survey launch. We expected to be fully operational after short commissioning periods, but four years later, we are still struggling to come to grips with this technology. I think it is fair to say we have a love/hate relationship with it.

We are very enthusiastic about the "sun illuminated" or "shaded mean" plots. These products show sea floor topography features no bathymetric plot could ever show, regardless of scale and details or the experience of the observer. They portray as-built information of offshore pipelines and cables to a much greater accuracy than obtainable from side scan sonar mosaics.

For the previous generation of hydrographers who could "read" the sea floor from an analogue trace, lack of a paper product is worrisome. Younger hydrographers may have an easier time accepting the statistical data handling. The hydrographer with a foot in each camp is left with a nagging doubt whether the sounding just deleted was spurious or anomalous. The decision to grid or not to grid the data and which method to choose to decimate the ever increasing data volume will continue for a very long time.

A cursory glance through sales literature for multibeam echo sounders indicates almost all manufacturers promise hydrographic survey accuracy (IHO SP-44 survey order ?) across the full swath. No wonder then that we enthusiastically embraced this new technology to gain all the promised benefits. They could not all be wrong, or could they? Recent survey results indicate we may not yet really understand this technology and that all is not quite as straightforward as one hoped.

Our standard procedure for pipeline inspection is two runs with multibeam echo sounder and side scan sonar parallel to the pipeline followed by an ROV dive at selected locations. During inspection of a large pipeline, we noticed top-of-pipe depths in the multibeam data significantly less than expected by two to three times the diameter of the pipe. This occurred along extended segments of the pipe, only to disappear and then reappear at apparently random intervals. The side scan sonar records did not substantiate this increase in pipe height. Further trials indicated that the phenomena happened when the pipe was off to the side, away from nadir, and only when the incident angle of the swath on the pipe was 90 degrees, or very nearly so.

When we first reported this, Simrad responded by sending a new firmware upgrade to the EM 1000, the latest of several upgrades since we took delivery of the system. This reduced the erroneous soundings somewhat but did not eliminate the problem. We have yet to determine if this modification has affected the echo sounder's sensitivity in any other way. Subsequently, Simrad sent us a technical note describing the reason for the incorrect

depths, but offering no solution to the problem. This description was included in the first draft of this article. However, when it was sent to Simrad for review prior to publication, they responded:

You can use the [following] statement as Kongsberg Simrad's comment to your observations. However, the technical note from Erik Hammerstad was sent to you as private and confidential information, not to be reported either to the press or to competitors. I will therefore request that Erik's technical note be taken out of your manuscript before it is submitted for publication.

"When discussing whether these multibeam systems comply with IHO S-44, one should be aware that the accuracy of a seabed mapping system is defined as a statistical measure, and the accuracy limits are defined for a confidence level of 95 percent. This means that it is allowed for up to 5 percent of the soundings to have errors larger than the set limits. Such errors will for the most part occur where there is a particularly difficult acoustic phenomenon or environment. The pipeline that you discuss is one such phenomenon.

"The Simrad EM 1000 multibeam system has been tested by several independent institutions, such as Rijkswaterstaat and Statoil, and in each test case found to be compliant with the IHO S-44 standards."

Why the head of the Hydrographic Department in Kongsberg Simrad should wish to prevent publication of a technical note issued to one of the company's customers is not clear; one can only speculate. The statement about the 95 percent confidence level is, of course, correct, even if the errors within the 5 percent limit really bite you. In a "normal" survey of a given area, the overall accuracy would most likely be within the 95 percent confidence level. However, a large portion of our work consists of pipeline inspection surveys as described above. Under these, for us normal, conditions the surveys fail to meet the accuracy requirements.

Trials with our Seabat 9002 indicated it also displayed the same erroneous soundings under identical conditions. Jens Steenstrup of Reson explains:

"... in 18 m water depth, let us consider the nadir case, and the 60 degree off nadir case. The 9002 uses a center of gravity amplitude detect, and reports the given range of the bottom as being in the center of the beam. The 81xx series uses the same center of gravity bottom detect on sharp returns that normally occur at nadir

*(See Mail Bag, page 7)*

**Mail Bag** (from page 6)

and phase detection on low grazing angle bottom intercepts, to more accurately report the range to the center of the beam at shallow grazing angles. The processor automatically determines which bottom detect method to use for each beam.

"Nadir case: The Nadir beam gets the strongest return of the top of the pipe line because this represents normal incidence. The footprint of the beam is approx. 0.5 meter, so most of the time one full beam will hit the pipeline, and it will report the correct depth. The neighboring beams will also receive energy from the pipeline, but the normal incidence return from the bottom will be strong as well, and the bottom detect will correctly lock on to the bottom.

The number of hits on the pipeline will vary, but my guess is that in 18 m water depth you will see 2-3 beams reporting the pipe line depending on the line-up of beams on the pipeline. (Center of a beam hit the top of the pipe, versus the top being right between two beams). When you are on top of the pipeline the number of beams reporting the pipeline is not that critical since it affects only the measured width of the pipe line, whereas the height is always correct. The situation however is different when the pipeline moves off to the side.

60 degrees off Nadir case: Now the range to the target from the sonar has increased to 40 m, and hence the footprint is 1 m wide, and this translates into a height uncertainty of 80 cm. The strongest acoustic return from the pipeline will come from the normal incidence of the pipe which is off the side a bit. This return will also energize the two adjacent beams, and because the bottom offers such a poor return, the bottom detect may lock on to the range the pipeline, but report the angle from the center of the beam. This can easily add a beam width (1 m) to the height reading of the pipe line, again because you have to consider that the beam center will move up and down the pipe line in a random fashion. . .

" . . . From a sonar point of view, this is a classical example of accurately resolving a target shape-it requires a resolution three times better than the target to resolve it. In this case the footprint of the sonar shall be no greater than 10 inches at the given range. In this example the 8125 would just about make it with its 0.5-degree beam. I also suspect that at these low grazing angles its high resolution would allow it to use phase detection to accurately find the position of the top. If we can acquire raw data with the 8125, we could probably fine tune this. . .

" . . . To summarize, the 8125 will exhibit 3-4 times fewer errors than the 9002. . . I would not rule out that we could design a special bottom detection to reduce the height errors off nadir further, but it would require that we record raw sonar data from an 8101 (or 8125), so we can play with the bottom detect . . .

" . . . It is possible that the reflection from the pipeline saturates the beam, but I suspect that what you are seeing is "leakage" between beams simply because the beam is the measure for "half power points," but that signal of more than double power can punch through even if they are outside the stated beam width . . ."

The fact remains that erroneous soundings occur under the above conditions and neither manufacturer offers a real solution to the problem. I suspect that other multibeam echo sounders behave similarly under the same conditions.

Consequently, we cannot trust soundings collected off nadir, but have to suspect erroneous depths whenever we encounter targets with a strongly reflecting surface perpendicular to the swath. Admittedly, the error will always be on the safe side, but how many ports may already have restricted vessel access or unnecessarily mobilized dredging spreads?

So what are we to do? Should we accept surveys performed with multibeam echo sounders as merely an indication of safe water depth, a modern wire sweep? Are we to ignore the problem and accept the depths as recorded? Are we to investigate all shoal soundings detected away from nadir? The multibeam echo sounder will continue to be a primary survey tool for our organization, but we must develop our knowledge of the technology through debates and education, in order to apply it in an intelligent manner. We will continue to adhere to the policy that no bathymetric survey is complete without 100 percent side scan sonar coverage. This means an independent, towed side scan sonar fish, not the side scan offered with multibeam echo sounders. In some cases, the latter is only a different processing of the same signal, and all multibeam systems obtain sonar images from a less than desirable position of the transducer.

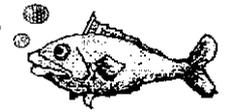
I do not automatically believe all advertising and I understand the pressure of matching a competitor's claim for comparable equipment. I have always taken the claim of hydrographic accuracy across the swath as flirting with the truth and accepted that a certain number of the outer beams would have to be eliminated to obtain clean data sets. But surely, a blanket claim of

hydrographic accuracy is not fair or complete product declaration when it is only achieved under certain conditions some of the time. Manufacturers have an obligation to ensure that their consumer information can be substantiated and that the users are informed about system limitations. Otherwise they must share liability when hydrographers unknowingly overstate the accuracy of rendered surveys.

Claus Fjord Christensen  
Chief Hydrographer  
Saudi Aramco

P.S. The above statements and opinions are my own personal views and should not be construed as the official position of Saudi Aramco in these matters.

## Salty Facts



from "Naval Meteorology and  
oceanography Command News,"  
Cathy L. Willis, Ed.

**F**or many years, the voyage most dreaded by seamen in sailing ships was that around South America. Whether their course took them through the Straits of Magellan or around Cape Horn, they would likely have to endure mountainous seas, gale force winds and treacherous coasts.

The relics of many ships that failed to make passage dot the shore along the route. Ships that succeeded in making passage often limped into the Falkland Island's Port Stanley seeking repairs. Many of these, damaged beyond repair, never left, making Port Stanley one of the world's largest maritime graveyards.

Some of these hulks are the lone survivors of certain types of 19th century ship construction. A number of them are being restored and will be returned for display in Europe or the United States.

(See **Salty**, page 8)

## Salty (from page 7)

### CARRY ON:

While the order “carry on” now means only to proceed with any duty, it was originally a specific order not to shorten sail, but to carry on all canvas the ship would stand unless stress or bad weather dictated otherwise. ✪

## Shallow-water multibeam echosounding on NOAA Ship RAINIER—Q and A

by Lieutenant Commander Guy T Noll, NOAA

The installation of a shallow-water multibeam (SWMB) echosounder on the third 9.5-meter launch of the NOAA Ship RAINIER was completed in July. This completes the implementation of these launch-deployed systems, leaving three launches outfitted with single-beam equipment for nearshore and deeper-water work. The first two launches were successfully converted to the Reson 8101 echosounder in March.

The intervening time has been used to integrate and test the various systems and train the users, almost all of whom were new to this method of surveying. In addition, many man-hours were dedicated to developing new USL-Caris processing algorithms, refining the interface of the Triton-Elics International's Isis acquisition software to enhance data collection in the punishing Alaskan environment, and developing a processing plan to meet current standards in an efficient manner. It has certainly been a busy six months for everyone involved! The answers to the two most common questions are stated below:

### Q. How are the launch systems configured?

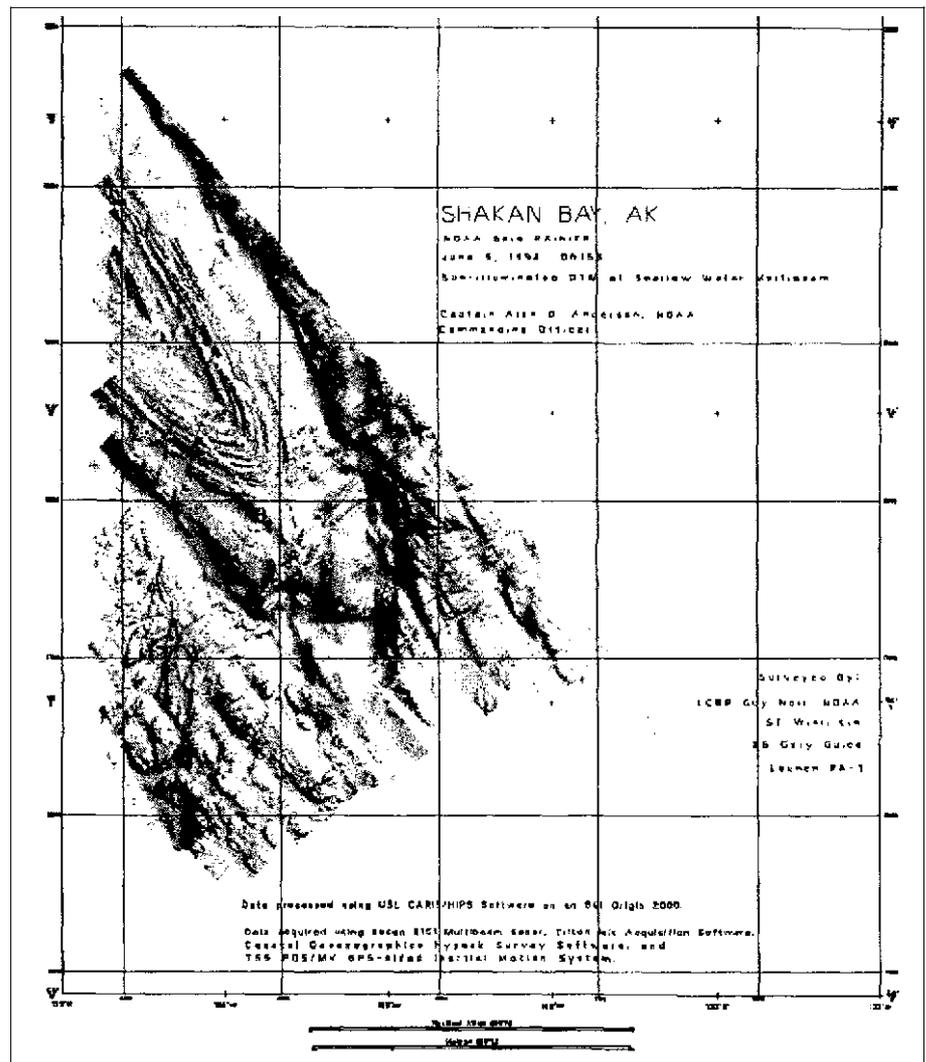


Figure 1. — Sample product from Caris HIPS. Multibeam data collected in Shakan Bay, Alaska.

A. Each of the three launches is similar in configuration. The titanium-head Reson 8101 is hull-mounted near amidships, just forward and below the centroid of the launch. The Inertial Measurement Unit of a TSS Pos M/V is located aft and within a meter of the echosounder under the deck of the main cabin. The Reson and Pos M/V feed data to the Isis computer through serial and ethernet cabling for all data logging in XTF format. The Isis performs most of the control functions of the Reson through a return serial cable.

Hydrographic line planning and control is accomplished by a separate

Hypack PC connected to the Isis via a serial line. Hypack single-beam (SB) echosounder (either a Raytheon DSF-6000N or a Knudsen 320M) data is collected simultaneously with the SWMB data for comparison purposes.

Two to three SeaBird sound velocity casts are acquired and processed during each launch day using the Hypack PC as well.

### Q. What do we do with all the data?

A. To our knowledge, this is the first multi-platform SWMB installation.

(See **Rainier**, page 9)

## Rainier (from page 8)

Our primary concern is dealing with the paradigmatic change from the economies of scale associated with six single-beam launches plus ship system to a higher quality-conscious 3 SWMB plus 3 SB and ship system.

At the end of the day, with the launches safely in their davits, all SWMB data (about 100 Mbytes per launch) are moved via T100 line to the ship's processing computer. This is a SGI Origin 2000 server and RAID box, where data are processed using Caris HIPS in an X-windows environment on high-end Intel PCs. After the requisite data cleaning and quality assurance checks are made, a conservative subset of the collected soundings is translated to dBase format for field sheet production.

Figure 1 (page 8) is an example of multibeam data collected in Shakan Bay, Alaska, using this system.

As we develop expertise in the use of the Caris tools and tailor them to our processing methods, we plan on moving more of the processing to the HIPS software to take advantage of the computing power of the SGI. ✧

## You gotta love IT!

from "Naval Meteorology and Oceanography Command News,"  
Cathy L. Willis, Ed.

**I**nformation Technology (IT) is exploding. Don't believe me? Consider the following bits of trivia:

- If computers were still made out of vacuum tubes, a Pentium would be the size of the Pentagon.
- The first commercial transistor (circa 1951) was about the size of an M&M candy. By 1958, the integrated circuit allowed about 1,000 transistors to fit in the same space. Current technology squeezes 5.5 million transistors in less than a square inch; that figure

should number in the billions early in the next decade.

- Intel's cofounder, Gordon Moore, recently said: "In a single year, there are more transistors made than raindrops fall in California, and producing one costs less than printing a single character in a newspaper."

## Welcome to the future!

Congratulations, you're among the six billion people chosen to witness the dawning of a new era! Think about it for a minute. The alarm that woke you up this morning? **Computer.** The watch on your wrist? **Computer.** Your microwave oven, the controls for the fuel injection and transmission in your car, the remote for your TV? **Computer, computer, computer.** We accept these modern conveniences as part of life, but 20 years ago, none of them even existed!

If you're in that vast, but shrinking, majority that would just as soon roll back to the good old IBM Selectric, take heed of CINCPACFLT ADM Archie Clemin's warning. In his speech, "Information Technology for the 21st Century," he said, "The stakes are tremendous. Without a strong and common system of information technology, our armed forces will be left to flounder in the ways of the past . . . With it, they will be empowered with an enormous force multiplier . . . and will be ready to face the new challenges of the 21st century." To paraphrase the admiral, it's IT or bust. Two things are certain: We need IT to do our jobs, and IT is here to stay. Not only can we use IT to do the job quicker and better, IT can help us do more, much more, than ever before. ✧

A candle loses nothing by lighting another candle.

—Father James Keller (1900-1977)  
Founder, The Christophers

## CLOSE TO HOME JOHN MCPHERSON



"Will you knock it off with the 'Chicken Soup for the Soul' excerpts!"

## 1999 U.S. Hydrographic Conference news

by President Pat Sanders, THSOA

**T**he 1999 U.S. Hydrographic Conference will be held at the Mobile Convention Center from April 26-29, 1999, in Mobile, Alabama. Hosted by The Hydrographic Society of America, the conference will be co-sponsored by the U.S. Army Corps of Engineers, NOAA, the U.S. Naval Oceanographic Office and the Canadian Hydrographic Service.

The conference will feature three days of technical sessions, featuring Inshore Hydrography, Offshore Hydrography and Data Presentation. In addition, technical training sessions will be hosted by many of the leading manufacturers of hydrographic equipment.

On-line registration for the 1999 U.S. Hydrographic Conference is available at the THSOA web site ([www.usahydrosoc.org](http://www.usahydrosoc.org)). The cost is US\$150 for members of THSOA, THS Branches or co-sponsoring organizations and US\$250 for all others.

(See **Conference**, page 10)

## Conference (from page 9)

Registration provides access to all technical sessions, training sessions, on-the-water demonstrations, exhibits and hospitality functions.

Companies interested in exhibiting at the 1999 U.S. Hydrographic Conference should contact Mr. David Clarke ([dcassoc@worldnet.att.net](mailto:dcassoc@worldnet.att.net); 201-828-9466) regarding booth availability and terms. Exhibit booths cost US\$900 for THSOA and THS Branch Members and US\$1,300 for all others.

The 1999 U.S. Hydrographic Conference provides a unique opportunity to target your products and services to hydrographers from North America. Expected attendance is 600-1,000 paid registrations.

Hotel space for the conference has been reserved at the Adams Mark Hotel (Mobile). Located directly across from the convention center and connected with a sky bridge, the Adams Mark has reserved 300 rooms at the U.S. Govt. per diem rate (\$55/night). Additional rooms at other hotels are available within walking distance of the Mobile Convention Center. ✪

## More about the 1999 U.S. Hydrographic Conference

by Jerry Mills, NOAA, Office of Coast Survey and David Clarke, David Clarke and Associates, LLC

The technical program for next April's U.S. Hydrographic Conference in Mobile, Alabama is taking shape nicely. Abstracts have been received on a wide variety of topics including multibeam sonar, motion sensors, side scan sonar, Lidar, real-time current and water level measurements, electronic charts, NAVOCEANO, new survey vessels/vehicles, and standards.

However, not all time slots have

been filled as of the publication date of this issue of *The Seahorse*. One-page abstracts will continue to be accepted to fill in the program. It is expected that the Program will be finalized by October 1. Differing themes are planned for each of the three meeting days: Inshore Hydrography, Offshore Hydrography and Data Presentation. Abstracts should be submitted to the Program Chair, Karl Kieninger via e-mail at:

[hydromarine@compuserve.com](mailto:hydromarine@compuserve.com).

For more information, contact Karl via telephone at (201) 295-1443.

The demand for exhibitor space for the conference has been exceptional. Originally planned for 60 spaces, the hall has been increased to 81 spaces. At the time of this article, only 14 spaces remain and are expected to fill quickly. Exhibitors are representing all levels of equipment manufacturing, software engineering (including ECDIS), GPS and robotic systems. Several manufacturers have also indicated that they will be using this show to reveal some of their new equipment.

Should the demand increase beyond the planned 81 booths, arrangements will be made to incorporate the late arrivals without sacrificing any current assignments. Priority will be given to those exhibitors who have paid the minimum 50 percent on time. Exhibitors who have not paid up can expect to have their assignment changed, so please make sure your account is current.

Many exhibitors have requested exhibitor kits, and these will be mailed out around October 1. Each exhibitor will be notified prior to mailing, and if there are any questions, please contact David Clarke via e-mail at: [dcassoc@worldnet.att.net](mailto:dcassoc@worldnet.att.net), or telephone at (201) 828-9466.

The Adams Mark Hotel, located adjacent to the Mobile Convention Center, will be the host hotel for the conference. With room rates of \$55

per night and a low conference fee of \$150 for THSOA members, this will be the most affordable conference ever. Make plans to attend now! Additional information on the conference can be obtained from The Hydrographic Society of America's web page at:

<http://www.usahydrosoc.org>. ✪

CLOSE TO HOME JOHN MCPHERSON



Hoping to make its graduation ceremony more entertaining, Cranston High enlisted the services of a fortune-teller.

## Memo to hydrographers about next year's OTC'99

Marine Geodesy Committee  
Marine Technology Society  
Memo

From: Dr. Patrick Fell, Chairman

Date: 06/18/98

Re: SPECIAL SESSION ON HYDROGRAPHY / OFFSHORE TECHNOLOGY CONFERENCE

1. The 1999 Offshore Technology Conference (OTC'99) will be held 3-6 May in Houston, Texas. OTC is the premier forum for offshore technology. For example, more than 43,000 people attended

(See OTC'99, page 11)

**OTC'99** (from page 10)

- OTC'97 and over 1,700 companies exhibited at OTC'98.
2. The 1999 OTC conference is sponsored by many participating organizations including the Marine Technology Society. As Chairman of the Marine Geodesy Committee of MTS, I was recently asked to organize a special session on hydrography for OTC'99. In response to this request I am circulating this memo to solicit support for the conference. I am looking for 6-10 papers on related technology and applications in hydrography and two volunteer(s) to chair the session. In the near-term, I am looking for titles for possible papers. I would like to receive these by 15 July. Formal abstracts are due in September and manuscripts in February.
  3. If you can support this session please e-mail me at:  
**pfell@nswc.navy.mil** or mail me at the address below. Additional information on the conference can be obtained via:  
**tech-prog@spelink.spe.org.**
  4. Thank you for your support. Please call me at (540) 653-8200 if you need additional details. Please pass this memo to parties who would have an interest in this session and in OTC'99.  
Dr. Patrick Fell  
5822 Jackson Road  
Fredericksburg, VA 22407-6709  
✪

**Announcements . . .**

**G**ary Chisholm, Product Manager Marine Systems, Trimble New Zealand, has told us that the New Zealand region of The Hydrographic Society now has its own web

# The Link Foundation

## Doctoral Candidate Fellowships in Ocean Engineering and Instrumentation

On the basis of an application to the Foundation in the form of a research proposal, awards will be made to doctoral candidates enrolled in academic institutions located in the United States and Canada. The award will consist of a grant of \$20,000. Several awards will be made each year.

*For additional information, please write to:*

Dr. George A. Maul, Administrator  
Ocean Engineering & Instrumentation Fellowship  
Florida Institute of Technology / Link Building  
150 West University Boulevard  
Melbourne FL 32901 USA

site: <http://www.hydrosoc-org.nz>.  
Check it out!



The Hydrographic Society's UK Southern Region, in association with Trimble Navigation, is to hold a GPS Workshop at the Science Museum, London on Nov. 26, 1998, from 1330 to 1700..

Proceedings will deal with a wide range of issues and applications involving use of GPS including coastal protection and marine surveys, precise vessel heading and tide and swell compensation. Also, there will be presentations on the General Lighthouse Authority's new Differential GPS service. Speakers include representatives from both industry and local government.

Cost of registration, which includes lunch and afternoon tea, is £20

for Society members and £25 for non-members.

Further details are available from Colin Waters, HR Wallingford, Howbery Park, Wallingford, Oxon OX10 8BA  
Tel: 01491 822242,  
Fax: 01491 825428,  
e-mail: [cbw@hrwallingford.co.uk](mailto:cbw@hrwallingford.co.uk).

The workshop will be followed by The Hydrographic Society's AGM from 1730 to 1830. Then, from 1830 to 1930 a presentation/demonstration of items from the Science Museum's reserve collection of hydrographic and oceanographic equipment will take place. ✪

There is more in us than we know. If we can be made to see it, perhaps for the rest of our lives, we will be unwilling to settle for less.

— Kurt Hahn (1886-1974)  
Founder. *Outward Bound*

[Here are two examples of photographs from the NOAA Library's web page:

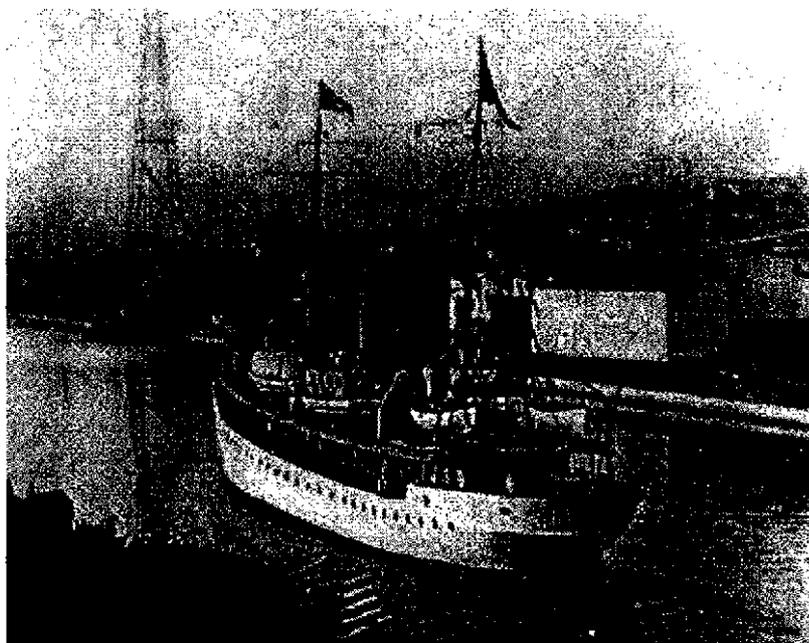
<http://www.lib.noaa.gov>

I'm particularly attached to these ships. I was assigned to the old SURVEYOR as an ensign in 1955 working on hydrographic surveys in the Shumagin Islands.

Her boilers cracked, and that year proved to be her last on the job. We were towed back to Seattle from Kodiak, Alaska, in mid-summer 1955.

Later, I was the executive officer on the Ship MARMER engaged in current surveys in the New York Harbor area in 1959.

Al "Skip" Theberge has improved the NOAA Library site tremendously since his article in *The Seahorse*, Spring 1998. Check it out! — Ed.]

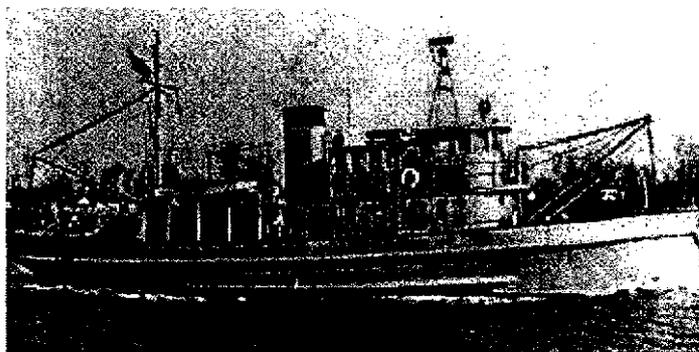


Coast and Geodetic Survey Ship SURVEYOR

In service 1917-1956. Photo date: 1925

Location: Seattle, Wash.

Credit: C&GS Season's Report, Sobieralski, 1925-82



Coast and Geodetic Survey Ship MARMER

In service 1957-1968

Credit: NOAA Office of NOAA Corps Operations

## Update on NOAA's hydrographic survey contracting

by Brian Greenawalt, NOAA, Office of Coast Survey

As of Aug. 18, 1998, NOAA has awarded four contracts for hydrographic surveying services and is in the process of awarding three others. These contracts are three-year, indefinite-delivery type contracts against which NOAA issues individual task orders. The contracts which have been awarded are in the approaches to Calcasieu, Louisiana; Sabine, Texas; Galveston, Texas; and Nikiski, Alaska. These went to C&C Technologies, Inc., John E. Chance & Associates, Inc., Science Applications International Corporation, and Terra Surveys LLC, respectively.

To date, the three contractors in the Gulf of Mexico have nearly completed field work on their initial task order and are about to commence operations on their second. Terra Surveys LLC has completed two task orders near Nikiski and will soon start their third.

Racal Pelagos, Inc. was selected to perform surveys in Cook Inlet, Prince William Sound, Southeast Alaska, and David Evans & Associates, Inc., was selected to perform surveys in California. NOAA anticipates awarding these contracts in September and October, respectively. Source selection is still underway for the North Carolina-South Carolina-Georgia-Florida contract, and should be completed by Sept. 15.

In 1999, NOAA may announce a contracting opportunity for the east coast area from Virginia to Maine. Also, pending the funding outlook for fiscal year 2000, NOAA will announce contracting opportunities in the Gulf of Mexico when the current contracts expire. ✧

## ACSM conference to be held in Portland, Oregon

by Jerry Mills, NOAA Office of Coast Survey

The American Congress on Surveying and Mapping will hold its annual conference in Portland, Oregon on March 15-18, 1999. As in past conferences, there will be several papers devoted to hydrographic surveying. In addition, instructors from NOAA's Office of Coast Survey and the U.S. Army Corps of Engineers will present an all-day workshop on hydrographic surveys that support nautical charting, dredging, coastal engineering, and related marine construction activities. Survey procedures and specifications will be emphasized, along with service contract requirements for those agencies.

This workshop will provide a broad overview of the topics that will be included in the ACSM Hydrographer Certification examination which will be given later in the week. However, given the time limitations, it is not an adequate preparation for the examination. For more information, visit the ACSM web site at: <http://www.survmap.org/educat45/educat01.htm>. ✧

## NEWS FROM THE CHAPTERS



### HOUSTON CHAPTER

[News from Houston is somewhat incomplete, but here is what I have.—Ed.]

The formal May meeting was canceled due to OTC week. However, an alternate activity, "THE MOTHER OF ALL REUNIONS

III," was held at the Hooters on Westheimer. A fun time was had by all. Thanks to Richard Seeger for sponsoring this event.

The June meeting was to feature a presentation of the Houston-Galveston Ship Channel Deepening and Widening Project by Grady Bryant, Robert Roman and Dana Price of Gahagan & Bryant Associates.

The July meeting featured a presentation on digital side scan mosaicking, processing and data acquisition entitled "Digital Data Acquisition . . . Why Bother?" by Dr. Ceri Reid of CODA Technologies. Due to inclement weather, attendance was only 15 people.

The August meeting featured a forum on Multibeam technologies. A four-person panel from the multibeam industry was selected which included Al Rogeau of Odom Hydrographic Systems and President of the Gulf Coast Chapter of The Hydrographic Society of America, Jim Manning from SeaBeam Instruments, Jeff Garlike from Reson and Chris Hancock from Simrad. The forum's format was a predetermined question and answer session with further questions welcomed. This meeting was extremely well attended-72 people.

The topic for the September meeting will be acoustic positioning. The speaker for the presentation will be Keith Victory of Sonardyne.

Houston also included a call for volunteers to allow the students from a new class at Texas A&M to visit their surveying projects.

☆☆☆☆

No news was received from the other chapters. ✧

**"We won't have a society if we destroy the environment."**

—Margaret Mead

## People say the stupidest things:

• You know, your nose looks just like Danny Thomas's.  
— President Reagan to the Lebanese Foreign Minister

• I'm not indecisive. Am I indecisive?  
— Jim Seibel, mayor of St. Paul, Minn.

• Outside of the killings, [Washington] has one of the lowest crime rates in the country.  
— Mayor Marion Barry, Washington D.C.

• You mean there are two Koreas?  
— U.S. Ambassador-designate to the Far East during Congressional hearings

• Wait a minute! I'm not interested in agriculture. I want the military stuff.  
— Former senator from Virginia William Scott — once voted the dumbest man in Congress — during a Pentagon briefing in which army officials were discussing missile silos

• The streets are safe in Philadelphia, it's only the people who make them unsafe.  
— Frank Rizzo, former mayor of Philadelphia

• I never said I had no idea about most of the things you said I had no idea about.  
— Former Assistant Secretary of State Elliot Abrams defending his veracity before a 1987 congressional hearing  
  
— From *The 776 Stupidest Things Ever Said*, by Ross and Kathryn Petras

*And my parents finally realize that I'm kidnapped and they snap into action immediately: they rent out my room.*  
— Woody Allen

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### Deep thought for the month

If you're ever stuck in some thick undergrowth, in your underwear, don't stop and think of what other words have 'under' in them, because that's probably the first sign of jungle madness.  
— *Deep Thoughts*, by Jack Handey

### Headlines of horror

The University of Oregon team nickname is the "Ducks," which led to the following actual headline in the *Seattle Times* when an Oregon women's team lost to a team from the University of Washington (the "Huskies"):  
HUSKY WOMEN SUBDUE DUCKS.  
— Dave Barry

Razors pain you  
Rizers are damp;  
Acids stain you;  
And drugs cause cramp.  
Guns aren't lawful;  
You might as well live.  
— Dorothy Parker

### DAVID LETTERMAN'S TOP 10 LIST:

#### 'Signs that the Other Beatles Don't Like You'

- 10) Whenever you start talking, they say, "Let it be, bonehead."
- 9) You're making less money from the reunion than Pete Best
- 8) You find out you were the inspiration for "Nowhere Man."
- 7) If you didn't see it in T. V. Guide, you wouldn't have known about a reunion
- 6) The only way you can get their attention is by eating Christmas ornaments.
- 5) After you spent the week working on a painting for the cover, they decide to go with "The White Album."
- 4) They make you sit in the back of Air Force One.
- 3) When they hear you play, they say, "Wow — you're even worse than Ringo!"
- 2) They won't stop singing, "We hate you — yeah, yeah, yeah!"
- 1) Always trying to set you up with Yoko



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# Membership Application



The Hydrographic Society  
of America  
and the  
U.S. Branch of The Hydrographic  
Society

Membership in The Hydrographic Society is open to any individual or organization with an interest in surveying afloat. No formal qualifications are required.

The Hydrographic Society of America (THSOA) serves as the focal point for activities in America. Members of THSOA receive *The Seahorse* newsletter, are eligible for membership in local chapters, receive a \$15 discount on subscription to *Hydro International* magazine and receive a discount on registration at THSOA sponsored events. Local chapters have been formed in Houston, Tx. and Bay St. Louis, Miss. THSOA also provides administrative support to the U.S. Branch of The Hydrographic Society.

The Hydrographic Society (THS) was founded in London, England, in 1972. For those members interested in the international aspects of the profession, the U.S. Branch of THS provides a convenient way to pay dues in U.S. dollars. Members of THS receive quarterly copies of *The Hydrographic Journal* and a discount on registration at sponsored international events.

THSOA Corporate Members receive *The Seahorse*, a free hotlink or company description on THSOA's website (www.USAhydrosoc.org) and free posting of recruitment notices in *The Seahorse*. THS Corporate Members receive two copies of *The Hydrographic Journal* and a discount on Journal advertising.

**The dues structure allows Individual, Retired, Student and Corporate Members to opt for THSOA alone or both THSOA and THS.** There is no THSOA-only Associate Corporate rate. Individual and Retired memberships begin on entry and are renewed on April 1. Corporate memberships are renewed on January 1. Student THS memberships begin on April 1, while THSOA Student memberships are totally flexible to accommodate the school calendar. In all cases, dues are not prorated. However, members joining in the middle of the year receive all back issues of the publications for that year.

NAME: Title (Mr, Ms, CAPT, Dr, etc.)			First	M.I.	Last
ADDRESS (for mailing and correspondence)					
CITY		STATE		ZIP	
EMPLOYER					
TEL:			FAX:		
e-mail address:					
YEAR	(From which membership is to be effective):				199
<input type="checkbox"/> Check box if name may be included on mailing list provided to Corporate Members					

## ANNUAL DUES

(Check appropriate box)

- |   |                                      |  |
|---|--------------------------------------|--|
| <b>INDIVIDUAL</b> (Houston Chapter add \$10 for local dues)                                       | <input type="checkbox"/> THSOA \$15  | <input type="checkbox"/> THSOA/THS \$75    |
| <b>RETIRED</b> and no longer employed in the profession of sea surveying                          | <input type="checkbox"/> THSOA \$10  | <input type="checkbox"/> THSOA/THS \$37.50 |
| <b>STUDENT</b> full-time undergraduate  | <input type="checkbox"/> THSOA \$5   | <input type="checkbox"/> THSOA/THS \$20    |
| <b>CORPORATE</b>  | <input type="checkbox"/> THSOA \$100 | <input type="checkbox"/> THSOA/THS \$385   |
| <b>ASSOCIATE CORPORATE</b> available to a different location or unit of a parent Corporate Member |                                      | <input type="checkbox"/> THSOA/THS \$205   |

If Student, name of institution \_\_\_\_\_

If Associate Corporate, name of parent \_\_\_\_\_

**STATEMENT:** I wish to make application for membership in The Hydrographic Society. I agree to abide by the Articles of Association and to further its aims and objectives. I declare that the answers to the above are accurate to the best of my knowledge and belief. I agree that the decision of The Hydrographic Society Executive in regard to this application is final.

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

Please return with payment to:  
The Hydrographic Society  
P.O. Box 732  
Rockville, MD 20848-0732



by Dale Westbrook

**T**hings have been pretty slow around the editor's desk lately. There haven't been any e-mails or letters concerning the question whether web sites and newsletter can co-exist. Even Goldbrick has been in hibernation this summer. Maybe it's the heat. Regardless, we have had good input of articles for this issue of *The Seahorse*.

I'd like to comment on the lead article in this issue. As one of the early pioneers in automated hydrographic surveying and nautical charting, I am quite impressed with the way some of the major issues have been working themselves out (but not without a lot of effort from those embroiled). There is a need (and an official status) for raster chart (RCDS) data after all. This should not serve to lessen the efforts being made to gather vector data for ENC charts for ECDIS, however.

All of these advances would not be possible without GPS and DGPS positioning. The ability to know precisely where one's vessel is located is the solid foundation behind the future success of all the chart and survey automation efforts. Thanks to DoD (for once), we are getting some return on our tax dollars with technology that has spilled over into the private sector. ✨



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