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Front Cover: An image of a portion of a 3-D data volume with superimposed interpretation. (Photo composition courtesy of Randy Fairchild/Photographic.)
Over the past few months, I have had an opportunity to visit with a large number of Western’s clients throughout the world. The purpose of my visits was to discuss what Western has been doing to improve the service and products that we provide. We also discussed with our clients their future plans and the improvements they deem most important.

During these discussions, it has been pointed out that Western views new technology as a critical factor in achieving success. Our commitment is demonstrated in a sustained investment in effective research and development and the largest capital expenditures in the company’s history.

While these efforts should help to ensure our leadership in the industry, we must also be aware of increasing pressure to be the lowest cost provider of our service. If this pressure continues to increase and price becomes the only consideration, we would necessarily discontinue these expenditures in order to keep Western in the most competitive position.

Our goal is to meet the two seemingly dissident objectives of improving quality while decreasing cost by continuing to improve the performance of each individual and the production of every department. It is critical that we all work very hard to ensure that the quality of our output meets or exceeds the stated goal and that delivery of our products occurs on or before the promised time. In other words, we must improve our in-house efficiency.

The past several years have been good years for Western in spite of the general industry struggle. Western’s success can be attributed to the determination of our personnel and to our investment in 3-D technology. Presently the near-term outlook is murky as virtually every one of our major markets appears to be experiencing a slowdown. The test will come in our ability to continue in this difficult market what we have done so well in the past—continue to build the long-term financial strength of our company.

Our employees have always met change with creativity and enthusiasm. The challenge is clearly set before us. Only if each individual and all groups working together accept responsibility for cost control and improved efficiency will we be successful in once again avoiding a disruption in Western’s growth.

I believe that Westerners will accept and meet this challenge with the same and even greater determination than they have in the past.

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Remote Processing Center established in Melbourne, Australia

Melbourne, Australia, is the site of Western's newest remote data processing center opened in February this year. The Melbourne facility is the second international remote center (in addition to a center in Kuala Lumpur) to be connected to Singapore's full-capability processing center and is the fifth remote center to be added to Western's world-wide processing network.

Managed by Mark Stanley, the Melbourne center is staffed by geophysicists Dee Connolly, Mike Hartley, Andrew Stagg, and Assistant Leith Barton.

According to Australia Data Processing Manager Steve Pickering, the new remote center is modeled on identical lines to the successful Perth remote center and was installed approximately 3000 kilometers from Perth. The center offers Western's Melbourne-based clients cost-effective, same-day seismic parameter testing and selection.

Developed as a proprietary system by Western Geophysical, the remote center processing system provides a low-cost alternative to mainframe installations at initial costs similar to those of a workstation. Like the Perth remote center, the Melbourne facility is connected by means of conventional, high-speed digital communication lines to a supercomputer site thousands of kilometers away, and is capable of processing all sizes of projects from 2-D land to large 3-D marine surveys.

Since its opening only a year and a half ago, the Perth remote center has processed more than 100,000 kilometers of seismic data, principally including possibly the world's largest 3-D survey (62,000 kilometers) processed as a single, contiguous dataset.

Staffing the Melbourne Remote Data Center are (left to right) Junior Analyst Andrew Stagg, Technical Assistant Leith Barton, senior analyst Mike Hartley, Dee Connolly, and Irene ChiA and Center Manager Mark Stanley.
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Delivery nears on two new seismic vessels

Amidst mid-winter darkness and snow at about the same latitude as Nome, Alaska, workers in the Ulstein Verft yard in Ulsteinvik, Norway, are constructing two seismic vessels to be added to the Western fleet—the Patriot and the Spirit. Severe winter weather (sometimes consisting of rain, wind, snow, sleet, and hail in the same day) has not slowed progress on these two newcomers to our seismic fleet. The Western Patriot, destined for the London office, will be christened by Mrs. Bonnie Auble, wife of London Senior Vice President Denby Auble, at the end of April. Delivery of the Western Spirit is expected in mid-October this year.

Both vessels, which can accommodate 54 crewmembers, are mid-sized at 78 meters (255.9 feet) in length and 17 meters (55.7 feet) beam. The ships will each be equipped with four streamer cables, three seismic air compressors, and nine active gun strings. Ship design allows for increased tankage (especially fresh water), one or two-man cabins throughout, increased storage capacity for the galley, a large mess area, separate day and TV rooms, and a designated exercise room.

Party 5/19 Manager Richard Jespex examines one of the Spirit’s two propeller thruster cavities.

Construction continues on Western’s two new vessels, the Western Patriot and the Western Spirit, at the frozen docks of the Ulstein Verft shipyard in Ulsteinvik, Norway.

Data center employees prepare data in Western’s new Melbourne remote center.

Cable reel installation aboard a back deck of the Patriot.
Joint NAPE Convention a Success
Western Atlas technology displayed in Nigeria

Reporter Mike West

Western Atlas’ position as a geophysical industry leader was reflected in our involvement in the 1992 Nigerian Association of Petroleum Explorationists (NAPE) convention held last November in Lagos. The locally-constructed Western Atlas booth represented an extensive joint effort between Western Geophysical, Atlas Wireline Services, and Core Laboratories and showcased the variety of services and technology offered by Western Atlas in Nigeria. The four-day, international class conference kicked off with an all-day workshop which covered the exploration business in Nigeria, followed by three days of technical sessions. Houston Senior Research Geophysicist Dr. Alfonso Gonzalez presented two papers, “Equalization of DMO for Irregular Spatial Sampling” by Drs. Craig Beasley and Rolf Kliitz and “Dip Moveout and Prestack Frequency-Wavenumber Migration in a Transversely Isotropic Medium” by Dr. Gonzalez and William Roberson of Chevron Overseas Petroleum.

Other Western presentations included “2-D Seismic Velocity Inversion” (authored by Darko Tufekcic and Dr. Gonzalez) given by Port Harcourt Center Manager Darko Tufekcic, a convention representative, Area Manager Chris Fox, Julie Fox, Aimee Marie Siddiqi, Lucy Bertram, and Nigerian Resident Geophysicist Mike West. (back row, left to right) Party SPT Manager Nathan Bertram and Field Supervisor Jim Siddiqi.

On site at the 1992 NAPE convention are (front row, left to right) Port Harcourt Center Manager Darko Tufekcic, a convention representative, Area Manager Chris Fox, Julie Fox, Aimee Marie Siddiqi, Lucy Bertram, and Nigerian Resident Geophysicist Mike West. (back row, left to right) Party SPT Manager Nathan Bertram and Field Supervisor Jim Siddiqi.

The destination may be different, but the format is the same for Western’s geophysical professionals traveling abroad. Extensive worldwide travel just comes with the territory. It also represents a substantial dollar expenditure each year — a controllable expense when managed efficiently.

The Rosenthal travel program makes it possible for Westerners to receive the lowest available rates through the use of a computer network the company has negotiated with over 25,000 airfare changes that take place daily and to enjoy substantial savings off of published corporate hotel rates.

The new travel agency in the Houston headquarters building offers:
• express visa and passport service
• direct billing for cars and hotels
• an international rate desk
• automatic ticketing with boarding pass
• car rental services
• reservation scripting and quality control, and
• both domestic and international emergency services.

Westerners based at the Exploration Products-manufacturing facility will be served through a ticket printer located in the Alvin plant. Tickets will be delivered from both locations.

Focusing on quality
In 1992, Western launched a Total Quality Management (TQM) program in conjunction with the assistance of the American Productivity and Quality Center (APQC) and a team of five consultants from the APQC Consulting Group. Members of Western Geophysical’s senior management undertook special training in the quality process and are currently implementing what is termed the “assessment phase” of the TQM program.

Using information gathered in an employee survey, focus groups, and a customer survey, Western’s senior management team will redefine our firm’s mission in today’s marketplace and rank critical success factors for our seismic services. Such factors include quality of seismic data, on-time delivery, cost of reserving services, and advancements in geophysical technology, and knowledgeable personnel.

The employee survey was sent last November to a cross-section of 20 percent of Western’s staff selected at random from Houston, London, and Singapore.

The focus group, which included department heads and work center representatives from major operating groups within Western, explored in-depth issues such as supervision (at all levels) of specific processes involved in conducting our seismic business and offered ideas to improve those processes.

Approximately 100 clients answered a special customer survey, indicating factors they deemed most important, assessing Western’s performance, rating the quality of our service, and comparing our service to that of other seismic firms.

Keep in touch with Rosenthal Travel using these numbers:
Houston Office
(713) 963-2000
24-Hour Emergency
Domestic
(800) 537-8647
International
(800) 472-4516
Overseas (collect)
(313) 352-4982

Western Geophysical/Rosenthal International
enter exclusive travel agreement

Controlling Travel Costs through an Onsite Agency

Express visa and passport services, discounted hotel rates, and the lowest available fares are among services now available to Western Geophysical and Western Atlas Software travelers as a result of an exclusive partnership arrangement with Rosenthal International.

An onsite ticketing agency staffed with five employees of Rosenthal, the third largest travel management firm in the U.S., opened March 1 in the Western Geophysical headquarters building in Houston. Besides helping to contain travel costs, the program offers personalized services such as ticketing and accommodation profiles for Western’s many frequent business travelers to ensure a certain level of comfort on trips abroad.

KEEPING UP WITH THE TIMES

"It's Tuesday. It Must be Belgium!"

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Pride and Quality

Exploration Products implements statistical process control, expands test track

"Do it right the first time" is a quality phrase that has become increasingly familiar to Westerners at the Exploration Products Alvin facility. To machinists, it means reducing the number of defective parts to zero using a system known as Statistical Process Control (SPC).

To field service engineers, it is the final examination of parts before they are shipped, and the relentless testing of newly fabricated vehicles on a recently expanded test track on which actual work conditions are simulated.

These two extensive testing programs involving management, engineers, and production staff are in line with Western’s ongoing effort to implement a total quality management system.

Statistical Process Control

A pilot SPC program implemented in the machine shop last year has already resulted in an approximate 50 percent reduction of defective parts. According to Quality Assurance Manager Roy Devereux, the SPC system is currently being used by machine shop staff on critical parts with tight production tolerances. Such parts include elements requiring critical dimensions (within one to two thousandths of an inch) to be used in WG-34 Marine Telemetry cable and airgun assemblies. Production Manager Bill Young, Supervisor Steve Pack, and 34 machinists in the Alvin plant were the first to receive special training in the use of statistical process control to be incorporated into existing continuous improvement programs. "What we have witnessed with the implementation of SPC is the machine shop," says Young, "is a significant increase in both quality parts and pride in our work."

Not only does the SPC system allow problems to be identified before they become critical, it also results in significant savings in rework and scrap metal costs while producing parts that meet or exceed engineering requirements. "Using the SPC system, we monitor and control variations in real time during the manufacturing process as opposed to after the fact," says Devereux. "Rather than stopping the assembly line in process to remove every fifth part and discovering unacceptable variations, SPC empowers the person who is actually machining or producing the part to control his level of accuracy in every dimension."

Exploration Products Plant Manager Steve Bladone has been instrumental in installing SPC measurement stations in the machine shop along with an automated data processing system to monitor and efficiently control variations in parts as they are being produced. "From the immediate measurements being made on the plant floor, we now have an "early warning system" whereby we can plot each manufacturing process and spot trends that could lead to defective parts," says Bladone.

According to Exploration Products Human Resources Manager Ray Long, training is ongoing in the Alvin plant with managers, supervisors, and floor personnel receiving hands-on instruction in the use of statistical process control. Plans are currently underway to institute the SPC system throughout the Alvin facility.

Expanded Vehicle Test Track

The increased amount of traffic along the recently expanded Exploration Products 10-acre test track is yet another aspect of the company-wide efforts towards total quality management. All vehicles fabricated in the Alvin facility are operated on the test track from three to eight hours, depending upon the model requirements. Involved in all phases of equipment production including design, manufacturing, assembly, testing, driver training, and final quality control, field service engineers examine and test every vehicle prior to shipment and include a comprehensive report to Western crews and clients.

The test track is equipped to simulate a variety of work conditions found throughout the world and includes a controlled hard surface test area with pre-set inclines for gradability testing. The Alvin testing ground is in addition to Western’s test site in Midland/Odessa, Texas; every vehicle is tested at the Alvin facility while only prototype vehicles are tested in Midland.

The expanded test track also offers clients and other visitors an opportunity to receive a "hands-on" impression of the various seismic vehicles.
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Statistical Process Control (SPC) classes are being held on a regular basis as part of Exploration Products' quality control efforts at the Alvin plant. Managers, supervisors, and production staff all receive onsite training in SPC. In January, Quality Assurance Manager Roy Devereux (back row, left) and Human Resources Manager Ray Long (back row, right) handled our training, completion certificates to (front row, left to right) Barbara Finzer, Don Carillo, Linda Nino, Cheryl Sychack, Jeff Pant and (back row, beginning second from left) Todd Lauren, Phil Goines, Bob McBride, and Dan Smith.

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Vehicles such as this Doodleybug® are operated on the Alvin test track from three to eight hours, depending on model requirements. (Photo by Glen Muse.)
Dresser Central Credit Union celebrates 40 years of service

The Dresser Central Credit Union is celebrating its 40th anniversary on July 9. Since Dresser Central received its state charter on July 9, 1953, it has served Dresser Industries and Dresser Industries joint venture companies located throughout the U.S. and in several foreign countries. In addition to employees of Dresser Industries and Dresser Industries Joint Venture companies, Dresser Central's membership is open to former employees, retirees, and family members.

Degner named U.S. Manager of EAME Operations; Utech appointed Western Hemisphere Technical Coordinator

Richard A. Degner has been named U.S. manager of EAME Operations, and Randall W. Utech has been appointed Western Hemisphere technical coordinator. Both will continue to be based in Houston, Texas. Degner, who joined Western in 1984, has served in Venezuela, Ecuador, Colombia, Nigeria, and Gabon as party manager, party chief, and field supervisor. He has most recently served as technical coordinator for Western Hemisphere operations. Degner received degrees in both geological engineering and geophysical engineering from the Colorado School of Mines in 1985.

Utech joined Western in 1982 upon graduation from the University of Wisconsin, where he received an associate degree in engineering and a B.S. degree in geology and geophysics. Utech's experience has included service in Western's U.S. marine operations, speculative data marketing, and most recently as a member of the technical coordination group.

Back in 1953, Dresser Central Credit Union (DCCU) was located on the far outskirts of the City of Houston on acreage that was later to be transformed into Western Atlas headquarters. Certainly, much has changed since its early days, but one thing has remained the same: the friendly smiles and service offered by the staff of Dresser Central. In celebration of 40 years of service, the Board of Directors and Dresser Central staff are hosting an open house on July 9 from 9 a.m. to 4 p.m. You're invited to drop by to meet the staff, visit with old friends, and perhaps make a few new ones!

For information about Dresser Central Credit Union, call (713) 972-6001 or stop by the office between 9 a.m. and 4:30 p.m. Monday through Friday.

Open House on July 9

Dresser Central Credit Union

Dresser named President of Western Atlas Software

When Westerners gathered in December last year to honor Western Atlas Software General Manager and long-time Westerner Geophysical Vice President Jim Hornsby in his retirement, they were greeted with a rare treat — a large photograph of Jim on camera-back during one of his foreign ventures for Western. During the course of Jim's 26-year career with the company, the Westerners have heard of his adventures while in digital programming and development. Besides being recognized for his ability to get things done (quite successfully) on the job, Jim has also been known for his understated, easy manner and his winning smile. Long-time friends and coworkers stopped by to say a reluctant goodbye to Jim and wife June at an informal gathering planned by the assistance of many years, Secretary Amparo Fecto, in Houston headquarters. Western Atlas President John Russell also hosted Jim at a formal dinner and presented him with a gold watch.

Born in Kentucky, Jim considers himself "from beautiful Colorado," where he spent most of his academic years. After attending high schools in both Victor and Glenwood, he spent a year at the University of Denver and then graduated in 1969 from Colorado State College with a B.A. in mathematics. He was a member of the "Blue Key" scholastic honor society. He did graduate work in mathematics at the University of Colorado in 1970, obtaining his master's degree in 1972. An experience between his studies and the start of his geophysics career, Jim investigated the weather from an Army weather station on an island in thePuget Sound.

Jim's long history in geophysical programming began before coming to work for Western Geophysical. From 1952 to 1964, he was a geophysicist in the geophysical industry. Shortly after being named digital program development manager and helping to establish our first Houston digital programming center, Jim supervised the installation of the industry's first array processing system. In 1969, he was instrumental in opening the Milan data center. In 1972, Jim led the conversion of Western's programming activities into a multi-programming mode with online programming and data entry. Next came the expansion of Western's programming services to include both Denver and Calgary, in addition to the already existing Houston, London, and Milan centers.

The year 1979 brought Western's first revamp processor and in 1985 brought vector computing for geophysical data processing. Jim's expertise and negotiations skills have resulted in such key Western endeavors as ventures in people as the Republic of China in 1982 in conjunction with the Geophysical Research Institute and to the former Soviet Union.
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Located in Building 3 on the Western Atlas campus at 10,201 Westheimer in Houston, Dresser Central Credit Union is a non-profit financial institution with members located throughout the U.S. and in several foreign countries. In addition to employees of Dresser Industries and Dresser Industries joint venture companies, Dresser Central’s membership is open to former employees, retirees, and family members.

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Long-time Westerner and Western Atlas Software President Hornsby retires

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Besides being recognized for his ability to get things done (quite successfully) on the job, Jim has also been known for his understated, easy manner and his winning smile. Long-time friends and colleagues stopped by to say a reluctant goodbye to Jim and wife June at an informal gathering planned by his assistant of many years, Secretary Amparo Fecto, in Houston headquarters.

Western President Hornsby remained President of Huntington Union, was promoted to manager of digital services to the company, and was later made supervisor of digital programming. He also spent two years as a university programming instructor.

While pursuing additional graduate studies in applied statistics at Tulane University in New Orleans from 1964 to 1966, Jim attended the petroleum department in his computer department, where he taught computer science, sophisticated systems programming, and consulted on statistical problems.

In 1966, Jim came to work for Western as manager of the Houston digital center and, less than two years later, was promoted to manager of digital program development. In December of the same year Jim became vice president of worldwide digital data processing, a position he held until January of 1991, when he was named president of Western Atlas Software.

Jim’s contributions to Western over the course of his career are numerous, and have included a number of "firsts" in the geophysical industry. Shortly after being named digital program development manager and helping to establish our first Houston digital programming center, Jim supervised the installation of the industry’s first array processor at Houston. In 1989, he was instrumental in opening the Milan data center.

In 1972, Jim led the conversion of Western’s programming activities into a multi-programming mode with online programming and data entry. Next came the expansion of Western’s programming services to include both Denver and Calgary, in addition to the already existing Houston, London, and Milan centers.

The year 1979 brought Western’s first 3838 array processor and 1985 brought vector computing for geophysical data processing.

Jim’s expertise and negotiations skills have resulted in such key Western endeavors as ventures in the People’s Republic of China in 1982 in conjunction with the Geophysical Research Institute and the former Soviet Union.
1992-93 United Way Campaign

Your donations are making a difference!

To the more than 1100 Western Atlas employees who made donations to the United Way of the Texas Gulf Coast this year, thank you! Because of your donations there will be help when people ask for it and hope when people need it.

In October last year, Western Atlas employees from the Houston area made a $129,000 investment in their community. With the company matching, of $97,000, the total contribution from Western was $226,000!

An upbeat musical performance by the United Way Harbor Lights Choir, bright balloons, and addresses by Western Atlas President and CEO John Russell and United Way’s Texas Gulf Coast President Judith Cravens kicked off this year’s week-long campaign.

Employees who attended any of the 11 information meetings during campaign week were eligible for complimentary dinner buffets. And, four winners of special prizes were selected in a random drawing.

The week’s special events offered employees an opportunity to join together in raising funds to support adoption, elderly assistance, emergency shelter, food, foster care, hunger relief, and vocational programs in the highly-populated, four-county Texas Gulf Coast community.

Western’s Senior Programmer Les Engelbrecht was the winner of a grand prize round-trip for two to a destination within the continental U.S. Western Geophysical Data Processing Manager Judy Adams and Senior Project Engineer Joe Koudelka of Atlas Wireline Services each walked away with complimentary weekend-for-two packages at local hotels, and Corporate Accounting Clerk Loretta Hendrickson won a complimentary travel voucher.

Campaign leaders included Western Atlas Vice President Jack Michael as company liaison; Atlas Wireline Services President Damir Skerl as campaign chairperson; Western Geophysical Profile Editor Diane Danielek as communications chairperson; and Atlas Wireline Services Controller for Latin America Curtis Denison as campaign treasurer.

Participants in this year’s project were (left to right, front row) Amparo Fechter, Corporate Account Coordinator Andy Kushner of Core Laboratories, Susan Waldrop, Corporate Account Clerk Judy Adams and John Bennett; (second row) Ampar o Fec to, Co o rdinator Andy Kushner, Co or di na to r Polly Neill, Mary K. Smith, Mark Talbott, Sue Davis, Eric Swagogue, (fourth row) Susan Clare, Karen Wiley, Anthony Williams. (Photo by Linen Maze.)

CPS presented Western Geophysical employees with a certificate of appreciation that will be displayed in the trophy case in the headquarters building cafeteria. Barbara Hudson of Corporate, Kathy Reid of Atlas Wireline Services, Susan Waldrop of Western Atlas Software, and Marc Schnell and Cathy Drews of Core Laboratories also received certificates of appreciation.

A special thanks to Santa’s elves who volunteered their time and holiday spirit to the General Services staff for providing wrapage for the many gifts, extra wrapping supplies, and manpower necessary to load the CPS trucks at each building; and to management for allowing volunteers to work on the project during business hours.

Indeed, the spirited cooperation of the many Western Atlas employees who have been involved in this program of giving represents the true meaning of the season.
1992-93 United Way Campaign

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Financial Reporting Director Sandy Bradley and Western Atlas President John Russell, were among others to walk away with campaign prizes.

Besides attending information meetings about the United Way and pledging their donations, four Western Atlas employees walked away with campaign prizes. Atlas Wireline Services President Danie Skerl (center) congratulates United Way campaign prize winners (left to right), Western Senior Programmer Les Engelbrecht, who took the grand prize, Western Mental Processing Manager Judy Adams, Corporate Accounting Clerk Loretta Hendrickson, and Wireline Services Senior Project Engineer Joe Koudelka.

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Western Recognized for Recycling Efforts

Recycling habit goes beyond Earth Day

One day each year, April 7, is set aside to honor the one and only Planet Earth. The tradition, begun in 1970, represented the beginning of a collective desire to maintain a healthy home for the future of all living creatures. Since the first Earth Day, businesses and individuals have responded to the need to protect the earth’s resources by implementing various programs such as recycling and have achieved commendable results.

Recently named a State of Texas “Clean Texas 2000” partner (a group of large companies having exceptional environmental projects and accomplishments), Western Atlas has successfully integrated recycling efforts as part of daily operations. The reason behind the program’s success, according to Project Coordinator Richard Rainwater, is that Westerners see action rather than just words set out in a company environmental policy statement and, as a result, they have responded enthusiastically.

The Western Atlas recycling effort is currently being considered in a Texas Water Commission awards program honoring the top 16 corporate efforts. Recycling has become a part of our daily operations with over 3700 employees actively participating in the program. The effort covers 30 buildings staffed by Corporate, Western Geophysical (including the Alvin manufacturing plant), and Core Laboratories personnel. The program also extends to Western’s seismic vessels working in the Gulf of Mexico.

“Recyclers of the Month” are recognized through posters displayed in the lobbies of Western Atlas buildings and they receive a private parking space close to the main building entrance for one month.

Since the program began in 1991, the following Western Geophysical recyclers have been recognized for their efforts: Sheena Moore, Patti Koehler, Eric Scroggins, Debi Williams, Linda Harter, Ramon Torres, Jr., Carol Bergschneider, Judge Watson, Frank Messina, Doug Humphreys, Livia Perez, Jennifer Smith, Jennifer Schreiner, Jennifer Castelino, Carol Real, Mike Rainwater, Linda Landis, Lee Davis, Shelly Knudsen, Marty Villarreal, and Michael Robinson.

The Texas Water Commission has cited Western Atlas as “Clean Texas 2000” partner for its exceptional environmental accomplishments.

Safety training plays key role in Alaska seismic operations

Operator Mike Roberts

Emergency trauma, safety management, first aid, and fire prevention/control were among recent training for Western employees in Alaska. The courses were held in preparation for the upcoming winter seismic season.

- Party 711 Manager Tom Ainsworth, Party 795 Manager John Davis, Instraqent Supervisor Ray Ness, Administrative Supervisor Michael Roberts, Instraqent Paul Bauer and Roger Monson, chief observers Scott Schiffl and Edward Nelson, Observer Bryan Mothershead, and Helper Terry Poole participated in a 40-hour Emergency Trauma Technician (ETT) class in October last year. Certified in the State of Alaska, the class covers advanced first-aid techniques while emphasizing common problems encountered in Alaska’s cold, remote environment.

- Training/Compliance Manager Michael Bemtman traveled to Anchorage in December to present a two-day safety management class to 10 key personnel involved in Alaskan land operations. Vice President of North American Operations Richard White took part in the training along with Alaska Manager Ron Bakke, Supervisor William Sarbis, Instrument Supervisor Ray Ness, Shop Supervisor Oliver Koss, party managers Tom Ainsworth, John Davis, and John Snyder, Administrative Supervisor Michael Roberts, and Observer Edward Nelson.

A third day of training in December covered standard first aid for an additional seven employees and a course in fire prevention/control for 16 Alaska employees. Besides offering hands-on practice in extinguishing a gasoline fire, the class on fire safety also addressed properties and behavior of fire, fire safety at home and at work, and the need for quick response.

Discovery crew celebrates zero accidents

The crew of the Western Discovery based in London celebrated their fifth accident-free year of operation at a safety dinner held in Deu Holder, Hitchin. In the middle of the group, displaying two plaques in recognition of the crew’s commendable safety efforts are Discovery coordinators Paul Domley (left) and Mike Constant (right). The awards were presented by London Marine Safety Manager Gary Reynolds.
SAFETY / HEALTH / ENVIRONMENT

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“Taste the difference between our older and newer buildings,” says Rainwater, “We cannot recall a program that has been viewed as positively by employees as this one. Most of the work is done by volunteers, and a very important part of the Western program is recognition of those volunteers.”

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"Where Oil Really Is ... Is In Our Own Heads"
“Where Oil Really Is ... Is In Our Own Heads”
Manag33 of Western's worldwide Research and Technology group, guided by scientific research and application, received his B.S. degree in mathematics from the University of Houston and completed an M.S. at Emory University.

Chambers received a B.S. degree in physics from the University of Houston in 1981, he joined Western Geophysical where he has served in various capacities in the research and geophysical research and development departments.

Specializing in geophysical applications of the wave equation, particularly in the areas of imaging and modeling.

The scientific theories that Western's potents in areas ranging from noise removal to 3-D migration.

Western's scientists may be seen in research center corridors, discussing their work, presenting breakthrough developments to their colleagues, and译v metal problems. The scientist's skill and ingenuity.

Western's geophysical staff, including with particular emphasis on 3-D velocity estimation. Dr. Gonzalez also worked as a post-doctoral research associate.

His B.A. degrees in physics from Juniata College and a Ph.D. in geophysics from Stanford University. He also holds a master's degree in geophysics.

He is currently conducting research in computer modeling of geophysical problems and methods of multi-way analysis. He has written several papers on the subject and is currently preparing a book on the subject.

Another member of the Stanford Exploration Program who has done research in wave equation analysis, John Research Associate.

Gonzalez joined Western's geophysical staff in 1989, where he did research in geophysics and related fields. From 1990 to 1991, he was a research scientist at Stanford University.

He has written several papers on the subject and is currently preparing a book on the subject.

He has contributed to the development of new techniques for seismic data processing and interpretation methods for the search for energy resources.

How do these research geophysicists relate their research, and refined interpretation methods to the search for energy resources beneath the oceans, polar icecaps, and mountain ranges?

An early geologist had the answer: "we all really are the final analysis, is in our own heads."

Successful on technological development

Advances in earth sciences and engineering generated by research geophysicists have propelled both Western Geophysical and the seismic industry forward at a record pace. Success has been built on technological development, crucial with skill and ingenuity.

Starting with the day in 1936 when Western Geophysical founder Henry Solvatori invented his "Apparatus for Detecting Subsurface Geological Formations," strong technological development has existed as a key element in the Western program of service and progress, and has played a dramatic role in Western's climb to the top of the geophysical industry.

Throughout the company's history, Western's research and technology department has provided field procedures, interpretation methods, processing techniques, and answers to special problems. The scientific theories that underlie Western's data-gathering and data-processing activities have long been invented and developed by our own geophysicists, physicists, mathematicians, and electrical engineers.

Historically, major oil companies have conducted large research programs in geophysics. However, due to current energy industry economics, fundamental geophysical research often is now more than ever the responsibility of the scientific contractors.

From a broad perspective, geophysical science includes any type of earth study including earthquake, seismology, and weather surveillance. Exploration geophysics constitutes only a small segment of this broad science; however, it is the primary commercial application. Although the foundations from which our geophysicists work are generally quite old, the applications of the results are quite new. Geophysical exploration is a relatively young science with Western's R&D staff being part of this small, highly focused community.

Geophysical research at Western has evolved from more than traditional fundamental scientific research. It includes...
G

guided by scientific research and application, Western’s research geophysicists conduct their search for energy by day and by night in the Denver, Houston, London, and Singapore research centers. Their computer-age tools include scientific and mathematical theory, a diverse array of integral and differential equations, interactive data visualization, and a multitude of algorithms for processing and interpreting complex seismic images.

Western’s scientists may be seen in research center corridors studying over a problem seismic section or analyzing particular software program. But, unlike the stereotype scientist, this group of mathematicians and physicists can also be found in the field discussing applications of scientific theory with clients to develop new technological tools, presenting breakthrough developments to technical societies.

How do these research geophysicists relate their theoretical calculations and refined interpretation methods to the search for energy reserves beneath oceans, polar icecaps, and mountain ranges?

An early geologist had the answer — “where oil really is, that’s the final analysis, is in our own heads.”

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Geophysical research at Western has evolved into more than traditional fundamental scientific research. It includes...
(Left to right) Secretary Cindy DeKeyser, Chief Geophysicist Ron Chambers, Research and Technology Manager Dr. Craig Beasley, and Senior Scientist Bill Dragset in the Houston research center.
Western's research expertise is now present in four major operating areas - Houston, London, Singapore, and Denver - to provide ongoing communications and interchange of information. Under the direction of Vice President Dr. Emil J. Mateer, Jr., Manager of Geophysical Research Dr. Craig Beasley, and Chief Geophysicist Ron Chambers in Houston, Western's R&D efforts are distributed worldwide. R&D efforts in London, Singapore, and Denver are supervised by Dr. Swavek Deregowski, Keith Hirsche, and Scott McKay, respectively. Houston-based senior scientists Bill Drago and Wendell Wiggins, Senior Research Geophysicist Alfonso Gonzalez, and Project Manager Dan Wisecup helped direct and support group efforts.

Having research activities located in Western's major operating centers is crucial because this is where the best research is performed," says Beasley. "By being part of the daily activity in these centers, we learn first hand of any client requirements or special dive cases as they arise, and quite often this interaction incites new ideas, resulting in new areas of research and enhanced capabilities."

Dr. Beasley devotes a large portion of his time to managing this diverse group of geophysicists, physicists, mathematicians, scientists, and engineers whose equations and analyses, theoretical studies, and computer simulations are directly related to the operations groups' search for oil. The group reflects the diversity of exploration geophysics; it borrows not only from the classical sciences, but also from state-of-the-art, technological sciences including such areas as submarine detection, digital signal interpretation, and computer visualization.

Economic necessity separates exploration geophysics from other sciences. While in fundamental, theoretical research, it may not really make much difference whether you achieve a result in one year or the next year, time constraints define a project as a "make or break" proposition for the research geophysicist.

"The history of geophysical technology shows a consistent compromise between cost and feasibility," says Pesale. "We have to remember that the usefulness of the data we are collecting and processing is time-critical in evaluating hydrocarbon potential - the data must be delivered in a timely fashion.

"The seismic industry is often aware of a technology that may be beneficial to exploration, but if results cannot be obtained within the required time frame, it will likely be put on the shelf until technology catches up with theory. Three-dimensional data acquisition and processing is an example of this.
developing, prototyping, and testing new theories, assessing their effectiveness in practice, and communicating these developments to the outside world. Former and current members of the research and technology group have made such major industry contributions as the first accurate, routine delay-T analysis method, large-scale analog processing, multi-channel digital recording, sophisticated data processing, and interactive interpretation.

Part of the mainstream

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An ear to operations

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\[ \psi(t=0, h=0, y, z) = \int_{-\infty}^{\infty} Q(y, z=0) \left| \frac{dh}{d\zeta} \right| \frac{dh_n}{dh} \]
"Clearly, our clients are interested in collecting large 3-D surveys, and Western addressed the trend by developing efficient methods to acquire and process 3-D data in a short time frame so that sufficient time remains for the client to interpret and evaluate prospects. It is an end-to-end process; we continually strive to perfect new methods as the technology becomes available."

"Our role is to be at the forefront of technology to offer the highest quality service," says Beasley. "But, at the same time, researchers must ensure that the highest quality product can be delivered when promised. Products and services developed in research must be made available at a cost that gives the customer the best value.

Translating theory into useful tools

According to Dr. Moutez, geophysical research is seeking out solutions to processing problems through a long and careful process of study, analysis, checking and re-checking results, development of a possible solution, and relentless testing of that solution. Exploration geophysics offers an opportunity to pursue fundamental research in a practical fashion in that our scientists get the opportunity to work on real, everyday problems facing the seismic industry.

There is a certain satisfaction in the work of research geophysicists being used broadly and being known throughout the industry; thus attracting people from various disciplines. Indeed the strength of Western's R&D group lies with the diversity of its staff. Beyond the physics and mathematics typically associated with geophysical research, Western's scientists also have considerable expertise in other disciplines including continuum mechanics, molecular biology, and even high-resolution electron microscopy of biological molecules.

A direct link of responsibility also contributes to the success of Western's technological endeavors. Our research geophysicists became involved in everything from planning surveys and carrying them out into the field to applying new methods in data processing and further to interpretation and mapping.

Newly developed technology is pursued to its full potential through application in these same areas. Western inventors communicate directly with clients to support the technology they have developed and to advise on its efficient use.

What's left to learn?

For as many years as mankind has studied the earth, have we run out of things to discover about the planet? Does the science of exploration geophysics have a future?

Although there are historical cases of sciences that have died, where technology peaked at some point and then something new came along to obviate previous scientific efforts, exploration geophysicists predict a bright future for this young science.

"We operate under the premise that something fundamental has been overlooked," says Chief Geophysicist Ron Chambers. "For example, we're unlikely to break new ground in the area of differential equations (a much studied topic). However, we may well make new breakthroughs in the manner in which..."
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The immense power of massively parallel computing is illustrated by the thinking computer, a product of parallel computing. It can be applied to a wide range of processes. The Thinking computer uses a parallel architecture that can achieve a speed of up to five million instructions per second.
The immense power of massively parallel computing is extending the range of processes that can be applied to seismic data. This Thinking Machines' Connection Machine Supercomputer Model CM-200 in Western's Houston center uses 8,000 processors operating in parallel to achieve peak processing speeds of up to five 512ops.
these equations are applied in geophysics, specifically in measurement of the earth’s velocity and methods to handle noise.

Geophysicists have a whole realm of processing techniques to explore that have not been touched on a commercial level because the computational power was insufficient to the task. Just over the horizon, however, strides are being made in computer science that will bring new technology to bear on the science of exploration geophysics; plus, much of the earth remains to be explored in three dimensions.

Historically, the science of exploration geophysics has moved in fits and starts. A large breakthrough comes along and turns the entire system. Such a fundamental change in technology requires a long shakeout period to systematize it, to make it into a stable, well-understood product throughout the industry.

For example, 3-D is one of those breakthroughs where the entire industry has had to change the way in which it was doing business. Sweeping changes occurred throughout the industry from planning, to acquisition, to data processing and interpretation.

The industry is still only just beginning to realize the benefits of 3-D data. Currently, visualization and processing algorithms are being developed to take full advantage of this powerful technology.

"Having realized from our early work with 3-D seismic that complex velocity models would be required in 3-D imaging, we recently borrowed computer-aided geometric design technology and are adapting it to represent geologic models," comments Senior Scientist Wendell Wiggins.

Computer-aided geometric design technology is more commonly used in manufacturing to design parts that could be built using only cylinders and straight lines.

The unifying theme of Western’s current efforts in R&D is the removal of a complex overburden, a thread technology that requires a number of different avenues in the area of research.

Complex imaging involves taking a new look at seismc data that have been classically characterized as disturbed by the near-surface or by complex geologic structures such as steep dips or extreme velocity contrasts.

"In the past, these types of problems were rarely attacked because of the enormous computational requirements and limitations of 2-D data," says Beasley. Today, Western scientists are tackling these issues using the full interplay of 3-D data, and are looking to recent advancements in computing technology such as massively parallel computing to resolve them.

"Recognizing the impact that massively parallel computing (invested in the mid-80s) could have on our research work, we decided to invest in this new technology," says Wiggins.

"While only two production applications are now being run..."
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Illustrating a problem in 3D statics, Houston Project Manager Dan Wiseau discusses possible solutions with clients.
Illustrating a problem in 3-D statics, Houston Project Manager Dan Wisecup discusses possible solutions with clients.
Singapore Senior Research Geophysicist Rolf Klotz received a B.S. in geology and a B.S. degree with honors in geophysics from Adelaide University (Australia). Since joining Western in 1980, Mr. Klotz has held various positions including marine processing and programmer.

Senior Research Geophysicist and Project Manager Dan Wisecup, who holds a B.S. in physics from Ohio State University, is currently involved in the development of J.D. survey design, acquisition, and processing methodologies with an emphasis on land statics, especially in the area of statics. Mr. Wisecup worked as a geophysicist for a major oil company prior to joining Western in 1990, where he has been involved in acquisition, data processing, interpretation, and geophysical research in both domestic and foreign assignments.

Senior Research Geophysicist Rolf Klotz of the Singapore research center and Senior Programmer Jane Troutner of the Houston center.

on our in-house parallel computer, more applications are in the development stages.

"We are also looking at the issues involved in integrating massively parallel computing into Western's overall processing system because, in the relatively short period of time in which massively parallel computing has become available, it has also become universally accepted as the most cost-effective computational method of the future."

Having already successfully developed production algorithms, the research staff is now tackling more complex overburden problems by means of special task forces assigned to study the interaction between algorithm development and the computing platform, anisotropy (the way in which the earth propagates sound), and the efficiency of currently used algorithms in conjunction with field acquisition systems. Many traditional processes such as deconvolution, statics, and amplitude analysis are also being studied in light of new computational abilities.

"We believe that the ability to take steps forward in fundamental areas such as complex imaging is going to be very important," says Beasley. "We are moving into an era of full service in which many subtleties will affect final interpretation and mapping of geophysical data."

Western's commitment to research and technology has resulted in state-of-the-art electronic acquisition and processing systems being used to delineate complex 3-D geology in friendly or hostile environments. Exploration and production success from Western data has shown that progress in geophysical technology is being measured not only in mathematical terms, but also in proven reserves.

It is the skill and ingenuity of our research geophysicists working in conjunction with operations groups to meet the needs of the industry and to move technology forward that will secure Western as the geophysical industry leader and guide the company into the 21st century.
Singapore Senior Research Geophysicist Rolf Klotz received a B.S. in geology and a B.S. degree with honors in geophysics from Adelaide University (Australia). Since joining Western - Singapore in 1980, Mr. Klotz has held various positions including marine processing analyst and programmer.

Senior Research Geophysicist and Project Manager Dan Wisecup, who holds a B.S. in physics from Ohio State University, is currently involved in the development of 3D survey design, acquisition, and processing methodologies with an emphasis on land seismic issues, especially in the area of statics. Mr. Wisecup worked as a geophysicist for a major oil company prior to joining Western in 1980, where he has been involved in acquisition, data processing, interpretation, and geophysical research in both domestic and foreign assignments.

Senior Research Geophysicist Rolf Klotz of the Singapore research center and Senior Programmer Jane Troutner of the Houston center.

Senior Programmer Jane Troutner received her B.A. degree in mathematics in 1979 from Washington University and her B.S. degree in petroleum engineering in 1984 from the University of Tulsa. A recent addition to the Western R&D group, Jane handles programming of interactive seismic processing applications. She formerly worked for Shell Research, Nollonite, Imaging, and Conoco.

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Houston Analyst Goran Stankovic (seated) and Senior Scientist Wendell Wiggins prepare 3D depth-migration velocity models from incoming data.
TRAVELLING YEMEN'S GOLD AND INCENSE ROAD

Reporters: N. Battaglio, M. Bearet, and V.W. Vagi

In search of energy reserves in the land of "Arabia Felix," Western crews 767 and 773 journey along an ancient route through the arid cliffs of Yemen's famed Hadhramaut. Here, seismic vibrator units and heliportable rigs leave transient marks in the wadis and hills.
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Long ago, voyagers enroute through the Gulf of Aden reported a pungent, rich fragrance that drifted out to sea to greet them as they passed a land known as "Arabia Felix." Indeed, the precious scents of Frankincense and Myrrh were noted not only in these mariner's logs, but throughout the known ancient world.

Scents of Frankincense and Myrrh followed camel-laden caravans along the wadis (dry stream beds) of the Hadhramaut to spice markets, and the route that the caravans took became known as the "Gold and Incense Road." The Hadhramaut (a physiographic region in Yemen known for its striking scenery) was the center of this historical trade route which wound its way from Qana on the Indian Ocean to Ghaza on the Mediterranean Sea.

The currency of the day was Frankincense and Myrrh. South and west of the Rub Al Khali (Empty Quarter), early settlers in the Hadhramaut grew spice trees and bushes on fertile lands fed by rainwater, enriching the soil in the wadis. They harvested the precious resins, making this land of "Arabia Felix" or "lucky Arabia" much celebrated because of its legendary wealth made possible by trade.

In biblical times, the Sabean civilization in Yemen was part of Saba (also known as Sheba), a powerful kingdom on the southern edge of the Arabian Peninsula. Ruled by the famed Queen of Sheba in the capital of Marib, the kingdom's territory included the Hadhramaut and its capital city, Shabwa, and at one time, colonies across the Horn Sea in Africa. Stories abound of the meeting between the Queen of Sheba and King Solomon.

Seismic crews travel the "Gold and Incense Road." In this ancient land of Yemen, new treasures are being sought and the "Gold and Incense Road" is being traversed once again, highlighting the importance of the region and its people. Modern Yemen is as fragrant as ever, having the spices still present in the markets of Sanaa, as long as they fetch their weight in gold and silver, and apart from the ever-sparkling gold, wares traded in biblical times are of curious interest today.

Oil is the coin of the day -- "hydrocarbons" the new word. The cities of Marib and Shabwa, and The Hadhramaut region have acquired renewed fame as seismic exploration crews move along the old routes in search of new treasures.
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Oil is the coin of the day - "hydrocarbons" the replacement word. The cities of Marib and Shabwa, and The Hadhramaut region have acquired renewed fame as seismic crews move along the old routes in search of new riches.
Western's history in Yemen began in 1963 with an extensive exploration program in the Hadramaut. As these early Westerners entered the Wadi Hadramaut, they were met with precipitous canyon walls rising menacingly on either side.

Water flows in these spectacular canyons during the rainy season, and because of the abundance of water along the Wadi, it has attracted farming communities of many past cultures. Western crews making their way along the seismic line continue to witness extensive archaeological remains being unearthed.

In the mid-80s, Western established an office in Yemen and a vibroseis crew began work, completing its assignment and departing in due course. Renewed activity in the Hadramaut began in 1990 with a number of proposals and subsequent awards, requiring importation and deployment of what started out as two, but has since grown to three exploration crews.

Supervisor David Coburn and Administrator Stephen Grosell spearheaded the importation of Party 767 into Yemen. Upon completion of work in Sudan and Oman, the crew was "stacked" in Jebel Ali, U.A.E., and sea-freighted to Mukalla, Yemen.

Some anxiety was experienced at the startup of Party 767 and the conflict in Kuwait seemed to coincide. A critical period from January to December that year will long be remembered by both Stephen and David, who were resident in the Taj Shiaa Hotel mobilizing the crew. Crew 767 went to work during the conflict and completed its assignment on time, completed a second project in early 1992, and then moved to its present concession.

A second crew, Party 773, was bid during this time, with work calling for the crew to be imported once more from Jebel Ali to Mukalla. Importation was completed with good speed and the crew went to work acquiring vibroseis data in the region. Crew 773 successfully completed its first survey in April, 1992, and is currently performing work on a prospect using both vibroseis and heliborne explosives.

Western's operations in Yemen have undergone a number of changes since the startup in 1990. Resident Manager Joe Vagt and his wife arrived in Sanaa in the summer of 1991; after the heat of Khartoum and Algiers, the sea air at an altitude of 7500 feet was a welcome change during the summer months.
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Western's operations in Yemen have undergone a number of changes since the startup in 1990. Resident Manager Joe Vagt and his wife arrived in Sanaa in June 1991; after the heat of Khartoum and Algiers, the move at an altitude of 7500 feet was a welcome change during the summer months.
Field Supervisor Bill Browne departed Yemen for the greener shores of Chad in May, 1991, while field supervisors Willie Stebeleski and Eric Wersich joined the staff in Sanaa. Supervisor Conrad Dombowsky, his wife, and Field Supervisor Lane Denzin also joined operations in Sanaa in 1992 while Eric Wersich joined startup operations in Romania.

Crews Encounter Wadis and Jebels in “Arabia Felix”

“Within the confines of such a ‘desert’-appearing region, it is quite surprising to reach the crest of a barren hill and suddenly find oneself confronted with lush tropical vegetation in the valley below, complete with roadside stands offering fresh coconuts for sale. Then, only a scant few miles beyond, the eerie landscape may appear as vast and deserted as the surface of some unknown planet.”

These words of an early Westerner are an apt description of Yemen with its striking wadis and precipitous jebels (mountains). From the high elevations of The Hahdramaut, the vast desert and monstrous dunes of the Rub al Khali in Saudi Arabian stretch as far as the eye can see.

For Party 767, directed by Party Manager Mike Ewart and assistant-party managers Kelly Dittus, Jim Brazel, and Darrell Robbins, work in Yemen commenced in vibroseis mode. With two contracts down and now on a third prospect, the operation has expanded to a dual-crew situation where Party 767A operates as a vibroseis crew with a portable-in-fill using pickups and cable buggies as well as helicopters to move line. A second component, Crew 767B, is a full-fledged heliportable crew using helicopters to transport both men and machines along the seismic lines.

Under the supervision of Party Manager Nick Batog and Assistant Party Manager Bill Hogan, Party 773 worked throughout the spectacular area of Yemen called The Hahdramaut. Here, sheer cliffs rise as high as 500 feet.

Both crews use helicopters to traverse the difficult terrain. Surveyors, drill, and recording crews all need portable support. Equipment and personnel are transported in a never-ending, well-organized sequence, to accomplish each specific task. Two Bell 212 and six Lama 225 helicopters are used by the two crews. Additionally, there is a fixed-wing aircraft available at each basecamp for crew rotation and emergency use.

In charge of aircraft movements, Crew 767’s OCM, Blaine Gervais and Crew 773 Assistant Party Manager Jack Batog run a control tower operation, directing fixed and rotary wing aircraft in an effort not to waste precious flying time.
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In charge of aircraft movements, Crew 767’s Chief Helicopter Pilot Blaine Gervais and Crew 773 Assistant Party Manager Jack Batog run a control tower operation, directing the fixed and rotary wing aircraft in an effort not to waste precious flying time.
The route from Mukhalla into The Hadramaut involves practically every type of terrain imaginable with the first leg of the journey consisting of steep, winding, roads literally hewn from the mountainsides. Chief Mechanic Tom Turnwald and mechanics Leslie Tabone and Steven Staley from Party 767 and mechanics Ron Allen, Brad Gangl, and Nigel Ogbourne from Party 773 continually meet the challenge to “keep’em running,” moving the crews’ equipment convoys along the treacherous mountain roads. In many instances, one careless movement could result in a vehicle tumbling headlong a thousand or more feet down the mountainside!

Sharing the duties of medical supervision and safety, an undertaking that includes caring for a total of 75 expatriates and well over 500 nationals spread throughout the various camps, are Doctor Jean Dehn and Safety Representative Billy Akers from Crew 767 and Doctor Kammel Houssam and Safety Representative Darrel Smethurst from Crew 773. Long hours and endless patience are essentials of their job description.

Apart from routine instrument and vibrator tests, including data from the crews are processed daily on West FACE™ system by Party 773 Seismologist Darrel Rob and Quality Control Technician Stephen Maharaj, Instrument Supervisor David Pilliwood and Party 773, and Technician Jonathan Hill of Party 767 handle upkeep of electronics equipment. The mountainous terrain and abrupt elevation changes interspersed with villages and agricultural plots have proved a challenge for Crew 773’s Chief Surveyor Dahl and surveyors Ron Cherry, Steve Brown, Steve Johnson, and Bill Cerkies and Party 767’s Chief Surveyor Gordon Crook, and surveyors Richard Saive, Mark Trudell, David Rogerson, Josiah Snips, Robert Forrest, and Steve King.

Crew 767A uses a mixed source made up of vibroseis and drilled pop skots in stretches dictated by the terrain. The vibrators are maintained by technicians Rafik Derbola, Quality Control Geophysicist Stephen Rob, Seismologist Darrel Rob, Instrument Supervisor David Pilliwood, and Technician Jonathan Hill of Party 773, and the vibroseis source is supervised by drillpushers Richard Saive, Mick Dawson, Sean Bedford, and Gary Forrest. Instrument maintenance and repair are handled by Mechanic Lowell Smith and Mechanic Lowell Smith.

Yemeni daggers are a favorite item in the Sanaa marketplace.
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Crew 767 members Jeffrey Hites, Andrew Newell, Phil Coleman, and Mohamed Abu-Zeid perform uphole drilling operations using a vehicle-mounted unit and a heliportable rig.

Staying ahead of Crew 773’s recording crew are Chief Driller Gerry Rindahl and Mechanic Mark Driver, Junior Observer Ollie Kingsbury, and Vibrator Mechanic Zed Chhor. Mechanic Kerry Steele splits his time between the basecamp and the field maintaining a dozen compressor/engine-driven drill units.

Training a local labor force on modern equipment as the crews move from area to area is an important part of Western’s presence in Yemen. Handling negotiations of territorial and loyalty claims that can date to ancient times is a sensitive job handled by the respective client representative and Western’s party managers.

Monitoring recording production for Crew 767 is Chief Observer Abdul Waheed, Senior Observer Allan Mathewson, Geophysicist Moamen Madkhour; observers Stephen Hill, Jack Peschel, Nadeem Akhtar; junior observers Ismat Ghanem, Adel Nasthy, and Junior Hook record production along Crew 773’s seismic line.

Observer Ahmed Radwan Sayouh and observers Dan Swainston, Finn Coll, Will Rivers, along with junior observers Ismat Ghanem, Adel Nasthy, and Junior Hook record production along Crew 773’s seismic line.

**Exploration Continues**

Although the tire tracks of Western’s vibrators scrawl only impermanent records in the rugged landscape of the Hadramaut, there is a sense of permanence inherent to “Arabia Felix” still holds many treasures in the form of energy reserves beneath its arid landscape. With the passage of time, the discovery of commercially viable quantities of hydrocarbons will aid the progress of Yemen, and this land will continue to be explored through the use of 3-D exploration technology to delineate the reservoirs that hold the precious liquid gold of these modern times.

When the day’s seismic work is complete and severe heat nears, the wadis and Jebels are peaceful and still except for a cool desert wind carrying the age-old fragrance of Frankincense and Myrrh out into the Gulf of Aden.

Sanaa, Yemen, is the world’s oldest living city.
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Observation, Yemen

Exploration Continues

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Sanaa, Yemen, is the world's oldest living city.

48
Sanaa (the Fortified One), founded by Shem, son of Noah, is an ancient city. The citadel Qasr Al Salih within and the mud brick wall surrounding the city bear witness to times past.

Although six wooden gates once afforded entry to visitors, only one gate, "Bab El Yemen," endures the ravages of time; however, the old city itself remains the heart of modern Sanaa.

Hundreds of small shops, artisans, and vendors vie for attention. Here, trades and crafts practiced of old are still pursued, most prominently the crafting of the Yemeni dagger or "Jambiah."

The spice market in Sanaa, with its Frankincense and Myrrh being only two of many available choices, evokes memories of ancient travellers visiting "Arabia Felix." The selection of spices is overwhelming, some unfamiliar and some we see everyday in a jar on the kitchen shelf.

Turmeric, pepper, cardamom, coriander, cumin, cloves, thyme, cinnamon, and ginger, to name only a few, are displayed in abundance. There are also almonds, raisins, peanuts, and pistachios in the market where vendors dip their wooden measuring cups into the giant bowls and ladle out the desired quantity.

Rounding a corner and entering the silver market in Sanaa, tourists and residents alike find historical coins, inlaid guns, jewelry, and every conceivable form of Jambiah on display.
Sanaa (the Fortified One), founded by Shem, son of Noah, is an ancient city. The citadel Qasr Al Silah within the mud brick wall surrounding the city bear witness to times past. Although six wooden gates once afforded entry to visitors, only one gate, "Bab El Yemen," endures the ravages of time; however, the old city itself remains the heart of modern Sanaa. Hundreds of small shops, artisans, and vendors vie for attention. Here, trades and crafts practiced of old are still pursued, most prominently the crafting of the Yemeni dagger or "Jambiah."

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Rounding a corner and entering the silver market in Sanaa, tourists and residents alike find historical coins, inlaid guns, jewelry, and every conceivable form of Jambiah on display.
Modern construction in the city replicates some of these features, especially the arched colored windows; and observers are fascinated with kaleidoscopic color play. Fully marks patterns on the floors and walls. The outside walls still require the work of skilled stone masons who carve the old haunted stones in various shades of white, grey, pink, and green.

Traditional family ties are very strong in Yemen. Modern houses in Sanaa, occupied by larger families including grandparents, parents, uncles, aunts, and children, are very large, detached, and surrounded by high clay privacy walls.

A semblance of the caravan of old can still be seen during national holidays as the Yemeni people travel to their birth villages laden with presents, sweets, and items of daily use for friends and relatives, leaving the city a temporary ghost town.

Another Yemeni ritual, the “Gad Chew,” takes place in every household throughout the City of Sanaa every Thursday. Friends of appropriate status gather in the “mawlay” (special room) built into every house in Sanaa that is carpeted and has cushioned along the walls separated by alleys. Here, political views are voiced, business is discussed, and marriages are arranged.

Inside these ancient walls, the traditions of the Yemeni residents in the City of Sanaa remain virtually unaltered. And here, in the old part of the city, the spicy scents and crafts of times past are preserved even in this modern age.
Modern construction in the city replicates some of these features, especially the arched colored windows; and observers are fascinated with kaleidoscopic color designs as the sun play. Tiny motifs pattern the floors and walls. The outside walls still require the work of skilled stone masons who carve the multi-faceted stones in various shades of white, gray, pink, and green.

Traditional family ties are very strong in Yemen. Modern houses in Sanaa, occupied by entire families including grandparents, parents, uncles, aunts, and children, are very large, detached, and surrounded by high clay privacy walls.

A semblance of the corridors of old can still be seen during national holidays as the Yemeni people travel to their birth villages laden with presents, sweets, and similar goods for friends and relatives, leaving the city a temporary ghost town.

Another Yemeni ritual, the “Gid Chew,” takes place in each home throughout the City of Sanaa every Thursday. Friends and acquaintances gather in the “mufras” (special room built into every house in Sanaa that is carpeted and has curtained along the walls separated by armrests). Here, political views and business is discussed, and marriages are arranged.

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A comprehensive method for evaluating the design of air guns and air gun arrays.

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Trace inversion using an interactive workstation.

Using the parabolic radon transform as a moveout filter.

Velocity-stacking processing.

Zero-velocity layer: Migration from irregular surfaces.
Technical Papers

A Comprehensive Method for Evaluating the Design of Air-guns and Air-gun Arrays (W84-000)
A Hybrid Refraction Algorithm (W85-000)
A Relationship Between Dynamic Range and Word Length in Digital Systems (W83-000)
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Cascaded FK-Migration: Removing the Restrictions on Depth-Varying Velocity (W89-000)
Coherent Noise in Marine Seismic Data (W81-000)
Compact Strobe Gun Source Arrays (W85-000)
Depth Migration of Isolated Time Sections (W87-000)
Desired Seismic Characteristics of an Air-gun Source (W87-000)
Dynamic Corrections for F-F Wave Reflections—Transversely Isotropic Solids (W90-000)
Effectiveness of Wide Marine Seismic Source Arrays (W88-000)
Enhancements to Prestack Frequency-Wavenumber (FK) Migration (W89-000)

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* Published for 1992 SPGG
The approach of winter, 1991, saw the **Discovery** leaving Den Helder, Netherlands, for the sunny Mediterranean. In the capable hands of Captain Macmurad Greene, Chief Engineer Ken Rodham, and coordinators Paul "Killer" Donnelly and Mickey "Duff" Constable, the **Discovery** crew began an extensive 3-D survey offshore the Netherlands, but the project was temporarily halted due to severe weather conditions in the North Sea.

The **Discovery**'s relocation to the Adriatic Sea along the east coast of Italy was greeted by thick snow and even thicker fog, and a host of small fishing boats. The **Discovery** crew first completed a small, but intense survey in conjunction with the **Western Ocean** that called for shooting among the many rigs, platforms, tanker terminals, and anchored tankers off Ravenna. Then came a larger survey further offshore, again a dual-boat operation with the **Ocean**, amidst the same thick fog and fishing boats.

On completion of the work in Italy, we parted company with the **Western Ocean** and steamed back to the Netherlands, arriving in Den Helder in April, 1992. Upon arrival, the crew said goodbye to Party Manager Dave Munro and welcomed Richard Llewellyn as party manager. In Den Helder, the **Discovery** was rigged and prepared for the continuation of the large North Sea 3-D survey begun in 1991.

The work continued through summer, and the **Discovery** changed its colors from gray to green and white. The same period saw several changes in the crew. Technicians Julian Ramsey and James Mace and Senior Navigator Paul Lester were replaced by Senior Navigator Joe Pechuck, Technicians Ken Fisher, and Gunners Mike Sanderson and Jimmy Greaves. Sadly, Peter Chishenre was taken ill and died this summer.

Completion of the Dutch 3-D survey saw us de-mobilizing in Den Helder and then steaming around south of England to Milford Haven to begin a prospect in the Celtic Sea between southern Ireland and Wales. During the course of work here, Safety Supervisor Dick Bye conducted a safety course aboard the **Discovery**. Interest and crew response were high.

Upon our return to the docks at Milford Haven, Crew 114 also participated in an "abandon ship" exercise, included jumping from the ship into survival suits into the less-than-welcoming harbor waters. The **Discovery** crew, along with other members of the fleet, will soon participate in a survival course presented by Analysts Packer.

![Photo by Marshall Studios, Hull, England.](image-url)
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Anniversaries

Anniversary Service Operator Ronald "Scott" Enslow (center) receives congratulations on 10 years of service from Houston Operations Supervisor Gary Chambers (right) and Ecognized Engineer Computer Services Group Manager Paul Perry.

New Orleans Data Storage Facility Manager Kathy Morel receives her 10-year service anniversary pin from Vice President of North American Operations Richard White.
Crew Support and Equipment Group Manager Ken Barnum (left) congratulates Field Supervisor James "Bubba" Boydstun on 15 years of service.

Senior Systems Programmer Robert Alford (center) receives his 15-year anniversary pin from Houston Marine Processing Center Manager Judy Adams and Programming Supervisor Scott Denham.

Land Cable Technician Annie Jackson receives her 15-year anniversary pin from Exploration Products Production Manager Gary Sconce.

Senior Data Entry Clerk Mark Tabbeman (right) celebrates his 10-year anniversary with Houston Marine Processing Center Manager Judy Adams.

Houston Senior Geophysicist Jeff Coleman (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.

Senior Data Entry Clerk Mark Tabbeman (right) celebrates his 10-year anniversary with Houston Marine Processing Center Manager Judy Adams.

Senior Systems Programmer Robert Alford (center) receives his 15-year anniversary pin from Houston Marine Processing Center Manager Judy Adams.

Houston Senior Geophysicist Jeff Coleman (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.

Crew Support and Equipment Group Manager Ken Barnum (left) congratulates Field Supervisor James "Bubba" Boydstun on 15 years of service.

Houston Senior Geophysicist Jeff Coleman (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.

Assistant Marine Processing Center Manager Larry Cain accepts congratulations on 25 years of service from Houston Marine Processing Center Manager Judy Adams.

Secretary Kris Ahendroth accepts congratulations on five years of service from Crew Support and Equipment Group Manager Ken Barnum.
Crew Support and Equipment Group Manager Ken Barnum (left) congratulates Field Supervisor James "Bubba" Boydstun on 15 years of service.

Senior Systems Programmer Robert Alford (center) receives his 15-year service pin from Houston Marine Processing Center Manager Judy Adams and Programming Supervisor Scott Denham.

Land Cable Technician Annis Jackson receives her 15-year service pin from Exploration Products Production Manager Gary Scow.

Senior Data Entry Clerk Mark Yntsman (right) celebrates his 10-year anniversary with Houston Marine Services Manager Andy Can.

Houston Senior Geophysicist Jeff Laube (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.

Associate Marine Processing Center Manager Larry Cain accepts congratulations on 25 years of service from Houston Marine Processing Center Manager Judy Adams.

Secretary Kristie Ahrendt receives congratulation on five years of service from Crew Support and Equipment Group Manager Ken Barnum.

Senior Systems Programmer Robert Alford (center) receives his 15-year service pin from Houston Marine Processing Center Manager Judy Adams and Programming Supervisor Scott Denham.

Houston Senior Geophysicist Jeff Laube (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.

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Houston Senior Geophysicist Jeff Laube (right) celebrates his 15-year anniversary with Manager of 3-D Interpretation John Sherwood.
Welder David Roden (right) of Exploration Products accepts his five-year service pin from Production Supervisor Dan Sheeter.

Exploration Products Mechanical Assembly Manager Sid Johnson (right) presents Production Supervisor John Bennett with his 15-year anniversary pin.

Exploration Products Production Manager Gary Scott (right) congratulates Production Supervisor Phil Ladwig on 15 years of service.

Exploration Products Production Manager Gary Scott (right) presents Production Supervisor Phil Ladwig with his 15-year anniversary pin.

Exploration Products Production Manager Gary Scott (right) congratulates Production Supervisor Phil Ladwig on 15 years of service.

Production Supervisor Don Falsbauer (center) celebrates 20 years of service with Western Hemisphere Processing Vice President Royce Sharp (right) and Computer Systems Manager John Kinane.

Data Processing Supervisor John Bonnell receives his 15-year anniversary pin from Houston Marine Processing Center Manager Judy Adams.

Programs Supervisor Don Falsbauer (center) celebrates 20 years of service with Western Hemisphere Processing Vice President Royce Sharp (right) and Computer Systems Manager John Kinane.

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Exploration Products Production Manager Gary Scott (right) congratulates Production Supervisor Phil Leslie on 15 years of service.

Exploration Products Production Manager Gary Scott (right) presents Production Supervisor John Bennett with his 15-year anniversary pin.

Data Processing Supervisor John Bonnell receives his 15-year anniversary pin from Human Resources Manager Judy Adams.

Programmers Supervisor Don Funkhouser (center) celebrates 20 years of service with Western Hemisphere Processing Vice President Royce Sharp (right) and Computer Systems Manager John Koonce.

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Data Processing Supervisor John Bonnell receives his 15-year anniversary pin from Human Resources Manager Judy Adams.
Exploration Products Production Manager Gary Scott (right) presents Senior Wiring Assembler Kalavati Mitrani with her five-year service pin.

Assistant Facilities Manager Frank Bertolino (center) receives congratulations on 15 years of service from Houston Facilities Manager John Bennett (left) and Vice President Bob Lowe.

Instrument Supervisor Roger Schade (center) accepts congratulations from Vice President Richard White (left) and Manager Rich Cieslewicz.

Avondale Travel Account Executive Lorrie Ditter (right) presents Secretary Jane Guthrie with a complimentary trip for two. Jane was the winner in a drawing held at the spring of the main agency.

Assistant Facilities Supervisor Brad Piner (left) receives his 15-year anniversary pin from Production Manager Gary Scott.

Instrument Supervisor Roger Schade (center) accepts congratulations from Vice President Richard White (left) and Manager Rich Cieslewicz.

Avondale Travel Account Executive Lorrie Ditter (right) presents Secretary Jane Guthrie with a complimentary trip for two. Jane was the winner in a drawing held at the spring of the main agency.

According to "All-Around Grand Champion" Western Chef and Houston Lead Playback Chef Tony Thomas, the secret to cooing Texas-style barbecue is to use a dry rub rather than the sauce. Thomas, who works the evening shift, stayed up around the clock in order to get his barbecue competition to the event.

Head Computer Operator Craig Golden bowled the first perfect score of 300 in the Western Atlas Mixed League. The American Bowling Congress presented Craig with a commemorative ring. He is a member of the "800" team.
Exploration Products Production Manager Gary Scott (right) presents Senior Wiring Assembler Kalavati Mirani with her five-year service pin.

Assistant Facilities Manager Frank Bertolino (center) receives congratulations on 17 years of service from Houston Facilities Manager John Bennett (left) and Vice President Bob Lone.

Instrument Supervisor Roger Schade (center) accepts congratulations from Vice President Richard White (left) and Manager Rich Cieslewicz.

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Exploration Products Supervisor Brad Piner (left) receives his 10-year anniversary pin from Production Manager Gary Scott.

Exploration Products Supervisor Brad Piner (left) receives his 10-year anniversary pin from Production Manager Gary Scott.

Westerners and vendors alike kicked off the new year with the 15th annual Superbowl party and chili cookoff. Winners of this year's event were (left to right) vendors Danny Jones in third place, Mark Fairie in second place, Michael Brown in first place, and Melanie Finger, wife of Product Service Manager Jim Finger, for best "roadkill." (Photo by Vicki Poon.)

According to "All-Around Grand Champion" chef and Houston Lead Playback vocalist Tony Thomas, the secret to winning Texas-style barbecue is using the snap, rather than the sauce. Thomas, who works the evening shift, stayed up around the clock in this year's charity fundraiser barbecue competition and came away with the grand "Fubar" award and first place in both the barbecue and sausage competitions.

Head Computer Operator Craig Golden bowled the first perfect score of 300 in the Western Atlas Mixed League. The American Bowling Congress presented Craig with a commemorative ring. He is a member of the "Fubar" team.
Linn Exploration Products Says "Yee-Hah!"

Boot-stompin’ fun at ‘Go Texan’ jamboree

Linn’s Exploration Products manufacturing facility in Alvin, Texas, is well known around these parts for putting on a full-fledged “Go Texan” jamboree that’s just plain boot-stompin’ fun. Residents of the Alvin facility recognize Houston’s Livestock Show and Rodeo days each year with their own rodeo roundup complete with live entertainment and home cooking. The third annual Go Texan Day event February 18 featured a best western costume contest and a chili, cornbread/dessert cookoff, along with special group performances set to country music. All of these events were centered around a chili luncheon for all employees in the Alvin plant.

Onlookers kicked up their heels to talent contest winners, the “Shakey Shakey Trucks” and the “Western Geo Lynch Mob.” Each talent contest team, made up of at least two and not more than six employees, wrote country/western-style lyrics that pertained to Exploration Products and performed on an authentic hay-stacked bandstand constructed by Alvin staff members.

Chris Taylor and Robert Hubbell walked away with the best-dressed prize while James Rustek and Linda Nino placed first and second place, respectively, in the chili cookoff.

Alvin Plant Manager Steve Blades also took this opportunity to recognize master scheduler Rick Frank as Alvin’s Employee of the Year.

A special thanks to our vendors who came to sample and judge our home cooking and western costumes.
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A special thanks to our vendors who came to sample and judge our home cooking and western costumes.
"Trailblazers" in the Western Research faculty gathered for the annual chuckwagon lunch on February 19 to congregate at Texas longhorn-dwed adorns, hand-tossed boots, and prairie attire. Approximately 200 resident employees came to taste the traditional homecooked by chefs from Exploration Products. The event, which has been held for nearly the past five years, features awards for the best-dressed cowgirl and cowboy and for best chili, photo, and dessert. The first-place winners were Jerry Friesen as best-dressed cowgirl, Dena Lozica as best-dressed cowboy, and best dessert; Jerry McKenize for the chili; and Cynthia Lewis for the best salad. Vice President Paul Morgan awarded each of the winners a blue ribbon.

A 12-person committee or "cowperson brigade," including Ian Coulter, Will Dauchy, Lawrence Domingo, DeWayne Friesen, Dena Lozica, Jerry McKenize, Mickie Patton, Eva Rastelli, Sherry Robinson, and Linda Stevens organized the day's festivities. Planning for this event begins five weeks in advance.

Judging of this year's western costumes was handled by Lynne Felkai, Earl Hamilton, and Kip Hussert. The official chili tasters included Russell Grevs, Paul Hernandez, and Brent Rennick. Tasting of desserts fell to Ernest Albers, Bill Dittrich, and Dave Durham, while Dave Chow, Ted Cruise, and Jan Hirsch voted for the best salad.
"Texan Days" in the Western Research building galvanized the annual chuckwagon luncheon on February 19 to commemorate Go Texan Day in Houston. Locals in Texas longhorn-adorbed hats, hand-tooled boots, and prairie attire, approximately 200 residents came to taste the traditional homecooked by chefs from Charloston Products. The event, which has been held for the past five years, features awards for the best dressed cowgirl and cowboy and for best chili, salad, and dessert. This year’s first-place winners were Janie Betts as best dressed cowgirl; DeWayne Fitzs as best dressed cowboy and best feature; Jerry McKenzie as best chili; and Cynthia Lewis for best salad. Vice President Paul Morgan awarded each of the winners a blue ribbon.

A 12-person committee or “cowperson brigade,” including Jan Coulter, Will Dauchy, Lawrence Domingo, DeWayne Friesen, Dena Lozika, Jerry McKenzie, Mickie Patton, Eva Renfro, Penny Robinson, and Linda Stevens organized the day’s festivities. Planning for this event begins five weeks in advance.

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Visitors to Western's Houston headquarters building were greeted by active freemasons and cowgirls as they went about their work on Go Texan Day, February 19.
Weekenders at headquarters
Go Team!

Photo courtesy of Gale Gurneller.

Visitors to Western's Houston headquarters building were greeted by active livestock and corn girls as they walked through the offices on Go Texan Day, February 19.
Christmas at headquarters

Surrounded by twinkle lights and reflections off of the mirrored dance ball, nearly 900 Western employees, spouses, and guests dined and danced into the early morning hours of December 12 celebrating the Christmas holidays at a new location this year — the J.W. Marriott Hotel. After dinner, guests danced to the music of a live band, and posed for professional photographs in the gala.

Western Geophysical President Orval Brannan extended holiday greetings to partygoers, while Geophysical Research Manager Dr. Craig Beasley served as master of ceremonies for the event. When the much-anticipated door prizes were awarded, a surprised Rolando Caste found the grand prize tickets for two to Amsterdam tucked inside a travel tote bag.

Partygoers also discovered 10 pieces of gold jewelry hidden among the table arrangements, and one lucky person at each table went home with the table decoration!

Other door prizes included roundtrip tickets for two to London, a $100 gift certificate from the Litton Federal Credit Union, a handheld video camera, a Sony “Watchman” black and white television, a toolbox with an assortment of over 300 tools, and many other prizes.

Special thanks go to 1992 Christmas party committee members — Chairman Janet Loveday; Door Prize Coordinator Marilyn Wrigley and helpers Dave Durham and Candy Smith; Retiree Guest Coordinator Annie Washburn; and Tickets Coordinator Vickie Klein and helpers Virgie Bryant, Retta Moore, Peggy Rockhold, Patia Crowe, and Suzanne Miller. Thanks also to Evelyn Brooks, the mailroom staff, and the Corporate Communications Art Department for publicizing the event.

(Left to right) Margaret Hale Alexander, Ben and Barbara Thiggins and Warren Alexander

(Left to right) Georgia and John Koonece, Cheryl and Mike Peck, and Gail and Randy Wood

(Left to right) Jerry and Gail Pottersen

Sharon and Pat Snell

Jerry and Gail Pottersen

Nancy and John Sherwood

Yuri and Vera Lansky
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In Memoriam

Lou Brents

Former Westerner Lou Brents died of cancer on January 30. He worked as a marine cable specialist for 35 years and retired in 1986.

A native Texan, Lou is survived by wife Doris, his six children (Darla, Shawn, Glenda, Lou, Jr., Herman, and Angela), and eight grandchildren.

Lou's career with Western began in 1951 in Taft, California, where he was hired as a drill helper. Future positions with Western took Lou and his wife to towns throughout the western U.S., and in 1965 he settled as a party observer for a short time in Shreveport, Louisiana. In 1967, Lou transferred to Morgan City, Louisiana, to work in the marine cable warehouse and was promoted to marine cable specialist, and in 1969, he was put in charge of the marine cable maintenance and repair shop in Provo, Texas. In 1980, Lou moved to the new cable facility in Alvin, Texas. Lou made many lifelong friends throughout his career with Western, and he will be greatly missed.

John Paul Jones

Westerners in the Houston Land Processing Center were saddened by the death on February 16 of 80-year-old retired Westerner John Paul Jones, father of Bookkeeper Hank Jones. He is survived by wife Connie and children Henry (Hank), Paul, Philip, Michael, Deborah Solice, and Laura Virgadamo. Hired as a prototype engineer by Western Geophysical founder Henry Salvatori in 1944 to work in the Sanalino Labs in Tulsa, Oklahoma, Jones was soon transferred as sole employee of the newly-formed Western Geophysical Company in Tulsa. His first assignments included manufacture of gravity measurement equipment, and one of these early meters is currently on display as part of the Petroleum Exhibit in the Houston Museum of Natural Science.

Jones transferred to Western's Shreveport office in 1950 and, in late 1969, to the Galveston (Pecan Island) facility. Solely by coincidence, Jones' son Hank reported for work at Western Geophysical on the same date as his dad (February 29), 24 years later.

Western friends and former coworkers offer their sincere condolences to the family of John Paul Jones. His contributions to Western in its formative years and thereafter will be remembered.

Kimberly Landry

On November 25, 1992, Westerners in Denver were informed of the death of friend and coworker Kimberly Landry. Kimberly is survived by father David Landry (formerly of the Denver office), mother Margaret Landry, sister Jennifer, and her two brothers, Jarrod and Erin. The Denver staff is saddened by 21-year-old Kimberly's untimely death to cancer. Kimberley, who came to work for Western in January, 1991, as a computer operator, was a dedicated employee whose smile will be missed by all those who knew her.

— Parry Ames
In Memoriam

Lou Brents

Former Westerner Lou Brents died of cancer on January 30. He worked as a marine cable specialist for 35 years and retired in 1986.

A native Texan, Lou is survived by wife Doris, his six children (Darla, Shawn, Glenda, Lou, Jr., Herman, and Angela), and eight grandchildren.

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Lou made many lifelong friends throughout his career with Western, and he will be greatly missed.

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— Patty Ames
Juni o r Anal ys t Kenne th McNa lty in th e
Dallas remote processing center eliminates
questionable issues from incoming data.

Dallas Senior Analyst Bob Breckling performs a reflection statics analysis on the Expeditek
workstation.

Senior Analyst Johnn y Wade prepares a marine
survey.

Analyst Louise Andrews of Western's Dallas
remote data center prepares to process a
land survey.

Houston Electronic Assembler Charles Ferguson assembles several types of products for use on
Western's seismic vessels.

Electronic Technician Dian Le performs
black box testing on greater modules at the
Houston manufacturing facility.

Senior Electronic Assembler Dan Tien constructs cable harnesses for use in WG-24 modules.
Junior Analyst Kenneth McNulty in the Dallas remote processing center eliminates questionable traces from incoming data.

Dallas Senior Analyst Bob Breckling performs a refraction statics analysis on the Expeditor workstation.

Dallas Analyst Johnny Wade prepares a marine survey.

Senior Analyst Louise Andrews of Western’s Dallas remote data center prepares to process land survey.

Houston Electronic Assembler Charles Ferguson assembles several types of products for use on Western’s seismic vessels.

Senior Electronic Assembler Ya Lam prepares to construct a cable assembly for use in remote acquisition units.

Electronic Technician Dan Le performs bench testing on seismometer modules at the Houston manufacturing facility.

Senior Electronic Assembler Dan Tian constructs cable harnesses for use in W-24 modules.
They Serve

Service Anniversaries — January, February

27 Years
Brown, Leslie E.

25 Years
Bald, Ronald D.

23 Years
Alvarez, Charles Allen

22 Years
Lew, Arthur D.

20 Years
Lichtenstein, Mark N.

19 Years
Carrigan, Brian M.

18 Years
Cruz, Florencio

17 Years
Reynolds, Robert B. Jr.

16 Years
Busby, Andrew J.

15 Years
Kee, Paul E.

14 Years
Ricou, David J.

13 Years
Cooper, Michael A.

12 Years
Powers, Richard A.

11 Years
Burns, Frank J.

10 Years
Falko, Neil L.

9 Years
Beltran, Frank J.

8 Years
Morgan, John R.

7 Years
Kumar, Suresh

6 Years
Rehr, Robert E.

5 Years
Peterson, Jack E.

4 Years
Hart, John A.

3 Years
Laird, Sally R.

2 Years
Talbert, William D.

1 Year
Humphries, Robert F.

24 Years
Barker, Josh W.

23 Years
Camacho, Mario

22 Years
Baker, Ronald D.

21 Years
Klopfer, John D.

20 Years
Cunningham, David C.

19 Years
Branch, Roger

18 Years
Brennan, Robert J.

17 Years
Barrett, George A.

16 Years
Alhamidi, Saeed A.

15 Years
Baker, Stephen A.

14 Years
Brock, William F.

13 Years
Bowers, William J.

12 Years
Burr, Robert P.

11 Years
Burns, Joseph P.

10 Years
Burnett, William M.

9 Years
Burns, Thomas T.

8 Years
Benson, James E.

7 Years
Bliss, Richard W.

6 Years
Brown, John P.

5 Years
Brown, John P.

4 Years
Baker, Ronald D.

3 Years
Baker, Ronald D.

2 Years
Baker, Ronald D.

1 Year
Baker, Ronald D.
BEHIND THE LINES

They Serve

Service Anniversaries —
January, February

27 Years
Brown, Leslie E.

25 Years
Maller, Ronald D.

23 Years
Hill, Mark N.

20 Years
Schultz, Alfred F.

18 Years
Lake, John D.

16 Years
Bennett, David E.

24 Years
Parell, Bruce

23 Years
Cally, David C.

22 Years
Byrne, Michael

21 Years
Jennett, Jr., Fausto

20 Years
Cunningham, David C.

19 Years
Branch, Roger

18 Years
Brown, John P.

16 Years
Sklar, Jack C.

Exploration Products Marine Cable Shop employees (background to foreground) Carolyn Garcia (left), Marine Reed, Vicente Ramos, Bababhad Patel, Jaine Espino, and Juan Michel prepare a cable for final inspection.

Safety Advisor Joe Brousard practices making a small craft as part of a marine safety course.

Field service technician Matt Gray sets up a new system. (Photo by Bill Parker.)

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