There is a subtle trend developing these days which is disturbing. We are witnessing the steady erosion of a characteristic of American business which, heretofore, has been accepted as fundamental by my generation…. this basic premise has been that if an individual went to work for a corporation, performed reasonably well, and did nothing overt, then he could pretty well count on continued employment by that organization for his entire working career. Although there were no iron-clad guarantees of continued employment, this tacit assumption did produce appreciable benefits for both the employee (in terms of security) and the employer (in terms of loyal and dedicated service).

Since its founding over half a century ago, WESTERN has recognized the value in having loyal and contented employees and we have taken great pride in maintaining a very special relationship with our people. Therefore, we were extremely dismayed when the abrupt drop in the price of oil destroyed the geophysical marketplace almost overnight and forced us to make a sizeable reduction in our work force. Consider for a moment that the monthly seismic crew count for the U.S.A. fell to 158 crews during July 1986—not since the mid-30’s has the total number of crews been in the 150-160 range. It becomes obvious that we had no alternative except to reduce staff in a hurry if we were to survive as a company.

As a consequence, many of our good friends are no longer working with us. For many, the exit was graceful with the benefits sufficient to compensate for a shortened career. For others not so fortunate, we can only say that we are truly sorry for the upheaval to your personal lives. For our former employees—one and all—I want to thank you for all your efforts on behalf of WESTERN, to tell you we miss you, and to wish you well in your new pursuits.

Neal P. Adams
HELIPORTABLE SEISMIC operations are never routine, but during the summer and fall of 1985, Parties 341 and 361 discovered just how difficult they can be, especially when the weather doesn’t cooperate.

In early May, when the trees were just beginning to bud at lower elevations and the snowline was slowly receding at the 6000-foot level, Party 341 commenced operations in the picturesque Alberta foothills of the Rocky Mountains.

Party Manager John Smith mobilized slashing and drilling crews and 10 days later the recording crew commenced. A Sercel SN-348 telemetry system was employed with 228 channels over a spread of 5.5 kilometers. The unpredictable May weather produced problems, as high temperature fluctuations combined with a spread that was laid on both the sunny and shaded sides of mountains, resulting in random system errors. Observer Dan Swainston worked patiently to overcome these problems and, as the weather steadied into summer, the crew was able to record as much as 12 kilometers production in a day.

To deploy the cables, geophones, and station boxes along the line, large canvas bags were packed with the necessary equipment for four stations, and then transported with the helicopter, four bags at a time, to the appropriate sites. The loadmasters, Macdonald Smith and Harold McKenzie, maintained a running account of equipment on the line, ensured that all bags contained the proper equipment, and exchanged any malfunctioning gear.

The demands placed on the helicopters and pilots were enormous. The pilots had to place the drill equipment and recording instruments on the line through openings cut out by the line slashers. Due to the height of the trees, all the equipment was slung from the helicopter on a long cable so that the equipment could be placed on the ground while the helicopter maintained safe clearance. The operations were often conducted amid swirling winds, creating some of the most difficult and demanding type of helicopter work. All the long-line pilots had a minimum of eight years’ experience in mountain flying.

Safety played a major role in the daily operations. Helicopters, weather, wildlife, and rugged mountain terrain had to be constantly considered. All Western subcontract personnel attended safety lectures and demonstrations by Safety Supervisor Keith Bailey and the helicopter pilots. Line bosses set the example needed for high, safe production.

The logistics of supporting heliportable surveys can be troublesome. For most of the job in Alberta, the crews worked from
nearby motels and restaurants. However, Party 361, under Party Manager Garth Seabrook, was located in a remote area of British Columbia, at least a two-hour drive from the nearest town. To handle the large number of drillers, line slasher, surveyors, pilots, and recording crew members, a camp capable of housing and feeding 90 people was constructed. Needless to say, Western camp staff, headed by Don Lindwall, had their hands full.

Southeastern British Columbia houses a high number of grizzly bears. Crews were armed with “bear scarers” and CO₂ horns in case of confrontation with the beasts. There were about 30 sightings during the program. In one incident, a lineman on Party 361 sighted a bear 50 meters up the cut line, so he drew his CO₂ horn and fired at the bear. Unfortunately the bear was backed up by a steep cliff face. The sound hit the cliff face and resulted in an echo, confusing the bear. He started running down the line toward the lineman, who found himself up a handy tree in an effort to escape. CO₂ horns were not used thereafter.

Through the hot, dry, summer months, the portable operation ran smoothly in the Alberta region. However, parts of British Columbia experienced severe forest fires and forestry officials would not permit field operations in the south during the month of August. Some of the fires covered thousands of acres and threatened not only our seismic operations, but several towns and villages.

Line crews and surveyors quickly learned how to get themselves and equipment up and down the rough terrain, but in one particularly difficult Alberta area they were faced with steep cliffs and unstable shale slopes. Two professional climbers were enlisted to deploy climbing ropes. Some of the crew quickly gained their “mountain legs” and were able to safely negotiate the cliffs without ropes.

Recording helpers Dave Gibson and Vic Lozic discuss their options.
The heliportable program was originally scheduled for completion in August. Due to the delays created by the forest fires and then by cool, rainy weather (which extinguished the fires but limited productivity), the work extended into September. Normally, early autumn in the mountains provides good, stable weather. Last year, the snows came early and dumped an amazing seven feet of snow on the line during a September storm. To get the seismic equipment off the mountain, the line crew had to dig for the geophones and cables through the wet snow. At regular intervals during the day a load of dry firewood was slung to the crew so they could dry out by a fire. Most of the seismic equipment was retrieved in this manner.

Plans are to finish the program started last year by summer 1986, and undertake additional heliportable work in the Rockies. The Sercel SN-348 system has proven to be a viable recording system for this type of operation. Crews are now accustomed to the physical demands of mountain work and operations have been modified for more efficient utilization of helicopters and manpower. Now, if we can just get the weather to cooperate...
OVER THE YEARS, WESTERN’S EMPLOYEES have worked together to make the company a success. PROFILE talked with several employees to find out what their jobs involve and how they feel about working at Western. It’s the people that make the difference and give Western its reputation as a leader.

PROFILE

Haynie Stringer

Originally from McComb, Mississippi, Haynie says that the opportunity to travel to many different places has been an exciting and enjoyable aspect of his career. He also has appreciated working for an organization that has remained on the “leading edge of technology.” He adds, “There’s a great deal of pride in being associated with Western Geophysical, the leading seismic exploration company, and Aero, the leading airborne geophysical company.

“Aero and Western are companies that are going to be around for ever and ever. We’re obviously in an industry that is not as lucrative as it has been in the past. But we’ve shown through the years that we have the innovative management that pushes us in the directions that allow us to be successful in depressing times.”

Haynie joined Western in 1968, in the same building that currently houses Aero, as a computer programmer under Vice President Jim Hornsby. He was one of the first employees involved in Western’s new disciplines of satellite navigation and integrated navigation systems, as well as in the use of Western’s first minicomputer.

After progressing to software project leader, Haynie transferred to Aero in 1974, when Aero became a division of Western and both companies were integrated into the Litton Resources Group. Prior to his current position, he was Aero’s manager, Software Development, and then vice president, Data Processing and Software Development.

He met his wife Barbara at Western, who worked as a computer programmer in the R&D department from 1969 to 1980. The Stringers have two children.

“Sheena Regier

Except for recent times, with the drop in oil prices, Sheena has witnessed a continual “rapid expansion and diversification” of the Calgary office during her Western Geophysical career.

She joined the company in 1979 as an administrative assistant in the Personnel department, under 28-year Westerner Grant Bates. “The challenges of maintaining an appearance of calm organization and orderliness in the department were monumental, but by working together, I think we did a pretty good job.”

Says Sheena, “Assembling field crews each spring and fall was like a roundup.”

She adds that veteran Westerners were matched with “energetic newcomers so the Western tradition would continue.”

In 1982, Sheena transferred to the Data Processing department, then managed by Frank Ralton, and saw the staff grow from roughly 20 to 125 within three years. With the move to the new center in northeast Calgary, a great quantity of offshore data to handle, new systems being de-
developed, and operators and analysts being hired weekly, it was what she calls "an exciting time."

Working for Roger Hawthorne, Data Processing department manager since mid-1985, Sheena still enjoys each day's challenges. A self-proclaimed "greenhorn from Barrie, Ontario," she says she hardly knew what geophysical meant, much less jug or shaker, when she started out with Western. But now, mother hen, shoulder-to-lean-on, sergeant (ensuring that orders are followed), and familiar voice (who always tries to get the right answer to every question) are terms commonly associated with Sheena.

In addition to some traditional clerical duties, Sheena is responsible for maintaining contact with employees in the Calgary office, as well as clients and other Westerners throughout the globe. "It's very important to keep the various lines of communication open," she notes.

Sheena has an educational background in office procedure and economics. Away from Western, she is an avid gardener and also enjoys hiking and cooking.

"Supervising Western's crews can be a very gratifying job. I enjoy the versatility it allows," says Gregory Mosley, supervisor, Southeastern United States, out of the Metairie, Louisiana office.

Greg has been with Western for nine and one-half years, beginning as a junior data processing analyst in the Houston Digital Center. He has worked on field crews out of Colby, Kansas, the Northeast United States, Victoria, Texas, and Lafayette, Louisiana, progressing to assistant party manager, party manager, and now supervisor. Greg's responsibility is to obtain work through client contacts for field crew operations and then follow through with the prospect until the final sections are delivered to the client. He also shows Western spec data to clients and handles the occasional permit problem.

"My challenge is clear: To keep seismic crews running profitably, I must spend the least amount of money and get the highest quality data in return. The key is to focus on the positive things, keep up with what's happening daily, and stay in close contact with clients."

With four other employees, Greg works to "keep things running smoothly" at the Metairie office. This office is also the home of the New Orleans Data Storage Facility.

When not on Western's time, Greg enjoys spending time with his wife, Myra, and one-year-old son, Blaine, as well as saltwater fishing in Louisiana's coastal marshes.

Greg explains his personal philosophy of working for Western. "Western allows its people the freedom to develop at their own pace. The individual strength and character of each employee is what makes Western strong."

He continues, "I prefer to look at Western's long-term future. Despite the current petroleum industry slump, I feel there is an opportunity for us all to emerge as better employees and be instrumental in securing Western's future. We can learn from the challenges of today. Soon the exploration effort will increase, and I want to be a part of it."

Tom Sergeant, Denver Shop supervisor since 1982, recently celebrated 35 years of service with Western Geophysical.

In his present position, Tom is responsible for buying, selling, trading, building/ rebuilding, and storing vibrators, drills, cable trucks, and pickups. He also assembles and disassembles field crews for the Rocky Mountain region and California. Challenges on the job include converting 309 vibrators to 315 vibrators—and getting a crew out "yesterday." In addition to Tom, there are two permanent employees in the Denver Shop. Other workers are brought in the shop from time to time, on an as-needed basis, from various crews.

Like most people, Tom has enjoyed the travel that has been associated with his Western career. He joined the company in the old Los Angeles office. His work as a driller and driller mechanic, vibrator mechanic, and crew mechanic took him to several locations: Alaska, Texas, Jamaica, Canada, Cuba, Venezuela, Argentina, Portuguese Guinea, Southern Yemen (Aden), Tunisia, and Iran. From 1967 to 1972, he also was equipment supervisor in the Los Angeles office for Alaska, the West Coast, and the Rocky Mountain area.

"Though he doesn't travel as much presently, born and raised in Colorado, Tom feels he can't complain that he is based in Denver. When asked what he likes best about his job, he replies, "It's in Colorado, and it's still here!"

Not that Tom is overconcerned, however, about Western and the current state of the industry. "There have been ups and downs before."

Through Western, Tom met his wife, Darla, when she worked as a secretary for Western in Los Angeles. Tom and Darla have three children: Diandre, 14; Carrie, 9; and Tommy, 6.
Party 390 In Nigeria

Wayne Prince, Photographer

CHARACTERIZED BY SWAMPY flatland and towering mangrove trees, the Nigerian jungle presents the ultimate challenge to Western Geophysical's Party 390. Currently cutting lines, the crew plans to deploy explosives in the fall after the summer rainy season.

The crew carpenter is pictured building a table from local raw timber.

A surveyor on Party 390 takes a line shot.

In his free time, Safety Representative Jeff Howell planted a garden. The tropical weather urged vegetables to grow rapidly!

Clearing the line is a difficult job in the humid temperatures and jungle entanglement of Nigeria.
Crew members clear the line area with machetes.

In a nearby village a Nigerian woman sells smoked fish, a local delicacy.

Chief Surveyor Vladimir Vanovac helps linemen with the radio.
Taking a break, Driver Aleki Okonu (left) helps Party Manager Paul Reuter (kneeling) bargain for native artwork.

Party 390 is currently based on the Nunn River in Nigeria.

Posed on their office/houseboat in Port Harcourt, Party 390 crew members prepare to shove off for a three-day river trip to make base camp.

A jungle canopy surrounds Jeff Howell, safety representative, and Peter Thompson, party manager, on their way to the line.
Cook Syd Rockham keeps Party 390 happy with hearty meals served three times a day.

Client safety inspectors are escorted through the swampy thicket to observe Party 390 procedures.

Crew members cut survey stakes for shot point numbers.
DEFINITION

Seismic stratigraphy is the study of stratigraphic and depositional facies as interpreted from seismic data. In practical terms, it is the exploration of any basin showing that hydrocarbons are not only trapped by structure but by a combination of structure and stratigraphy. Structural traps can easily be seen on seismic sections. The stratigraphic traps sometimes have visible expressions on the seismic data but in many cases we need additional exploration tools to help locate these traps.

HISTORY

To understand the implications and power of seismic stratigraphy we must first have a clear understanding of seismic reflection. Classically, the product of velocity v and density $\rho$ is acoustic impedance. A change in acoustic impedance across a rock boundary generates a reflection coefficient, $R_{12}$.

A seismic reflection will occur when $R_{12}$ is large enough in either a positive or negative direction. This relationship caused geophysicists to assume that reflections followed lithologic boundaries. As seismic sensing improved in quality through the 1970's, and subsurface data was tied accurately to the seismic sections, it became apparent that this assumption is incorrect.

In 1976, Vail gave the definition of a seismic reflection which is the basis of seismic stratigraphy. Seismic reflections follow time lines and will cross lithostratigraphic boundaries. They will pass through a variety of lithofacies changing waveform, frequency, amplitude, and phase as they go. Armed with this definition of a seismic reflection, the science of seismic stratigraphy has developed into a powerful exploration tool.

BIOSTRATIGRAPHY

Since seismic reflections follow time, we need input from the biostratigrapher to interpret the seismic data properly. The biostratigrapher studies rocks on the basis of the fossils they contain, and can tell the geophysicist where the time-sequence boundaries occur within the sedimentary section and the ages on either side of these boundaries. This enables the geophysicist to correlate seismic reflections as sequence boundaries and recognize unconformities—a key to locating stratigraphic traps.

An example of reflecting and non-reflecting sequence boundaries is shown in Figure 1. The identification of sequence boundaries and unconformities is thus an interactive process involving the geophysicists and the biostratigrapher. At Western Geophysical, the biostratigraphic work is under the direction of Peter Rauwerda at Core Laboratories, with Lee Gibson as senior consulting scientist. The geophysical part of this team involves all the members of the Western Interpretation department.

The biostratigrapher is able to tell the geophysicists the ages on either side of time gaps or unconformities. These time gaps, in their simplest form, are caused by either erosion of already deposited rock or a period of time when no rocks were laid down. The unconformities are often angular in nature and can be seen on the seismic data. The angularity of the unconformity can create a trapping mechanism which is then classed as a stratigraphic trap. Figure 2 is an example of a stratigraphic column defined by a biostratigrapher. Note the unconformities where erosion or non-deposition has taken place. Figure 3 is an example of an angular unconformity.

RESOLUTION

One important aspect of seismic stratigraphy is how thin a bed of rock we can actually see on seismic data. If one walks across any layered rock outcrop, it will seem that nature deposits rocks in comparatively thin beds. Many cases are known of hydrocarbon production from thin sands.

Vertical resolution is a complex subject, and interested readers are referred to the work of authors such as Robert Sheriff for detailed information. In simple terms, resolution is 1/4 to 1/8 of the dominant wavelength. Signal-to-noise ratio and other parameters determine whether we can resolve closer to 1/8 than 1/4.

The velocity increases with depth and the frequency decreases with depth, both of which will increase the wavelength and decrease the resolution.

When we integrate the geological formations into the seismic data, we must keep in mind the seismic resolution of bed thickness that can actually be resolved.

DATA PROCESSING

When processing seismic data, a compromise usually takes place between the structural continuity of seismic reflection which is enhanced by many of our processes, and the stratigraphic need to keep our seismic wavelet as "clean" as possible. For this reason, it is now standard practice to generate both an AGC or structural section and a RAP section where the relative relationship of the amplitude of reflections has been preserved as accurately as possible. Figures 4 and 5 show the same piece of a seismic section from California processed for both AGC and relative amplitude.

The preservation of amplitude is a prerequisite for analyzing lithologic aspects.
Figure 4. AGC Processing

Figure 5. RAP Processing
Figure 6. Instantaneous Phase Display

Figure 7. PIVT - Pseudo Interval Velocity
Figure 8. Submarine canyon fan deposits in the San Joaquin Basin, California.

Figure 9. Mechanisms for stratigraphic trap.
of seismic stratigraphy. Angular unconformities, and thus obvious stratigraphic traps, can be seen on the AGC section (Figure 3) but preserving amplitude enables the interpreter to locate subtle stratigraphic traps.

Having preserved the amplitude during processing, there are several poststack processes which will aid the evaluation of stratigraphic traps. If we think back to our original definition of the seismic reflection, we said that seismic reflections change waveform, frequency, amplitude, and phase laterally. Displaying these and other seismic attributes is an essential step in stratigraphic analysis. Figure 6 shows a display of instantaneous phase, and Figure 7 shows a PIVT which displays pseudo sonic in color. These displays describe a stratigraphic trap in California. The trap is a series of stacked submarine fans in the Miocene section.

ENVIRONMENT OF DEPOSITION

With the seismic data correctly processed, we can evaluate and interpret the data to obtain the maximum amount of geologic information. There are three stages in this interpretation.

A. Correlation and definition of the major sequence bounding reflections. These are usually identified in conjunction with the work of the biostratigrapher. This area-wide evaluation enables us to build a time stratigraphic framework as well as the basin stratigraphy.

B. The second stage is to study the set of reflections between the sequence boundaries. Particular attention is paid to the geometry and continuity, as well as the amplitude, frequency, phase, and velocity of the reflections.

C. Fine detail is obtained through the study of the lateral variations of seismic attributes and geometries along a single reflection.

These three levels of interpretation enable the geophysicist to evaluate the environment in which sediments were laid down. The geometrical shapes of the seismic reflection can be associated with both lithology (sand, shale, limestone) and the paleogeographic depositional environments such as deltas, slope, shelf, submarine fans, canyons, continental rise, basin fill, reefs, banks, etc. It is beyond the scope of this article to go into details of the individual reflection shapes and how we recognize them. Interested readers are again referred to excellent recent publications on seismic stratigraphy. Figure 8 shows one example from California of a submarine fan sequence; this is the same feature as shown in Figures 6 and 7.

A very valid question that may be asked is what geologic information can be extracted from each of the seismic attributes we have discussed. Listed below are geologic parameters which can be derived from various seismic attributes.

<table>
<thead>
<tr>
<th>SEISMIC ATTRIBUTE</th>
<th>GEOLOGIC PARAMETER</th>
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<tr>
<td>Velocity</td>
<td>Lithology, porosity, fluids</td>
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<td>Amplitude</td>
<td>Acoustic impedance, bedspacing, fluids</td>
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<td>Frequency</td>
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</tr>
<tr>
<td>Geometry</td>
<td>Bedding patterns, depositional process, erosion, paleo- graphy, fluids</td>
</tr>
</tbody>
</table>

PROSPECTS

The ultimate objectives of an interpretation are to a) locate subsurface hydrocarbon trapping mechanisms for drilling and b) gain as much information about the lithology and petrophysics of the rocks before drilling. Trapping mechanisms which can be developed by seismic stratigraphy fall into two broad categories:

A. Geometrical expression of reflection terminated by unconformities. An excellent example of this is shown in Figure 3 where uplift of older beds has been followed by erosion and horizontal bedding. Many variations of this are possible. Figure 9 shows some of the terminating reflection geometries. The first type of trap is fairly simple to recognize on seismic data.

B. The second category is less obviously recognized on seismic data. These are the traps caused by lateral variation in facies and fluids. In this category we have such features as:

- lateral porosity and permeability barriers,
- sands grading into shales where the shale then becomes a seal,
- reef and other carbonate build up.

This brief discussion of some of the elements of seismic stratigraphy demonstrates the geologic information which can be extracted from seismic data. As the quality of our seismic data improves and as the geophysicist becomes more aware of the geologic implications, our ability to detect complex hydrocarbon traps will continue to improve.
ON FEBRUARY 27, the cafeteria in the main building in Houston bustled with Westerners congratulating Vice President Jimmy Jordan on his 40th anniversary with the company. Organized by the Data Processing department, the reception accommodated over 200 people from all areas of the company.

Since 1946, Jimmy’s responsibilities have been varied. He was originally hired as a computer on Party 13 in Mississippi. The next year he was promoted to party chief of Party 19, traveling to Texas, Arkansas, Wyoming, Louisiana, Mississippi, and New Mexico. He became party chief of Party 75 in 1953, the second marine crew Western had ever launched. For the next 10 years Jimmy was a party chief on marine crews in the Gulf of Mexico and did interpretation work on marine data throughout the world. When Western’s first compositing unit was set up in Shreveport, Louisiana in 1962, Jimmy was assigned to it, and the majority of his work since then has been in data processing. He helped set up and supervise Western’s first analog processing center, as well as setting up and supervising the transition from analog to digital processing. He was named manager of the Shreveport digital center in 1968 and manager of the Houston digital center in 1970. Jimmy became a vice president on December 6, 1978.

A native of Dushau, Mississippi, Jimmy attended junior college and the University of Georgia. During World War II he attained the rank of sergeant in the army and continued his education by attending radio and radar technical schools. Eventually he served in the Philippines, Okinawa, and Japan, before returning to Western, which had employed him for three months prior to his military service.
IN HONOR OF 35 YEARS of service with Western Geophysical, Vice President Jimmy Jordan presented Geophysicist John D. White his pin at a department gathering on March 7.

John was hired as a junior draftsman on Party 13 in Spur, Texas, in 1951, and immediately began to learn life as a “doodlebugger.” He worked in west Texas, Oklahoma, and Louisiana before settling for a while in New Orleans in 1956. He was a seismologist on review crews and he remained in New Orleans, with occasional trips to Houston and Shreveport, until 1970 when he moved to Houston.

A native of Jackson, Tennessee, John spent three years in the U.S. Marine Corps, serving as a corporal. Upon his discharge from the service, he attended Mississippi State University, graduating with a B.S. in petroleum geology. He joined Western after graduation.

AMIDST COLORFUL BALLOONS in his office and an elegant luncheon at Vargo’s, Area Manager L. E. (Bebo) Bratos celebrated 30 years with Western Geophysical. In addition to these surprises, Chairman of the Board Howard Dingman, Senior Vice President John Russell, and Vice President Orval Brannan were on hand to present Bebo his service pin.

Hired on January 18, 1956, as a recording helper on marine crew 70, Bebo later helped staff two playback offices in Shreveport and New Orleans, Louisiana, working as a helper, assistant computer, and technician. His promotions from assistant observer, observer, coordinator, field supervisor, supervisor, and area manager have afforded him the opportunity to travel extensively. Bebo has worked in Central America, South America, the Caribbean, the Middle East, West Africa, Europe, the Far East, Russia, China, and most currently in Alaska. As Manager/West Coast & Alaska Marine division, Bebo is responsible for all marine operations, from the California coast to the Arctic Ocean.

Born in Mobile, Alabama, Bebo attended Perkinston Junior College in southeastern Mississippi before joining Western.

Bebo Bratos receives a 30th anniversary gift from co-workers.

From left to right (background), Chairman of the Board Howard Dingman, Vice President Orval Brannan, and Senior Vice President John Russell congratulate Area Manager Bebo Bratos (foreground) on 30 years of service with Western.

John D. White prepares to cut into his cake at a March anniversary celebration in the Data Processing department.

Vice President Jimmy Jordan (left foreground) awards John White (right foreground) his 35-year service pin as co-workers provide background congratulations.
Behind the Lines

Loading supplies during a recent Western Harbor port call in Galveston is Recording Room Helper Tim Nalley.

Paul McKee, who works for Aero Service in the navigation department, temporarily moved to the annex in Houston to help digitize well logs.

Geophysical Technician David Klemm checks intersections on a map.
Setting up an offset DMO are geophysical technicians Paul Kaiser (left) and Long Trinh (right).

Overseeing alterations aboard the Western Caribbean is Gun Mechanic Wendell Brock. Wendell recently transferred to the Western Horizon in Seattle, Washington.

As geophysical technician in marine group 43, Sandra Nuerge checks 3D diagonal lines.
Technical Writer Ian Coulter prepares a users manual in Western’s Training and Documentation department.

Preparing delicious fare for Western crews for almost 12 years, Cook Richard Frenz currently delights the palates of Western Caribbean crew members in the Gulf of Mexico.

As administrative manager for Eastern Hemisphere Land, Jim Lowe travels extensively, handling registration of Western with foreign governments and the coordination of our field administrators, and accountants.
Editing navigation data set is Analyst Bill Skibbe.

Planning dual cable conversion for the Western Wind, located in Africa, are Supervisor Tom Trainor (left) and Geophysicist Bill Behrens.

Gulf Coast Assistant Party Manager Tom Meyer recently left for a three-month stint in Alaska to “learn the ropes” of arctic operations.
In the Computer Science department, Programming Supervisor Scott Denham currently develops codes for the IBM-3090 VF computer.

Routing calls, paging people, placing long-distance calls, and arranging conference calls are some of the duties handled by PBX Operator Myrtie Foil.

Western Odyssey Party Manager Terry Leighton successfully completes another port call in Australia.
YES! I would like to receive additional copies of the following Western, Aero Service, and Downhole Seismic Service brochures and technical papers. I have indicated my preferences and desired quantities in the spaces provided.

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- High-Sensitivity Aeromagnetic Surveys
- High-Sensitivity Measured Vertical Gradient
- Integrated Interpretation Services
- Marine Gravity and Magnetics
- Sedimentary Anomalies from High Resolution Aeromagnetics
- SedMag™ Process

Photogrammetry:
- Photogrammetry

Remote Sensing:
- GeoImages® (Digital Processing of Multispectral Imagery)
- Thematic Mapper (Digital Image Processing)

Surveying:
- Geodetic Surveying
- MACROMETER® Interferometric Surveying System
- MACROMETER II Surveys: The Dual Band Advantage
- MACROMETER II Interferometric GPS Surveying System
- SAR Synthetic Aperture Radar
- SAR System® Imagery (Synthetic Aperture Radar Non-Exclusive Proprietary Imagery)
- SAR System Imagery (Alaska Non-Exclusive Proprietary Imagery)
- Digital Spectrometry

Western Geophysical Technical Papers
- Coherent Noise in Marine Seismic Data
- A Comprehensive Method for Evaluating the Design of Airguns and Airgun Arrays
- Data Enhancement from a 500-Channel Streamer
- Depth Migration of Imaged Time Sections
- Desired Seismic Characteristics of an Airgun Source
- Effectiveness of Wide Marine Seismic Source Arrays
- Efficient 3-D Migration in Two Steps
- Far-Field Signatures by Wavefield Extrapolation
- Imaging Beneath Complex Structure: A Case History
- Migration of Seismic Data from Inhomogeneous Media
- Predictive Deconvolution and the Zero-Phase Source
- Prestack Layer Replacement
- A Relationship Between Dynamic Range and Word Length in Digital Systems
- Simultaneous Estimation of Residual Statics and Crosstalk Corrections
- Experimental Investigation of Interference from Other Seismic Crews
- Airgun Source Instabilities
- Cascaded Migrations: A Way of Improving the Accuracy of Finite-Difference Migration
- Migration Velocity Analysis by Wave-Field Extrapolation

Expanded Abstracts
- The Generalized Primary and the O’Doherty-Anstey Formula
- Model-Based Wavelet Processing of Deconvolved Seismic Data

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LRG conducts San Joaquin Basin stratigraphic potential study

Western Geophysical and Core Laboratories, two companies in the Litton Resources Group, are conducting an integrated geophysical and geological study of the San Joaquin Basin in California.

The purpose of the study is to evaluate stratigraphic traps in the basin and their exploration merit. Specifically, 700 miles of seismic reflection data will be examined to characterize trapping mechanisms in the plioene, miocene, oligocene, eocene, and cretaceous sections.

"This is the first stratigraphic study available to clients on a speculative basis," said John Sherwood, manager of Special Processing and Interpretation at Western Geophysical.

A final report on the study will be released in November, 1986. The report will include correlations of well logs, litho- and chronostratigraphic columns, synthetic seismographs, seismic sections, derived attributes, and lithological modeling. Maps highlighting major stratigraphic trapping mechanisms will also be part of the report.

Vice President Cliff E. Thomas of Core Lab is serving as the coordinator of the project. Participants in the study from the Western Geophysical Interpretation department include Sherwood, manager, Jack Keyes, senior geophysicist in charge of project coordination and seismic stratigraphy, Roger Murray, geophysicist in charge of data processing and modeling, and Dick Snyder in charge of log interpretation. Core Lab's Dave Demshur is in charge of geochemistry and petrology integration.

New Litton graphic identity system introduced

The new Litton identity system was introduced to 60 representatives from 31 Litton divisions and corporate office at a company-wide meeting held May 6, in Santa Monica, California. Fred W. O'Green, chief executive officer and chairman, was the keynote speaker at the seminar.

O'Green explained that the new identity system was an important element in the strategic plan to focus Litton's image. "In the past, we believed that many of the divisions' own names were more important than Litton's and encouraged each division to use what was the most successful," he said.

"In this identity system we wanted to capitalize on both of our strengths—the strong product and marketplace recognition of our divisions and Litton's strong image and capabilities."

This graphic identity seminar followed a two-year assessment and design process, but was just the beginning for the new identity program. At the seminar, division and corporate representatives were reminded that the system would only be successful if implemented consistently and widely throughout the company.

The assessment and design process began in February of 1984 when a revised manual was issued to update the existing guidelines booklet produced about 13 years before.

Gregory Thomas, principal of Thomas Associates in California, began working on a design solution to fulfill the recommendations which resulted from a comprehensive assessment of the identity program. These included discontinuing the use of the "Li" monogram, emphasizing the Litton name and designing a simplified system to link division and corporate identities to strengthen both identities.

On February 26, 1986, Fred O'Green issued an announcement introducing the new Litton logotype to division presidents and key company marketing and communications executives.
Western hosts guests from China

Western Geophysical continues to host technology briefings for individuals involved in Chinese delegations. In June, visitors from the Ministry of Petroleum, People’s Republic of China and China National Technical Import Corporation toured Western Geophysical, Aero Service, and Litton Resources Systems. The program, scheduled by Special Representative, China Projects Liu Lu, provided an overview of application of computers in geophysical data processing, VSP data processing, 3-D interpretation, and high-resolution exploration.

The MOPI delegation, led by Mr. Pan Yuan, President of Geophysical Prospecting Bureau, showed an interest in advanced seismic technology for oil exploration and field equipment manufacturing capabilities. Their itinerary included meetings at Western, a tour of LRS in Alvin, and a visit aboard the Western Inlet in Galveston. Planned entertainment for the delegation members included tours through Houston and a trip to the beach.

Technology briefings are performed by several of Western’s departments. The visiting groups, representing various segments of the petroleum industry in China, visit petroleum companies, computer manufacturers, and geophysical companies in the United States on a regular basis.

Western a smashing hit at EAEG in Belgium

Western Geophysical was one of five exhibitors and the only U.S. company visited by His Majesty the King of Belgium at the 1986 EAEG held June 3-6 in Oostende, Belgium. Patrick Cherlet, a member of London’s Western Research department, hosted the King at Western’s booth.

Patrick, a Flemish-speaking native of Belgium, described workings of the Western Challenger, the company’s largest dual-streamer vessel which was displayed in the booth as a model. A poster and an associated brochure described Western’s specialized dual-streamer instrumentation, including the Streamer/Source Tracking System (SSTS) for real-time positioning.

The center of attraction in Western’s booth was the CRYSTAL® Interactive Interpretation Workstation linked to Digital’s VAX host computer. Delegates were able to observe practical demonstrations of the new software for interactive 2-D interpretation as well as the versatile 3-D package.

Participating in the demonstrations from the Western Research department in London were Manager Aftab Alam, Project Leader Malcolm Francis, and Programmer Norman Jessup. Pete Swinburne and Facilities Manager Gerry Reynolds, brought the CRYSTAL Workstation from the London office, and
Swinburne had overall responsibility for the system’s installation in the booth.

Other topics featured at the convention were 3-D DMO, DMO and steep-dip migration, interactive 3-component VSP analysis, crew noise, SLIM®, DIGISEIS®, European and Egypt spec data, and descriptions of Western’s dual-cable capabilities.

Vice President Ken Larner and Research Geophysicist Craig Beasley presented a technical paper on “Cascaded Migrations: A Way of Improving the Accuracy of Finite-Difference Migration.” Several brochures describing new processing capabilities were released at the convention:

Marine Statics—application of refraction-based and reflection-based static corrections to deep- and shallow-water marine seismic data.

Wave-Theoretical Layer Replacement—removal of time distortions caused by complex overburden.

Wave-Equation-Based Multiple Suppression—a wave-extrapolation method for multiple attenuation.

Poststack Signal Enhancement—suppression of incoherent noise with Radial Predictive Filtering (RPF) process.

DMO and Steep-Dip Migration—a process for preservation and proper imaging of steep structures.

3-D Dip Moveout—application to land and marine surveys with nonuniform source-receiver azimuths.

Aero Service also attended the convention, and Geophysical Manager Dick Lambert talked with clients about Aero’s MACROMETER® surveys, synthetic aperture radar, spec data, and other topics.

Several delegates described the atmosphere of the convention and the outlook of the attendees as relatively positive and optimistic. As Western Research Geophysicist Walt Lynn put it, “To the Europeans it may have been a downer, but it was pretty upbeat compared to U.S. shows I’ve been to.”

Because of the proximity of the convention site, delegates from many oil companies found attending the convention relatively convenient. Most of the 1900 delegates attending the convention were from Great Britain, with the next highest number of attendees from the Netherlands, U.S.A., Norway, France, Germany, and Belgium, respectively.

(For copies of Western’s new brochures, please contact the Marketing Services department.)

Western vice presidents retire after 74 years combined service

Carl H. Savit, senior vice president of Western Geophysical, has retired after 38 years of service and will devote himself to professional and public affairs and a limited consulting practice.

Carl was responsible for the coordination and direction of the technical activities of Western and its associated companies in the Litton Resources Group. His career began in 1948 when he was hired as a mathematician in Los Angeles, California, Western’s original headquarters. He began his service to Western by spending six months on Party 9 in California’s Cuyama Valley. He became chief mathematician in 1952. In 1961 he became the director of systems research and was promoted to vice president of research and
development during the summer of 1965. After the company's headquarters were moved to Houston, Carl took a leave of absence to serve as assistant to the science advisor to the President of the United States. Upon returning to Western in Houston, Carl was named senior vice president, technology.

He holds undergraduate and graduate degrees in mathematics from the California Institute of Technology, has authored numerous professional papers, and has obtained more than 36 U.S. patents in geophysics and related fields.

Carl has worked in a number of professional and government capacities, notably as president of the Society of Exploration Geophysicists (SEG), editor of SEG publication GEOPHYSICS, president of the International Association of Geophysical Contractors, chairman of the National Ocean Industries Association, and chairman of the National Academy of Sciences National Research Council Committee on Seismology.

Carl was named Classic Author of GEOPHYSICS in 1960 and was awarded the Marine Technology Society Compass Award and the SEG Kauffman Gold Medal in 1979. In 1980, he received the Litton Advanced Technology Achievement Award for his inventions in marine geophysics and was elected an honorary member of SEG in recognition of his contributions to the geophysical profession. He became the first recipient of the International Association of Geophysical Contractors Distinguished Achievement Award in 1983.

Carl has most recently been named an Honorary Member of the 28th International Geological Congress to be held in Washington, D.C., in July of 1989. He also attributes much of his success to his wife Sandra. She frequently travels with him, taking an active part in political and government relations for Western and the energy industry.

Ben B. Thigpen, vice president, instrumentation and field services for Western Geophysical, and assistant director of Western Research, has retired after 36 years of service.

Ben was responsible for Western's field services worldwide for over 25 years and was a major contributor to the development of Western's energy sources, marine streamers, control systems, instrumentation, and field operating techniques, resulting in 18 U.S. patents. His contributions resulted in improved performance of Western's instrumentation.

Hired as an assistant observer for Party 52 on October 30, 1949, this Lamesa, Texas, native, with a bachelor of science degree in electrical engineering from Texas A&M, has worked closely with Western's instruments - as observer, chief observer, assistant observer supervisor, instrument supervisor, and manager of operations and digital systems before being promoted to vice president in 1973. He was responsible for field services, digital systems planning, and all other recording equipment development.

Thigpen will remain the SEG representative to the API Central Committee on Telecommunications and will act as chairman of the Technical Standards Committee for the next two-year term. He will also serve as consultant in Texas A&M University's College of Geosciences.

Attending the retirement reception held for Carl Savit, senior vice president, technology, are (left to right) Vice President John Laker, President Neal Cramer, Senior Vice President Darin Skerl, Sandy Savit, Aero Service President Emil (Buck) Mateker, and Carl Savit.

As assistant director of R&D, Ben Thigpen (center) often worked with managers Ted Cruise (left) in electrical engineering and Gary Scott (right) in field services.
Western Caribbean converts to dual cable

In the competitive exploration industry, if you can get a fast start with an innovative product and clear the hurdles of field testing without faltering, you have the opportunity to leave the rest behind.

Western Geophysical has always been in the forefront of successful developments in the seismic field. In keeping with tradition, domestic marine operations installed dual-streamer capabilities aboard the Western Caribbean in June, second only in the company to the conversion of the Challenger operating in the North Sea.

Dual-streamer data recording expedites survey time on 3-D surveys, thereby reducing costs. A dual-streamer vessel can record data from both cables on one set of instruments. The Caribbean is also capable of configuring other combinations of streamers and sources to meet specific survey objectives. The LRS-16 KILOSEIS® digital streamer, with the LRS-16A Shipboard Electronics upgrade and the Seismic QC System, provides a variety of real-time tools, including cable instrument tests, cable noise analysis, and read-after-write record displays.

Responsible for the new layout and efficiency of the recording room aboard the Caribbean is Instrument Supervisor Roger Schade. Party manager for the vessel is Peter Van Borssum.

In addition to the conversion, this ice-class vessel boasts long trip duration and worldwide capabilities.

The Western Caribbean is pictured in the shipyard during dual-streamer conversion. (Photo by Clayton Seeley)

Brannan heads all domestic operations for Western

Orval Brannan

Orval Brannan has been promoted to vice president over all domestic operations, both land and marine. All other vice presidents in the United States will report to Brannan and he will report to President Neal Cramer. Brannan moved to Houston in May from the Denver office where he has worked since 1974.

Brannan was hired by Western in July, 1966 as an instrument trainee and served in several capacities in the field service and operations divisions before his promotion in 1976 to area manager of U.S. West Coast and Alaska Marine Operations. He was named vice president in 1980.

Instrument Technician Steve Dabagian (right) conducts an operation training class on the LRS-16A aboard the Caribbean. Observers attending are (left to right), James Abel, Danny Kellogg, Terry Farley (standing), Mike Long, and Dave Vasek.
PARTY 61—WESTERN ATLANTIC

Nenad Tufekcic, Reporter
Ian Cobban, Michael Purtill, and
Tim Benet, Photographers

The last time Party 61 reported its jobs in northern Europe was nearly a year and a half ago. Everyone on board felt it was time to share the news of another demanding year that's behind us. In terms of personnel, last year was an exceptionally busy one in that the current crew does not resemble the one we had last year or the year before.

Finishing the job off the west coast of Ireland in December, 1984, the boat returned to its usual environs of North Dutch Sea, where it conducted an extensive speculative job. During that period, Coordinator John “Scotty” Steven took over from Patrick O’Sullivan, while the recording room was staffed by observers Ken Edwards, Anthony Herbert, Quentin Kitson, Michael Purtill, Carmelo Perez, and Tom Perera, Senior Technician Frank Fox, and Technician Roger Wilson.

Having finished the spec survey, the boat left Den Helder, Holland, for Norway, giving some of the crew a first glimpse at 24-hour daylight and the quaint, sleepy streets of the port of Tromso.

Prior to the departure for Norway, Junior Observer Mathew Lamb and our youngest member, Gunner Paul Shorrock, joined the crew. While on the Tromso job, observers Anthony Herbert and Ken Edwards were lost to the newly formed crew on board the R/V Western Reliance, which brought observers Ian Cobban and Gary Steer into the recording room. Coordinator Colin Reid, who had been asked to relieve John Steven for a short spell, returned to the same duty on
board the R/V Western Ocean.

After nearly two months in Norway, the crew bid farewell to their Party Manager Ken Caskie, who continued the same job on the Western Europa and was replaced by Tom Perera.

Preparing for a 3-D job in May, 1985, the Atlantic had a dry dock overhaul of the engine and scraping of the hull in Rotterdam. During a week-long stay our Danish crew, consisting of Captain Jens Jorgensen, Chief Mate Jan Larsen, First Mate Arne Hansen, Chief Engineer Jens Bisgaard, and Engineer Kurt Ladegaard, busied themselves with maintenance repairs. Captain Jorgen Fabian, chief mate Thomas Ruane and Teddy Jensen, Chief Engineer Niels Rasmussen, first engineers Peter Tranberg and Bent Thomsen, and Compressor Engineer John Hansen took the boat out into the Dutch waters of the North Sea after completion of this overhaul.

Some of our crew members had been involved in previous 3-D jobs and they were of invaluable help to those less experienced, even though this was the first time the Atlantic used the LRS-16 system for a 3-D survey.

The greater volume of data stacked provided our coordinators John Steven and Victor Lopes and observers in the recording room with additional responsibility, while the use of trilateration and extra cable compasses kept navigators Bill Ward, Hugh Smyth, Mike Bows, and Tony Satterly busy. Mike Hares, in charge of 3-D realtime quality control, was relieved for a short spell by Colin Bennet.

During the extensive survey, which lasted until mid-October, Gunner Chris Clark, Observer Steve Hurst (transfer from Western Europa), Junior Observer Robert Toghill (transfer from Western Challenger), Technician Tim Bennet (transfer from Anne Bravo), and R/V Western Voyager Party Manager John Miller joined the crew while Navigator Tony Satterly departed for the shores of Gabon to join the Western Ocean.

After almost five months on the 3-D job, during which we also conducted a 2-D survey in two blocks of the North Sea, the boat found itself in its semi-home port of Den Helder, getting ready to depart for Shetland Isles. Here, the recording room Helper Nenad Tufekcic joined the boat while our Chief Gunner Derek Hayes, left for the Western Arctic.

On our way to Shetlands, we briefly stopped in Bergen, Norway to install the DFS-V system required for gun signatures, while the boat received highest marks from our client for its safety standards. Once in Lerwick, the main port of the island group, we installed a gravity magnetometer, an essential component of our instrument set-up, due to the unusual gravity fluctuations in the sedimentology of the survey area.

For most of November, we battled severe weather conditions off Fetlar Island. As much as we were handicapped by early and unpleasant winter weather, our next job in the Dutch sector of the North Sea went smoothly and we were soon underway for Southampton for the derigging of air guns for the next job in the English Channel. While in Southampton, Chief Gunner Roger Shaw, with the help of
Chris Clark, Dave Sciberras, Paul Shorrock, Antonio Sosa, Antonio Martel, and Rob Toghill, rigged up waterguns.

Christmas, 1985, found us paralyzed off the Isle of Wight, unable to work because of the severe gales and rather consistently rough weather in the English Channel, offshore Brighton and Newhaven. On New Year’s Day, John Miller left us to resume his job as party manager of the Western Voyager while Cook Fernando Poe was replaced by Virgilio Cinco and his galley help.

After the turn of the year, we were able to resume our speculative survey in coordination with the Western Tempest, doing a shallow-water survey off the same prospect. As the whole area was laden with fish traps and crab cages, our coordinators were in daily contact with Tempest coordinators Ian Miller and Kevin Simpson, exchanging pertinent information on various lines.

When this reporter left on break in Shoreham-by-Sea, England, gunners Antonio Sosa and Antonio Martel were replaced by Ricardo Alamo, Antero Ilogan, and Rodolfo Francisco. The recording room was given a new-hire, Andrew Wyatt. Following the completion of the job, the boat went into Shoreham again to have airguns rigged up.

Another sizeable speculative job was conducted offshore Tyne-Tees. It was the first time during the winter of 1985/86 that the weather was kind and we completed almost 1500 km of survey in relatively record time. Gunners Dave Sciberras, Chris Clark, and Felixberto Neives have rejoined the crew since we started another spec survey in the same area. Upon completion, we are bound for Denmark to complete infill shooting on a 3-D job.

PARTY 704—BEEVILLE, TEXAS

Rocky S. Mann, Reporter
Michael L. Merrigan, Photographer

Since our last appearance in the PROFILE, we have experienced a change in management with the introduction of Party Manager Michael L. Merrigan. Mike took over our crew upon the promotion of previous manager Chris O. Tutt to supervisor of the Beeville crews.

Although our territory generally covers the whole south Texas area, most of our recent efforts involved completion of a large-scale spec program centered in Webb, Zapata, Jim Hogg, Starr, and Duval counties, Texas. As this article is being compiled, we may be assigned additional work in the same area.

Long-time Chief Observer George Bernal is retiring after almost 17 years of service with Western. Calvin Martwick, having a lot of experience himself, will assume George’s duties in managing the recording truck and keeping the crew going in the field. We all wish George the best of luck in his future plans.

Vibrator Mechanic Manuel Garcia keeps rather busy in the never-ending job of repairs and preventative maintenance when it comes to keeping the vibrators in operating condition. He is assisted by vibrator operators Juan Aguirre, Ruben Molina, Ray Moya, and Marcelo Ortiz.

It is important to note that these fellows also lend a hand whenever possible to the line crew in laying out and picking up the line.

Speaking of the line crew, we have Joe Henry Villarreal acting as cable pusher.

Robert Garza, Jr., Robert Moreno, and Alfonso Orozco are our cable truck drivers.

Helper Gilbert Gonzales rounds out the personnel assigned to duties on the line. It appears to be a small group but these guys team up to make up for the difference.

Surveyors Jeffrey Breon and Joe Perez stay right behind the permit agents with assistance from helpers Randy Barbour, Orlando Alvarez, and Rudy Trevino.

Once again, these people help out on the line crew whenever possible just as the vibrator crew does.

Observer Gary Steer (left) observes Roger Wilson monitoring the LRS-16 oscilloscope.
Permit agents James Maxey, Leroy Greiner, and Rocky Mann have their hands full in keeping ahead of the surveyors and recording crew. Keeping ahead at times can be quite a challenge when facing high permit fees and slow responses on mineral permits, not to mention numerous delays by line changes. Because of these factors, permitting can either be easy and satisfying or difficult and frustrating. Nonetheless, these agents give full effort and shoot for the best.

Cable Technician Joe Cantu has been with the company a number of years and has much experience in the cable-geophone repair routine. Certain animals, along with normal wear and tear, play havoc with Joe’s efforts to keep satisfactory cables and phones available at all times. It is indeed tedious work, and his type of work plays a key role in obtaining successful results for clients.

From Party 704, we wish all of our fellow Westerners the best of luck and prospects for a brighter future.

Vibrator Operator Ray Moya cleans his vibrator after completing a recent line.

Truck Driver Robert Morena has just completed testing a load of cables and geophones and is ready to call it a day.

Surveyor Joe Perez (left) and 752 Permit Agent Don Cain discuss the “do’s” and “don’ts” on some work they have prepared for the crew.

Permit Agent Rocky Mann searches for the correct map to use in attacking a newly assigned program in south Texas.

In charge of party 704’s shop maintenance and inventory is Vibrator Mechanic and Observer Juan Aguirre.
Four vibrators in a staggered pattern shake a seismic line in the Western Desert in Egypt.

Senior Observer John Narang (left) and Egyptian Observer Maget are steady at work in the recording truck.

Surveying the line is Senior Surveyor John Milner.

Crew members from Party 715 gather in the evening for dinner after a long, hot day in the desert.
Passing on daily production statistics to the regional office in Cairo is Party 715 Party Manager Luke Emanuel.

Checking a leak in a hydraulic hose is Vibrator Technician Greg Raburn.

An Egyptian cook prepares dinner for crew members.

Party 715's survey chain crew places stakes and pin flags.

Using plenty of mud, due to the sandy soil, Driller Rick Kitchener (left) drills a 200 meter up-hole.
Crew Cuts

Mark Williams, observer for Party 722, climbs a steep grade to lay out lines. (Photo by Butch Allen)

As a new well produces in the background, Party 705 makes its way down the line. (Photo by Butch Allen)

Party 760 makes its way through the "llanos" region in Puerto Rondon, Arauca.

In Dalhart, Texas, Party 722 celebrates six month's of steady safety with a banquet. Party Manager Rick Drake (left) presents crew member Paul Taylor a safety award at K-Bob's restaurant.
In Barrancabermeja, Santander, Crew 347 loads recording equipment onto a barge to be shipped up the Magdalena River to camp. (Photo by J. Boydstun)

Survey Helper Labib (left) and another crew member prepare wooden stakes with numbers of the next line to be laid out for Party 720 in Cairo, Egypt. (Photo by Luke Emanuel)

A recent visit by a Chinese delegation prompted Party 752, working in the Richmond/Rosenberg, Texas area, to demonstrate Western crew activity. (Photo by Butch Allen)

Party Chief Rich Degner checks Crew 347’s first river crossing in La Rompida, Colombia. (Photo by J. Boydstun)

From Crew 760, Vibrator Technician Noel Browne “rides a vib” during a river crossing in Colombia.
Michele Houston, daughter of Manager Mark Houston, was one of 16 students, all children of Litton employees, recently announced as winners of the 1986 Litton National Merit Scholarships. The National Merit Scholarship Corporation (NMSC) selected the scholarship recipients based on test scores, academic records, personal leadership and significant extracurricular accomplishments.

Michele says her “primary goal in life is to succeed in doing what others have only dreamed of doing.” She is a member of the JETS (a scientific organization), the French Club, the French Honor Society, and the National Honor Society. She will pursue a career in medicine as she prepares herself by attending the University of Virginia in Charlottesville, Virginia, as a premedical student.

Litton Scholarship recipient Michele Houston (seated) is surrounded by her family. (From left to right) Juliet, Eileen, and Mark Houston, manager of applied technology for Western.

Honored at a retirement dinner and dance held recently at the Hidden Valley Golf and Country Club was John “Jock” Coull, assistant operations manager. More than 60 of his colleagues and associates gathered to say goodbye to this veteran Westerner. Memories reached from 1953 when Jock first joined Western as an observer.

In a brief farewell address by Leo Dunn, president of Western of Canada, Leo expressed appreciation to Jock for his many years of loyalty and service, and his special part in the growth and activities of Western of Canada. This was followed by the presentation of a gold, inscribed watch commemorating Jock’s 32 years with Western.

At another celebration the shop and lab staff gave Jock a rod and reel along with a fishing box, and at a farewell luncheon attended by more than 30 office employees, he was presented with a golf bag.

Jock and Helen Coull were honorees at a March 21 retirement dinner commemorating Jock’s 32 years of service to Western.

Michelle R. Desharnais, daughter of Insurance Analyst Joanne D. Griner, graduated from Alief Hastings High School in June. Presently working in banking in Houston, Michelle was a member of DECA in high school and graduated in the top half of her class.

Graduating Magna Cum Laude from Alief Elsik High School, Mary Louise Meredith ranked eighth out of a class of 580. Mary, daughter of PBX Operator Joanne Meredith, plans to enter Texas A&M University at Galveston as a marine biology major.
Marvin Dewayne Edwards, son of Librarian Elizabeth Bell and Navigation Analyst James Bell, Jr., graduated from B. F. Terry High School in Houston in May, 1986, and plans to major in computer science at Texas A&M University.

Vice Presidents Orval Brannan (center) and John Laker (right) share a chuckle with Al Knox, patents supervisor, at Al's 40th anniversary reception on June 17.

Office Manager John Bennett places a 10-year service pin on the lapel of a beaming Virgie Bryant, receptionist in the Houston office.

May 25 marked 20 years of service for Senior Draftsman Cooper Hall (left). Cooper works under Digital Center Manager Soule Mellette (right) and Drafting Manager Sybil Kerry.

Vice President Jimmy Jordan (left) congratulates Data Processing Supervisor Robert Russ on 20 years of service with Western.
Wilton B. (Boots) Dungan (dark jacket) was joined by his wife and daughter for a luncheon with Vice President Ben Langston (right) on May 16 to celebrate Boots’ retirement after 36 years of service with Western.

Vice President Joe Salamachia (left) says farewell to Marine Administrative Supervisor Bill Hatton on Bill’s retirement from Western. Bill joined Western in 1971 and had varied assignments worldwide.

Survey Supervisor Jeff Hadlford (left) receives his 20-year service pin from Vice President Al Ferworn at a luncheon in honor of Jeff on May 23 at the Crossroads Motor Inn in Calgary. Jeff and Al were joined by President Leo Dunn, Bill Ross, Jim Neis, Roger Henningsgard, Rolie Tang, and Keith Bailey.

Land Processing Analyst Mubarak Malick (left) receives his ten-year service pin from Land Processing Manager Angelo DiBattista in London.

Diana Marie Skerl, daughter of Senior Vice President Damir Skerl, married Michael Louis Karakasians on Saturday, June 14 in Houston. Following an elaborate reception at the Adami’s Mark Hotel and a honeymoon trip to Acapulco, the couple will reside in New York City.
Field Supervisors Willie Lane (right) and T.J. Phillips discuss T.J.’s retirement plans. After 38 years of service, T.J. retired on April 30, 1986.

Supervisors Steven Winborn (left) and Mike Shoup celebrate Steve’s 38 years of service at a retirement reception held for Steve and T.J. Phillips on April 30.

Showing off his retirement watch to Manager Ralph Landrum (left) and Supervisor Neal Cramer, Jr. is Supervisor C.Q. (Quin) Williams. Quin began working for Western in June, 1948 and retired this past May.

A reception was held at the Lone Tree Country Club in Littleton, Colorado for West Coast Field Supervisor Mark Landis and Margaret Courtenay who exchanged wedding vows on May 17, 1986 in Louisville, Kentucky.—Pat Noah

Gregory Charles Cejka
born March 30, 1986
son of Darrell G. Cejka
Analyst
Denver

Zachary Jonas Yoder
born October 30, 1985
grandson of Becky Dill
Librarian
Houston

Ryan Douglas Hinkle
born November 25, 1985
grandson of Becky Dill
Librarian
Houston

Daniel Thomas Frentz
born January 31, 1986
son of Richard Frentz
Cook, Party 108
Western Caribbean
They Serve
Service Anniversaries...March, April, May, June

38 YEARS
Coombe, Robert
Dingeman, Howard

37 YEARS
*Dick, Charles W.
*Sebastian, Charles, Jr.

36 YEARS
Novak, Stephen

35 YEARS
Bates, Grant
Sergeant, Thomas G.
White, John D.

34 YEARS
Boyd, Victor C.
Denniston, James
Ross, William F.

33 YEARS
*Johnston, David
*Semeliss, Herman A.
Watts, Harold D.

32 YEARS
*Blair, Jimmy D.
Clapsaddle, Darrel
Krein, Oliver A.
Lane, Willie G.
Mellette, Soule M., III

30 YEARS
*Henry, James L.
*Mathewson, John C.

28 YEARS
Ireton, Roy R.
Walz, William J.

26 YEARS
*Fontana, Paride
*Leonard, Fred O.
Zowie, Richard L.

25 YEARS
Dowdy, Lawrence
Goff, Brunner E.
Merten, Fred A.
Vorpagel, George A.

24 YEARS
Hamilton, Samuel
Kubik, James J.

23 YEARS
*Picchiani, Ugo

22 YEARS
Chambers, R. E.
Sutcliffe, Donald

21 YEARS
Bishop, Edward J.
Bivin, David D.
Cole, Patrick
Goodman, David W.
*Kolozs, Boyd
Richards, Allan
Roberts, Richard L.
*Russ, Robert S.
Solliday, Jacob A.

20 YEARS
*Arndt, David E.
Creel, Norman J.
Dorsey, Richard W.
Green, Jack
Hadford, Jeff
Hall, Cooper E.
Lonsdale, Geoffrey
*Schulstad, John L.

19 YEARS
*Blomer, Bernie
*Durham, David P.
Fish, Richard S.
Goddard, Delbert B.
Kudrna, Antonin J.
Massey, Derek
*Miller, Larry E.
Mitchell, Leslie
Swaroop, Brahma N.
Webb, Nolen A.

18 YEARS
Bickham, Ronnie N.
Evans, John T.
*Hellier, Paul John
*Kitchen, William A.
Parker, Marion L.
Stringer, J. Haynie
Swearingin, John T.

17 YEARS
*Baker, Christopher G.
Battaya, Alfred F.
Brettell, Murray W.
Brown, Kelvin Sr.
*Bruckshaw, Donald W.
Darwish Ali, Roshanally
Knevitt, David R.
*Prandin, Paolo
Russell, John R.

16 YEARS
Chua, Kim Siang
Gillespie, Mavor
Horn, Peter
*Huges, Raymond

15 YEARS
*Boyd, Andrew R.
Brown, David
Harler, John C.
*Kauk, Kenneth K.
Little, Herbert A.
*Roche, Evelyn
*Schade, Roger D.
*Scott, Grenville
Stegall, James D.
Taylor, Harper K.
Winnefeld, Carl H.

14 YEARS
*Bernal, Steve H.
Briggs, William T.
*Cavazos, George L.
Chaparro, Humberto
Clegg, Joseph F.
Denham, Scott S.
Grimes, Ray
Harris, Philip
*Hill, William B.
Michener, Kenneth
Mierkiewicz, Robert A.
Morgan, Paul M.
*Norris, Michael W.
Ruffin, James W.
*Swenson, Miles S.
Teran, Raul A.
13 YEARS
Benton, James W.
Gillard, David J.
Girouard, Kirk L.
*Hanson, Ronald E.
Humphreys, Sally
Kinlaw, Barbara F.
Maricle, Ward R.
*Mullens, John
Rodrigues, Robert
Shorter, Herman
Tomkinson, John S.
White, Donna L.
Young, Novell L.

*Prior, Keith S.
Saunders, Christine
*Spies, Stephen R.
Stafford, Larry G.
Stavlas, Teetsa

11 YEARS
Anderson, Archibald
Benson, Marjorie J.
*Benson, Ronny D.
*Beringer, Jeffrey D.
*Bixby, Brent L.
*Brown, Brent R.
Gutierrez, Julio J.
Kavia, Dhiraj
O'Brien, Thomas E.
O'Meara, Raul
*Robertson, John R.
*Ross, Reva C.
*Salazar, Joe H.
*Schwarz, Herman

10 YEARS
*Aguirre, Juan D.
*Bauer, Clayton J.
Billips, David R.
Bryant, Virgie M.
*Caragounis, Peter
Davis, John R.
*Flythe, William T.
Geffre, Mike C.
*Grosell, Stephen
Groves, Paul M.
*Hill, Roy E., Jr.
Kjos, Nickoli O.
Lundquist, Eric R.
McFarland, Richard, Jr.
*Moers, Cheryl Ann
Nurre, Martin H.
Rowland, Richard E.
Steiber, Richard L.
*Steven, John C.
*Thraves, William J.

9 YEARS
*Alaniz, Lionel
Austin, Marcus E.
Bull, John A.
*Dilling, Peter G.
Eudy, Benny D.
*Exito, Fe Esperanza
Gatus, Trevor J.
Gomez, Pablo A.
Hill Harvey F.
Hurst, Stephen C.
Irvin, Timothy K.
Knowlton, John W.
Lemmerz, Frousen N.
Luna, Andrew
Martinez, Roberto R.
McDonald, Stuart
McMinn, John L.
*McPeek, Michael J.
*Ortiz, Marcelo M.
Palermo, Rosemary M.
Spoonts, William E.
Stebelski, William A.
Tamez, Antonio, III
Trevino, Rodolfo B.
Van Wagenen, Buddy L.
Walsh, Michael J.

Hewitt, Rickey W.
Huggins, Fred
*Lein, Mark P.
Lewald, John J.
Long, Guadalupe
Mainus, Danny L.
*Mann, Rocky S.
Martinez, Ismael, Jr.
McLendon, Charles D.
Moreno, Robert L.
Noah, Patricia S.
Norris, Bob R.
O'Brien, Dorothy L.
*Ojedo, Rufino, Jr.
Piper, Patrick B.
Reese, John D.
Rolfe, Brian K.
Seeley, Clayton R.
Sims, Joe C., Jr.
*Skoog, Kurtis K.
*Smith, Chester D.
Smith, Richard R.
*Smith, Thomas W.
*Stroich, Kevin G.
Truett, Sam L.
Ward, Rod
Winson, Jane M.

7 YEARS
Alam, M. Aftab
Allman, Jeremy
Anderson, Terrence
Anter, Mehmet E.
Bell, Cynthia S.
Bell, Geoffrey
*Bennett, Carolyn F.
Bishop, Teresa L.
*Brooking, David W.
Broussard, Joseph, III
Butler, Gary
Chang, Nai-Ching
Childers, Lori S.
Christison, Jay P.

SUMMER 1986
6 YEARS
Alder, Christopher
Alley, Richard D.
Amick, Carl S.
Barker, Charles R.
Bergen, Keith L.
Bible, Dennis J.
Blackwood, William J.
*Brombacher, Soraya A.
Buice, Richard E.
Burch, Robert C.
Cairns, John A.
Cale, Alan R.
Cannoy, Howard H., Jr.
*Chan, Chi Man A.
Crawshaw, John
Creel, Theodore
Crosby, Richard O.
*D Hondt, Aaron J.
Davis, Jefferson A.
Dennison, Michael
Donohue, Patrick
Doss, Robert D.
*Durnall, Phillip
Evans, Shanti
Fenech, Sunny
Garate, Daneille A.
Garza, Robert, Jr.
Gassen, Steven R.
Gilmore, Lajuna M.
Gilpin, Robert L., Jr.
Gomez, Jesus
Gray, Darrell
Grimaldo, Juan E.
Guerrero, Young Sim
Guyton, William A.
Harris, Marc S.
Hasette, Michael
Hathorn, Carl M.
Hazardine, Kenneth J.
Heed, Bruce A.
*Heinzler, John R.
Henderson, Christopher
Hernandez, Geronimo
Heyes, Derek
Hill, Rebecca A.
Hirsch, Marion T.
*Howard, Lawrence
Huette, William L.
Huska, John J.
Jafarzadeh, Hooshiar
Jeso, Richard M.
Johnson, James K.
Johnson, Ji-Lu
Jones, Gareth
Kim, Kun W.
Klutchka, Joan M.
Lenz, Eric G.
*Long, Danny J.
Lowe, Denise M.
Lui, Alfred Yui S.
*MacDonald, Gordon
Maher, John P.
Malik, Syahrial
Manganello, Robert D.
Mangum, Maynard, III
*Martin, Daniel
*McCreasie, Andrew
McElhenny, Patricia J.
McGuirk, Michael
Meade, Matthew
Michael, Marina
Mitchell, Walter C.
Moen, Carlo
Mollon, Harold D.
Moore, Andrew G.
Murphy, Peter D.
Myers, Donna L.
Nguyen, Anh Nga
*O’Callaghan, Terrence
Palumbo, Aline E.
Pence, Jon L.
*Perez, Joe M.
*Perez, Narcisco G.
Peterson, Curt D.
Phan, Con D.
Prewitt, Philip W.
Rasmussen Martin D.
Remmler, Dennis J.
*Reyna, Belen
Riyat, Manjit
Roberts, James A.
Root, William H., III
*Ryan, Pat T.
Salter, John
*Samudio, Paul W.
Schroeder, Stephen R.
Sherry, Mark D.
Shores, Terry
Silva, Sigifredo F.
Sirrieh, Edward H.
Southam, Thomas J.
Stebbins, Danny L.
*Steven, Brian
Stinson, Shirley J.
Stromberg, Darrell W.
Su, Gena H.
Sullivan, Stephen J.
Tchida, Leonard Jr., Jr.
Thomas, Christopher
Tou, Jang
Turner, Gregory P.
Uren, David J.
Vitello, Connie E.
Vixo, Darcy L.
Wheeler, Jonathan
*Wilson, Paul J.
Yuan, Chao-Yu Tsai

5 YEARS
*Aiello, Paul C.
Allott, Colin
Alvarez, Imelda
*Armijo, Connie
Atkins, Joseph A.
Bachour, Jamil
Barlow, George E., Jr.
Bastnagel, John L.
Bates, Michael D.
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Front Cover:
Overlooking a producing well, a Party 722 crew member works a line through a mesa outside of Post, Texas. (Photo by Butch Allen)