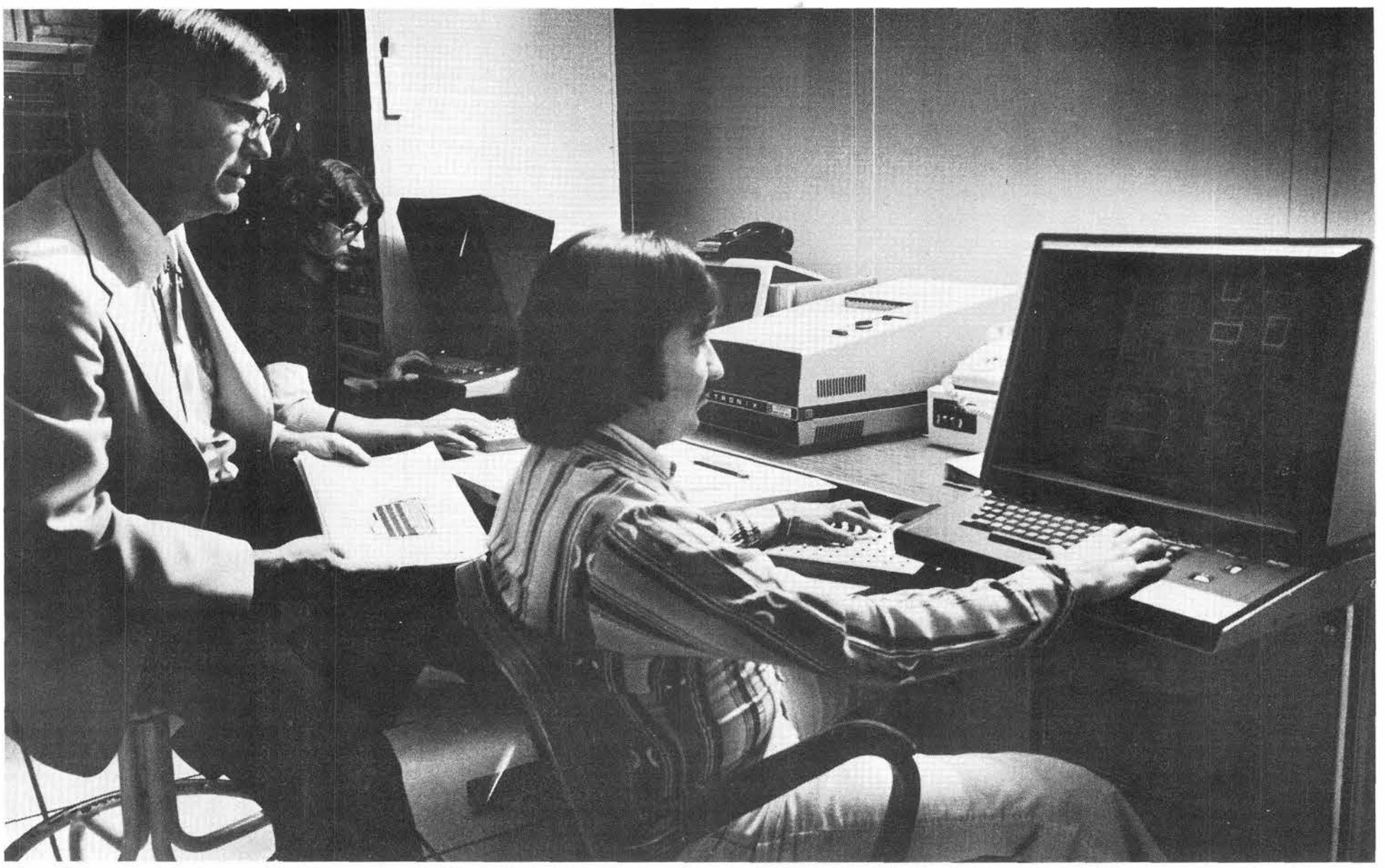
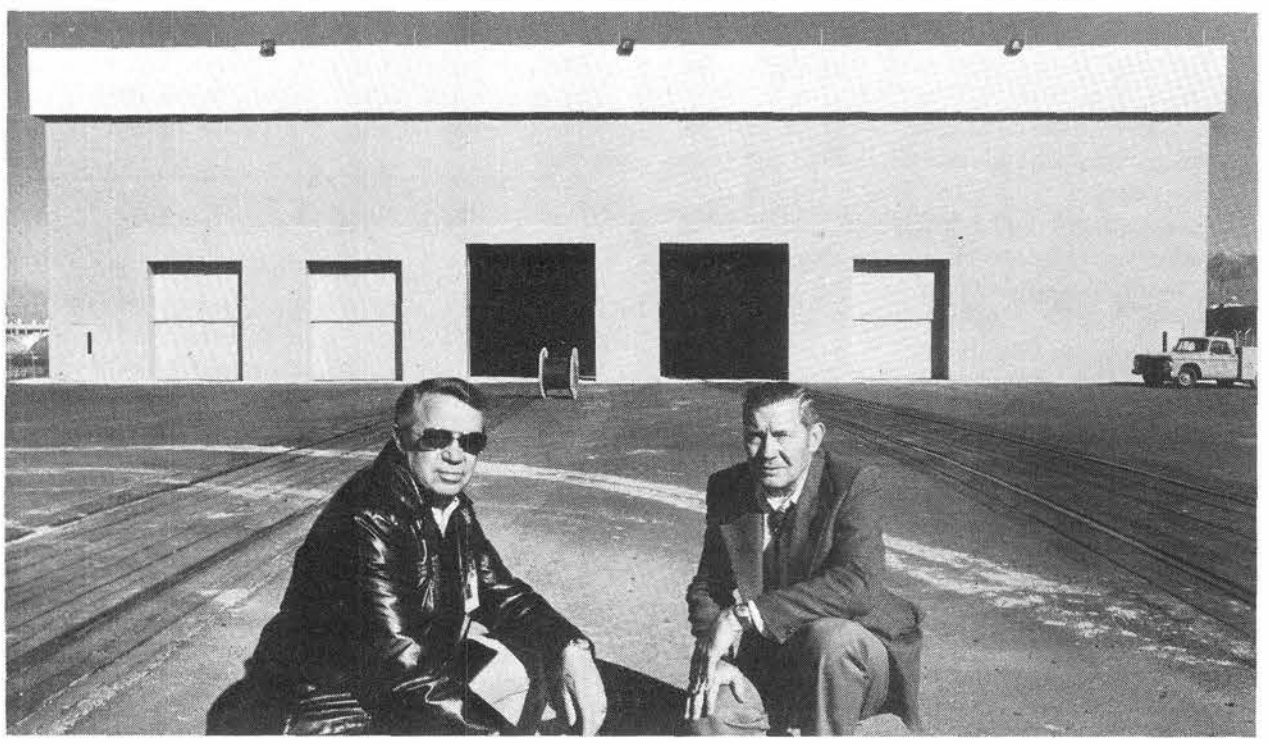


DEL OLSON, DIRECTOR OF MICROELECTRONICS 2100, looks on as Eloy Guiterrez and Bill Ingram use interactive graphics system to generate and modify new integrated circuits. Automated equipment in other areas (like acceptance testing) and extensive microcircuit fabrication areas help 2100 meet mission of supplying firesets and a wide variety of components to both weapon and energy programs. Story on page 4.

LAB NEWS

VOL. 30 NO. 25 **DECEMBER 8, 1978**

SANDIA LABORATORIES • ALBUQUERQUE NEW MEXICO • LIVERMORE CALIFORNIA • TONOPAH NEVADA



CONSTRUCTION is just about complete on the new Safeguards Heavy Lab on the south side of Tech Area I. Occupancy by the 1700 organization will start Dec. 11. Railroad tracks lead into the 15,000 sq. ft. high bay area to provide easy access for safe/secure rail equipment being developed for transport of special nuclear material. (No nuclear material will be housed here, however.) Other entries allow access of safe/secure tractor/trailer rigs and for large equipment used in the development of facilities safeguards. In addition, the building contains 5600 sq. ft. of light laboratory area. Safeguards complex includes two other buildings now under construction. In foreground are Chuck Mills (3643), plant engineering project engineer, and Ed Bruce (1714), chairman of the 1700 occupancy committee.

Labs Study: Coal Into Liquid Fuel

Sandia Laboratories is researching three major elements of coal liquefaction, a process to convert coal into a versatile, clean-burning liquid fuel.

Liquefaction involves crushing coal, mixing it with liquids, preheating the resultant slurry to about 450°C, and pumping this mixture under pressure into a chemical reactor where catalysts help convert the coal into liquid fuel while non-combustible minerals and air pollutants are removed.

The resulting liquid fuel could be blended into existing refinery crude stock, be used as a fuel oil for industrial or home applications, or possibly be used as chemical feedstock.

Sandia's research involves characterizing catalysts and determining causes for their deactivation, analyzing effects of coal mineral matter on liquefaction, and understanding preheater processes.

The research supports the Department of Energy's program with private industry to build pilot and demonstration plants to evaluate three coal liquefaction processes — the Solvent Refined Coal Process, H-Coal Process, and Exxon Donor Solvent Process.

"Coal liquefaction is a complex process," says Dick Traeger, supervisor of Advanced Development Division 4731 in the Geo Energy Technology Dept. "Our work contributes to an understanding of the chemistry, physics, and engineering involved. This should lead to more efficient processes so that commercial production of synthetic, coal-based fuels and lubricants can occur rapidly,

(Continued on Page Six)

Afterthoughts

A matter of perspective--I received a phone call this morning from an irate employee who suggested I write an editorial condemning those individuals who park in car pool slots and, in so doing, exclude bona fide car poolers. This is a perennial complaint, and I really rather agree with company policy here which, in essence, is "hands off." If individuals abuse the system, such as it is, their decal numbers can be turned in to Security for greater or less admonishment. Some will observe that this scarcely deters the hard core violator, but my reaction to that is "That's too bad." There is no significant problem relating to parking at Sandia Labs. If you can't occupy your usual slot, how much farther do you have to walk from your second choice slot? A few hundred yards? This is hardship? Consider the parking picture for the bulk of commuters around the country and even here in Albuquerque. Want to try your chances downtown or at the university? Some things are best said bluntly: I think we're straining at trifles when we complain about parking at Sandia.

* * *

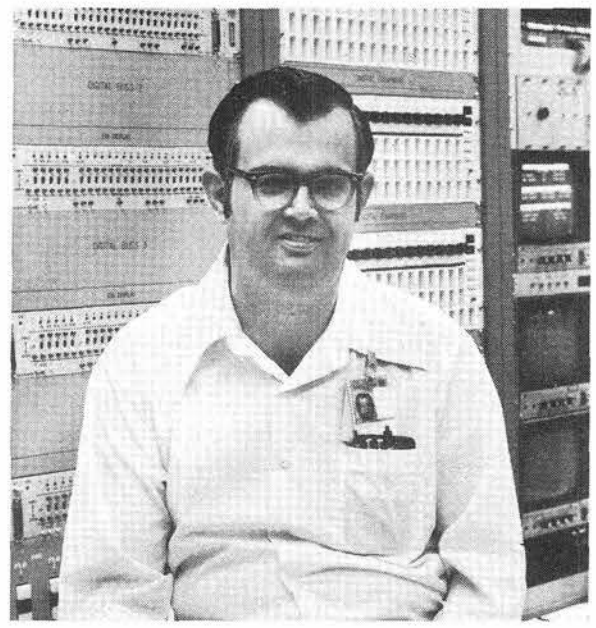
Not your usual 1040--In September, AT&T filed its Bell System consolidated federal income tax return for 1977--a 25-pound, 3200-page form for reporting a total tax payment for the year of $668 million." (from an AT&T release)

* * *

Imaginative title--In Nordyke's Great Roundup, he reproduces this bill of sale for a jackass, made out by an old cowman in the Big Bend country:

> "Sold to R. H. Jones, one lineal descendant of Christ's conveyance into Jerusalem for the sum of seventeen ($17.00) cash in hand. His age is unknown to the present generation, color twilight, guaranteed to be perfectly tame and docile, and easy to catch if handcuffed and chained to a mountain; otherwise it is easier to catch four aces." *js

Supervisory Appointment



BOB TRUDO to supervisor of Computer Communications Section 2634-1, effective Dec. 1. Bob, a graduate of DeVry Technical Institute, joined Sandia in May 1964. He worked in the x-ray crystallography lab until five years ago when he transferred to the computer group as an engineer and trouble shooter. Bob's new section has responsibility for the Com Center, dealing with all external communication, and for the recently opened Tech Control Center — a computer diagnostic facility.

Bob's hobbies include flying and electronics — he's building his own microprocessor. He and his wife Adrienne and their three children live in the NE heights.

Labs Hosts International Nuclear Security Course

Albuquerque's Hilton Hotel was probably the Southwest's most cosmopolitan hostelry during November as representatives from 26 countries met to attend a training course on the physical protection of nuclear facilities and materials. Sandia's Safeguards Evaluation Division 1758 under Chris Olson was principally responsible for development of the 15-day course, and Preston Herrington of that division and Gene Bates of Education & Training Div. 3522 were chiefly responsible for its organization and execution.

Work on the course started after a visit last year by Joe Stiegler, who manages Facilities Protection Dept. 1750, to the International Atomic Energy Agency in Vienna. IAEA saw the need for such training among those of its member countries who were relatively new to the nuclear energy business. And, within DOE, a similar need existed under the requirements of the Non-Proliferation Act of 1978. Sandia Labs agreed to undertake the job — preparing the syllabus and all course material, scheduling speakers and instructors, and making facility arrangements.

Course objectives were threefold: to create an awareness of the need for nuclear security and of the consequences of neglect; to present technology available to meet the need; and to introduce system design techniques. The course itself consisted of an initial four days of orientation on nuclear energy matters, while the balance of the 15 days was spent in presentations on specific subjects and in workshops.

Those who attended had some facility with English. Just in case, though, translator Pat Newman of Sandia's Tech Library was at hand to help when some technical phrasing produced quizzical expressions.

According to Preston, the diverse group encountered (or created) few problems. "Very professional," says Preston. "We had thought there might be some tension among, say, the representatives from the Middle East but we saw none. We did have one slight glitch — the Hilton substituted ham for chicken one luncheon. For Moslems and Jews, among others, that's out. So Gene Bates had a talk with the Hilton's head chef and got things straightened out."

The visitors took advantage of their two free weekends in New Mexico. One group even managed trips to both the Grand Canyon and Bandelier on the same weekend. They commented on the physical dimensions of Albuquerque compared to its population, and one noted that in his country some five million people would occupy such an area. People in the 1700 and other organizations invited individual visitors to their homes, affording the visitor a view of the American home scene.

According to Preston, the training course was judged to be highly successful, so much so that plans are already underway for a repeat next year. More than a hundred countries are members of IAEA, and it appears likely that many will want to take this training.

Not One John Smith

Sandia instructors at the nuclear security course didn't take roll for class sessions, but if they had the resulting linguistic exercise would have been interesting. They might have started with Zoran Alic from Yugoslavia, easy enough, but next would be Ghassan Salim Al-Saffar from Iraq, then Kandothankandy Prabhakarn from India, Sharifa Azizah Syed Ibrahim from Malaysia, Andrzej Pietruszewski from Poland, Gulcihan Agaoglu from Turkey and Virat Srepetdee from Thailand. Other countries represented included Argentina, Brazil, Chile, Czechoslovakia, Indonesia, Iran, Israel, Korea, Mexico, Pakistan, the Phillipines, Portugal, Rumania, Spain, and Venezuela. Guest speakers from Canada, Iran, the United Kingdom and France also participated.

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so does russell smith

bruce hawkinson & lorena schneider report livermore.

LIVERMORE NEWS

VOL. 30 NO. 25 LIVERMORE LABORATORIES DECEMBER 8, 1978

Supervisory Appointment

LEN HILES to supervisor of Instrumentation Development Division 8466, effective Dec. 1.

Joining Sandia/Livermore in 1966, Len worked in general instrumentation development for underground testing, designing thin film devices for temperature and magnetic measurements and laser systems for effects tests. He later designed control systems for maneuvering weapon systems and, for the past year, has been technical manager in an advanced solar receiver program.

Len holds a BS from Fresno State University and an MS from UC/Berkeley, both in EE. He is a member of IEEE and the National Society for Professional Engineers.

Off the job, Len enjoys running, skiing and scuba diving. He and his wife Laura live on Adams Avenue in Livermore with their two sons.

Two Warheads in Phase 3 at SLL

Two Sandia Livermore divisions are at the center of development activity on two new war heads. Don Bohrer's Project Engineering Division 8153 is coordinating Sandia efforts on the W82 while Arnie Rivenes's System Engineering Division 8162 handles the W84.

The W82 is a 155-mm AFAP (artillery-fired atomic projectile), or nuclear round, that can be fired from the same Army and NATO howitzers used for conventional rounds. Sandia's task is to design the arming and firing components as well as the structural case holding the LLL-developed nuclear package. While Don's group is responsible for the case and handles overall coordination, most of the component work is being done by half a dozen divisions at Livermore and Albuquerque.

"The biggest challenges are to pack a sophisticated weapon inside a round only about six inches across and to protect it from the severe gun loads — high axial and angular accelerations as the round is fired from a howitzer's rifled barrel. And it has to have the same ballistic characteristics as a conventional round. Finally, it has to meet strict budgetary requirements. We're helped here by being able to apply the knowledge we gained in our experience with the W79 round."

The W84 will be carried in the Ground-Launched Cruise Missile (GLCM), General Dynamics/Convair's Tomahawk. The mobility of such a system, being developed for the Tactical Air Force, reduces its vulnerability to attack. Since the sub- and air-launched versions of the Tomahawk are already in an advanced state of development, one major task is to ensure that the W84 is compatible with the existing vehicle. Another is that the development schedule must be accelerated to meet the Air Force deployment goals while keeping costs at a minimum.

Sandia's task is to design the arming and firing components, the structural parts, and the PAL system. "Of these tasks," says Arnie, "the most challenging is the PAL system.

"Because of the accelerated schedule and our commitment to keep costs at a minimum, we don't have time to design and test all possible options. This time constraint has the benefit of forcing us to make design decisions early so that we can push ahead with final design configurations." Major cost savings are anticipated with use of existing components wherever possible and with simplification of existing ones.

Sandians at both Livermore and Albuquerque are designing the W84's arming and firing components, as well as the PAL system.

THE "LIVERMORE MERCHANTS" softball team, sponsored by Sandia and several local merchants, took the slow pitch championship in the City of Livermore. Shown are co-captains Darlene Baumgartner (8161, kneeling at left) and Marcia Bernacil (8212) with team members (from left) Annette Hicks (8341), Cathy Casey (SLL/CFSI), Janet Fachner (8153), Sandy Lum, Connie Stewart (SLL/CFSI) and Jeanne Bernacil (husband Danny, 8266).

Blood Drive Successful

The recent Blood Bank drive at Sandia Livermore was again a big success. One hundred twenty-one employees donated blood, with 72 units going to the Sandia Blood Bank and 49 to the Kaiser Health Care Plan. The drive is coordinated by Training and Benefits Division 8214.

Speakers

Steve Robinson (8314), "Structural Materials Properties in Hydrogen Assessed by Burst Testing and Toughness Measurements," and Duane Lindner (8315), "Dehydriding Mechanisms and Kinetics," Brookhaven Symposium and Workshop on Hydride Storage, June 20-21, Upton, NY.

Glen Otey (8442) and Harry Dwyer (8354), "A Numerical Study of the Interaction of Fast Chemistry and Diffusion," AIAA/SAE 14th Joint Propulsion Conference, July 25, Las Vegas, NV.

Pat Gildea, Hans Birnbaum and Bill Wall (all 8443), "Modification and Testing of SLL Tritium Decontamination Systems," 15th DOE Air Cleaning Conference, Aug. 7-10, Boston, MA.

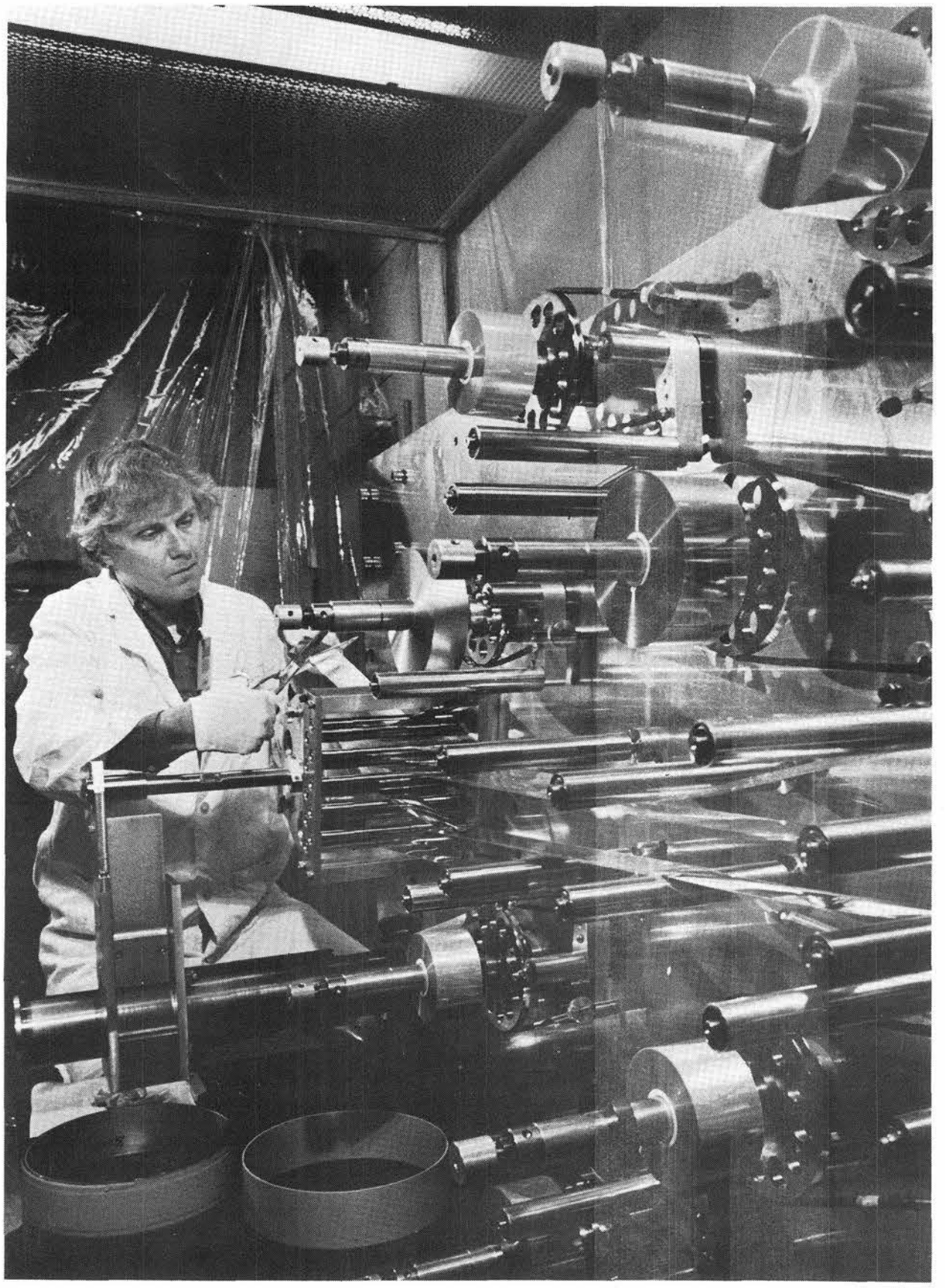
Jack Dini and Rudy Johnson (both 8312), "Mechanical Properties of Thick Electrodeposits," Fourth Pennsylvania State University Conference on Electrodeposition, Aug. 9, University Park, PA.

Mike Soderstrand (8466), "Applications of Microprocessors in Digital Signal Processing," IEEE 21st Midwest Symposium on Circuits and Systems, Aug. 14-15, Ames, Iowa.

Joe Hankins (8326), "Optimal Modual Sizing for Solar Central Receiver Thermal Electric Power Plants," Joan Brune (8326), "Hybrid and Repowered Solar Electric Plants," Joan Plastiras (8326), "Capacity Displacement for Solar Plants," Joe Iannucci (8326), "Central Solar/Fossil Hybrid Electrical Generation: Storage Impacts," and Jim Woodard (8326), "Role of Storage in Determining the Value of a Solar Electric Plant in an Electric Power Grid," International Solar Energy Society meeting, Aug. 28-31, Denver, CO.

Dan Dawson (8314) and John Brooks (8316), "Microstructure-Property Relationships in High-Strength Steel Welds," Fifth Joint AIME/ ASM/AWS Bolton Landing Conference, Aug. 27-30, Lake George, NY.

The Directorates — 2100: Microelectronics



THIS COMPLEX MACHINE winds mylar and aluminum foil into energy storage capacitors for firesets. Ron Cheek (2153) trims aluminum foil before attaching it to circular frame like one shown at lower right. Capacitors like one at lower left are automatically wound. Firesets are one major area of design and development in Microelectronics Directorate 2100.

When better integrated circuits, thin- and thick-film hybird microcircuits, firesets, semiconductors, passive components, cabling, connectors and photovoltaic cells come along, they'll very likely be designed and developed by the Microelectronics Directorate 2100.

Director Del Olson explains that 2100 has responsibilities in two distinct areas — one devoted exclusively to weapons work, the other dealing not only with weapons but also with advanced energy programs.

"We design most of the firesets used by weapon design groups," Del says, "most of which are of the traditional capacitor discharge type, while others are explosive, using ferroelectrics or other tranducers."

Advanced fireset development centers on electrooptics, fiber optics, acoustic transducers and on "ripple fire," a series of precisely timed explosive events. Recent advances have been made in fireset capacitors, increasing the stored energy density by a factor of five.

In addition to firesets, the 2100 directorate designs, procures, evaluates and improves a wide variety of electronic parts used in weapon components. They have also developed new state-of-the-art, radiation-tolerant technology in integrated circuits (technology that has now been transferred to industry), as well as computer-aided design (CAD) technology used in the design of complex integrated circuits.

"We have the largest in-house CAD activity in a government-owned lab," Del says. "Coupled with our fabrication capabilities, we can build and evaluate electronic devices from large-scale integrated circuits to complex radar-type logic circuits. And the work we're doing here has spin off all over the country since we're making our technology available to both government and industry."

The Microelectronics Directorate also works closely with private industry in the design and qualification of all types of electronic hardware for use in weapons.

Over the years, 2100 has compiled an impressive number of technological improvements and devices — including an entire family of lightning arrestor connectors, hardened microelectronic devices for use in weapons, and major improvements in capacitors. They provide thin-film hybrid microcircuit technology for weapons and are now in the process of adapting thick-film hybrid microcircuits for weapons use. (Thin films are produced photolithographically; thick films by a screen printing process.)

Del points out some of 2100's work in advanced energy programs.

"We're working closely with Sandia's geothermal groups," Del says, "developing microelectronics for instrumentation and control in areas like deep wells where temperatures and pressures would destroy ordinary electronics. We're also doing design work and supplying parts for Sandia's satellite programs, and we're supplying silicon photovoltaic cells to our solar energy groups."

Del pauses and smiles. "We're especially proud of these photovoltaic cells," he concludes. "They have the highest electrical efficiency ever reported for a silicon device — above 18 percent efficient in converting sunlight directly to electrical power. And we think within a reasonable time we'll be producing cells that are above 20 percent efficient."

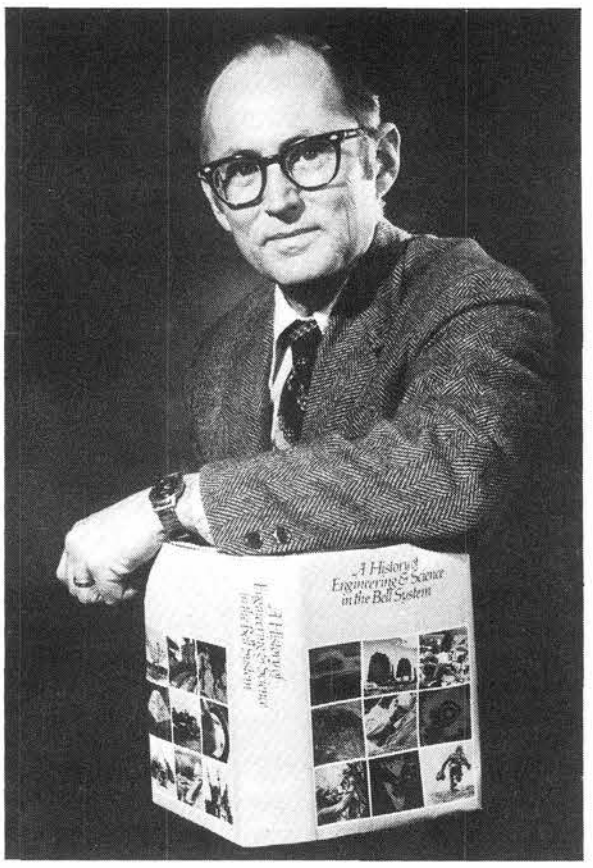
Fun & Games

Frisbee golf? — Corry McDonald (2436) sends us a release describing yet another possibility for you and your frisbee. "Frisbee golf is played much like regular golf . . . Play begins at a designated tee area and progresses down a fairway. Each successive toss after teeing off requires the player to keep one foot on the spot of the previous lie. A 'hole' is completed when the player successfully hits the target (a 2-foot section of 30-inch pipe that stands above the ground). Like regular golf, the player with the lowest score is the winner." Golf equipment manufacturers are said to be lukewarm about frisbee golf.

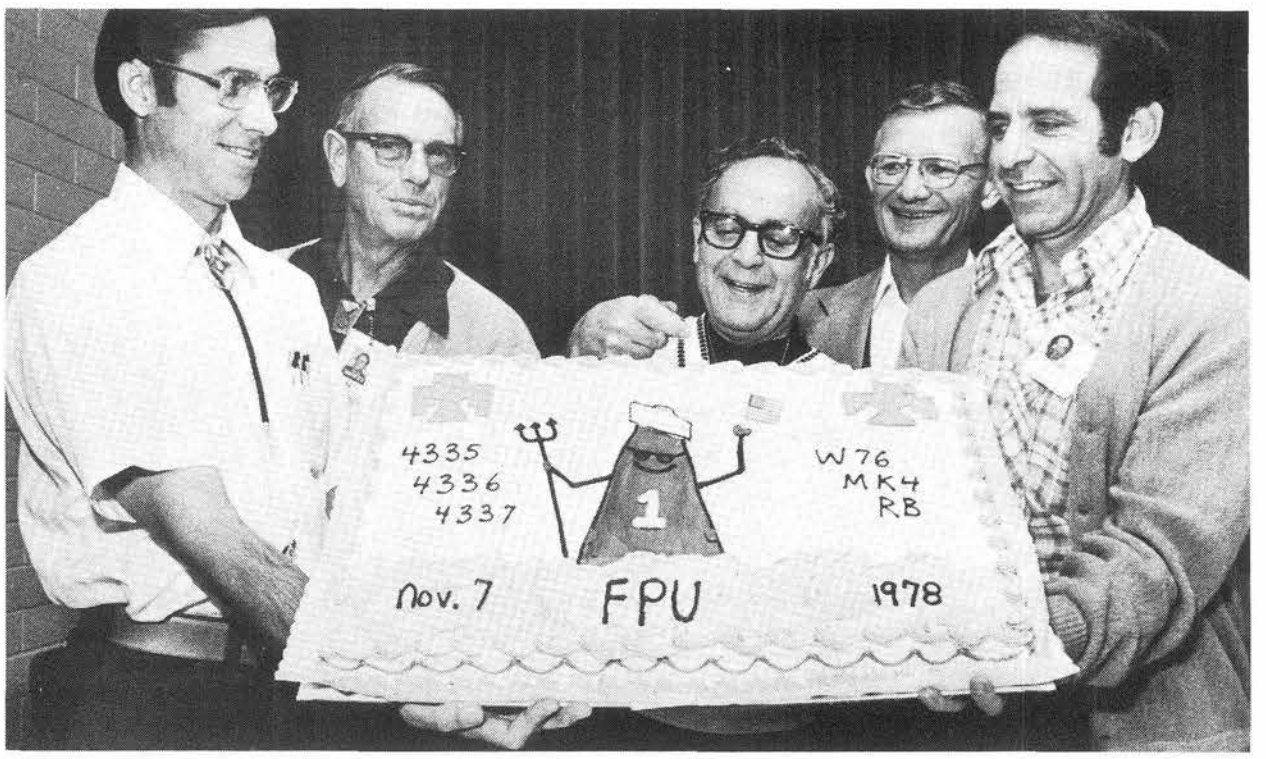
* * *

Skiing — The new season appears to be upon us both for downhill and cross country skiing, and many of us learn at this late hour that our ski equipment is out of kilter — dull edges, bindings not properly adjusted, delaminations, and the like. So what we need is a ski mechanic, and there are people who are certified in this field. Most of them work for sporting goods stores, but there are free lancers and if you would like a list of those available in Albuquerque call LAB NEWS on 4-1053.

Running — A five-mile "Run For Our Children's Lives" event will be held on Base Saturday, Dec. 23 at 10 a.m. It starts at the west gym, proceeds east to the vicinity of the east end of the airport runway, then returns to the gym. T-shirts will be given to the first 100 finishers. There are seven age brackets. Entry forms are available in LAB NEWS office, Bldg. 814.

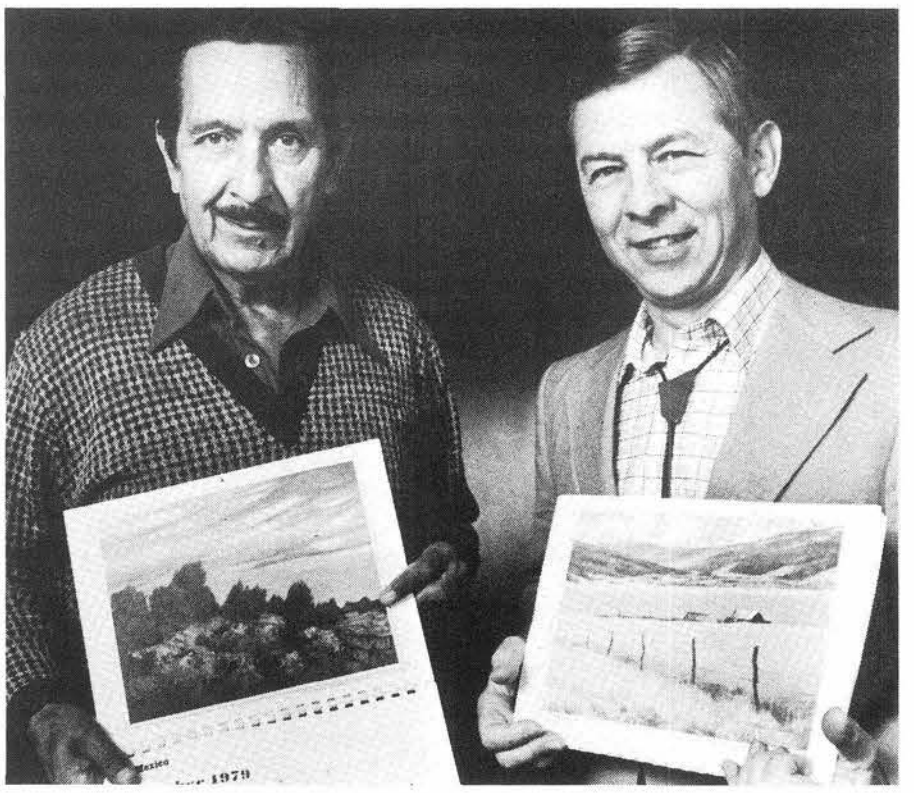


JIM MOGFORD of Management Staff 400 contributed a chapter on Sandia Labs to this recently published book, ***A History of Engineering & Science in the Bell System.*** Prepared by members of Bell Labs' technical staff, the book runs to nearly 800 pages. Copies are available in Sandia's Tech Library.



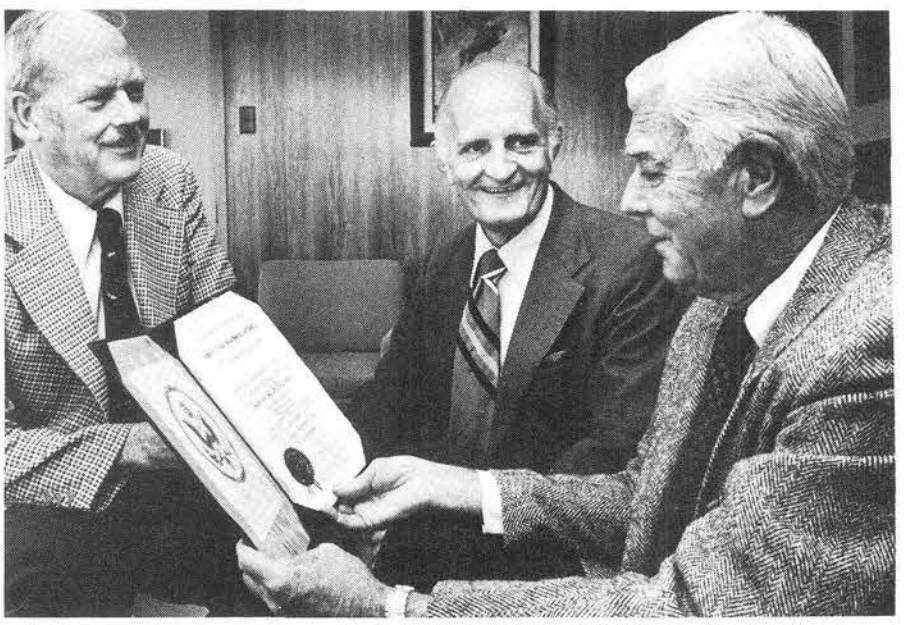
A PIECE OF CAKE? — When the first production unit of the W76/MK 4 reentry body rolled off the line at the Pantex nuclear ordnance plant in Amarillo, it was clearly the occasion for celebration in the halls of Dept. 4330, the outfit responsible for the program. Here we have Sam Jeffers (4336), Ed Smyth (DOE/ALO), Ernie Stewart (LMSC), Bob Christopher (4335) and Ben Bader (4737, formerly 4337) admiring the art work as Ernie samples the icing.

sandia PEOPLE Report



PAINTINGS by Felix Padilla (3425) and Joe Rivard (4422) are featured in the 1979 calendar published by *New Mexico Magazine.* Felix (who creates the back page cartoons for the LAB NEWS) submitted an acryllic landscape, "The Beauty of New Mexico." Joe's oil landscape is called "Morning Freshness." Joe's work is on display at his High Plateau Gallery, 1715 San Pedro NE.

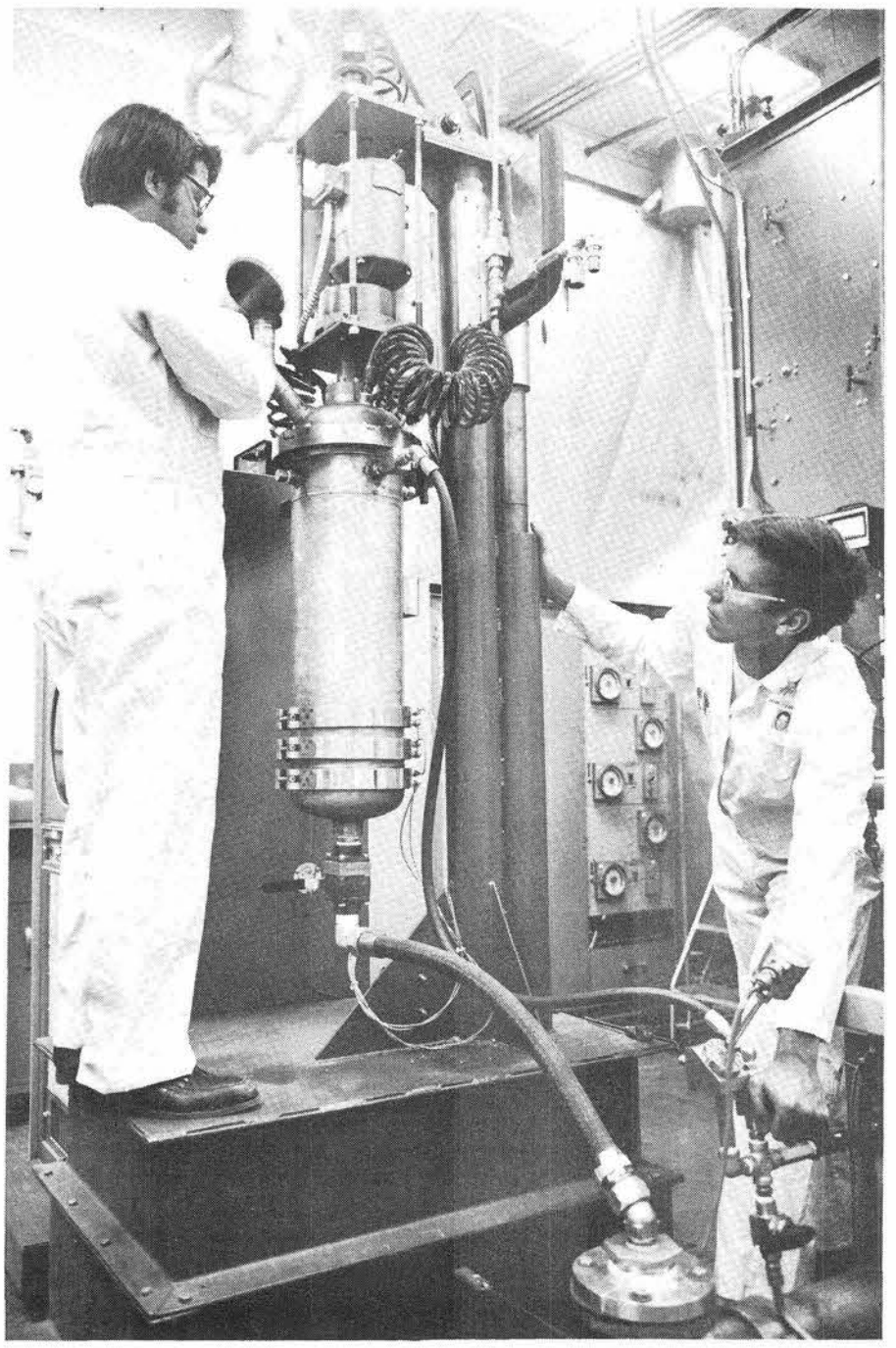
SANDIA COMPUTING NEWSLETTER, published monthly by Betty Straba, Gary Shepherd and Pauline Vandeliner (all 2642) carries articles of interest to computing people. With expanded content and listings of classes, consultants, new programs and a comprehensive index, the Newsletter is prepared on computer and distributed by computer-controlled mailing list. To add your name to the list, call 4-3867.



TAKE STOCK IN AMERICA Chairman Morgan Sparks turns over the reins for that job to Public Service Company President George Schreiber (at right) as Glenn Fowler (VP-1000), State Chairman for Savings Bonds, looks on. Mr. Sparks, who served three years as TSIA Chairman for Albuquerque (Industrial Committee), received an award in recognition of his service.

Continued from Page One

Coal Into Liquid Fuel



JIM LYONS & DAVE HAWN (both 4371) are shown with bench-scale reactor which is used to study how coal liquefaction process can be made more efficient. They are adding a coal slurry to the reactor preheater in experiment to identify what happens in early stages of coal liquefaction.

reducing the nation's dependence on foreign oil."

Although coal has been liquefied for years — Germany used the process during World War II — liquefaction is still expensive and not throughly understood. Variations in organic composition, mineral matter, and other characteristics of coal make definition of the liquefaction process difficult.

Coal liquids are estimated to cost $18-$30 a barrel. Yields are generaly 2 ½ to 4 barrels of oil per ton of coal. Liquefaction pilot and demonstration plants will process 25 to 1200 tons of coal a day. However, to be economically feasible, a commercial plant would need to produce 50,000 to 100,000 barrels of oil a day from 20,000 to 40,000 tons of coal.

One goal of Sandia's work is to determine what causes rapid deactivation of catalysts. Cobalt molybdate — a catalyst long used in the petroleum industry for upgrading heavy oils — is useful for only a few months in coal liquefaction operations while in petroleum refining its useful life extends from six months to a year.

Studies so far show that coking — decomposition of coal liquids into solid carbon which then coats the catalyst surface — causes rapid deactivation. The coke, however, can be burned off and the catalyst regenerated. Permanent deactivation is believed to be caused by diffusion — penetration of metals such as boron, titanium, or iron into the catalyst — and by growth of metal sulfide crystals on the catalyst surface.

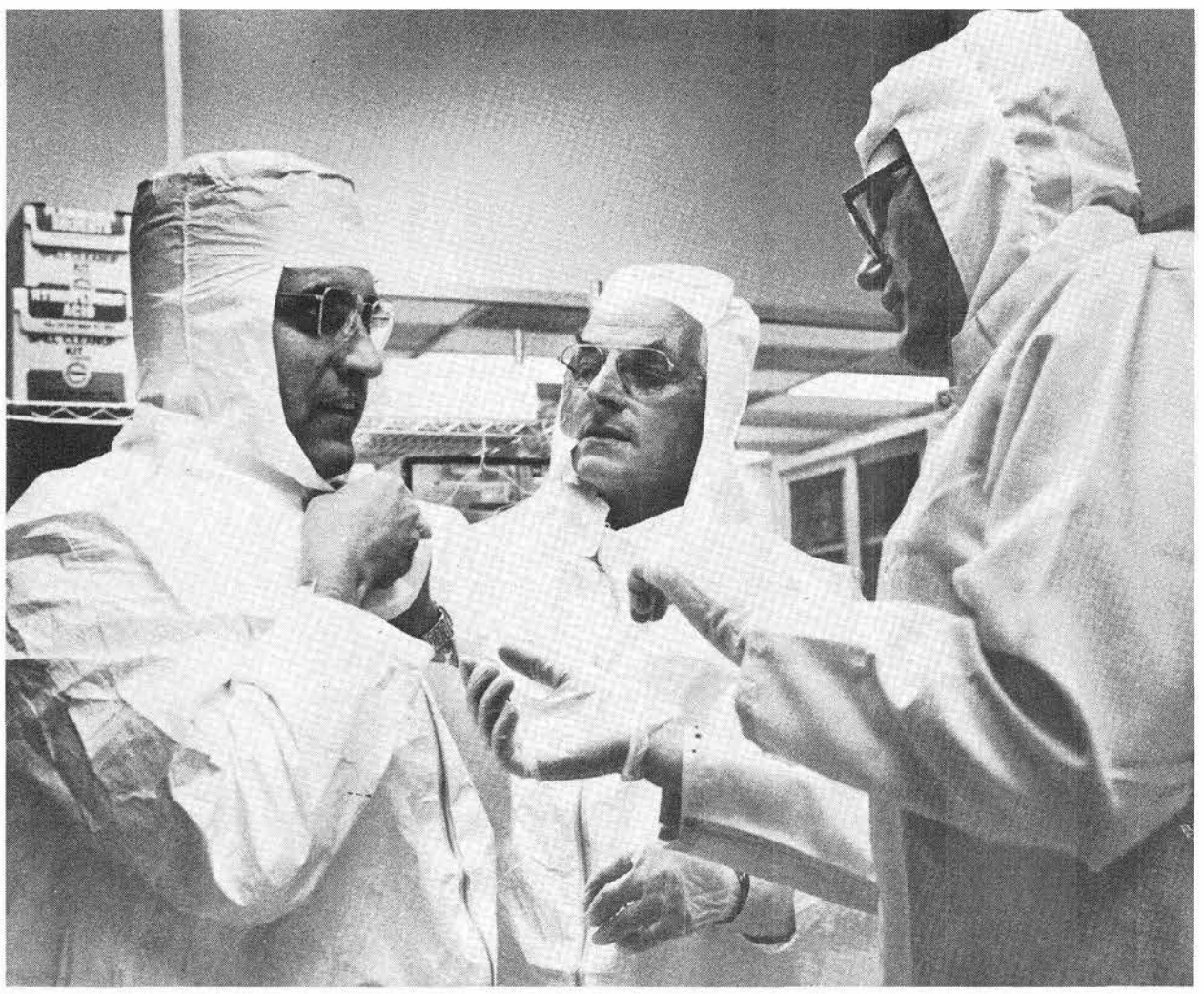
A second objective of Sandia's research is to identify how various ash and mineral ingredients in coal affect liquefaction. "Clays, pyrites, and other minerals in coal are known to affect the conversion from solid to liquid," Traeger says.

"Also, since different coals have different mineral constituents, knowing the effect of each mineral on liquefaction is important to design and operation processes."

Tests have shown that minerals in general lower the viscosity of coal liquids and that pyrites appear to provide an active catalytic ingredient.

Research on preheaters aims to bring understanding of reactions occurring in these devices, which heat slurries to 400-450°C at 1500 to 4000 psi. The viscosity and composition of the product leaving the preheater and entering the reactor can have a large impact on reactor operation.

The Sandia research is supported by $930,000 from the DOE for fiscal year 1979.



SUITED UP for a tour of Sandia's Microelectronic Lab are Senator Harrison Schmitt, Gene Reed (VP-2000), and Vic Wells, head of IC Processing Division 2141. The Senator was here last week for briefings on Labs programs.

Having always believed that literature was its own excuse for being, we were heartened by a comment in a recent issue of *American Scholar:* ". . . there is something incongruous and unsatisfactory about the very idea of a ***department*** of English literature, about corraling off the reading of novels and poems as one more academic specialty among the rest. . . . Ultimately, ordinary people have always provided the content and context of every work of literature ever created. If they have stopped reading the classics for no end but their own pleasure, what is that but the death of one kind of meaning?"

Take Note

Boy Scout Troop and Cub Pack 165 sponsored by St. Paul's United Methodist Church, 9500 Constitution, are again selling luminarias for the holiday season. Prices are $1.75 per dozen picked up at the church or $2.25 per dozen delivered. Pickup days are Dec. 16, 22 and 23. Call Robert Burnett (2513), 4-3066, for more info.

* * *

Hundreds of irate Sandians were delayed for up to half an hour getting off Base recently when a STOP sign was erected just outside the Eubank gate, forcing outbound traffic to come to a full stop. Next day the snafu was corrected when a county road department work order was changed. Seems the sign erectors got carried away and thought the intersection was to be made a two-way stop, instead of just the northbound traffic on Eubank coming from south of the KAFB gate.

* * *

The Christmas season approaches, and LAB NEWS plans its usual coverage of the various Christmas projects that employees undertake. If your organization is planning such a charitable project, be sure to let us know so that we can carry your story in our Christmas issue. Call Norma on 4-7841 with the details.

* * *

It was the 1930's and things were tough if you were just out of school. Unemployed and with few prospects, the nation's youth was in desperate straits. Along came something named the Civilian Conservation Corps — usually called the CCC — and four million young men went off to forest camps where they planted trees, reclaimed damaged land, built fire trails, dams, bridges and the like under a paramilitary discipline. Many lived in tents, the pay was minimal, ($30 a month), but the food was plentiful and wholesome, and the physical labor turned flab into muscle. The CCC was an outstanding success and now its alumni have formed an association, in part devoted to nostalgia, in part devoted to support of programs dealing with problems of both young and old Americans. Frank Kohut (2433), who was first introduced to New Mexico by the CCC ("the best 18 months of my life"), would like to interest other CCC alumni in the association. Call him at home on 296-8537 for details.

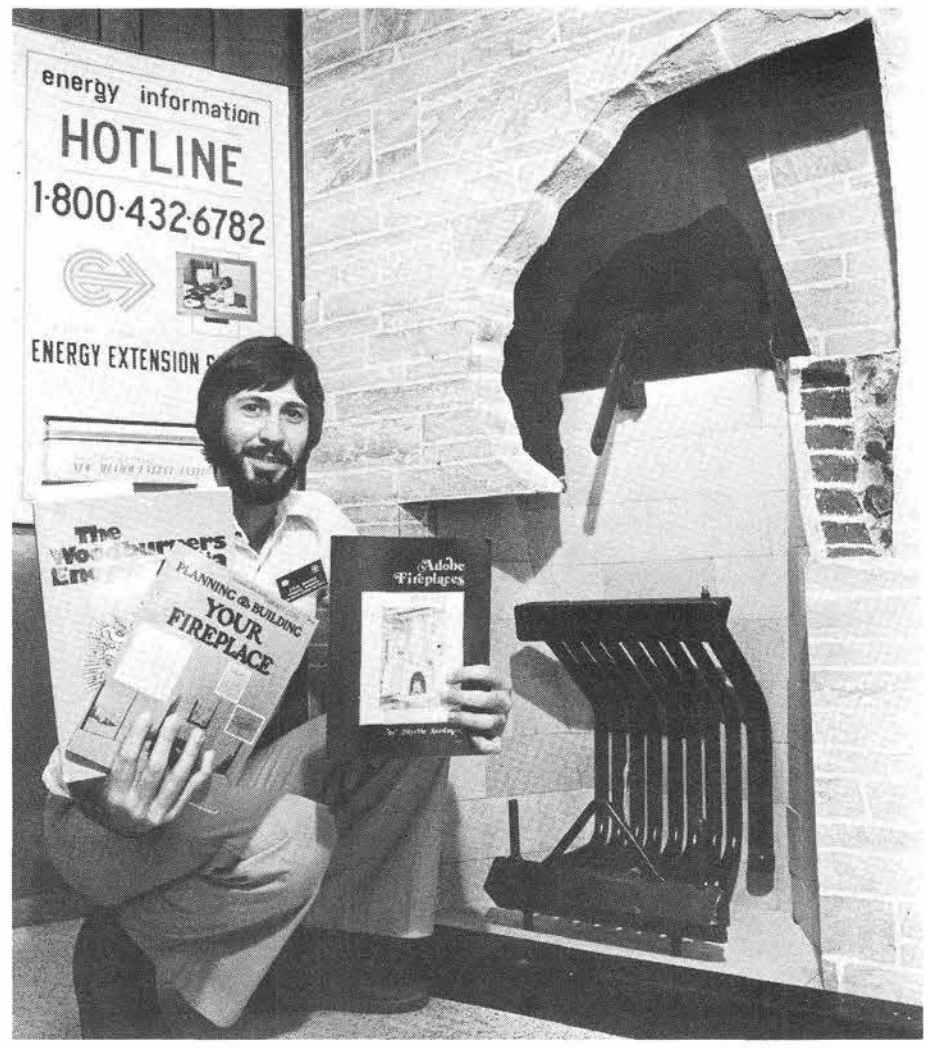
* * *

An accident occurs involving the release of radioactive material. Question: who pays damages? Since any discussion relating to radioactivity seems these days to attain instant criticality, we found a letter by John Dendahl, president of Eberline, on the subject of insuring nuclear risks to be informative. It states, in part, "So in 1957 — before the first nuclear generating station came into commercial service — Congress passed the Price-Anderson Act establishing a unique system of insurance to meet two objectives: to protect the public against loss resulting from the development of nuclear power (and) to protect participants in the nuclear program from the risk of unlimited liability . . . For more than two decades, then, both government and industry have made certain that substantial and secure funds are available to compensate the public financially against nuclear accidents."

Sympathy

To Bennie Montoya (1474) on the death of his father in Socorro, Nov. 28.

To Glen Casey (1482) on the death of his father in Arkansas, Nov. 26.



INFORMATION SPECIALIST Steve Shaffer with a sample of reference material and the model cut-away fireplace at the Energy Information Center.

Our Town

Save Energy, Save Money: Visit the Energy Information Center

Saving energy is a nationwide theme; perhaps you've thought about energy savings on a personal basis. But have you done anything about it?

If your answer is "I don't know where to start," consider a visit to the Energy Information Center at 3018 Monte Vista NE.

The Center, one of six in New Mexico, is funded by a DOE grant. Purpose of this pilot program, encompassing 10 states, is to make energy savings information available to the public at no cost. The Center is administered by the Energy and Mineral Department of the N.M. Energy Extension Service. Staffed by information specialists and consultants, the Center can provide answers to your questions on energy conservation.

Facilities include slide shows, a reference library of books and reports on energy-related subjects — fireplaces, woodburning stoves, solar heating and cooling, wind energy, etc. — storm window displays, insulation exhibits, a model solar greenhouse, and much more.

Mike Minturn, field agent in charge of the Center, conducts workshops on solar greenhouse construction, passive solar applications, and other subjects. "The Center," Mike says, "is for the homeowner who wants to improve the efficiency of energy usage and, consequently, to save money. We work with individual do-it-yourselfers, not with contractors."

Other material available includes research reports on all state-sponsored energy programs, and a series of Home Energy Savings leaflets. The leaflets carry these titles: *Your Home in Winter; Your Heating System; Insulating Your Home; Energy Scorekeeping* (utility bill & meter reading); *Read All About It* (a list of outstanding books on Home Energy Conservation, Alternative Ideas, and Woodburning Devices); *Your Fireplace; Your Hot Water System; Home Lighting and Appliances; Energy and Your Apartment; Your Home in Summer; The Total Home Concept; Energy and Your Mobile Home;* and *Action Checklist.* Soon to be published is a series of six "How To Do It" leaflets.

Mike suggests a good starting place for an evaluation of your home's energy usage is the Home Energy Questionnaire, a supply of which will shortly be mailed to each division office. The questionnaire is also available at the Center. The home energy analysis provides you with a detailed evaluation of your home's energy usage and with specific recommendations on ways to reduce fuel costs.

Also available is the New Mexico Home Energy Savings Calendar with monthly reminders and tips about conserving energy.

The Center, located at 3018 Monte Vista NE (between Richmond and Dartmouth), is open Monday through Friday, 8 to 5, tel. 277-3661.

Retiring

Henry Strauss (3713)

WORD PROCESSING CENTER in Bldg. 880 is scene of quiet efficiency. Lena Valerio, foreground, is center coordinator. At left is secretary Nancy Roth at one of the keyboard terminals. Supervisor Marie Syme, right, talks with Jack Wesbrook (2631).

TERMINALS with keyboards and cathode ray tubes are operated by secretaries Doris Spohr and Jo Chavez in the Bldg. 880 word processing center.

In Bldg. 880

A New Approach to Secretarial Work

An experiment relating to secretarial work is now underway within the 2000 organization. Traditional activities of a secretary — dictation, typing, filing, handling mail, making travel reservations and maintaining office routine — have been divided into two areas, major typing and administrative support.

Typed material is now completed in a new word processing center in Bldg. 880. Administrative support for 13 divisions is handled by three administrative secretaries in a core area surrounded by division offices. These three handle small typing jobs — one or two pages — plus all administrative duties, including the back-up answering of telephones for staff people in their areas. (After three rings without an answer, the staff person's phone automatically rings at the secretary's phone console. She takes a message and turns on the "message waiting" light on the staff person's phone.

"It means constant interruptions," says Ann Murphy, one of the administrative secretaries, "but you get used to it. The message signal works and the staff is appreciative." Ann handles administrative support for divisions 2631, 2632 and 2642. Much of her time is spent keeping track of the time cards and schedules of more than 80 computer operations people who man Sandia's Computing Center in three shifts, seven days a week.

Melinda Markey is the administrative secretary for divisions 2651, 2636, 2637 and 2623. Cecelia Cordova handles administrative duties for divisions 2641, 2644, 2647 and 2648. Both agree that the work is varied, sometimes demanding and always interesting.

Ruby Cochrell, Jo Chavez, Nancy Roth and Doris Spohr are the secretaries who operate the computerized equipment in the word processing center. Patty Lujan is a trainee with the group and Lena Valerio is coordinator, responsible for scheduling and training. Marie Syme is supervisor of the WP/AS centers.

"In the traditional setting," Marie says, "a secretary averages 222 lines per day of typing. Our word processing secretaries are averaging 1000 lines per day."

The center has six keyboard terminals with cathode ray tubes which display the material as it is typed. Printout is from three printers which can print 40 characters per second and one high speed rough draft machine that can print 200 characters per second. The central processing unit is a Wang 30. Text may be stored in the computer (4000-page capacity) or on discs. Editing and revisions may be made quickly without re-typing the entire manuscript.

"It takes a while — about a month — to learn to use the word processing equipment so that it becomes second nature, like a typewriter," Marie says. "But once learned, the machines are marvelous.

"Although the word processing secretary is located in the center," Marie continues, "she still works directly with the customers who come in and tell us about their jobs. The jobs range from single page letters to multihundred-page reports or technical papers."

One service gaining in popularity is the automated phone-in dictation system. The staff person calls the number at anytime, dictates the material and gets it back within 24 hours.

"One of our supervisors dictated his 40-page quarterly report this way," Marie says. "He thought it was great — he didn't have to do a longhand draft. To encourage its use, we give dictaphone material first priority."

The experiment in secretarial service was first proposed by the Management 400 organization. The word processing/administrative support grouping, pioneered by the Bell System, is now in widespread use.

After a year of operation at Sandia, the experiment will be evaluated by Small Staff to determine if the word processing/administrative support idea should be implemented in other areas of the Labs.

"In the meantime," Marie says, "the feeling around here is very positive."

ANN MURPHY is administrative secretary for divisions 2631, 2632 and 2642. She, Melinda Markey and Cecelia Cordova handle administrative duties for 13 divisions of the 2600 organization.

JO CHAVEZ, word processing center secretary, checks output from one of the high speed printers. In background, Patty Lujan operates duplicating machine.

Events Calendar

Through Dec. 31 — "Accommodations," Barn Dinner Theater, 281-3338.

Through Dec. 31 — "Goodbye Charlie," Westgate Dinner Theater, 293-5060.

Dec. 11 — "The Magic of Micronesia," Kiwanis travel-adventure film, Popejoy, 277-3121.

Dec. 15 — "The Marriage of Figaro," Canadian Opera Company on tour, UNM Cultural Entertainment Series, Popejoy, 277-3121.

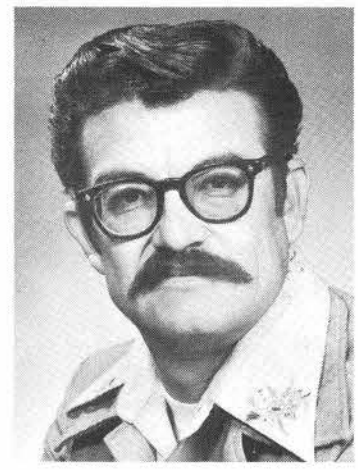
Dec. 16 — The Wee-Folk Puppeteers perform, Christmas music and story telling, Vortex Theater, 10 a.m.

Dec. 22-25, 28-31 — "Funny Girl," Albuquerque Civic Light Opera, Popejoy, 344-2317.

Being prone to nervousness in new and unknown situations, we've always been emphathetic when others indicate their uneasiness by light quivers of the voice or occasional dry and uncomfortable coughs. An ad in airline flight magazine indicates we'd be better advised (and certainly more with it) if we purchased and used a device called a "voice stress analyzer." It has eight red and eight green lights to indicate stress or non-stress. The inventor offers this commentary: ". . . the green lights go on when the person with whom you are speaking is *not* experiencing stress. Where there is no stress there is no guilt, and where there is no guilt there is no deception. When the red lights go on, some very probing questions are in order." We think someone should put some probing questions to the inventor.

MILEPOSTS
LAB NEWS

DECEMBER 1978



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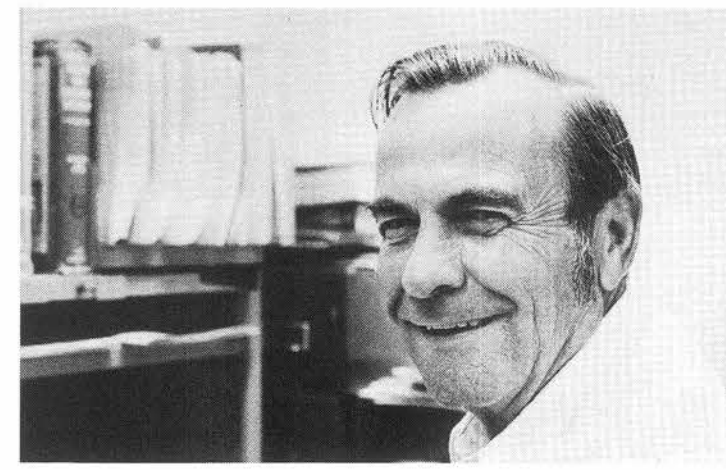

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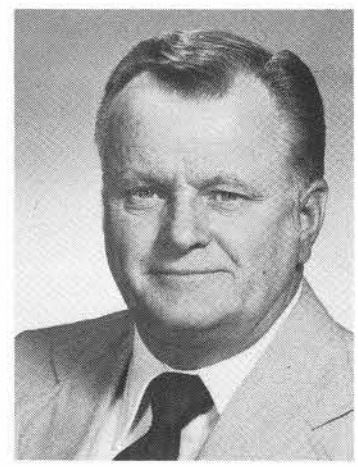
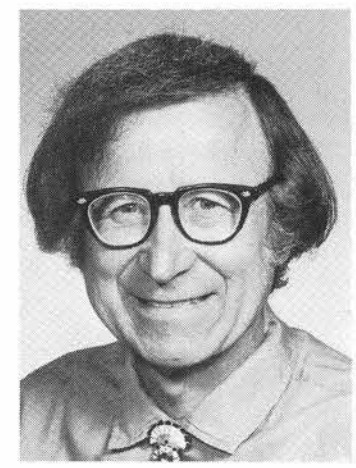
Fran Roelle-1730 15



Craig Summers-3727 30



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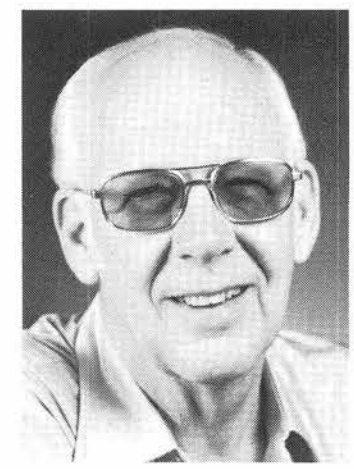

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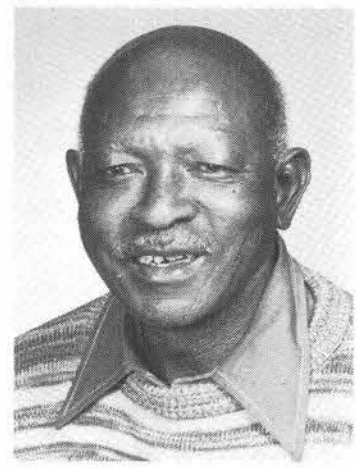

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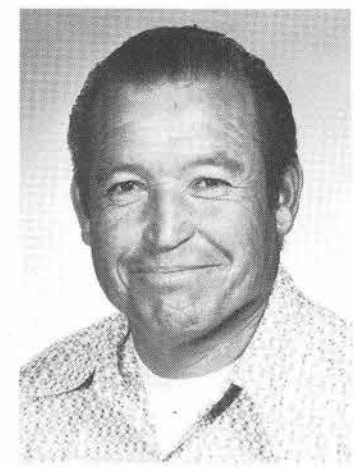

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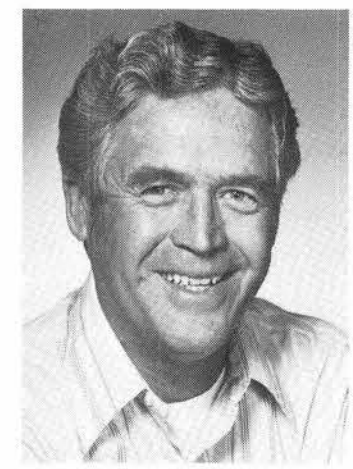

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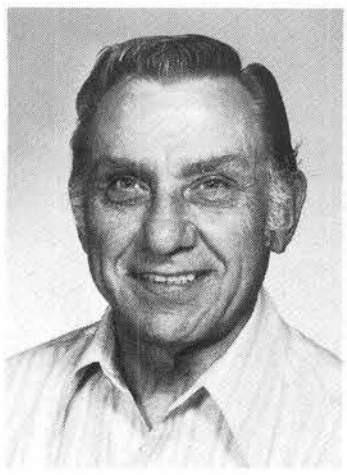
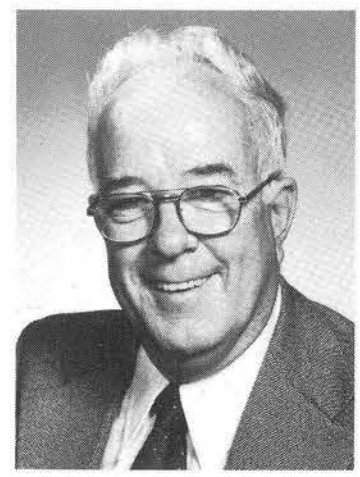


Gordon Williams-1247 20

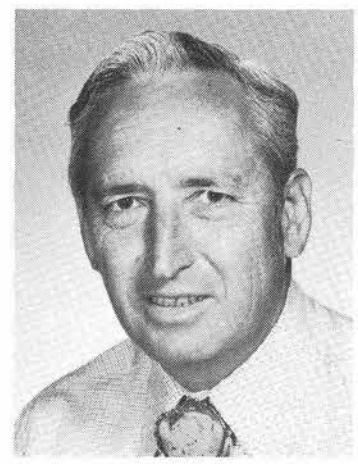
Mavis Flower-3141 15



Harold Christenson-3434 30

Bob Cuthrell-5834 15

Paula Asturias-3531 20



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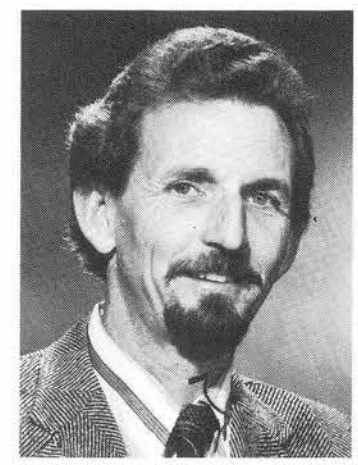

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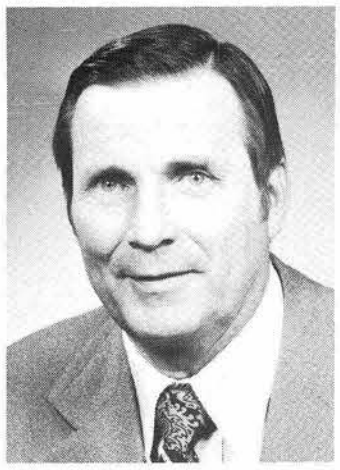
Florence Lenz-8273 15



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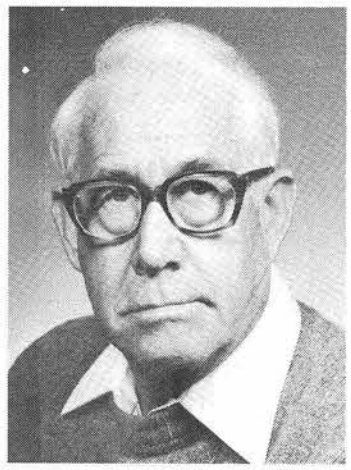
Robert Reed-1714 30



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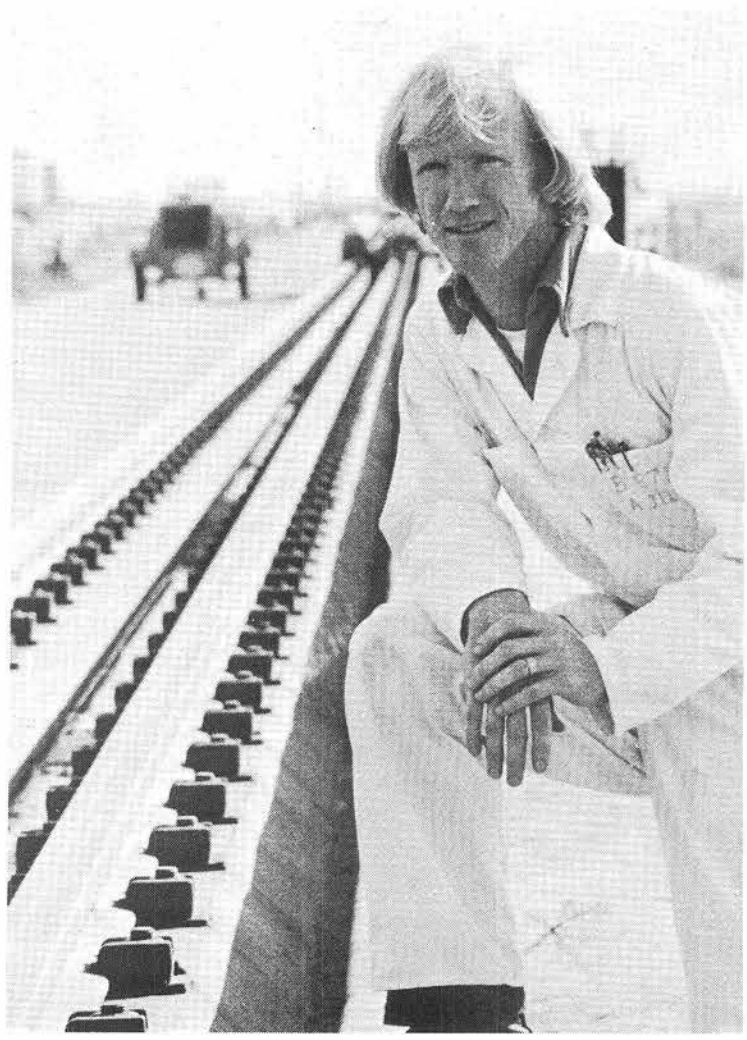
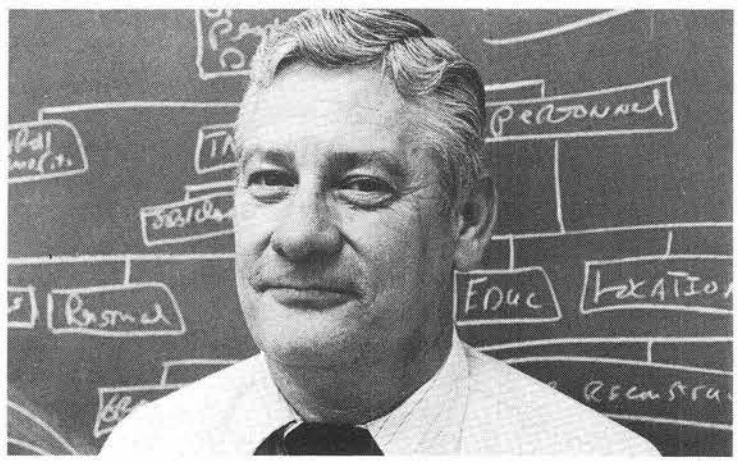


John Arnold-1535 15



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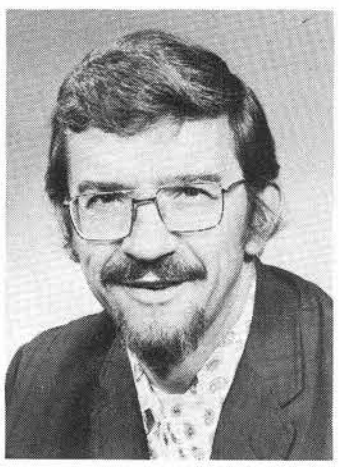
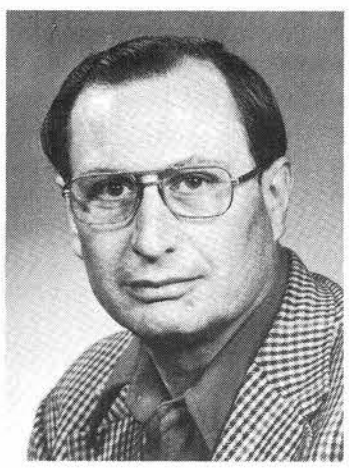
Ken Dunbar-4341 15



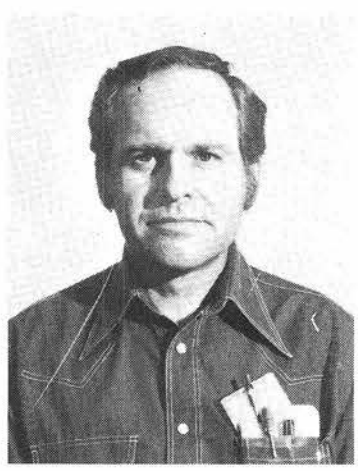
Murl Moore-2611 20



Allan Fine-1758 25

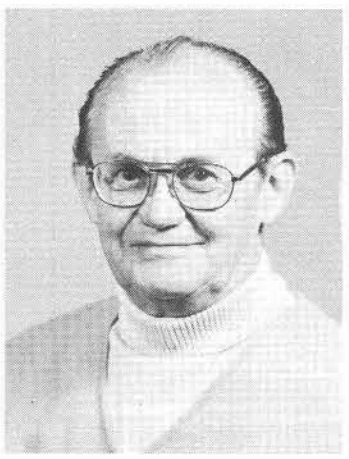
Paul Benson-1247 20

John Miller-2633 20



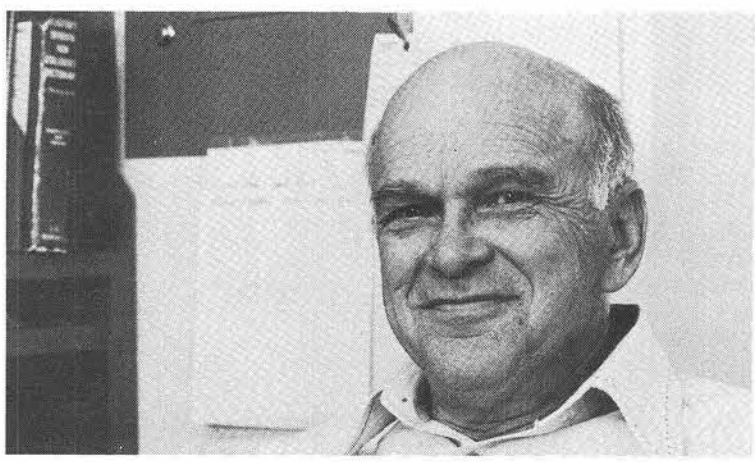
James Enlow-1173 20

Maxine Stephenson-2431 20



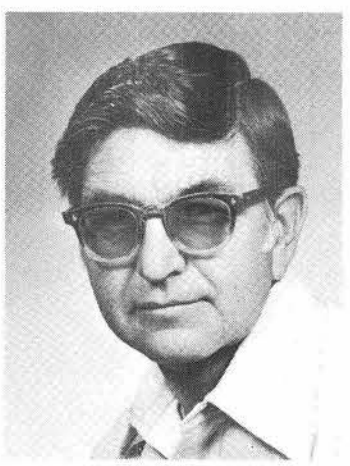
Tom Earp-1127 30

James Armstrong-1551 20



Armand Fink-4733 30

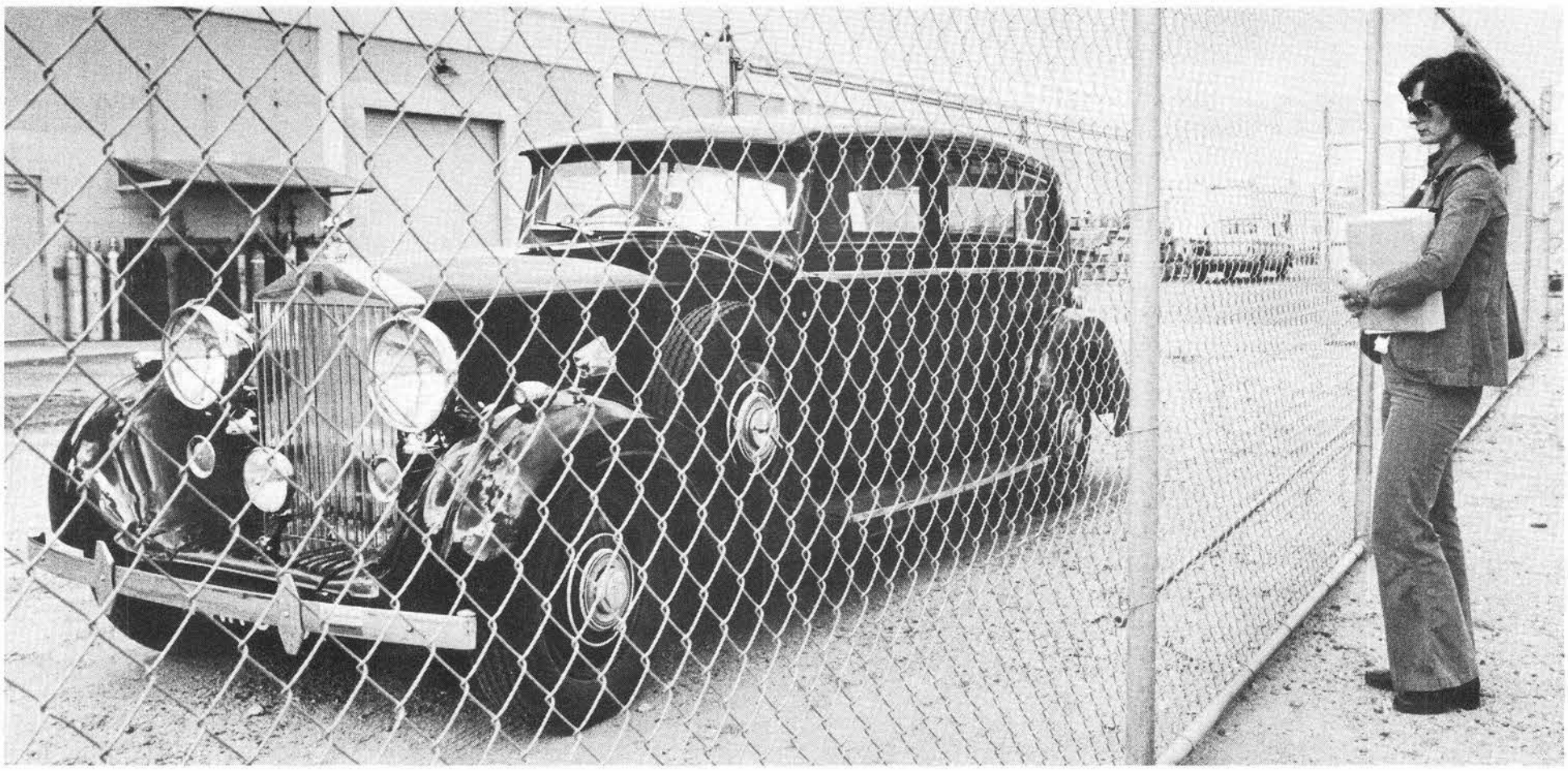
Al Cherino-3432 20



Jimmy Thompson-3618 20

B.D. McConnell-3614 30

Evaristo Gonzales-3614 15



IT STOPPED THEM IN THEIR TRACKS. Peggy Bonn (4736) was one of many who found a Rolls Royce in the Tech Area an irresistible invitation to stop and look. Ron Hill (4216), who owns the Rolls, is recovering from a back injury, so Medical gave him permission to drive his personal vehicle into the area. "You don't often get to drive your own car into the area," Ron says. "I thought I might as well make it a memorable occasion."

JUNK•GOODIES•TRASH•ANTIQUES•KLUNKERS•CREAM PUFFS•HOUSES•HOVELS•LOST•FOUND•WANTED•&THINGS

CLASSIFIED ADVERTISING

Deadline: Friday noon prior to week of publication unless changed by holiday. Mail to: Div. 3162 (814/6).

RULES

1. **Limit 20 words.**
2. **One ad per issue per category.**
3. **Submit in writing. No phone-ins.**
4. **Use home telephone numbers.**
5. **For active and retired Sandians and ERDA employees.**
6. **No commercial ads, please.**
7. **Include name and organization.**
8. **Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.**

MISCELLANEOUS

TRASH BAGS, city approved, $4/box, $20/case of 6, South Hwy. 14 Project. LAB NEWS office, Bldg. 814.

LARGE amount of used carpeting, reddish-purple. Strip, 255-7230.

10-GAL. aquariums: light, cover, filter, stand, decorations, $25; cover, filter, decorations, $15; goldfish bowl w/filter, $5. Shanahan, 296-8924 after 5.

GE wall oven, self-cleaning, $100. Shane, 884-7925.

FOUR wheels, hub caps & lug nuts for 3/4T Chev. pickup; 8-hole, 4 used tires included, $65. Hardin, 293-5679.

ZENITH 16" color TV, 5 yrs. old, w/stand, $89.95 or best offer. Sullivan, 299-6545.

TWO Jensen 6x9 coaxial car speakers, never used, $35. Kovacic, 256-0062.

CARPET, nylon, w/pad, candystripe, 11'x13', $25. Trump, 299-5162.

ANTENNA, Mosley TA33 JR, 10-15-20 meters, $50. Day, 881-2664.

TV, 17" B/W Wards Airline, $50. Gunckel, 293-7414.

PLAYTEX nurser set; Sears baby play'n feed table; 2 toddler's safety car harnesses; set twin-bed flat springs; popcorn popper. Bernard, 821-2568.

TWIN mattresses & frames, 2 at $30 ea.; 12x13 striped carpet, $40; H.O. train layout, complete w/2 engines, $100. Magnani, 299-8693.

SKI EQUIPMENT: Fiberglass Rossignol Stratoflex 185 cm skis; pivot release bindings; Humanic foam-filled buckle boots, size 9½, package for $200. Weart, 298-0614 after 5.

OLD RIFLE BAYONETS & knives; leather rifle slings, $1.50 ea.; 2 old dolls, $5 & $12; want Camero or Mustang. Smitha, 881-1001.

ONE DOZ. Spaulding Ace golf balls in orig. sealed pkg., $10. Moyer, 881-3879.

'76 TENDERFOOT camper shell, fits long-wide-bed, $275. Armijo, 268-7645.

HO TRAIN SET, $50; 14" wire spoke wheel covers, $50/set; 14"x6" 5-stud rims, $15/pr.; '65 VW rear seats, $10. Hart, 255-2133.

DRUM SET, base, snare, tom-tom, top hat, cymbals, $75. Barnaby, 265-4353.

HO SCALE train equip.: 2 engines, 15 cars, switches, lots of track, buildings, etc. Henderson, 884-8309.

CAMPER SHELL, short-wide-bed, $175. Padilla, 887-2116.

ROUND TABLE & chairs, $150; black wrought iron fp screen, 25½x34½ wide, $15. Haid, 292-0159.

ANTIQUE horse-drawn farm equipment: riding plow, $60; farrow, ½ yard, $40; knife cultivator (Go Devil), $40. Street, 294-6217.

CAMERA, Yashica TL-Electro X, 35 mm SLR, $150; also accessories for camera. Stump, 293-1272.

WATER SOFTENER, Culligan Mark 5, timed auto. cycle, $599 when new, used less than 1 yr., $285. Farnsworth, 865-6160.

SOFA, 82" contemporary, neutral color, $75; Kay elec. guitar & Sears amplifier $100. Gray, 265-1883.

MEN'S ski boots, Dolomite "Dino," size 8, $50. Peet, 294-1250.

COMPLETE HO train set, mounted on 8'x4' board, $35; 2 36" rollaway beds, $20 ea. Coughenour, 296-4146.

FW POOL TABLE, 7', cues & rack, $150; Tasco telescope, 16mm refractor, zoom lens, $150. Plein, 293-5041.

AKC REG. red Doberman puppies, $50. Zaluga, 344-1564.

DINING ROOM TABLE, blonde, 5 chairs & 1 arm chair, 57 x 38, extends to 72". Burns, 873-1144.

REFRIG/FREEZER, GE side-by-side, green, 20.5 cu. ft., $350. Nogle, 299-3863.

CHILDCRAFT encyclopedia, 1964, $45. Rudolph, 298-0941.

SIGHT LIGHT floor lamp, $45; deluxe brass finish door-side mail box, $7. Catt, 821-4726.

THOMAS ORGAN, early model, tube generation, 2 manuals, octave bass, separate expression pedal each manual, needs tuning, $100. Maase, 299-3647.

BOX SPRING, 72x37", new, $40; 2-burner 24" Colman stove, $20; old NM maps, 1864-1940, $3-$100. Dalphin, 265-4029.

PORTABLE refrigerator, Norcold, Model MRFT-630, 2 cu. ft., 11.5 VAC & 12 VDC, $250. Jenkins, 299-6395.

TOY BOX, all wood w/3 attached shelves, walnut stained 33" long, 18" wide, 50" high, custom made. Widenhoefer, 298-2510.

SNOW TIRES: 2 ea. size G78-14, $20 ea. Morton, 296-6108.

TRAILER, 16', sleeps 4, gas stove, elec. refrig., new tires, insulated & undercoated, $700. Neas, 883-0178.

CHILD'S Magnus 12 chord elec. organ w/stand & bench, $25. Bohannon, 344-9235.

ROUND BUMPER pool table, convert. to game table, $140; Tappan built-in range & oven, $30. Simon, 898-3275.

CHEST FREEZER, $20; child's backpack, $15. Drumheller, 821-9527.

COUCH, contemporary 60", 7 loose pillows, multi-color, 4 mos. old, $250. Sanchez, 299-1414.

BALDWIN Orga-Sonic concert organ w/quality Leslie speaker, solid walnut cabinet, $800 or best offer. Schkade, 293-7453.

GERRY baby backpack, $10; Wonder spring horse, $18; Miranda fl. 9 single lens reflex camera, $25. Biffle, 293-7043.

8-PC. Cherry mahogany dining set w/ext. leaf & protective pad. Owens, 881-0815.

MINIATURE twin lens Rolleiflex, uses 127 film; 1½ ton floor jack. Laskar, 299-1024.

FIREPLACE screen, brass finish, 31"x38" w/andirons, $10; "Spudy" paint gun w/parts list & directions, $15. Harstad, 298-6551.

CANARIES, lg. selection, singers, $24.50-$29.50, hens, $15, will hold for Christmas; black teddybear hamsters, $2.50. Riggan, 268-1961.

SHIP MODELS: Cutty Sark, $10; blockader, $5; sailing game, $3; walking doll, $5. Watterberg, 294-6759.

KENMORE GAS DRYER, $100; 4-pc Kroehler sectional, $75; cherry china cupboard, $200; baby bed, $15. Strance, 298-0258.

HAM RADIO TRANSCEIVER, Kenwood TS-520, $575; Cubex Quad, $100; Dentron Tuner, $50; Honda generator, 400 watt, 35-lb. camping generator, used less than 10 hrs., $275. Baremore, 296-9267.

PUPPIES, AKC registered Golden Retrievers, available mid-Jan. but selectable now. Volk, 345-0339 before 5 p.m.

REAL ESTATE

4-BDR. HOME on 2 acres, Applewood R., Corrales, $105,000, assume with $29,500 down. Mitchell, 897-1136.

SOUTHWEST design house, landscape: 3-bdr., 1¾ bath, fp, beams, brick & tile floors, 3 yrs. old, North Valley, mid 70's. Zickert, 898-3475.

SHARE purchase & retire: 160 acre island private land in National Forest SW Utah, ideal solar heating, gardening. Maak, 294-3207.

3-BDR, 1100 sq. ft., 1½ baths, living, dining, laundry, single garage, large lot, close to base. Forsythe, 298-4034.

TRANSPORTATION

10-SPD., '78 Raleigh Grand Prix, many extras, $175. McLaughlin, 881-0875.

'67 BUICK LaSabre, 4-dr., white, PS, PB, AT, AC. Guist, 294-2047 after 5.

'74 DODGE camper van, 1 ton, fiberglass top, refrig., stove, oven, undermount, 10-gal. LP tank, new tires. O'Niell, 881-7360.

'72 SUZUKI TS-250J bike, adult one owner, under 1000 miles, $550. Baca, 884-7793, after 5.

'77 TOYOTA Celica, spoke wheels, pin striping, AM-FM radio, 13,000 miles, $4200. Banach, 344-7580 after 6.

'63 CHEVY Impala, 90% restored to mint condition, 327, 3-spd., serious inquiries only, best offer over $2000. Bedeaux, 345-1456.

ELECTROPED, 25-mile range, elec. motor, battery, 2-spd. pedals, headlight, stoptail light, 2-wheel brakes, 2 pieces, for storage, $295. Bassett, 898-1840.

'69 HONDA Trail 90, $325; bumper carriers, $12.50; helmet, $10. Wilkinson, 299-8327.

'73 VW BUS, 7-passenger, below book $2495. Thompson, 299-0092.

'77 FORD pickup, F-150 Supercab, reg. gas, 6-cyl., 3-spd., 14,000 miles, make offer. Williams, 884-9430.

'73 DATSUN pickup, AT, PB; new brakes, alternator & reg.; shell, 47,000 miles, $2000. Fowler, 883-0107 after 6.

'77 AMC Pacer wagon, AC, PS, AM/FM radio, 6-cyl., 22,000 miles, $3800. Edgar, 884-8567.

'77 BUICK Regal, 351 V-8, PB, PS, AC, 2-dr. HT, 30,000 miles, steel belted tires, $700 equity, assume payments. Costales, 298-9194 evenings.

'72 CHEV. Suburban ¾-ton, PS, PB, AT, AC, $2400. Konkel, 299-5108.

'66 BRONCO V8 HT, PTO winch, dual tanks, roll bar, 4 new M/S, air shock, new hubs, U-joints, brakes. Cook, 869-6921.

'73 PINTO, NEW BRAKES & shocks, 29 mpg, 4-spd., recall fixed, $950. Martin, 869-2049.

'75 SUPERIOR motor home, 20', 440 Dodge, 26,000 miles, self-contained, new tires, Cook, 281-5689.

'73 CHEVY Malibu stationwagon, 9 pass., V-8, PS, PB, PC, new tires; '74 International Pickup, ½ ton; 6 cyl, 4-sp. Price, 867-5719.

FOR RENT

FULLY furnished 3-bdr. home, 3 baths, den, near UNM, available Jan-July '79. Abrams, 265-8988, 277-4253.

TAOS chalet, deluxe, sleeps 8, fp, loft, big kitchen, Peet. 294-1250.

3-BDR., 1¾ bath, unfurnished, major appliances, dbl. garage, carpets, new kitchen, fp, children OK, $375/mo. Bloomquist. 296-9701.

3-BDR, unfurnished, den, fireplace, 2-car garage, carpets, drapes, near Eubank & Candelaria. Moss, 298-2643.

LOST AND FOUND

LOST — Black bi-focal sunglasses in black plastic case, 3 to 5 keys on ring, $25.

FOUND — Rx glasses w/black & grey frames, Polaroid sunglasses "Cari Michelle," AO Rx glasses in maroon case, "GAS" silver key, "Yamaha" key & small brass key on silver ring. LOST AND FOUND, Bldg. 832, 264-1657.

WANTED

WOODWORKING tools: hand & power tools, band saw, router, belt sander, and others. Strip, 255-7230.

A SCHWINN (only) exercycle in good condition. Mauney, 299-3634.

RESPONSIBLE, non-smoking, married college students would like to rent inexpensive apartment, preferably furnished. Detorie, 299-1868 after 5.

TIRES: 2 used G78 x 15; used office desk. Hall, 298-8617.

LATE MODEL 4-wd. Bronco, Jimmy, or equiv., low mileage desirable. Gallo, 296-0112.

HOLIDAY MAGAZINE, Jan. 1974, long enough to Xerox an article. Miller, 255-7716.

PING PONG table for hospital patients rehabilitation program. Hansen, 869-2716.

DINING ROOM SET w/at least 6 chairs & china cabinet or server. Chorley, 296-1454.

SHOP MANUAL for '72 or '73 Olds Delta 88. Reed, 268-7484.

TWO-METER HANDI-TALKIE, like Wilson, Motorola, 1 com. small stereo phono outfit. Laskar, 299-1024.

HOUSEMATE, non-smoker, 20-35, 3-bdr., 2 bath, W/D, walk, bike, drive to work, $130 w/utilities & phone. Campbell, 294-6000.

METAL LATHE, milling machine, gas welder, gerbil and/or cage. Watterberg, 294-6759.

Coronado Club Activities

Christmas Party Time

ORGANIZATION Christmas parties fill the Club calendar for the remainder of the month, but there's something for everyone. Happy Hours continue Friday evenings in the lounge only.

SANTA CLAUS drops in at the Club on Saturday morning Dec. 16 to spread cheer among the kids. Also on hand will be Ron and Mary Kay Day with their stagefull of puppets along with the Good Day Singers and a super musical presentation. This is an annual affair — for 28 years now. Members of the board put a lot of time and effort into it. Bring the little ones and enjoy.

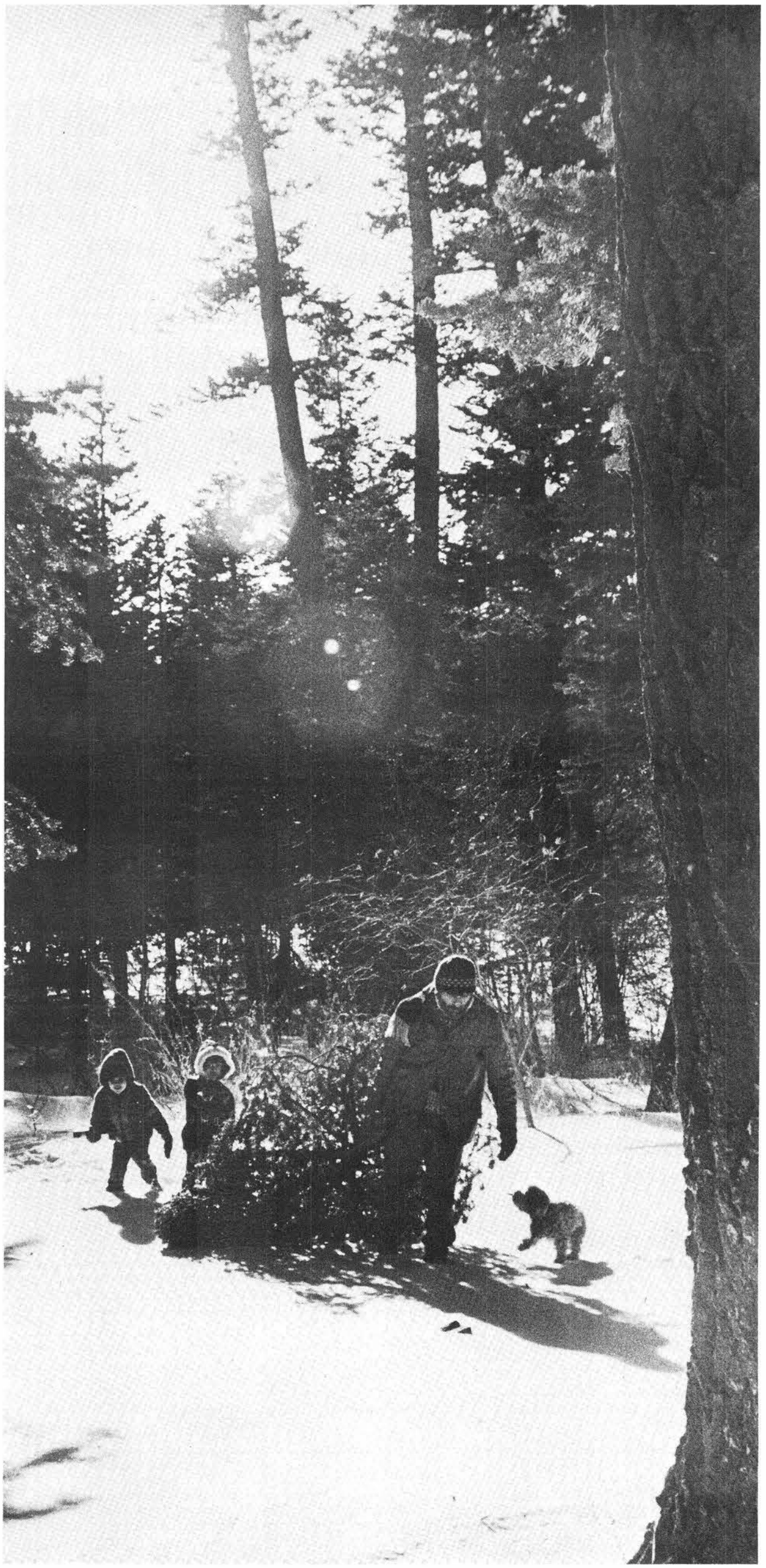
SKI CLUB members party Tuesday, Dec. 19, in the main ballroom. It's a disco event with munchables and door prizes.

TEENAGERS disco Wednesday, Dec. 20, to start their holiday vacation. Rick Dustin is the emcee. Member parents should pick up tickets for their youngsters.

TRAVEL DIRECTOR Ed Neidel is looking for travelers with interesting tales to tell and slides or movies to show. He's scheduling travelogue nights for next year and needs speakers. Call Ed on 4-5264.

Ed can also tell you about a go anytime travel package to Britain, a Caribbean cruise Jan. 6-14 and a jaunt to Puerto Rico in late February.

THE CORONADO CLUB is where it's happening New Year's Eve. Hats, noisemakers, confetti, champagne breakfast and dancing upstairs and downstairs. Tickets ($13 per member couple) should be picked up by Dec. 18.



A CHRISTMAS TRADITION — In New Mexico, cutting your own tree is a family outing. But be prepared for cold, snow and mud. For national forest trees, permits are required. They're available at 10308 Candelaria NE. None will be available at the Sandia Ranger Station this year. For a recorded message with the full scoop, call 242-6071.