



THE STRIP in Las Vegas is a familiar sight to Sandians who work at Tonopah Test Range. Most reside in this city, commute by air to the Range. TTR is

undergoing modernization. Story is told on Page Four.

LAB NEWS

VOL. 32, NO. 4

FEBRUARY 22, 1980

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

Explosive-Driven Flyer Plate

New Testing Technique Developed

A new explosive-driven flyer plate testing technique is saving time and money in testing impact fuzes at high velocities.

The technique is particularly useful in testing of impact fuzes designed for use in RV warheads, where the fuze must react within microseconds after impact so that the warhead has time to function before disabling damage occurs. These fuzes must perform at impact velocities from 1000 to 4500 metres per second and usually at oblique angles of impact.

In the past, to test fuzes at oblique angles, rocket sleds have been used to provide impacts into soft and hard targets shaped to the desired angle. This testing technique works well, but impact velocities are limited to about 1800 metres per second because of the length of Sandia's sled track facility in Area III—1500 metres isn't quite long enough.

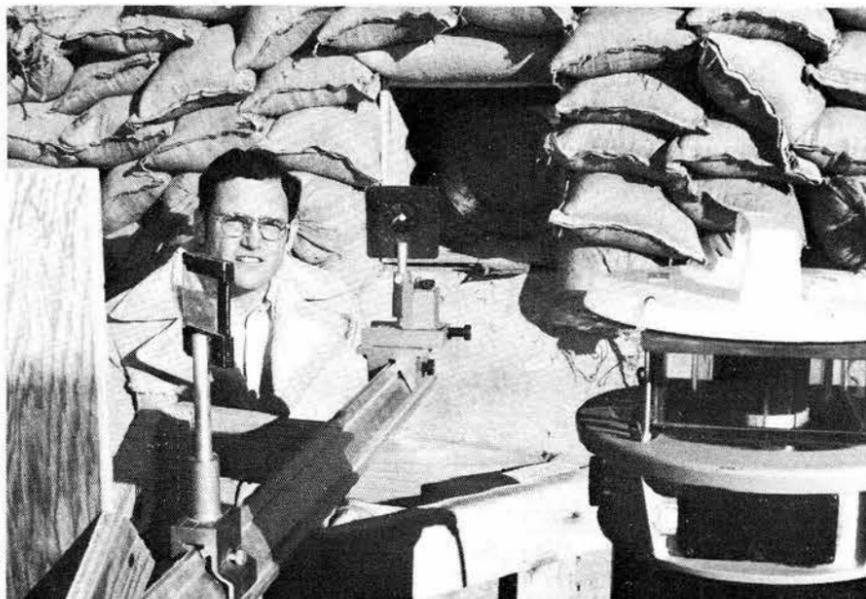
Floyd Mathews and Bob Benham of Explosive Testing Division 1533 have perfected a technique which drives a flyer plate into the fuze with precision of impact angle and at high velocities. They call it

the "barrel-tamped, explosively propelled flyer plate" method. A large selection of angles of impact at velocities up to about 4000 metres per second can be achieved.

A steel cylinder, weighing about 450 kg, is loaded with 45 kg of plastic explosive. The flyer plate fits into one end while the other remains open. Upon detonation, the

flyer plate is driven several metres into the fuze target and test instrumentation. Precisely timed flash x-rays photograph the flyer plate as it moves through its trajectory in the explosive debris cloud. The surrounding sandbag and concrete igloo over

[Continued on Page Two]



BOB BENHAM (1533) test engineer, uses a laser beam to position the fuze target in front of the explosive barrel and flyer plate at the Thunderwell facility south of Area III. Precisely controlled impact angles and velocities are achieved with the new testing technique.

Afterthoughts

Laskar leaves the LAB NEWS--When Bill Laskar, our photographer for nearly two decades, came to see me last month to quietly announce his retirement, my reaction was something like "Uh... wait a minute --you can't do this to us." So much for that--Bill departs the end of this month. His unique talent will be missed. For those of you with an interest in the photographic process, let me count the ways by which an editor measures a photographer:

- * Creativity--making much out of little, producing a dramatic photo when the ingredients are prosaic.
- * Coolness under fire--when the VIPs are behind schedule on their Labs tour, it takes savoir faire (and a little brass as well) to step in, soothe the nervous host and calmly set up a picture while exchanging pleasantries with the VIPs.
- * Meeting deadlines--every second Friday, this paper comes out no matter what. The inexorable deadline must be met by all, including the photographer.
- * Print quality--like a good chef, a good darkroom practitioner produces prints more by artistry than by rote. His (or her) prints sparkle, where most are merely grey.

There are, of course, other measures of a photographer. I emphasize here only those qualities esteemed by the editor and, in these, Bill Laskar gets best-of-breed. You can see what I'm talking about in Bill's photo exhibit now on display in Bldg. 802.

* * *

Jim Kaiser (3435) sends us the latest addition to our collection of mutilated addresses:

Sandlapa Labout
P.O. Box 5800
Albuquerque, NM 87185

*js

Take Note

A call is out for volunteer judges for the Northwest Regional New Mexico High School Science Fair, which will be held at Johnson Gym on the UNM campus, March 21 and 22. About 400 judges are needed. Olden Burchett at 844-3066 or 869-6093 has detailed information on the fair and application blanks for potential judges.

* * *

Small problem department: LAB NEWS readers occasionally send us material for the paper and, assuming the material is of interest, we'll try to work it in, usually in edited form. Sometimes, though, there isn't enough space in our normal 12-page issue and that's the problem--we publish in increments of four pages and, if we elect to go beyond 12 pages, we have to come up with an additional four pages of copy. It's all a function of the printing press, which prints four pages simultaneously. It would be nice if we could print, say, a 13- or 14-pager, but you just can't get there from here . . . and some items of interest may not make the LAB NEWS.

* * *

Colloquia coming up: astrophysicist Trevor Weekes from Harvard whose presentation is entitled "A Search for Exploding Black Holes," Feb. 27; historian Jake Spidle from the Air Force Weapons Lab, "AFWL-Laser Research," March 5; and Robert Hjellming of the National Radio Astronomy Observatory west of Socorro, "The Very Large Array Radio Astronomy Telescope, Accomplishments and Potential," March 12. Colloquia are presented at 10 a.m. in Bldg. 815.



Make of it what you will: a study of 1,045 undergrads at the Univ. of Cincinnati revealed that of the left-handed students, 14.89% majored in music, 12.24% majored in the visual arts and only 4.35% majored in the sciences.

Continued from Page One

Explosive Testing Technique

the explosive area retards shrapnel and is destroyed by the blast.

"The impact angle and velocity are calculated from the geometry and mass of the barrel and the flyer plate plus the properties of the particular explosive used," Bob Benham says. "We've proved the theory in a number of development tests."

Another successful test in the ongoing series was conducted recently at the Thunderwell facility south of Area III. Test preparations are made by Division 1533; fuze hardware preparation is done by Divisions 2164 and 2342. The explosive

charge is the responsibility of Division 1482. The fuze development program is centered in Power Conditioning and Subsystems Department 2160 under C. B. McCampbell. George Clark (2164) is fuze development project leader.

LAB NEWS

Published every other Friday

SANDIA LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO

LIVERMORE, CALIFORNIA

TONOPA, NEVADA

Editorial offices in Albuquerque, N.M.

Area 505 264-1053

FTS 475-1053

ZIP 87185

In Livermore Area 415 422-2447

FTS 532-2447

john shunny is editor

&

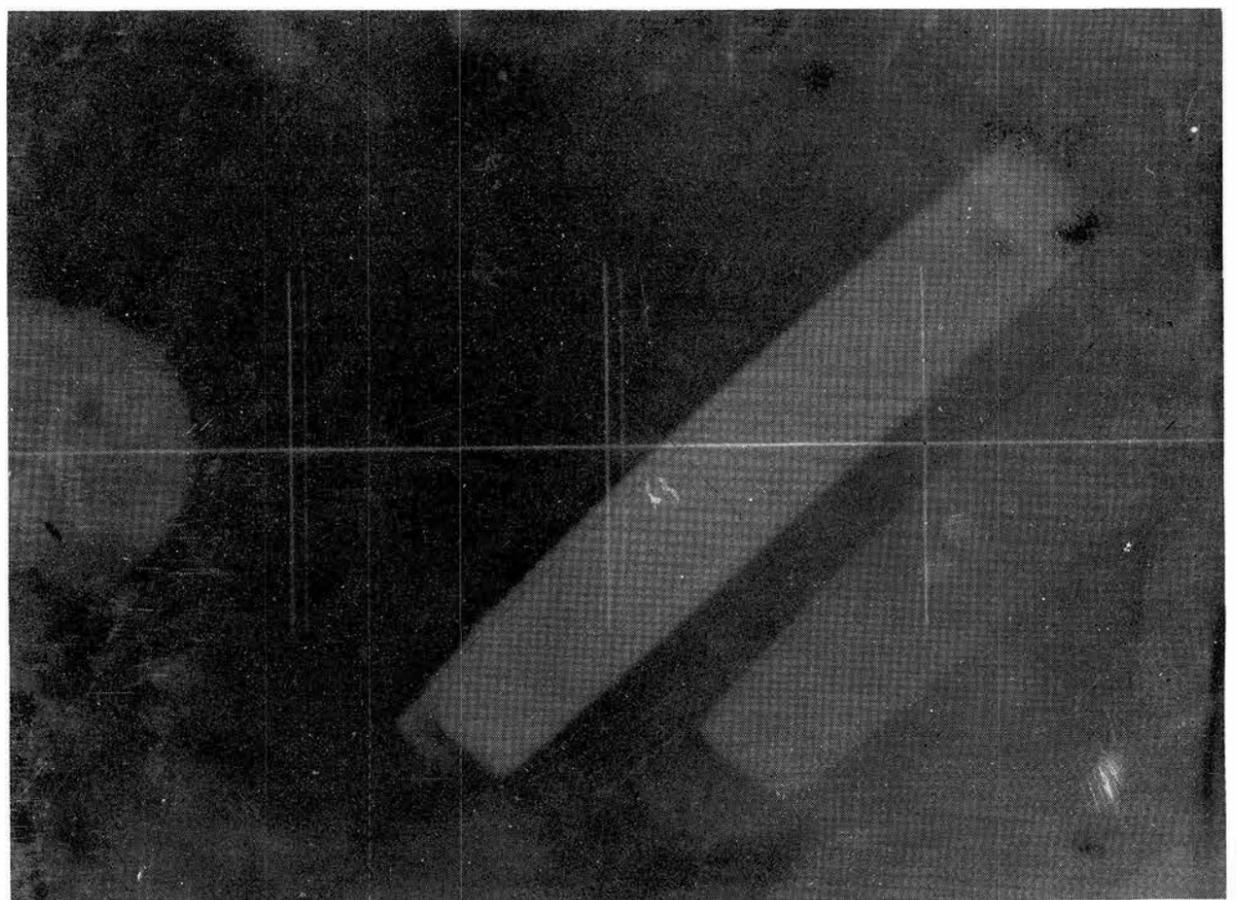
don graham ass't. editor

chuck cockelreas & norma taylor write

bill laskar does picture work

aided by gerse martinez

barry schrader & lorena schneider report livermore.



FLASH X-RAY shows the oblique angle of the explosive-driven flyer plate in its trajectory toward impact on the target fuze (at left). White lines are lead wires used as reference points. This testing technique, providing high-velocity impacts, is used in conjunction with rocket sleds which provide lower velocity testing.

Commuter Assistance

Getting To Work: Benefits Can Help

Don Stone of Benefits (3543) expects to spend a lot of time on the phone in the next few weeks. He was recently asked to set up a "Commuter Assistance" service within the Labs, with himself and an assistant, Barbara Champion, handling the job. Previously, volunteers on the Employee Transportation Committee had worked on commuter assistance matters as their time permitted, and they will continue to participate in an advisory role.

The telephone activity for both Don and Barbara will derive from their serving as the Labs' clearing house for information on car pools, van pools, buses, biking-to-work and other matters relating to getting to work by means other than one-person-in-one car. "We're after the lone rangers," says Don. "Most Sandians still come to work solo. I'm hoping we can convince many of them that there are better ways—better for them and better for the country."

How employees get to work has been the long-time concern of the Employee Transportation Committee, whose chairman is Jeff Gammon (3741). Largely through the efforts of this committee, bus service for Sandians was arranged and seven buses now deliver passengers within the Tech Area. Executive VP Jack Howard (2) worked closely with the committee to help smooth the way. The commuter assistance role now given to the Benefits organization as a full-time assignment underscores the resolve of Sandia's management to insure that Labs' people have every opportunity to come to work by a more energy-efficient means.



COMMUTER ASSISTANCE—Don Stone and Barbara Champion of Benefits (3543) have recently been given the full-time assignment to handle commuter assistance matters for Labs people. They'll be working on car and van pools, buses, biking-to-work and other means of getting here, all with the aim to reduce dependence on the automobile.

The principal upcoming activity for Don, aside from his phone business, will be the mailing of a commuter questionnaire to a sample of employees. The questionnaire is designed to get a handle on how employees now commute to work and how their commuting habits might change in the future. Once returns are in and analyzed, Don hopes to be able to offer Sandians a program for ride sharing that will attract a large percentage of the population.

The next major activity after the questionnaires are in will be the reestablishment of a computerized ride matching

system, both for car and van poolers. Until the ride matching system is set up, employees are urged to use a new "Share-a-Ride" section of the LAB NEWS want ads to find rides or riders.

Van pools are another means of commuting and, at this writing, one van pool is in operation and two are awaiting delivery of vans. "We see many more opportunities for setting up of van pools," says Don. "Areas such as Placitas and Bernalillo are obvious candidates. When gas was 65 cents a gallon, any area 15 miles or more from work was considered a van pool candidate. Now, with gas around \$1.10 a gallon, this 15-mile radius drops to about 12 miles. They say gas will go up even more, from \$1.50 to \$2.00 per gallon by the end of 1980. If we use the 12-mile radius criterion, Sandians could easily support 15 to 20 van pools."

Don adds that a commercial van service from Rio Rancho to the Labs is expected shortly to be in operation; an announcement will be made when the service becomes available. Moreover, a group of employees from Los Lunas is making good progress in establishing a van pool from that area.

LAB NEWS will continue to carry commuter information under its "Commuter Notes" heading as new developments occur. A "Share-a-Ride" section will be added to the classified ads for Sandians who wish to join a car pool or van pool or who need additional members for an existing pool.

To get more information about getting to work by an alternate means, call Don Stone or Barbara Champion—they're on 4-6281.

Congratulations

Mr. and Mrs. Otto Simon (2436), a son, Otto Herman Franz III, Feb. 6.

Mr. and Mrs. Jose Rodriguez (2146), a son, John Sebastian, Feb. 1.



SANDIA BICYCLE ASSN. President Ron Malpass (1761) had a bright idea: why not use some of the money in the SBA treasury to buy a bike bag which members could borrow when they travel? (Otherwise the airlines wanted the bike crated.) That's the bag in its rolled-up mode on the back of Ron's bike. Later, wheels removed and stored within, that's the bike-in-bag. Not exactly storable under the aircraft seat but checkable as luggage. If you want to give it a try, Ron's number is 4-5032.



Updating of Tonopah Test Range Continues



From the incandescence of the Las Vegas Strip to this lonely stretch of State Highway 6 (above) just outside the town of Tonopah (Pop. 2200), is only 200 or so miles, a drive of a few hours. But the gaudy Strip could be on the other side of the world in terms of its kinship with the other Nevada—the “real Nevada” of the natives, an unending landscape of mountains and deserts, largely untouched, fiercely beautiful.

This is the setting of the Labs' Tonopah Test Range, a facility which, in its 525 square miles, is nearly half the size of the state of Rhode Island. The successor to the

Salton Sea Test Range, TTR has been in operation since 1957 when it began test work with four Askania phototheodolites, a tracking telescope, one radar and a small telemetry station. The early permanent Range crew numbered five. Today that number is 53 people.

Tonopah Test Range has experienced several modernization programs. The latest, begun in 1978, is the most extensive. At a cost of eight million dollars, it is also the most expensive. Significant projects completed under this program of updating include replacement of the network of

20-year-old fixed cinetheodolites with new mobile units, deployment of a new target acquisition and tracking system, and replacement of the Range computing and data display facility with modern hardware.

The most visible project, a new Operations Control Building, is now virtually complete and is scheduled to be operational this spring. Its four floors and 8500 square feet of space will contain the sophisticated computers and other electronics with which the Range can meet the technical challenges of the '80s.



ENTRY road leading to Range is 13 miles east of town of Tonopah. From here it's another 27 miles to Range complex.



RANGE MANAGER Sam Moore and new Operations Control Building.



IMAGE MOTION photograph stops accelerating rocket sled as it emerges from a simulated explosive debris cloud. The wedge-shaped nose contains

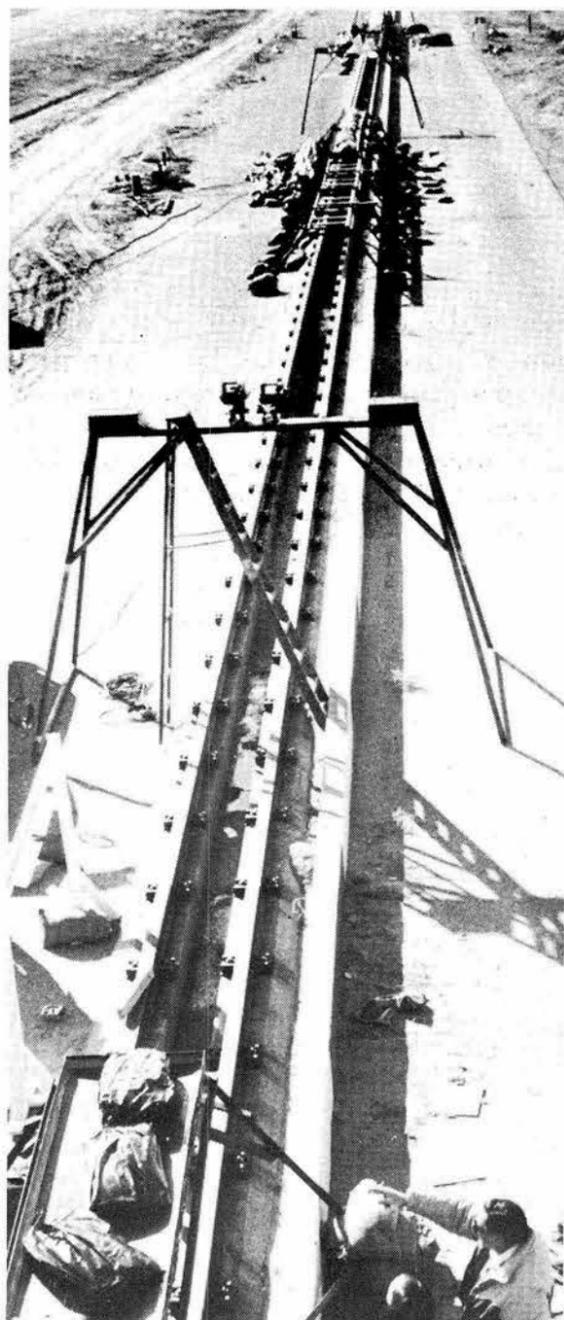
candidate skin materials for an advanced missile design. Velocity at this point is 2950 feet per second.

On Rocket Sled Track

Explosive Debris Cloud Simulated For Missile Materials Test

A one-second rocket sled run last week in Area III climaxed months of preparation for one of the most complex—in a physical and logistical sense—tests ever conducted on Sandia's 5000-ft. rocket sled track in Area III.

Under test were several skin materials, candidates for an advanced missile design, and the reaction of these materials to a



SHAKER STATIONS with bags of calibrated sand and gravel are readied above the sled track. During the test, each of the 34 shaker beds dropped 800 lbs. of sand into the path of the sled to simulate an explosive debris cloud.

simulated explosive debris cloud.

To simulate the cloud, sand and gravel of selected sizes were dropped from a shaker system into the path of the sled. The particle sizes ranged from very fine dust to half-dollar-sized pebbles. The pebbles were imbedded in plastic sheets and suspended along the track.

The wedge-shaped nose of the sled containing the test materials was programmed to change the angle of attack as it moved down the track—decreasing from 27 degrees at launch to three degrees at the end of the sled run.

The sled accelerated to a velocity of 3000 feet per second during the run, and was braked by 2000 ft. of plastic bags of water taped to the end of the track.

Six stations consisting of nine pebble hangers and 34 shaker beds driven by electric motors were mounted on welded A-frames above the track. Each shaker bed held 800 lbs. of sand. During the test the shaker stations were covered by plastic sheets to protect the simulated debris cloud from ambient high winds. Image motion cameras, high-speed motion picture cameras and other instrumentation were positioned to photograph the sled as it emerged from the tunnel-like shaker stations.

The test was conducted for the Defense Nuclear Agency with the materials, design of the experiment and post-test analysis the responsibility of Prototype Development Associates.

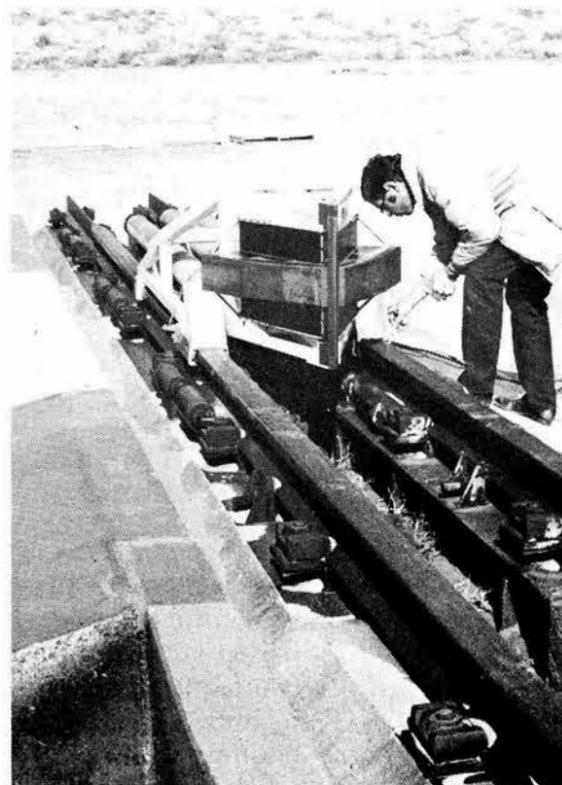
Dave Preston (1535) was test engineer; Harold Rarrick (1535), test project manager.

Bill Pierce (1556) headed the Photometrics effort.

Winn Erdman (1535) was responsible for installation of the shaker beds and frames on the track.

Assembly of the frames, fabrication, calibration, loading and test support were provided by the craftsmen of Department 3610. Chuck Wells (3618) coordinated the extensive support activities.

Another test using the same track setup but with different materials samples carried on the nose of the sled is scheduled later this month.



DAVE PRESTON (1525), test engineer, makes final check of rocket sled before launch. Nose of the sled changed angle of attack during the run from 20 degrees at launch to zero degrees at the end of the test.



PEBBLES imbedded in a plastic sheet are suspended in the path of the sled by Dave Bremmer (PDA) and Harold Rarrick (1535), test project manager.

Fun & Games

Skiing—Ski tourers get a chance to show their stuff this weekend at the Campground Races in the Jemez Mts. More specifically, the Clear Creek Campground Races with 15 and 30 kilometre races over largely flat courses. Clear Creek is ten miles east of Cuba on Highway 126. Date is Sunday, Feb. 24, at 11 a.m. and, if you want to car pool it, meet at the Goodwill parking lot on San Mateo at 7:45 a.m. If you're interested in a weekend in the Durango area for X-C skiing, the Touring Club will run a bus to that area over the March 29-30 period. Cost for bus and lodging is \$45 (two/room) or \$40 (four/room). Kathy Hiebert (5642) needs your money by March 1.

Running—Last issue we asked for expressions of interest from those interested in the Duke City Dashers Corporate Cup Track & Field Meet, to be held sometime in May or June. In this meet, people from different firms in the area would compete as members of a team representing their firm, and the team with the highest score would get the Corporate Cup. We're pleased to report that 23 Sandians have responded and there's a pretty good mix of male and female. We're still collecting names—if you're interested, send us yours, plus organization and phone to Corporate Cup, LAB NEWS.

Volleyball—Alan Spencer (3611) reports that the Sandia Volleyball Assn. will start its 10-week season on March 24 with two leagues—the A-league for the more competitive players and the B-league for recreational players. You can sign up as an individual, in which case you'll be assigned to a team, or you can crank up your own B-league team. In either event, you need to send the information to Ree Gerchow in Org. 3222 no later than March 10. She needs your name, org. and phone, whether you wish to play A or B and if you wish to be assigned to a team. Cost is \$8/head. If you do have a team, send Ree the complete roster.

Yoga—Guru Deep, who taught this subject last year at the C-Club, starts a course in beginning yoga next week, Tuesday, Feb. 26, in the KAFB-East gym. Emphasis is on "developing a positive mental attitude," using body and mind exercises. The eight-week course costs \$16, meets from 5 to 6 p.m. on Tuesdays.

Guns—The New Mexico Gun Collectors Assn. 22nd annual Antique & Modern Gun Show will be held Saturday and Sunday, March 1 and 2, from 8 a.m. to 6 p.m. at the Albuquerque Convention Center. Rifles, shotguns, pistols, knives, swords and Indian artifacts will be on display, and you can buy, sell, haggle, or just browse. It costs \$1.50 to get in.

SLL Model Labs

Hybrid Microcircuits Produced

Sandia Livermore's Model Labs Division 8424 recently has been given responsibility for the design and development of all Livermore-generated hybrid microcircuits. The assignment follows upon the acquisition of new equipment to enable the staff to produce hybrid microcircuits having high reliability and increased capabilities.

Model Labs supervisor Ray Sheppard (8424) described the high technology equipment now assembled in the Labs to produce prototypes of thin and thick film microcircuitry:

- a laser trimmer for removing resistor material capable of achieving resistor values accurate to 1/10 of 1 percent;
- a precision screen printer for creating conductor lines as fine as 7½ mils in width;
- a programmable automatic wire bonder.

These are some of the tools with which the Labs is able to produce the ever-smaller, high density, high reliability hybrid microcircuits.

Design and fabrication of a hybrid microcircuit begins with a drawing, usually on a scale of 10x or 20x, that shows placement of circuit components and electrical connections. The components could include commercial integrated circuits or custom-designed chips produced at Sandia's Semiconductor Development Lab in Albuquerque. The design minimizes the surface area required for placement of the components and routing of electrical interconnections, and several iterations are usually made before reaching an optimum layout. A version showing only the electrical interconnection pattern is then photographically reduced to actual part size, and the resultant "photograph" becomes the basis of the photolithographic process used in fabrication.

To deposit the electrical network upon the ceramic substrate commonly used in hybrid microcircuits, two processes may be employed:

—the thin film process, a subtractive process in which thin film gold on the ceramic substrate is selectively etched away leaving the network pattern;

—the thick film process, an additive process in which the network pattern is printed upon the ceramic substrate; this process permits multilayering of circuits by printing insulating material between circuits and, thus, higher packaging density.

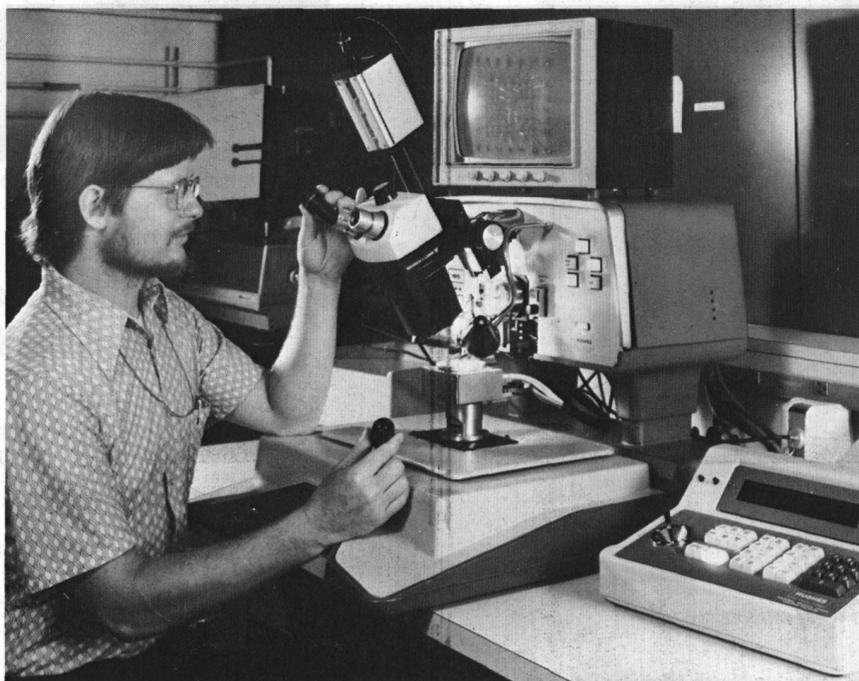
The precision screen printer is used to print both conductive and resistive material. Since thick film materials require "firing" at high temperatures, a furnace is employed, and the items travel through the furnace on a moving belt. Once the screen printer and the furnace are set up for a given job, it takes little additional effort to print and fire in volume quantities. After printing and firing, laser trimming becomes necessary because material and process variables don't permit printing and firing

LIVERMORE NEWS

VOL. 32, NO. 4

LIVERMORE LABORATORIES

FEBRUARY 22, 1980



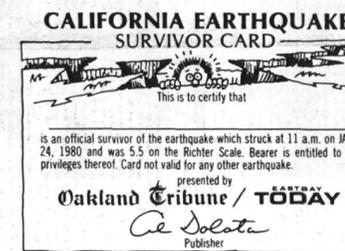
USING THE NEW Hughes programmable automatic wire bonder is Gary Simpson of Model Labs Division (8424).

of precision resistors. For this reason, they are printed low in value, and material is laser-removed until the desired value is obtained.

With the network now on the substrate, components may be placed on it. A new adhesive bonder is used for this operation. From its turret, small bars of different sizes project that correspond to component sizes. As the vacuum tip picks up the component, the appropriate turret tip is dipped into the adhesive, which is then applied to the substrate. Finally, the component, still held by the vacuum tip, is placed on the adhesive.

Electrical connections from component terminals to the electrical network are now made, typically using 1 mil gold wire. The automatic wire bonder, once programmed, makes wire hookups of the proper height and length quickly and automatically, without need for an operator.

The new equipment is one element contributing to higher product reliability and increased laboratory capability. Materials used have an increasingly important role. A prototype hybrid microcircuit was recently fabricated on a substrate of porcelainized steel, a material like that used in refrigerators. Currently used in GE's Flash Bar II as the substrate for the flash bulb circuit, the porcelainized steel is being studied by Sandia for use in high shock environments beyond the structural limit of ceramic substrates.



SHAKEN—Receiving "special recognition" for bumps and bruises were 13 Sandians who suffered minor injuries in the Jan. 24 earthquake. Holding up their "Survivor Cards," offered by the *Oakland Tribune*, are Clyde Taylor (8413), Bob Hofford (8272), Wayne Townes and Dwight Soria (both 8257), Don Gregson (8440), Doyle Baker (8463), Brian Chamberlain (8214), Carl Schoenfelder (8315), David Dent (8257-1) and Fred Hart (8453). Not shown are James Kersey (8153), Shelia Daigle and Paul Van Dyke (both 8413). Card they received is shown at left.

Congratulations

Mr. and Mrs. John Smugeresky (8312), a daughter, Lisa Joy, Dec. 12.

Renee (8450) and Chuck Canfield, a daughter, Margaret Elizabeth, Jan. 31.

Lynda (8413) and Mont Hadley, a daughter, Mayla Eileen, Feb. 5.

Iona Ratcliff (8273) and Michael Perrell, married in Reno, Dec. 29.

Sympathy

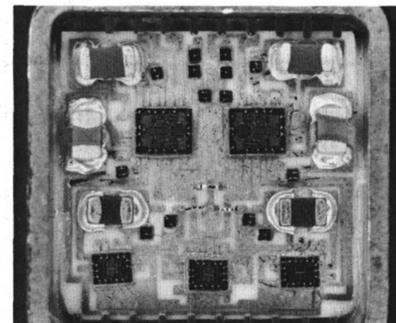
To Bobbye Goodman (8443) on the death of her mother in Auburn, Wash., Jan. 14.

To Mel Callabresi (8121) on the death of his father-in-law in Stockton, Kan., Jan. 18.

To Ollie Olivotti (8412) on the death of his father-in-law in Merrill, Wisc., Feb. 5.

To Cliff Schafer (8453) on the death of his father-in-law in Tulsa, Okla., Jan. 18.

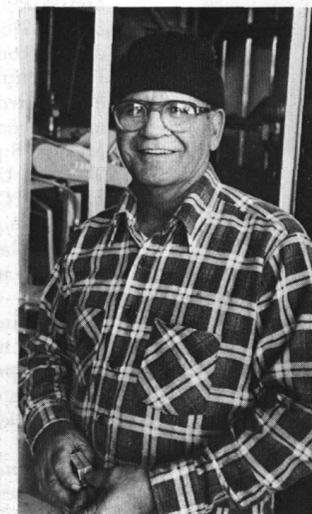
Retiring



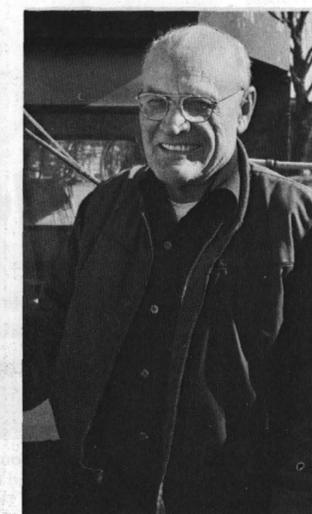
ENLARGEMENT OF A THIN film hybrid microcircuit.



Joyce Doyal (8250)



Mike Lovato (8257)



Zell Terry (8257)



Vivian Lenz (8423)

Supervisory Appointments

TONY CHAVEZ to supervisor of Packaging and Shipping Section 3417-3, effective March 1.

Tony joined Sandia in October 1948 and worked as a special handler in the transportation organization for seven years. Since then, he has been a service clerk in the packaging and shipping organization.

During WWII, Tony served in the U.S. Army as a Tech Sergeant in England and France and, immediately before coming to the Labs, worked for the New Mexico Timber Co. Tony was born and raised in Bernalillo but has lived in Albuquerque for about 20 years. He and his wife Estella spend weekends and most of their spare time caring for their apple orchard in Belen. During the summer, Tony supervises the usherettes at the Dukes' baseball games. Tony and his wife have three children and live in the NE heights.

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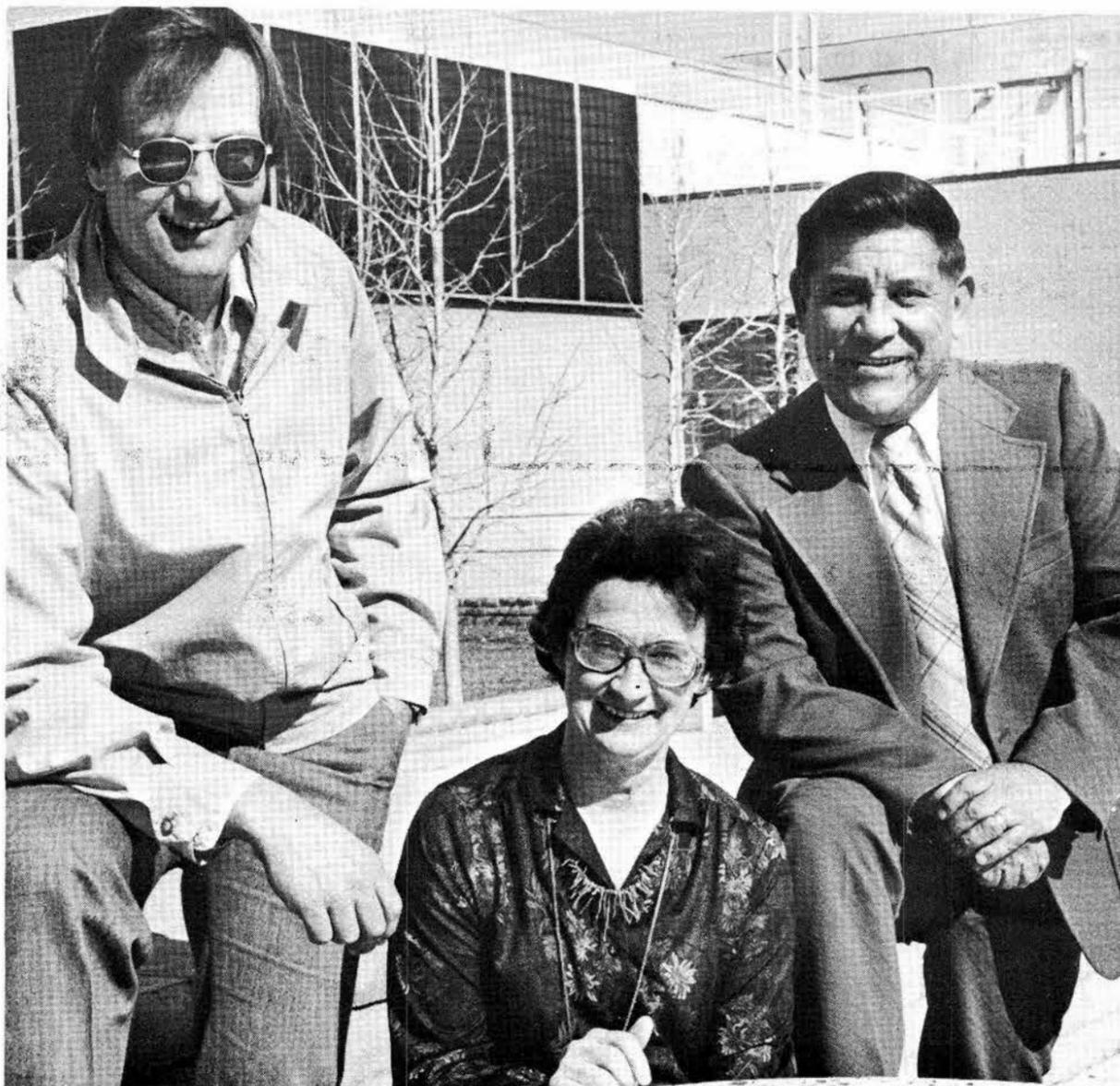
CLARA GEARHART to supervisor of Library Acquisitions and Cataloging Section 3141-1, effective Feb. 16.

Clara joined the Labs in 1955 as a clerk typist and, later on, worked as a secretary. She transferred to the Technical Library in 1961 where her most recent position has been as an ordering/cataloging coordinator. Currently, she is enrolled at UNM, under Sandia's Educational Aids Program, working towards her BA degree with a minor in library sciences.

Off the job, Clara enjoys golfing, bowling, sailing and water skiing. She has a married son living in Albuquerque; Clara lives in the SE heights.

* * *

DALE SCHAEFER to supervisor of Corrosion Division 5841, effective Feb. 16. Dale joined the Labs in 1972 as a staff



DALE SCHAEFER (5841), CLARA GEARHART (3141-1) and TONY CHAVEZ (3417-3).

member conducting research in a polymer physics group. Since, then, he has done research in several areas—electronic properties of thin films, structure of colloidal suspensions and, most recently, dynamics of polymers.

Dale earned a BS in chemistry from Wheaton College (Ill.) and his PhD in physical chemistry from MIT. He is a member of the American Physical Society and the American Chemical Society. Dale and his wife Arlene have two children and

live near Golden on North Highway 14. He enjoys hunting, fishing and camping, and often uses his horses for making pack trips.

Events Calendar

- Feb. 22-23*—"The Merry Widow," Albuquerque Opera Theater, 8:15 p.m., Popejoy.
- Feb. 23*—Collector Car Show and Sale, Ag. Exhibit Hall, State Fairgrounds.
- Feb. 24*—Experiment in Jewish Learning: lecture by Yosef Yerushalmi, "Israel, the Unexpected State: Messianism, Zionism and Jewish History," 8 p.m., 1st Unitarian Church, 3701 Carlisle NE.
- Feb. 26*—"Return to the Tetons," Audubon Wildlife Film, 7:30 p.m., Popejoy.
- Feb. 27*—Jocuri Folkdance Ensemble: dance concert at Manzano School, 1801 Central NW, 7 p.m.
- Feb. 27-March 2*—"The Travelin' Show," musical comedy set in 19th-century New Mexico, 8 p.m. & 2 p.m. (2nd), Rodey Theater, UNM.
- Feb. 29*—"Chapter Two," Neil Simon play, 8:15 p.m., Popejoy.
- Feb. 29*—Classical guitarist Glenn McFarland, 8 p.m., Kimo Theater, 766-7816.
- March 1-2*—NM Symphony Orchestra with violinist Boris Belkin, 8:15 p.m. (1st), 3 p.m. (2nd), Popejoy.
- March 2-April 20*—French Oil Sketches from 18th century, UNM Art Museum, lower galleries, Tues.-Fri., 10-5, Sun., 1-5.
- March 2-June 8*—Katachi: Form & Spirit in Japanese Art, Museum of Albuquerque, Tues.-Fri., 10-5; Sat.-Sun., 1-5.

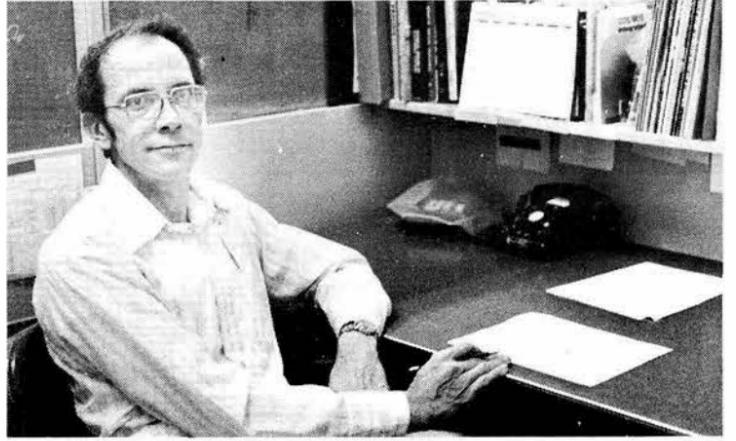


WHEN ED HARLEY (4725, center) was a boy back in the '30s, he belonged to Boy Scout Troop 4 here in Albuquerque, later became Scoutmaster of the troop. So did Bill Caskey (4716, left) and Gene Jeys (1473). They hold Troop 4 charters dated variously back to 1921. The occasion is a reunion of Troop 4 alumni, set for Feb. 27 at 7:30 p.m., at the McCollum Elementary School. Former members are urged to drop by. Gene has additional information—293-4400.

MILEPOSTS
LAB NEWS
FEBRUARY 1980



Jane Lord - 3141 25



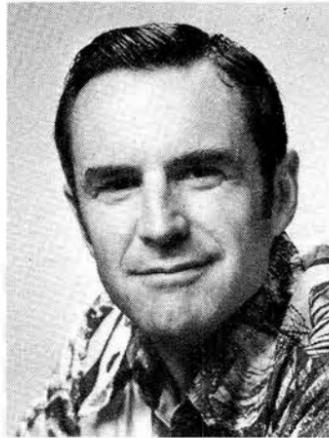
David Kendall - 1426 20



Robert Hannigan - 1412 25



Howard Tessler - 1721 20



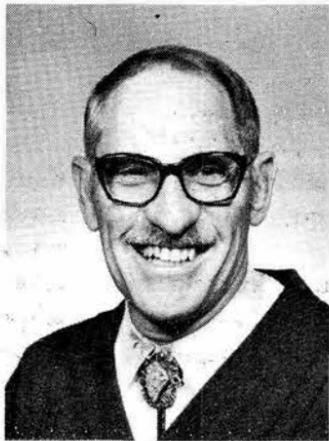
John Liebenberg - 8453 15



Roy Palmer - 5634 15



Nadine Sheppard - 8213 20



Dave Poli - 1754 25



Dick Isler - 8333 10



Jack Renaud - 8213 30



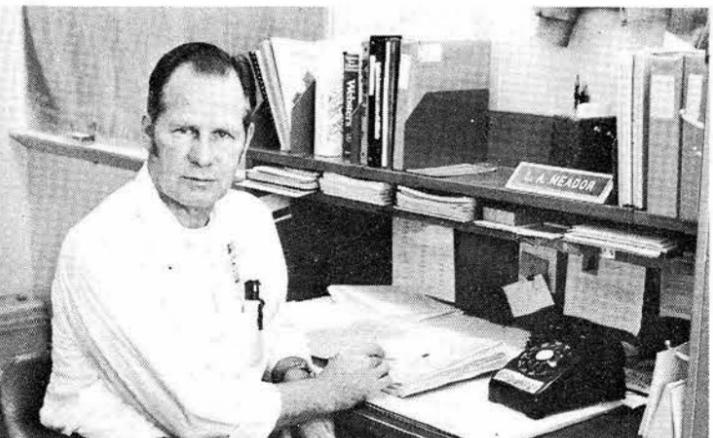
Jesse Floyd - 8257 30



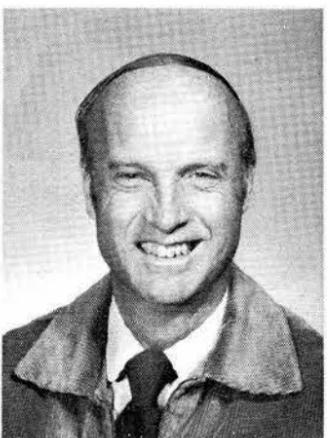
Gladys Kimberling - 8264 20



Myron Pilat - 1412 25



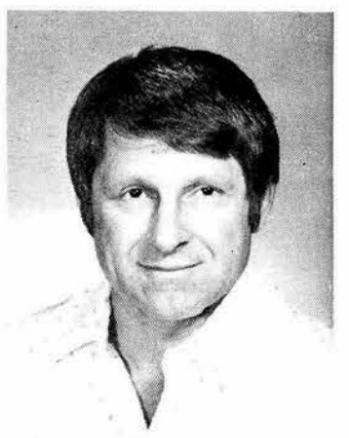
Alton Meador - 2335 25



John Kane - 1766 20



William Hoffman - 1137 20



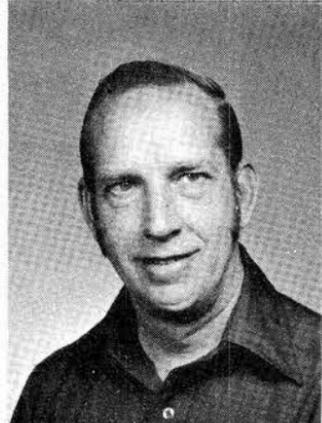
John Moyer - 1766 20



Edgar Richardson - 2533 25



Louis Wigley - 3154 20



Robert Nagel - 2335 20



Cyrus Hall - 4311 20



Charles Radigan - 2458 25



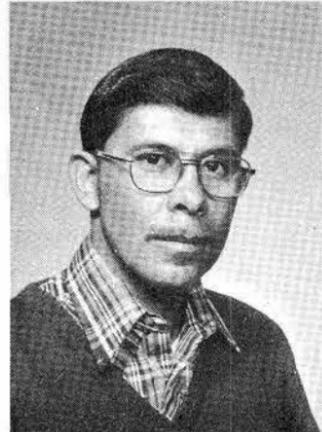
Don Tipton - 4335 20



Dan Cooper - 2336 10



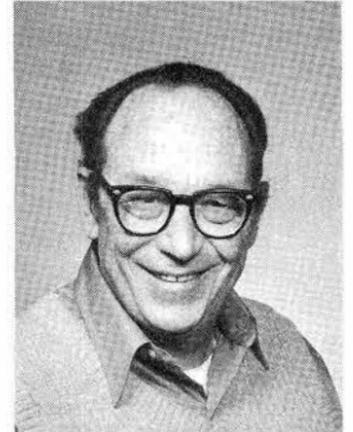
Ray Thomas - 2451 10



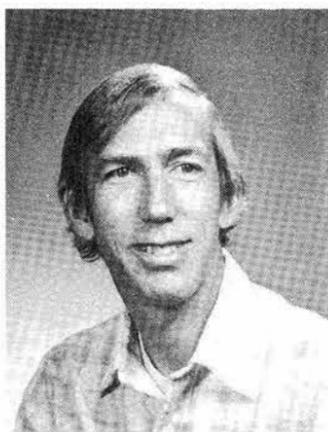
Guillermo Candelaria - 2454 10



Jim Pierce - 4535 10



Simon Steeley - 1241 20



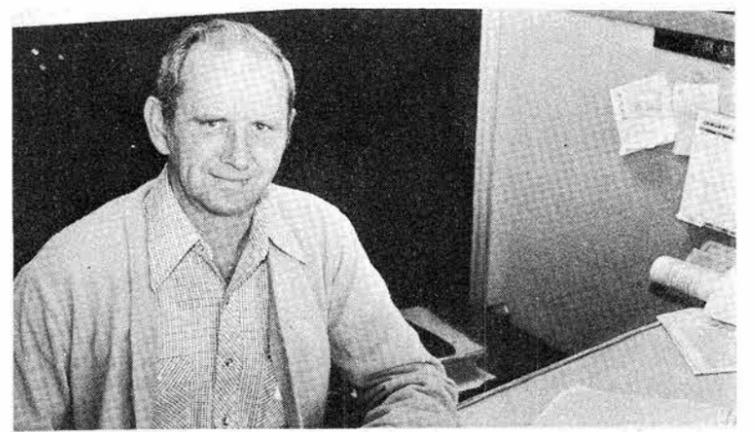
Barry Hansen - 2146 10



Albert Gower - 3642 25



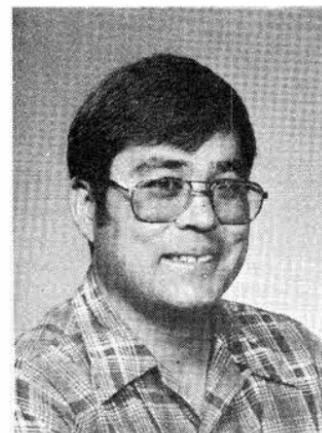
Edward Vulkan - 1764 30



John Snowdon - 3643 20



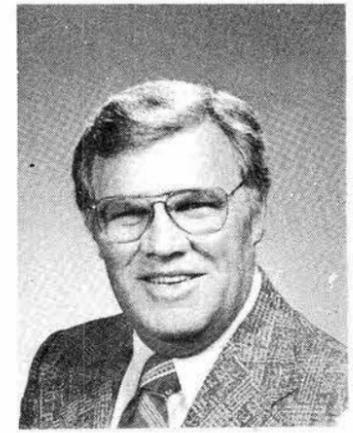
Rand Rozelle - 2451 20



Herman Kaneshiro - 2514 10



Carol Kaemper - 5510 10



Gerald Thompson - 3721 20

Death

Mary Quigley (3533) died Feb. 15 after a lengthy illness. She was 56.

She had worked at the Labs for more than 21 years, many of them as supervisor of Education and Training Division and of Personnel and General Employment Division.

She is survived by her husband Pat (2433), a daughter, son, two step-children and three grandchildren.



Sympathy

To Merle Elifritz (2514) on the death of his mother in Sidney, Ohio, Feb. 4.

To Bill Dawes (2144) on the death of his mother in Coral Gables, Fla., Feb. 6.

To Al Rakoczy (4363) on the death of his mother, Feb. 5.

To Dawn (2/3000) and Joe Calek (1411) on the death of her father, Feb. 9.

To Jan Willis (3152) on the death of her mother-in-law, Feb. 6.



WALLY SCHIRRA of astronaut fame now represents the Savings Bonds division of the US Treasury and passed through Albuquerque and Sandia recently. He visits here with Glenn Brandvold (4710), who is describing the Labs' solar energy projects, and with Ray Powell, VP-3000, who is Chairman for 1980 of the city's Savings Bonds campaign. The Labs' Savings Bonds campaign is set for late April of this year.

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 DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name & organization.
9. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

- NEW 10" balanced pressure plate & clutch disc for Ford small block. Brion, 821-8217.
- TRAILER, '58 Westcraft, 8'x20', not self-contained. Sharp, 867-2815.
- 2 800x16.5 tires, \$30 ea.; 205/75x14 radial, \$20; elec. wall oven, 24" wide, copper-tone, \$50. Martin, 299-3004.
- GLASS enclosure for fireplace, up to 46" wide, used part of 1 season, \$75. Patterson, 299-1062.
- MAPLE pedestal table, 48" solid top, new, make offer. Kraft, 299-2157.
- COUCH, early American, red/gold, \$225; swivel rockers, upholstered, red plaid, \$80 ea. (2). Holmes, 292-0898.
- CAMPER SHELL for 3/4-ton pickup, boot installed, carpet for truck bed included, best offer over \$300; cactus for the taking from yard of Rio Rancho home. O'Neill, 898-5753 after 5.
- 8 1/2' CASITA Cabover camper, refrig., porta-potti, 3-burner stove, boot for sliding truck window, \$1100. Romero, 821-7629.
- PHOTO chemicals for a special (Pyro) black & white film developer. Smith, 242-9576.
- GRANADA-MONARCH custom made trailer hitch, cost \$75, sell for \$25. McIlroy, 8907 Los Arboles NE, 299-4977.
- GREAT DANE puppies, AKC, blue, black, brindle, for show or pet. Flora, 281-5919.
- SALVAGED lumber, posts & fencing materials. Norcott, 865-7789.
- '75 SECURITY travel trailer, 19' self-contained, 2 holding tanks, dual axles, load equalizer hitch. Browne,

- 898-6823.
- ADULT Saloman 502 ski bindings, \$20; Webcor record changer free to someone who needs parts. Leeman, 299-9149.
- WILSON X-31 sand wedge, \$12.50; wood gun rack, 4-position w/drawer, \$15; twin bed, complete w/Serta mattress, \$50. Stang, 256-7793.
- CAMPER SHELL, LWB, insulated, paneled, bubble side windows, wired for running lights, \$250. Liguori, 256-3613.
- JACKET, wool, Boy Scout official red, size 14, \$10. Stevens, 884-7984.
- BANJO, Framms, 5-string w/case, capo & 2 books, \$100. Conley, 296-0695.
- USED FURNITURE: sleep sofa, 86" long, brown cover; desk, 19" x 36" x 30" high. Boyer, 298-3893.
- HORNS: Groover air horn, 24", \$40; Dual Sparten elec. horns, 12" & 14" length, \$30. Nickolson, 255-3678.
- SKIS, 160cm, Hot Head, \$40; Hi-Fi cabinet, AM-FM radio & turntable, need work, \$35. Garst, 884-5176.
- EXERCYCLE, deluxe Columbia, adjustable, speedometer, odometer, timer, adjustable seat, HD construction. Trowbridge, 293-1073.
- LONG BED, 15" metal lathe, 2 chucks, accessories, \$1500; auto engine servicing stand. Martin, 255-8030.
- QUEEN SIZE mattress & foundation, made by Sleep-N-Aire June '79; price new \$310, sell for \$150. Shew, 299-8045.
- DRUM SET, bass w/foot pedal, snare w/stand, high hat, cymbal, sticks, \$150. Levy, 821-2294.
- HAM GEAR: Heath SB-614 station monitor, \$145; Heath Ham-Scan spectrum analyzer, \$45; SX-71 receiver, \$30. Berg, 299-5640.
- BELL & HOWELL B&W 1" video tape recorder, best offer. Grahek, 293-7810.
- DRILLING GUN, Inman Meffert 16x16ga. x7.57R Krupp Laufstahl steel, Suhl. "Oberland" model, box lock, Circassian walnut, 50 rounds. Tedesco, 281-5318.
- ASSORTED house plants, 3 hanging plants, some violets. Carpenter, 299-4312.
- SKI BOOTS, Hanson Esprit model, women's beige, size 8, worn 3 times, orig. \$180, paid \$140, \$100 firm. Hawkinson, 281-5239.
- MOTOR, 5hp Century, 110/220, 6-belt pulley, \$110; turntables, Garrard & Wards; amplifiers, Grommes & Fisher; speakers, \$50. Madsen, 294-3235.
- BEDFRAME, metal, adjustable, box spring & mattress, twin size, \$30; studio couch, 32x76, needs pad, \$20. Joseph, 299-6989.

- LAZY BOY swivel rocker, avocado, \$85; upholstered chair, \$25; dbl. bone-colored sink, mixing faucet, sprayer & basket, \$40. Kerns, 821-4122.
- SLR CAMERA set, 35mm w/f1.8 50mm lens, includes 135mm lens, 2x & 3x extender, auto. strobe & charger, accessories, \$275. Norwood, 292-0072.
- CALCULATOR, SR-52 magnetic card programmable, includes program libraries & charger, best offer; 10-spd. bicycle, \$55. Davie, 296-3950.
- TWIN BED, choice of 2 headboards, complete w/mattress, spread, \$50; pre-schooler indoor slide, \$15. Larson, 299-2384.
- EDELBROCK intake manifolds for a small block Chevy Victor JR #2975, \$120. Roybal, 299-0938 after 5.
- new. Fuller, 294-3089.
- AIR SUPPORTED SHELTER, 45x92 sq. ft., blower & heater, never used, \$4000. Coronado Aquatic Club, 298-1431.
- YOUTH bdr. set, maple, twin bed, \$300; chest of drawers, \$80; beds: 2 twin, \$200; 1 twin, \$90; King size, \$120. Roybal, 299-0938 after 5.
- DOUBLE BED, box springs, mattress, frame, \$70. Beckmann, 296-1829.
- GAS CAP for '79 VW Rabbit, \$5 or best offer. Hochrein, 299-5225.
- .357 MAGNUM, Ruger Blackhawk, custom holster, belt, orig. owner, \$170/trade for K-22. Cook, 869-6921.
- 3 MATCHING limed oak tables; Conlon cabinet ironer; foot stool; 6x12' wool carpeting; picnic table & benches. Wheeler, 265-2187.
- MAGNAVOX 25" color TV; 40" Salem maple cabinet, no scratches, TV works, \$100. Brown, 881-2982.
- ROPING SADDLES, double rigged, padded seats, fiberglass tree, \$150 & \$175. Baxter, 344-7601.
- 16.5 X10 RIMS, fit 1/2-ton Ford or Dodge; '76 Yamaha Enduro dirt, licensed. Brock, 865-4055.

TRANSPORTATION

- FORD F-100, 302 V8, AT, long bed, w/camper shell, recently overhauled, \$1850. Komarek, 281-3826.
- '77 CHEVROLET truck, 23,000 miles, new tires, \$4000. Peeples, 877-3942.
- '73 CHEV. 1/2-ton pickup, LWB, AT, PS, AC, 350 V8, best offer; '58 Ford 2-dr. sedan, running, best offer. Sanchez, 831-1785.
- '77 JEEP Cherokee 4-wd, AC, low mileage, under book. Gardner, 344-2547.
- '74 CHEVY Nova, custom hatchback, vinyl top, AC, PS, many extras, \$1350, below NADA. Alvarez, 262-0548.
- '70 PONTIAC, needs work, best offer.

- O'Neill, 898-5753 after 5.
- '77 CUTLASS Supreme Brougham, full power, AC, AM-FM stereo w/tape, vinyl top, cruise, tilt wheel, low mileage, below book, \$4000. Padrick, 299-7971.
- BICYCLE, child or small adult, 10-spd., 24" wheels, 17" frame. Drumheller, 821-9527.
- '77 TRANS AM, loaded, below NADA, loan value \$3995, firm. Blaine, 299-1036.
- '67 VOLKSWAGEN, new paint, upholstery, motor, \$2500. Huston, 266-6614.
- '76 HONDA 750 Super Sport, price negotiable. Brion, 821-8217.
- '73 VW 2-dr., \$1400. Sharp, 867-2815.
- '60 MERCEDES BENZ, 220 SB. Smith, 299-5060.
- '75 BUICK LeSabre, less than 30,000 miles, orig. owner. Hobbs, 268-6461.
- '74 CHRYSLER Newport, 8-cyl., 4-dr., AT, AC, PS, PB, vinyl top, \$1100 or best offer. Chavez, 298-4250 after 5.
- '74 DODGE Tradesman 100, Good Times Van, AT, AC, PS, PB, AM/FM, 1/2-ton, \$3400 or best offer/negotiable. Montoya, 821-8502.
- '73 FORD Mustang, 2-dr., AT, AS, PS, 8-track, chrome rims, new paint & vinyl roof, \$2400. Esterly, 881-1973.
- '71 AUDI 100LS, 4-dr., AT, \$800. Wray, 294-2019.
- '71 DATSUN, 2-dr. sedan, 30 mpg in town, R&H, 4-spd., bucket seats, \$900 or best offer. Joseph, 299-6989.
- 1972 LT-1 CORVETTE, dk. blue, 4-spd., w/fact. AC, AM-FM tape, CB, luggage rack, 73,000 miles, make offer. Frederiksen, 806-352-4620 in Amarillo.
- '78 DODGE power wagon, AT, PS, PB, insulated shell, Jackman wheels. McKinney, 292-2146.
- '74 CHEVY 1/2-ton pickup, long bed, V8, 3-spd., \$2100. Richardson, 877-2731.
- '77 CUTLASS Supreme, silver w/maroon, Rally Sport wheels, new 721 Firestone tires, new brakes & shocks, 350 engine, fully equipped. Mireles, 865-7420, 864-7420.
- '57 CHEVY Belair 4-dr. HT, all stock. Graeber, 298-0662.
- '72 CHEVROLET Suburban, 6-cyl., AT, Positraction, \$1200. Causey, 881-7534.
- '79 YAMAHA XS750, full dress, 10,000 miles, \$2700. Brooks, 296-6870.

REAL ESTATE

- 2300 SQ. FT. HOUSE w/lg. shop on 2 acres, south of Los Lunas-Los Chavez area. Jones, 865-9059.
- 4-BDR. w/heated pool, 2 baths, den w/fp, SW landscaping, dog run,

- \$75,000 negotiable. Rivera, 292-5212.
- ENERGY EFFICIENT Holiday Park home, 3-bdr., 1 1/2 bath, den, storm windows, landscaped, Sandia bus route, \$67,500. Jones, 298-8492.
- 2100 SQ. FT. home, surrounded by lg. trees, 2.3 acres, small orchard, fenced pastures, out buildings, \$79,500. Williams, Belen, 864-3617.
- 3-BDR. custom brick w/full finished basement, fp, oak floors, 2 1/2 baths. Wheeler, 265-2187.

FOR RENT

- NEW TOWNHOUSE, 2-bdr., W-D hook-ups, appliances, dining room, adults, no pets, 2 miles from Base, 1st & last. Gallegos, 268-0271 or 255-5264.
- STORAGE ROOM, 10x10, fenced & secured area; also open storage available. Liguori, 256-3613.

WANTED

- HO GAUGE TRAIN SET for teenager. Bush, 281-3773.
- USED patio cover, suitable for car port. O'Neill, 898-5753 after 5.
- NORTH 14-Cedar Crest area, want to rent parking spaces for camper & boat, shelter not required. Shafer, 281-3036.
- 1960 to 1970 Encyclopedia Britannica, in good condition. Leeman, 299-9149.
- "THE OLD WEST," a Time-Life set of books. Swain, 265-0098.
- ELECTROLUX tank vacuum sweeper, working or not, must be cheap. Souder, 281-3121.
- CEMENT MIXER, fairly good condition, gas or elec. Jones, 281-3617.
- BORROW or rent an audio spectrum analyzer to check out home stereo equipment. VanDenAvyle, 898-6474.
- EXERCISE ROPE. Allen, 821-8533.
- DOUBLE BED, suitable for teenage boy; small receiver to tune 5-10MH. Laskar, 299-1024.
- STEREO cassette player, under dash. Garton, 298-8510.
- ADD-ON electronic cruise control, air shocks for Mark IV. Brock, 865-4055.

SHARE-A-RIDE

- CAR POOL from Bridge and Sunset Rd. SW to Area I. Metzgar, 242-1028.
- JOIN car pool from Corrales, Rio Rancho or Paradise Hills. Arnold, 898-1467.
- ONE regular & a few more alternates for the Moriarty-Edgewood Van-pool. Dungan, 281-3862, or Jenkins, 832-4532.

Kiddie Carnival Tomorrow

HAPPY HOUR tonight features Joseph Salazar entertaining in the lounge, Brazada wired into the bandstand. A shrimp peel is the buffet special. Next Friday, Feb. 29, a New York strip steak or lobster tail is the buffet feature, Gary Waters entertains in the lounge and Youngblood holds the bandstand. Happy Hours start right after work on Fridays, run with special prices until midnight or so. Call the Club office, 265-6791, by mid-week to reserve buffet tickets.

KIDDIE KARNIVAL tomorrow from 11:00-2:30 sees clowns, a midway of games and goodies and other delights for members' kids under 12. "Every child is a winner," is the slogan. A buck buys 10 tickets for admission to the games and a shot at the big give-away prize. Members' kids only, please.

SINGLES MINGLE on Wednesday, March 5, starting right after work, upstairs near the main lounge. This is your standard singles party with music, goodies, good music and door prizes. Mark your calendar—singles are now meeting on the first Wednesday of each month.

TRAVEL—"Real Mexico" guided tour April 1-15, \$550; Puerto Vallarta, May 4-11, \$355; Disneyland, April 1-4, \$253 adults, \$179 kids. See Travel Director Frank Biggs in the lobby tonight from 6 to 7 for full details.

Frank announces two new trips—Las Vegas, Nevada, March 24-26, and Cancun, Mexico, May 3-10. The Las Vegas package includes air fare, transfers and lodging at the Castaways. Leave Albuquerque at 5:55 p.m. on Monday, return at 9:08 a.m. Wednesday. Cost is \$142 (double occupancy) and \$175 (singles).

The Cancun package includes air fare,

transfers, baggage handling and a week at the luxurious Plaza Blanca Hotel. Cost is \$519 (double occupancy).

Anyone interested in the "Real Mexico" trip is invited to a meeting Monday, Feb. 25, at the Club. Trip leader Lyle Thompson will discuss the itinerary and show slides starting at 7 p.m.

VARIETY NIGHT on Saturday, March 1, features funny man Mark Doyle, ventriloquist, and his friends entertaining at 7. He's followed by a festival of cartoons, pure pleasure for the kids. Super sandwiches are available starting at 6; admission is free to members and families.

UPCOMING EVENTS—St. Patrick's Day celebration, March 15; Easter Egg Party for kids, March 29.

Women's Golf Meeting

Golf—The Sandia Women's Golf Assn. is having its annual membership cocktail party on Feb. 26, 4:30 to 6 p.m., in the El Dorado Room of the C-Club. Sandians and DOEans, active and retired, as well as dependents are eligible for membership. The group offers both beginner and intermediate golf lessons, and a program of league play and tournaments. Association president this year is Earlene Brinegar; other officers include Hazel Minter (1100), Gretchen Cassell (3544), Helen Finley (2145), Barbara Ford (2151), Judy Schmitz (1761) and Ruth Wright (2145). Contact any of these for additional information.



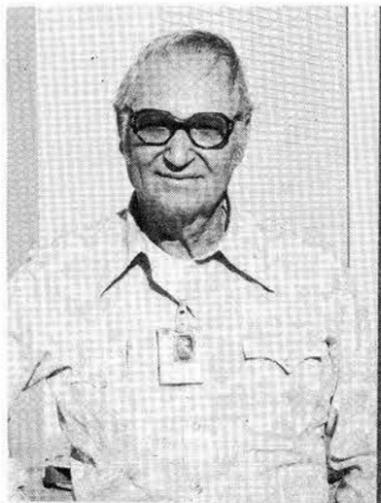
CHARLIE CLENDENIN (2611), rehearsing his clown act, tells Tracie Cordova and Leslie Shepardson about all the fun and games in store for them starting at 11 tomorrow morning at the C-Club's Kiddie Carnival. (Tracie is the daughter of Gil Cordova, DOE/SAO; Leslie's dad is Richard Shepardson, 3242.)



On New Year's Day, Judy Nickell, who writes the "fix it" column for the *Albuquerque Tribune*, ran a few of the funniest questions of the year received by similar columns around the country. In case you missed them, here are three we thought especially humorous:

- Where can I write or call to get someone to trace my family tree? I want to know who I am.
- My landlord wants to put me out because I am one month late on the rent. What can I do?
- Please ignore my previous complaint about bad brakes on my car. The problem was solved by three escaped convicts who stole the car and demolished it when they wrapped it around a tree.

Retiring



Walter Self (1482)



Albert Eno (2452)



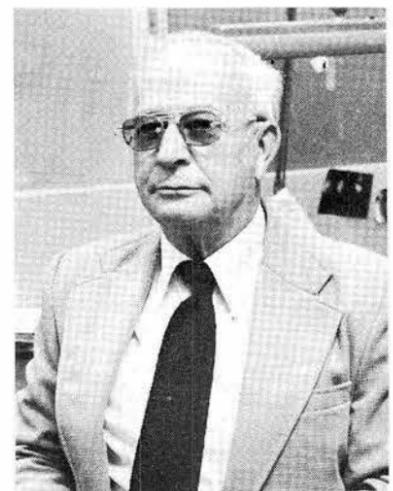
Earl Brooks (1710)



Bill Laskar (3162)



Dick Strome (3155)



Ralph Fries (4311)

