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# LAB NEWS

VOL. 28, NO. 3

FEBRUARY 6, 1976

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

### State of the Labs

## Labs 'Good' Currently, Future 'Likely Bright'

In a LAB NEWS interview last week on the state of the Labs, Morgan Sparks emphasized the present good health of Sandia and, allowing for ever-present uncertainties, stated his belief that the future is likely to be bright. He reaffirmed the Labs' primary mission — the development of nuclear weapons — adding that our non-weapons activities are an outgrowth of the talent and expertise we have developed in the weapons area.

"Today we have many opportunities to apply that talent — in both of these areas," he stated. "Our way of life is different. We all know that money is much tighter than in the '60s, but then we've learned these last few years how to manage under this constraint. I think we've come a long way since the dark days of the layoffs — just consider the diversity of our efforts. And while weapons are the mainstream activity, Sandia has succeeded in staking out a significant portion of the energy business. We're well established."

Here are other questions discussed by President Sparks.

*What does the budget look like for the remainder of this fiscal year? For fiscal '77?*

"As I mentioned earlier, the '76 budget is 'tight,' but that's become our — and everyone's — way of life, and we'll make it through the year without undue difficulty. At the recent mid-year review in Washington we lost some of our '76 funding. This wasn't totally unexpected, and we'll be able to

accommodate the cut with deferred purchases. '76T' — the transition period from July 1 to Sept. 30 — is largely an extrapolation of the present year. As for fiscal '77, which now starts Oct. 1, the Labs budget is part of the larger ERDA package that has completed the two initial steps, having gone through ERDA and OMB. Next it goes to the Congress. As you know, Congress is giving all expenditures very searching examinations these days."

*We see many new faces around the Labs. What are the goals of our hiring program?*

"There are many new faces. In fact, we're in our first significant hiring program since the layoffs. Since last summer we've added about 400 people, mostly technical staff, and by the end of '76T we expect to be close to a total of 6700, up from the calendar '75 low of 6400. This is a good development — new people have a salutary effect in any organization. We plan to continue an active program of college recruiting."

*What is the reimbursable picture?*

"Historically, reimbursables — mostly for the DOD — have accounted for some 10% of our effort, and it appears that this amount will not change much. (Ed. note: "FLAME," described elsewhere in this issue of LAB NEWS, is an example of a DOD reimbursable.) We like reimbursables because, among other things, they offer work during the occasional period when there is a lull in our principal activity. The very diversity of our reimbursables suggests the breadth of the Labs' capabilities."

*What is the status of the ERDA/DOD study on the future of the weapon labs?*

"The study is moving along on schedule. That is, it has been completed and was submitted to the President by Jan. 19. We contributed to the study but have not seen the detailed recommendations. After President Ford's review, it then goes to the Congress with his views."

*Any comment on Sandia's energy programs?*

"It has become clear that the fundamental consideration in the energy field is economic. The technology in our various solar projects has already produced working systems. Our principal job is to so design these systems that the energy produced is less — or at least no more — expensive than that available from conventional sources.

"Our drill bit effort has unusual potential. Bore holes are getting deeper and deeper — down to 20 thousand feet — and our new drill bits will find use not only for oil well drilling but also in drilling in natural gas, uranium, and oil shale formations.

"The work with E-beams in Everet Beckner's group is most interesting. Though the physical effects are chiefly employed to simulate certain weapon effects, this work also has rather promising implications for controlled fusion. The payoff here could be

*(Continued on Page Two)*

## Morgan Sparks On 'State of the Labs'

enormous, but I hasten to add that I don't see controlled fusion by any process becoming a reality before the next century."

*Are any major new facilities in the offing?*

"I'd list three. Construction starts this year on the 5-megawatt thermal solar plant just south of Area III. It runs about \$20 million. The project will be administered by Sandia Livermore, while the facility is operated by our test people here.

"The '77 budget carries \$8.3 million for the Nuclear Safeguards Security Lab, to be built in Area I. And, finally, there's the \$14.2 million E-Beam Fusion Facility that will go in on the north side of Tijeras Arroyo, not too far from Area II. Construction on that should start late this year or early next year."

*Where do we stand now on the pending complaints relating to equal opportunity matters?*

"As you know, we avoid commenting on specific complaints, especially those that are still pending. In summary, however, Sandia has had a total of 55 charges in the past 12 years. Of these, 44 have been settled; 30 of the complaints were dismissed by EEOC because no reasonable cause could be shown. Eleven complaints are still pending. Our experience in this relatively new and developing field is about the same as other companies operating under similar circumstances."

Concluding the interview, Mr. Sparks reiterated his high confidence in the Labs' capabilities as well as his essential optimism about Sandia's future.

### ENERGY SAVINGS

COMPARED WITH USAGE IN BASE PERIOD— JULY 1972 THRU JUNE 1973  
CURRENT REPORTING PERIOD ENDING DEC '75

ELECTRICITY	BASE PERIOD 92276 MWH	1975 73725 MWH	20.1% SAVED
STEAM PLANT FUEL EQUIV. OIL	BASE PERIOD 224583 BBLs	1975 197920 BBLs	11.9% SAVED
VEHICLE MILES	BASE PERIOD 2468 MI.	1975 1940 MI.	21.4% SAVED

## LAB NEWS

Published every other Friday

### SANDIA LABORATORIES

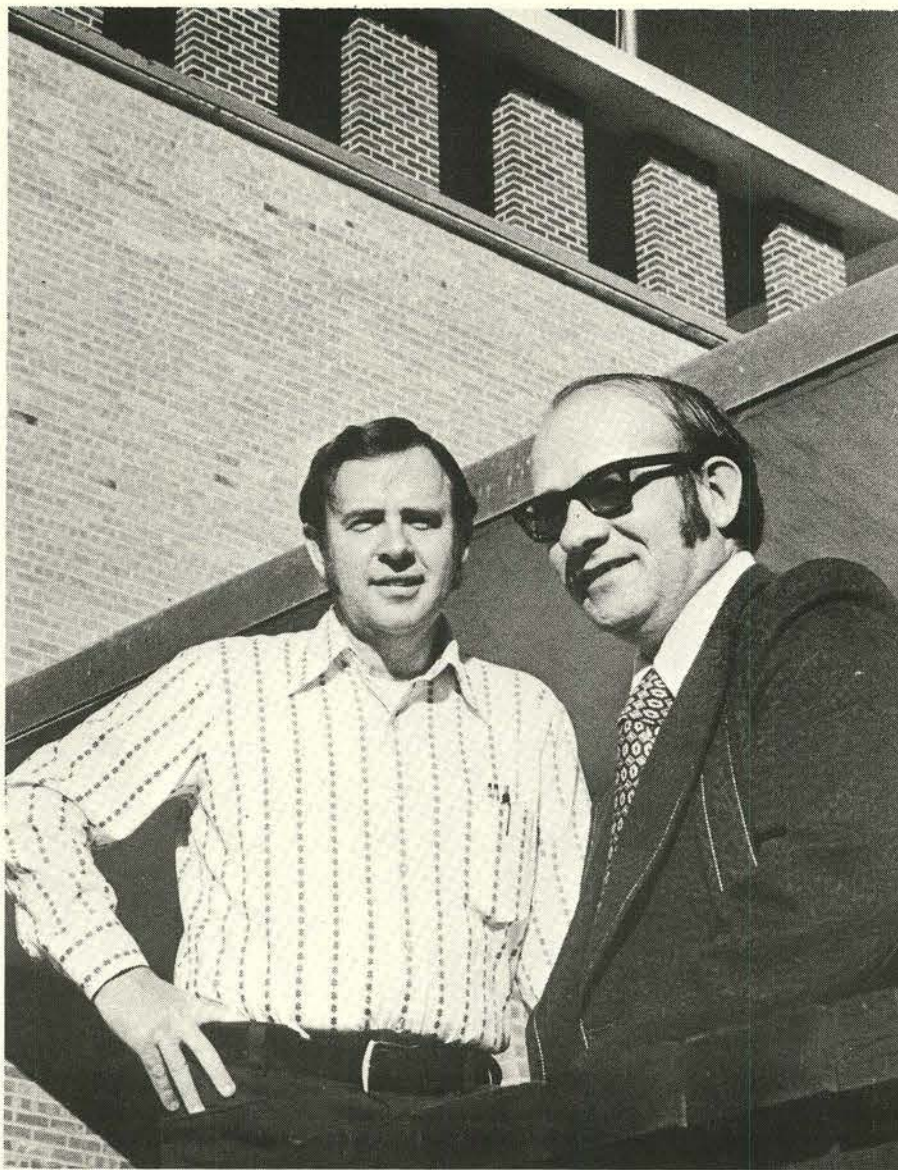
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ALBUQUERQUE, NEW MEXICO  
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john shunny is editor  
&  
don graham ass't. editor

bruce hawkinson & norma taylor write  
bill laskar does picture work  
gerse martinez lends a hand  
&  
lorena schneider reports on livermore



AL STEVENS (5734), left, and CHAP CHAPMAN (5741).

## Supervisory Appointments

L. D. "Chap" CHAPMAN to supervisor of Systems Analysis Division I, 5741, effective Feb. 1. Chap has worked with the systems analysis group since coming to the Labs in August 1974. His work has included construction and study of models for the liquid metal fast breeder reactor, investigation of toxic emissions into the environment, use

of large scale energy resources, and activities of the special safeguards committee. His new responsibilities will be a continuation of the energy resources study and safeguards activities.

A graduate of Oklahoma State University with BS, MS and PhD degrees in EE, Chap worked for Continental Oil Co. for three years, served two years in the Army and three years in the Reserve. He was an assistant professor in computer science and operations research department at the University of Alabama from 1971-74.

Chap has a one-handicap golf game and enjoys square dancing. He and his wife Jean and their five-year-old son live at 816 Rio Arriba SE.

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AL STEVENS to supervisor of Oil Shale Program Division 5734, effective Feb. 1. Following graduation from Michigan State University with a BS and MS in ME, Al joined Sandia's environmental testing organization in September 1961. He returned to MSU in 1964 and earned his PhD in applied mechanics. Rejoining the Labs in 1968, Al worked for 10 months with a weapons development group at SLL. Since returning to SLA, Al's work — dynamic fracture, shock waves, and spallation — has been in the Physics of Solids and Solid Dynamics Departments. His new responsibilities entail the fracturing of oil shale for later extraction of the fuel.

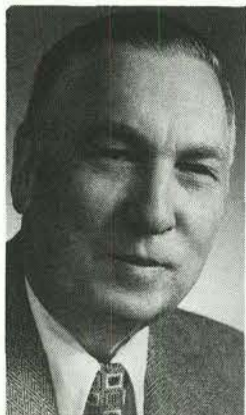
He is a member of the American Physical Society and the Society of Experimental Stress Analysis. Al's hobby is woodworking, including detailed cabinet work — he's built five grandfather clocks — and construction of a mountain cabin. He is also active in Scouting work.

Al and his wife Lois have two children and live at 7105 Lantern Road NE.

## Events Calendar

- Feb. 6-March 7 — Barn Dinner Theatre: "Roomies," 281-3338.
- Feb. 6-8 — Old Town Studio: "6 RMS RIV VU" comedy by Bob Randall, 500 Marble NW, 242-4602.
- Feb. 7 — UNM Invitational Track Meet, Tingley, 6 p.m.
- Feb. 7 — Ski Touring Club, Peralta Canyon in Jemez, Berg, 294-4112.
- Feb. 10 — Club Culturale Italiano: Movies on Italy, 7:30 p.m., Reception Center, 146 Quincy NE.
- Feb. 12-13 — Albuquerque Symphony: Pinchas Zukerman, Violinist, Music of Strauss, Brahms, Kay, 8:15 p.m., Rodey Theatre.
- Feb. 13 — Basketball, UNM vs Wyoming, 7:30 p.m., UNM Arena.
- Feb. 14 — Basketball, UNM vs Colorado State, 7:30 p.m., UNM Arena.
- Feb. 15 — Popejoy Travel Series, "Around the World Via Cape Horn," 7:30 p.m.
- Feb. 15 — Roadrunners meet at 1:30 in Montgomery Park (San Mateo & Ponderosa NE) for a variety of events.
- Feb. 16 — Popejoy Cultural Series, "Irene," 8:15 p.m.
- Feb. 17 — Czechoslovakian Folk Ballet, 8:15 p.m., Popejoy.
- Feb. 18 — Popejoy Cultural Series, "The Intimate P.D.Q. Bach," 8:15 p.m.

## Scotty Romine Named Professional Safety Engineer in California



Scotty Romine of Safety Engineering and Environmental Health Division 8252 has been certified as a professional safety engineer in California by the State Board of Registration. California last November became the first state to register professional safety engineers, with qualifications based on experience and academic and technical education.

At Sandia over 20 years, Scotty has been in Safety Engineering for the past 13 years. Previously he was a test project engineer for seven years, four in Albuquerque and three in Livermore. He retired from the U.S. Navy in 1955 as a lieutenant commander after serving as chief engineer of an aircraft carrier and in various special weapons and engineering assignments.

## Take Note

A major portion of a new book, "Efficient Use of Energy," is authored in part by Dan Hartley and Don Hardesty (both 8115). Their portion, titled "The Role of Physics in Combustion," describes use of laser diagnostics and computer simulation to provide new insights into the combustion process. It's published by the American Institute of Physics.

A condensed version, "Physics in Combustion Research," appears in the December 1975 issue of PHYSICS TODAY, and was the basis of a recent presentation by Dan at a U. of C. research seminar.

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Walt Dzugan (8212) participated in a recent Industry-Education Workshop sponsored by the City College of San Francisco and the California Community Colleges. The workshop was set up to develop curricula in electronic and mechanical disciplines for use in the California junior college system.

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EEO and Women's Coordinator Gertrude Williams (8212) represented SLL at an Employment Fair jointly sponsored recently by the Dublin High School Counseling Department and the Dublin Parents Club. The event provided high school students and recent graduates with employment information and college-bound students with data on financial aid and work-study programs. Over 300 students and their parents attended, while some 35 businesses and government agencies participated.

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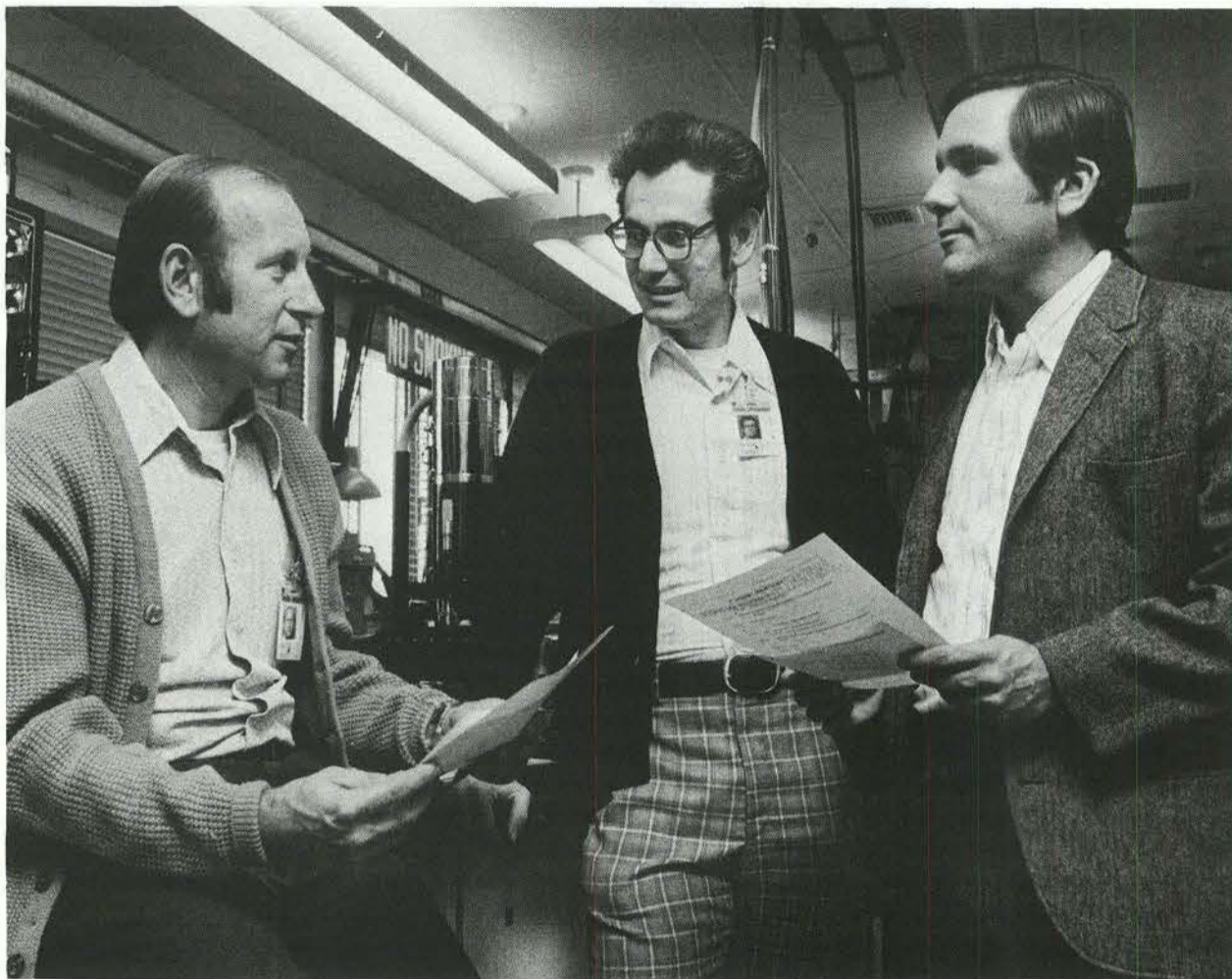
SLL hosted the recent Atomic Energy Systems and Operators (AESOP) seminar held in San Francisco. Gary Drummond (8323) coordinated arrangements for the three-day seminar, which provided an opportunity for 65 computer operations managers in the ERDA complex to discuss and exchange information of mutual interest. Participants included Arnold Schuknecht and Tim Cody (both 8323). Jack Wesbrook (2631) served as seminar program chairman.

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SANDIA/LIVERMORE and ERDA host the Second International Conference on Surface Effects in Controlled Fusion Devices at the Sir Francis Drake Hotel in San Francisco Feb. 16-20. Discussing arrangements are program chairman Walt Bauer (8334), left, and coordinators George Thomas (8314), center, and Pete Mattern (8334). The week-long conference will provide a forum for interdisciplinary discussions between some 100 plasma physicists, surface scientists and fusion reactor technologists from many countries.

## Pat Childers — Art Association Featured Artist-of-the-Month

A new feature at the Livermore Art Association Gallery highlights Sandiar Pat Childers (8261) as its first Artist-of-the-Month. Her paintings will be on exhibit through Feb. 15. Located in the Carnegie Building at Third and "K" Streets, gallery hours are from 11:30 a.m. to 4 p.m., Thursday through Saturday.

An artist who works almost exclusively in oil and watercolor, Pat says she finds painting a relaxing hobby and especially exciting when someone enjoys her work. "Each painting," she comments, "becomes a new challenge. Nature develops interesting skies, trees, hills, and water scenes which I try to interpret artistically. In commission work, however, an additional challenge comes in interpreting with my brush what the buyer wants from a photograph or an idea."

Pat has studied with a number of local and Bay Area artists and has been active in the Livermore Art Association since 1970. Last year, she served as co-chairman of the art exhibit at Livermore's Festival '75. Her paintings have been shown in exhibits sponsored by Valley Artists, Pleasanton Art League, Lodi Art Festival, as well as the LAA.



ARTIST Pat Childers (8261) and one of her paintings which will be on display at the Livermore Art Association Gallery through Feb. 15.



## Dr. Judy Ewing Joins Sandia Medical Staff

Dr. Judy Ewing is the newest member of Sandia's Medical staff. She comes to the Labs from Lovelace-Bataan, where she was director of emergency services for eight years.

"A stressful job," she says, "so I joined Sandia to head off ulcers. Also, when I came home in the evenings I was too tired to enjoy the children — ages four and six. Compared to an emergency room, practicing industrial medicine is peace and quiet."

Still, Dr. Ewing works one-half day each week in the emergency room at Lovelace "to keep up." Although her specialty is pediatrics, she is now committed to emergency medicine.

At Sandia, new equipment has been added to the Medical facility so that any employee injured or becoming suddenly ill may be treated in Area I. In emergencies, Dr. Ewing will accompany the Sandia ambulance to the scene.

Other duties include giving periodic routine physical examinations to all employees, a major part of Sandia's industrial medicine program.

She is currently organizing medical information programs for employees and plans to conduct a number of noon-hour seminars on symptoms of diseases.

A native of Enid, Okla., Dr. Ewing earned her bachelor's degree at Phillips University in 1960. She graduated from Oklahoma University Medical School in 1964 and completed internship-residency at Bernalillo Medical Center in 1967.

Leisure activities for Dr. Ewing include, first of all, enjoying the children. Cross country skiing with husband Ron (1112) is another favorite activity. In the summer the family enjoys four-wheeler trips into the boondocks with side trips on mini-trail bikes.

### Congratulations

Mr. and Mrs. Tom Heine (3613), a son, Jan. 21.

## McCarran Airport Office

### In Las Vegas, See Bill West

Bill West of Field Support and Logistics Division 1135 is our man in Las Vegas. He heads the Sandia office located on the mezzanine in McCarran International Airport.

"McCarran is a crossroads," Bill says, "for Sandians traveling to Nevada Test Site and Tonopah Test Range. We coordinate airline, hotel and rental car reservations. Anyone who has been to NTS or TTR knows how rapidly test plans can change and how often travel reservations must be changed. We manage to handle most of these on a routine basis. Still, contingencies occur often enough to keep us on our toes."

During the peak activity in an underground test operation at NTS, a group of Sandians travels from Albuquerque to NTS on Monday mornings and returns on Fridays. Sandia's F-27, ERDA-owned and operated by Ross Aviation, is used and coordinated with Travel Section 3732-2. This aircraft transports TTR employees from Las Vegas to the range and back Tuesdays through Fridays (probably the country's longest commute). It returns to Albuquerque for maintenance on weekends allowing NTS test personnel to return to Albuquerque at considerable savings. When test schedules do not permit use of the F-27, Bill books these people on commercial flights at group rates.

Bill is also concerned with Sandia air freight moving through McCarran. He sees that shipments are received and delivered to the right place at the right time.

In addition, Bill handles local purchasing

as a cash buyer for NTS and TTR activities.

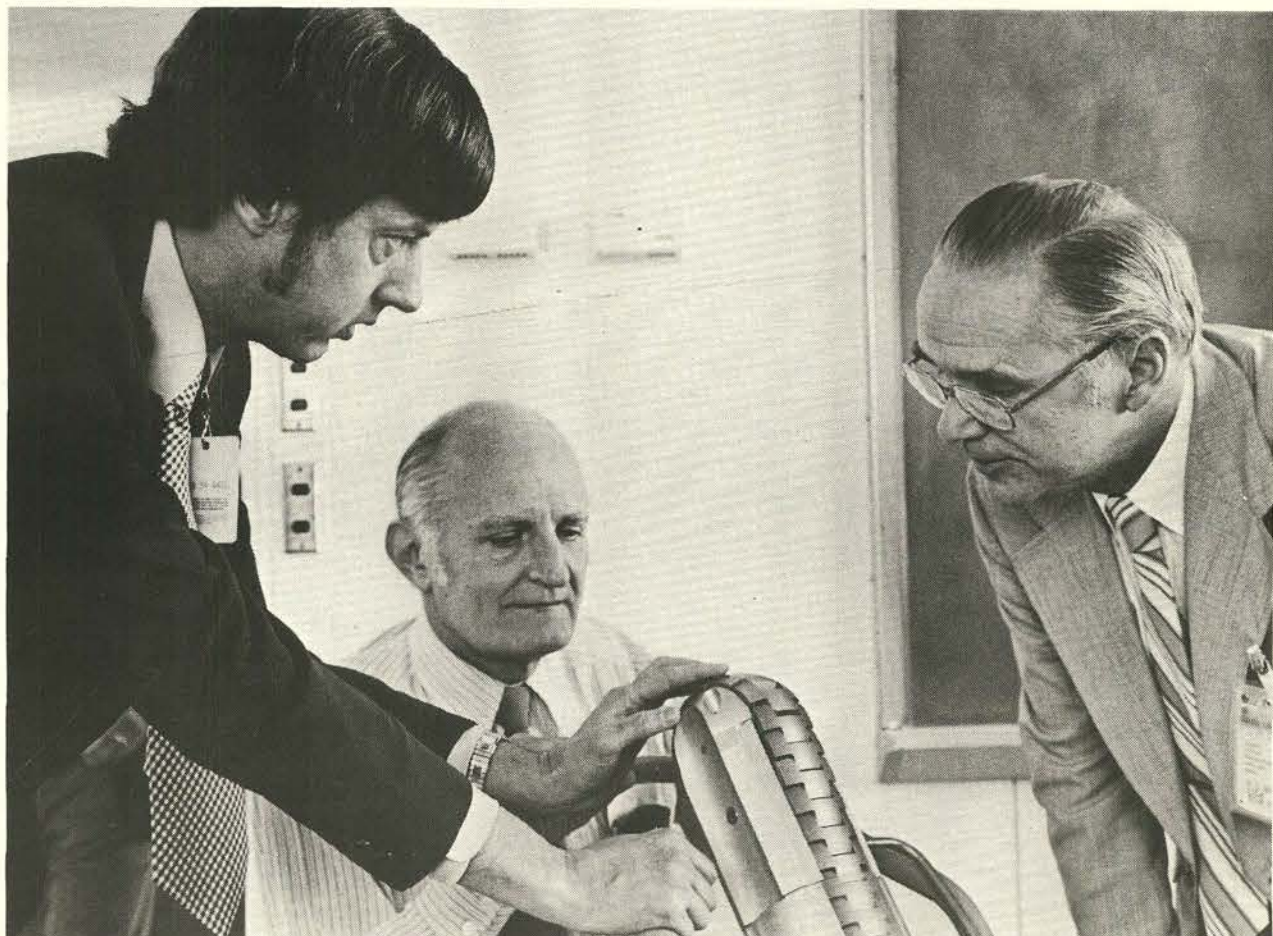
"Someone might need a transistor or something," Bill says. "He needs it in a hurry, naturally. Saves time and money if we can buy the item locally."

Bill also maintains an agent's account for Sandia. He can cash a personal check or issue a cash advance to traveling Sandians.

Bill has been with Sandia 23 years, the last four at McCarran Airport. He has been engaged in logistics and administrative support for field test operations for the last 10 years, and previously in R&D administrative support. • dg



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ERDA's AA for Fossil Energy, Philip White (at right), spent most of his recent visit here with Pres. Sparks and Hap Stoller, manager of Geo Energy Technology Department 5730 (at left). The three are examining a Labs-developed drill bit currently under test.

## New Laser May Be Tool In Isotope Separation

Sandia Labs researchers have produced lasing from argon fluoride for the first time and, in the same experiment, they have greatly increased the power of a previously known krypton fluoride laser.

Developed by Gary Tisone, Kay Hays and Jim Hoffman of Laser Physics Research Department 5210, the pulsed lasers may have applications in uranium enrichment and in laser fusion research.

The laser beams were produced by directing a powerful electron beam (7.7-kilojoules) into a 180-centimetre-long, 15-centimetre-diameter cylinder containing a pressurized mixture of argon, krypton, and fluorine gases.

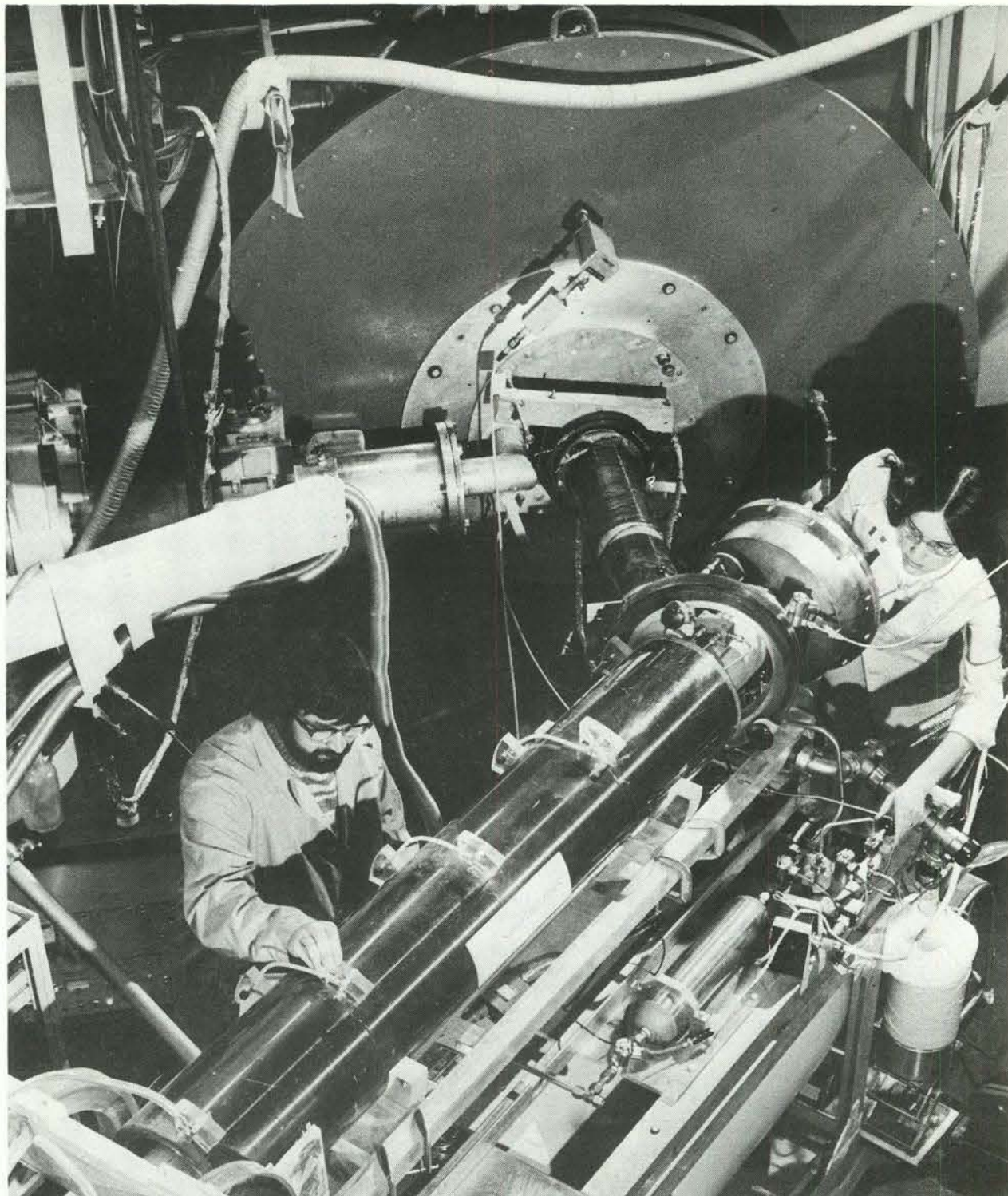
Intense ultraviolet laser beams were produced, with the krypton lasing at 2482 Angstroms, and the argon at 1933 A.

The krypton laser produced up to 117 joules in a 55-nanosecond pulse. Power output was 1.9-billion watts. Efficiency (laser energy output divided by electron energy deposited in the gas) was 3½ percent.

This energy is about 20 times greater than the previous record output from a KrF laser — a 5.6-joule pulse obtained at Sandia last July. However, it is far short of the record energy for a submicrosecond pulsed laser — 4200 joules and 200-billion watts obtained from a hydrogen fluoride laser at Sandia last May.

The ArF laser — discovered during the course of experiments on the KrF system — produced a maximum energy of 92 joules, with a peak power of 1.6-billion watts. Efficiency was 3 percent.

Applications of the new lasers in isotope separation and photo-induced chemistry are being explored. Separation of uranium isotopes, now being attempted at a number of laboratories, will require powerful, relatively inexpensive ultraviolet lasers which can be fired several hundred times a second.



**NEW LASER**—Gary Tisone and Kay Hays, of Laser Physics Research Department 5210, prepare electron beam-pumped gas laser for experiment in Area V. Laser, shown attached to REBA e-beam machine (background), was used to achieve first lasing of argon fluoride and to greatly increase output from existing krypton fluoride lasers. Not shown is third member of the research team, Jim Hoffman.



**PREPARATIONS** for the upcoming ASME symposium on Energy Alternatives are well underway. (L to R) Walt Schimmel (1283), Marv Becktell (5245) and Lynn Tyler (1111) check out some environmental evaluation equipment.

## ASME Will Explore Energy Alternatives

Energy Alternatives is the subject of a symposium to be held at the Albuquerque Convention Center, Feb. 26 and 27. Walt Schimmel (1283) is general chairman of this 16th annual symposium, jointly sponsored by the New Mexico Section of the American Society of Mechanical Engineers and UNM's College of Engineering.

"By bringing together knowledgeable persons in this field, we hope to expand our understanding of it," Walt says. "We must develop alternative energy sources before fossil fuels are depleted."

Marv Becktell (5245) is chairman of the NM Section of ASME and will give the welcoming address. Session chairmen include: Jim Muir (5412), nuclear energy; Marvin Moss (5844), bioengineering; and Burl Donaldson (2513) who will lead the potpourri sessions. Gerry Yonas (5240) is a featured speaker in the session on nuclear energy.

Many Sandians are serving as committee chairmen: Lynn Tyler (1111), program; Larry Weingarten (1284), administration; Mike Huerta (1282), treasurer; Jim McClure (1282), publicity; Steve Benzley (1282), registration; Charlie Adams (1284), facilities; Joe Abbin (2324), printing; Harold Maciolek (4325), miscellaneous; and Don Cox (5422), proceedings.

# Nosecone Materials Test — FLAME Flies at Tonopah Test Range



OPS CONTROL ROOM is center of TTR activity.

The F-4J streaks just under Mach 1 toward Tonopah Test Range on its run from the China Lake Naval Weapons Center. Altitude is 10,700 metres (35,000 ft.). Slung under the sleek fighter is a missile-shaped vehicle called FLAME (Fighter Launched Advanced Materials Experiment).

Fifty-six kilometres (35 miles) from TTR, the jet accelerates to Mach 1.6 and steeply climbs. FLAME is released, the fighter dips a wing and rolls away, and FLAME continues its upward trajectory.

The unit slows, eases over the top of its climb and noses down. Its first-stage Pedro rocket fires, glowing brilliantly in the late afternoon sky for nine seconds. At this point the vehicle's velocity is 2590 metres (8500 ft.) per second. The first stage separates and the second stage Recruit rocket fires, pushing the vehicle to 3960 metres per second (13,000 fps) in two seconds. The nosecone, an experimental design with exotic materials, glows white hot.

FLAME is only moments from impact when heat shields pop out from the body of the vehicle to slow its tremendous speed. It resembles a fiery meteorite. Suddenly, a parachute emerges. The nosetip swings violently for a moment, then rapidly drifts to earth.

A helicopter takes off from TTR's control point and, minutes later, a recovery team picks up the still-warm nosecone and brings it back to the TTR briefing room. Roughly, 30 minutes have elapsed since the release of the unit.

Weeks of preparation go into the test. FLAME is a Defense Nuclear Agency program under Col. Jack Rinehart, with research and development performed by Aerojet Liquid Rocket Company and Prototype Development Associates. Several other agencies are also contributing.

Purpose of the vehicle is to test missile nosecone materials at reentry dynamic pressures. The FLAME program is vastly less expensive than the cost of using large scale rockets.

Sandia's contribution to the FLAME program is the use of Tonopah Test Range. The range provides extensive documentary photography and performance data.

Focal point of the program at Sandia is Harold Rarrick (9411), test program

manager. Harold coordinates schedules, services and facilities. He worries about everything from test design through the weather reports to the budget. Sandia is reimbursed for the FLAME program (some \$150,000).

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As the F-4J approaches TTR, three Sandia radars reach out to pinpoint its location. Once established, the aircraft is locked into the range computer system which automatically tracks and moves all the elements of the photo-optical systems into position. The giant tracking telescopes, long focal length high speed cameras and Contraves theodolites swing to meet the approaching aircraft. Radar range data is automatically computed for each telescope/camera and focus is adjusted 10 times per second.

In the operations room, test director John Johnson (9473) notes the position of the jet on Lloyd Young's (9473) plotting board. Lloyd is talking to the pilot, directing him through the proper maneuvers to put his aircraft on course over the range.

John checks with Art Rodriguez (9473) at the camera control board. Art nods that all is ready. Earlier all exposure instructions had been individually plotted for each camera, and all tracking movements checked.

Lloyd announces that the aircraft is 10 minutes away from the drop point. Communicator Ken Datz (9473) repeats the information over the TTR address system. It's heard at all the remote stations at TTR.

Lloyd talks the aircraft closer, constantly correcting course, altitude and airspeed. In the ops control room, the aircraft appears on several TV screens. By this time, the camera operators have the plane in sight on their telescopes and manually take over the tracking. Humans can do a better job than the computer in centering the aircraft in the film frame. The camera operators follow the test unit from release, anticipating the "lob" trajectory, rocket stage firings, deceleration and parachute release.

The aircraft begins the release sequence, accelerating and starting to climb. Tension is high in the control room. Success or failure rides on decisions made in the next few seconds.

In the FLAME program, the unit must be aimed at the earth at a critical angle to

insure maximum "burn" of the nose tip material; it must simulate reentry conditions. The fire command must be given at the precise split second that the FLAME vehicle is at the proper attitude.

To help make this decision, Bob Finnell (9471) has written a computer program which takes radar data at the release point, computes trajectory information and predicts the fire command point. This program information is then sent to the CRT display board in the ops room observed by Don Matejka (1135), the Sandia aeroballistic consultant who helped Bob write the program.

"Do we have a test?" Lloyd's voice demands.

John Johnson's response is immediate. "Yes." The countdown begins. "10-9-8-7-6 . . . . ."

On the plotting board, the aircraft's position moves to the release "box" marked in red.

"Release." John and Lloyd speak almost simultaneously.

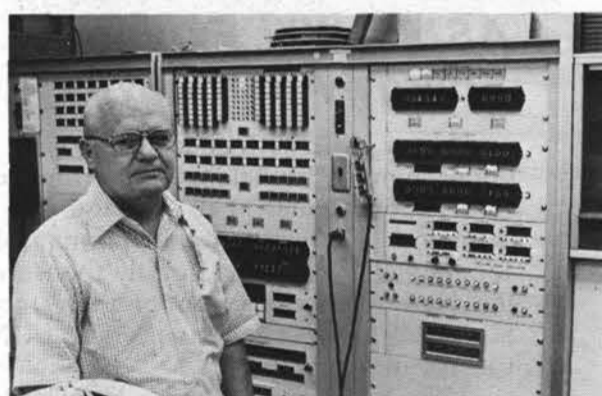
The computer does its work instantly. Rocket "fire" time is displayed along with a countdown sequence. Don Matejka quickly checks his trajectory tables, verifying the computer information. He nods to John who pulses the fire command button, enabling the computer to send the actual fire signal.

The rocket, now visible to the eye, streaks toward the earth. The heat shields pop and it slows. The parachute brings it in. Radars and theodolites vector in on the unit. Impact point is plotted.

Cecil Lang (9473) climbs aboard the waiting helicopter to direct recovery operations. The men in the ops room are jubilant. It's been a successful test. Range Manager Sam Moore congratulates each member of the range crew on a job well done. Six units have been tested at TTR as part of the FLAME development program

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For the staff of TTR, it's been a long day. Sandia's F-27 aircraft, ERDA-owned and operated by Ross Aviation, leaves McCarran International Airport in Las Vegas at 6 a.m. It takes about an hour for the 320 kilometres-(200 mile) flight to the TTR airstrip. After 10 or more hours (TTR Sandians work a 40-hour, four-day week) on the range, the flight back to Las Vegas is quiet. Most of the men sleep. • dg



BOB FINNELL (9741) heads TTR computer operations.



ART RODRIGUEZ (9473) at camera control board in ops room.



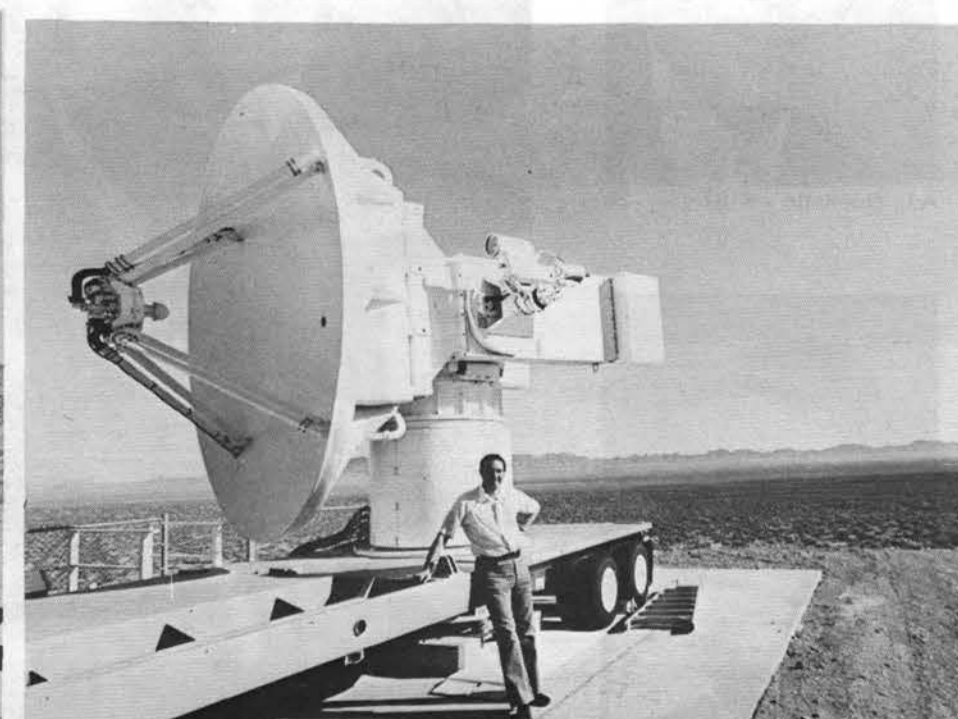
LLOYD YOUNG (9473) at TTR plotting board.



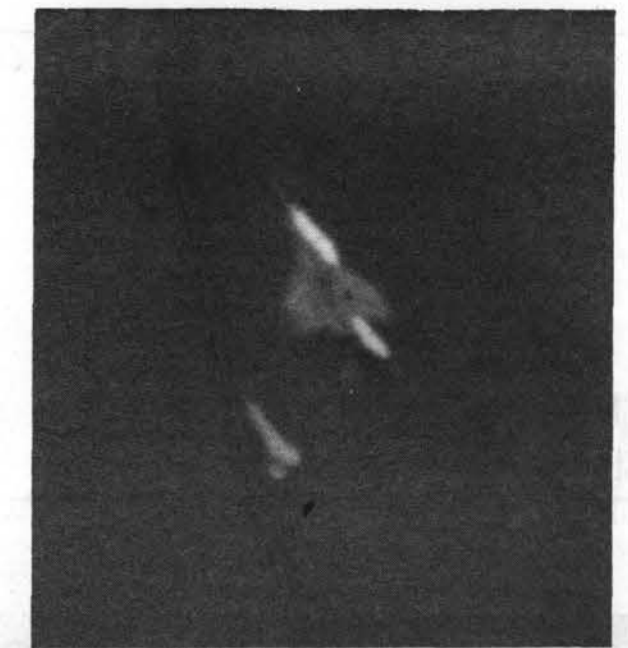
KEN DATZ (9473) is range communicator.



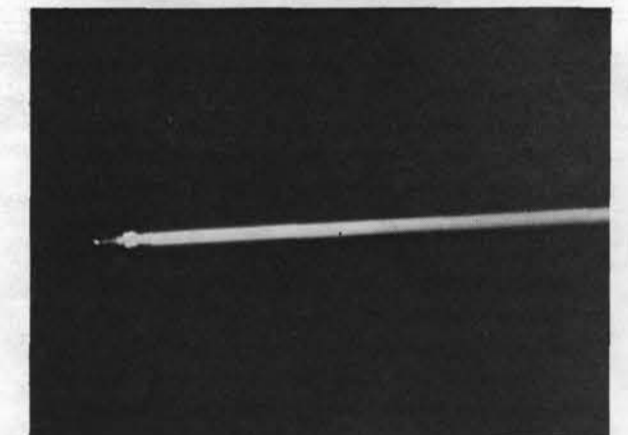
JIM ALLEN (9473) operates mobile camera station.



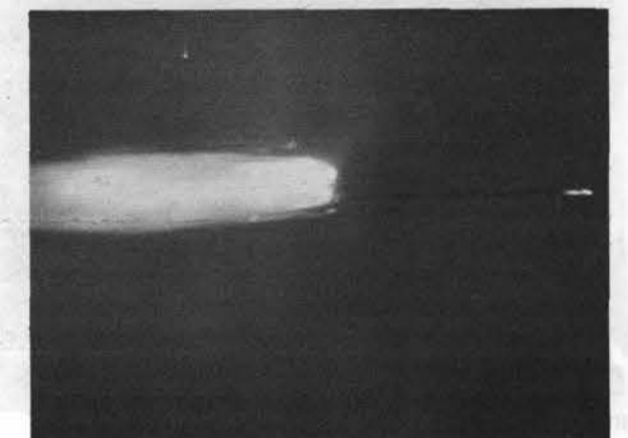
DAN TEBBIS (9471) is TTR radar project leader.



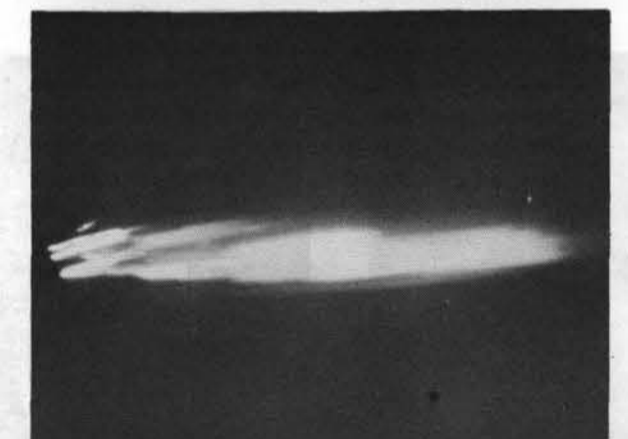
F-4J releases FLAME unit.



FIRST STAGE Pedro rocket burns for nine seconds.



SECOND STAGE Recruit rocket fires.



FIRST STAGE is consumed after separation.



HEAT SHIELDS on side of rocket pop out to slow vehicle for recovery. Photos (including F-4J on page one) were taken with Sandia's 596.9 centimetre focal length LA-24 tracking telescope at a distance of more than 50 Kilometres (30 miles) on 70mm film.

# MILEPOSTS

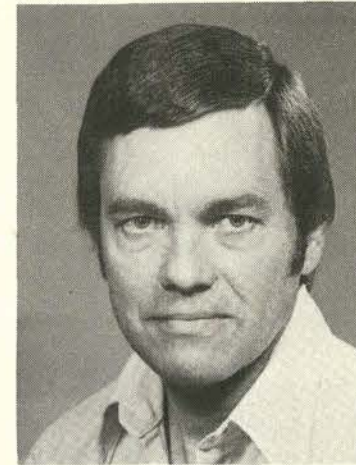
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Vernon Moore - 9550

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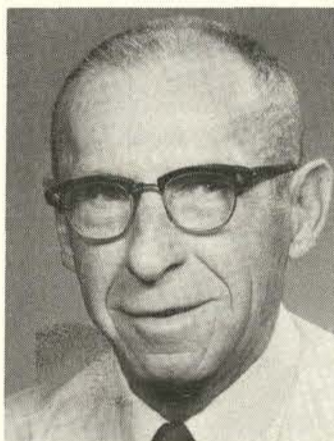
William Nickell - 1562

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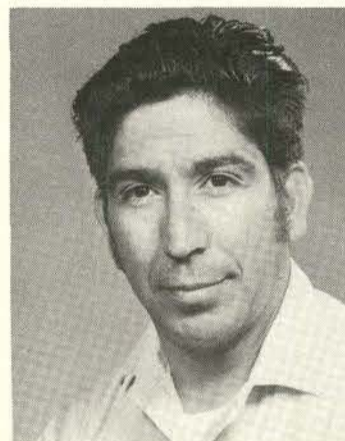
Michael Butteri - 3732

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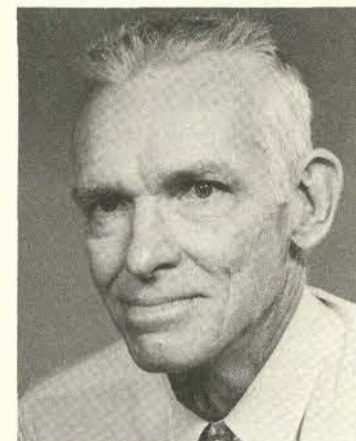
Wamon Cope - 3283

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Nestor Zamora - 9632

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Gordon Gaskill - 9632

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Jim Arnold - 1753

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Donald Benoist - 1213

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Kathryn Duvall - 9512

15



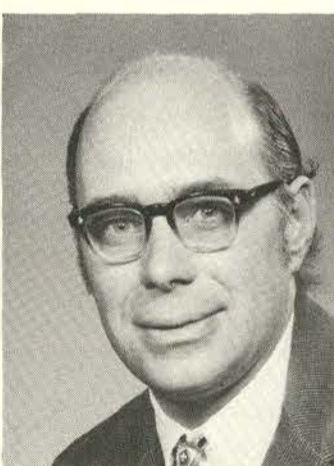
Cecil Land - 5133

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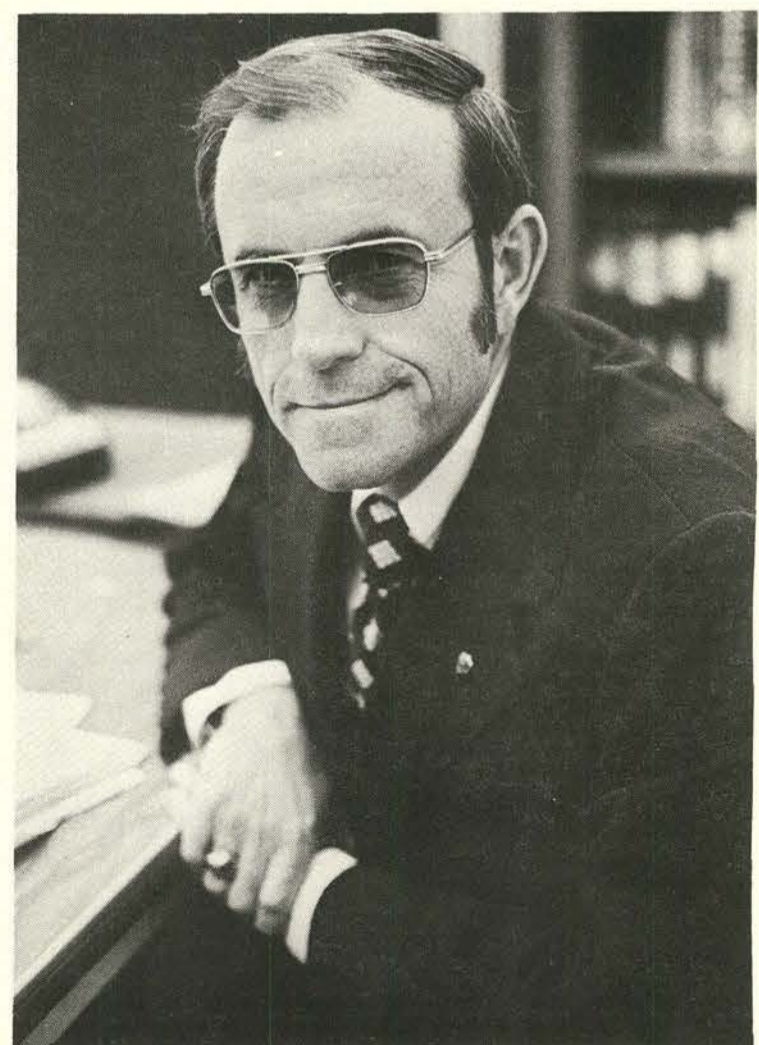
George Ray - 2323

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A.L. Ouellette - 5167

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William Thomas - 9512

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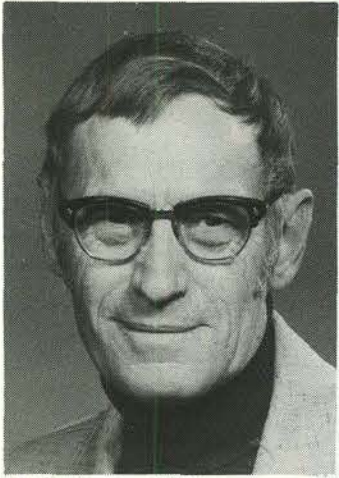
Enid Mortin - 3251

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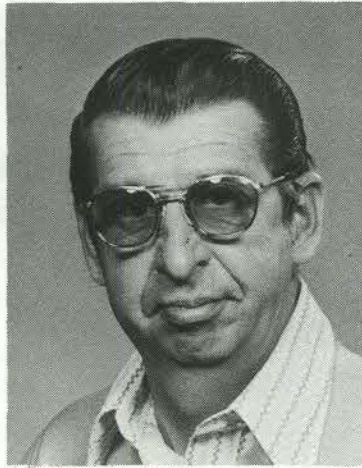


Dean Yearout - 2312

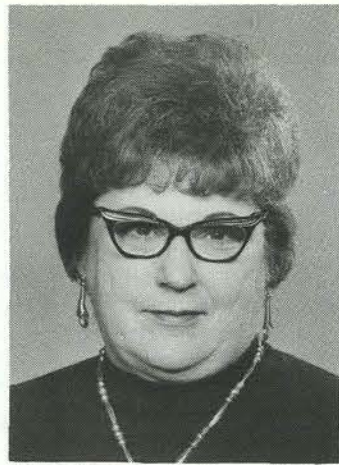
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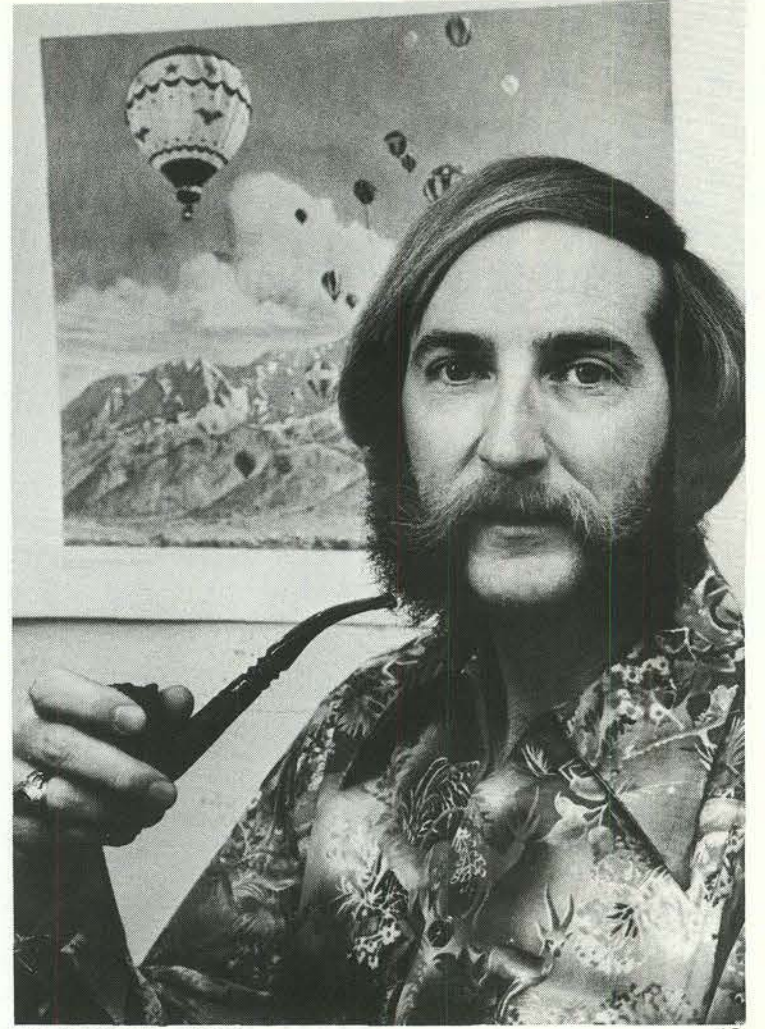
Ed Spriggs - 3155 25



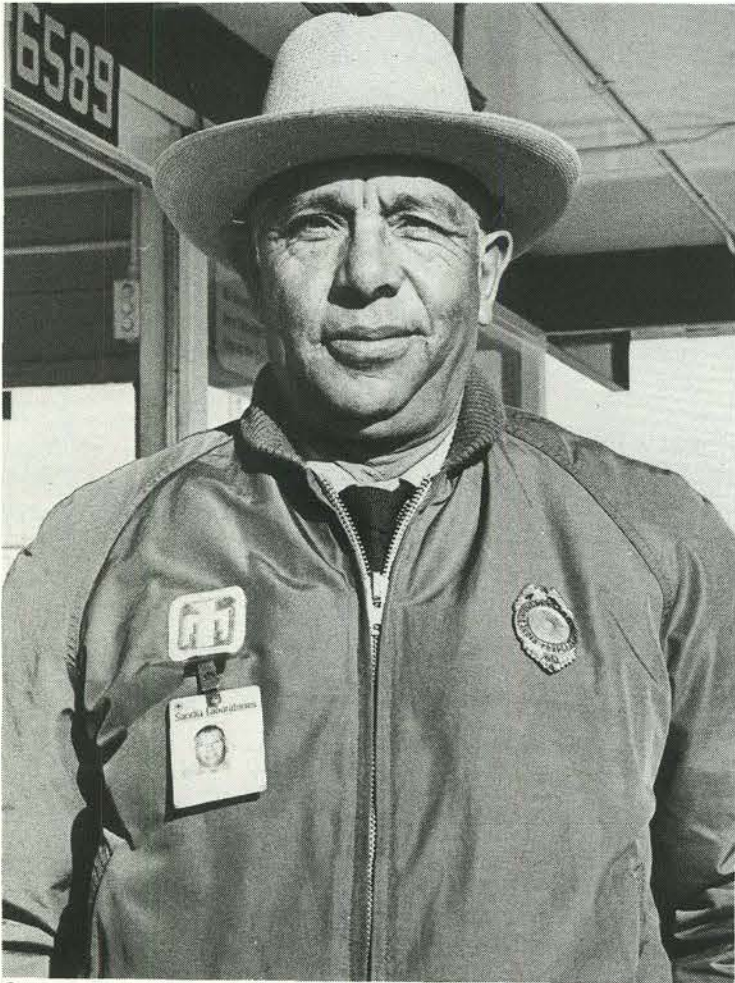
Bill Yoder - 2533 25



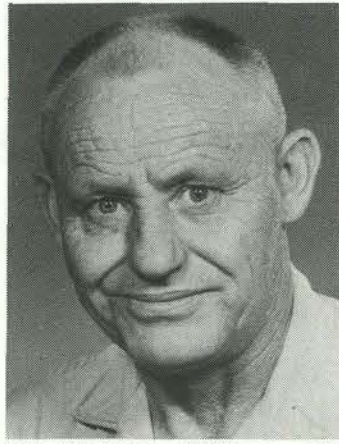
Alma Van De Velde - 9536 25



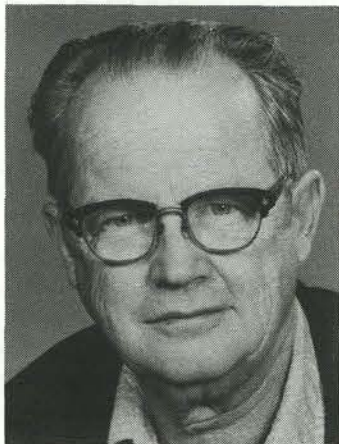
Jon Ashworth - 9553 10



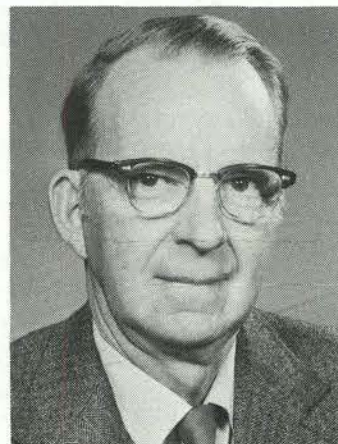
Sam Baca - 9550 25



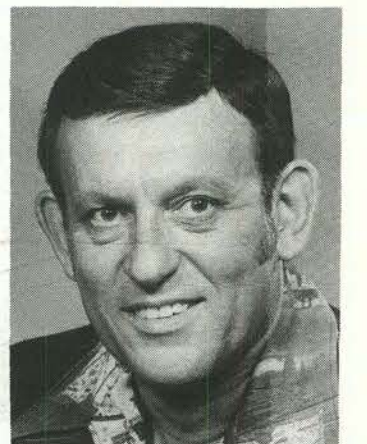
H.A. Hinrichs - 9713 25



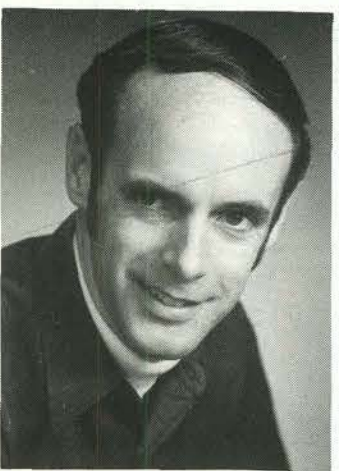
Dick Carlisle - 9713 25



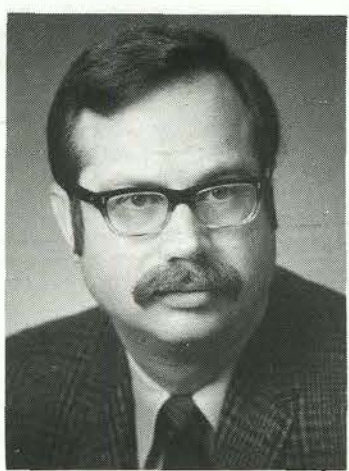
D.D. Hesselbarth - 2627 25



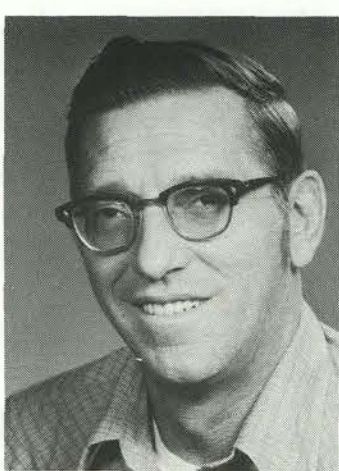
Ray Brown - 9751 25



Don Swanson - 8182 15



Bob Gaeddert - 8210 25



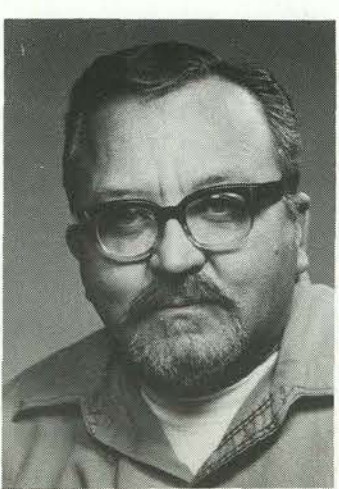
Harry Kovaschetz - 3613 25



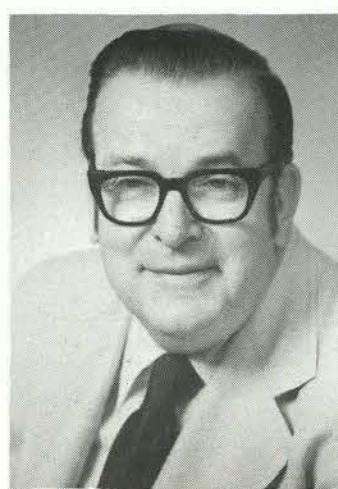
Lorella Salazar - 212 10



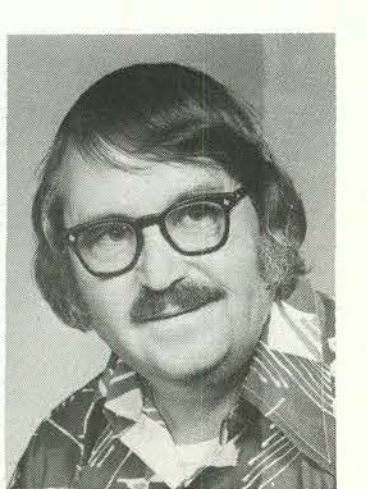
Vivian Montoya - 9550 25



Daniel Sheldon - 1223 25



Jim Henderson - 8214 25



Levi Baca - 9712 25



## FUN & GAMES

*Sandia Runners Ass'n.* — From the KAFB Bulletin: "All joggers/aerobic runners utilizing the East gym are cautioned to be very careful not to interfere with programs (basketball, volleyball, etc.). On numerous occasions, joggers/runners have been cutting across playing areas and running onto courts and into participants of games . . . If this practice continues, the sports office will have to eliminate jogging/running in the gym until after programmed games have ended . . ." All you indoor runners are going to have to stop cutting corners! Note that the notice doesn't address the problem of basketballers who trespass into the running track.

Outdoor runners are subject to some rules, too. There are regulations for Base pedestrians and, following the decision that a runner/jogger is a Base pedestrian *de facto & de jure*, these regulations apply: (1) don't run on the roadway where sidewalks are available, (2) don't stand on the roadway where it is possible to stand off the roadway, (3) run on the left side of the roadway facing traffic and step off it when a vehicle approaches, (4) cross the roadway only at crosswalks (where available); cross the roadway at right angles otherwise and, (5) observe control signals at intersections. If you'll just think warm thoughts about that 2-ton behemoth bearing down on you, you won't have any problems complying with both the letter and spirit of these regulations.

\*\*\*

*Sandia Bowlers* — The SLBA 4-member Team Doubles and Singles Tournament originally scheduled in January has been rescheduled for March 20 and 21. Under the tournament sanction, all participants qualify for an award as described under ABC/WIBC Rules.

\*\*\*

*Ski Touring* — This winter is a bust, at least for downhillers. But it's provided one more reason for consideration of an alternative skiing mode, to wit, cross country skiing. Less snow is needed. During January we spent most Sundays in the Jemez area, cross country skiing on snow whose depth ranged from over a foot (rarely) to one or two inches (mostly). And we skied across patches of grass occasionally. No problem. After a few miles of leisurely skiing, lunch with a little wine in a sun-filled meadow has to be one of Western Civilization's better moments. If you're looking for snow suitable for touring in a thin year (like this), stay above 9000 feet altitude and look for northward-facing terrain where sun exposure is minimal.

\*\*\*

Is your wife still kicking sand in your face? You don't have to take that — join the men's judo class, 5 to 7 Tuesday evenings in the East Gym. Instruction is free, USJA dues are 7 bucks/year, and your judo uniform costs \$25. Capt. John Gowan, 294-1906, is the judo guru.

\*\*\*

*Sandia Bicycle Ass'n.* — Stop at stop signs in the Tech Area. So says Safety. And if you don't you face one of two consequences. In the first, a squad of Mafia hitmen emerge from the nearest manhole, kiss you on the cheek, then run over you and your Schwinn Varsity repeatedly with a '39 Packard with wide whitewalls. In the second, a kindly security inspector, or inspectress, gives you a ticket, a copy of which goes to Your Supervisor and you know what that means. And you have no choice in these consequences!



NEW BOOK STAND is now operating just outside the LAB NEWS' new location—Bldg. 814 (east of Base cafeteria, south of Parade Ground, north of Bldg. 815—you'll find it). Benefits' Vicky Baca and Vern Henning do a little browsing. Drop over during lunch to pick up some of the world's great literature. Book and record donations are cheerfully accepted. Proceeds go to the South Highway 14 Village Project.

## Take Note

Jack Reed (5443), president of the Albuquerque Coin Club, reports that the Club will hold its Lucky 13th Annual Coin Show at the Convention Center, Saturday & Sunday, Feb. 14 & 15. There is no admission charge. According to Jack, crowds numbering in the thousands visit the show to see, study, buy and sell coins. Fifty dealers will display numismatic material from around the world. If you've got a stash of old coins you've wondered about, take them with you — coin identification and evaluation service will be provided.

\*\*\*

Ernie Bolton (3732) will be honored this Sunday, Feb. 8, as he receives recognition for his 25 years as a Registered Scouter and 20 years as Scoutmaster of Troop 285. He has successfully been named for the Scout's Arrowhead Award, the Scouters Key, St. Andrews Award, the Silver Beaver and the Wood Badge. During his 20 Scoutmaster years, 35 Scouts attained the rank of Eagle Scout.

\*\*\*

If you've been to Acapulco, Paris, and Bernalillo, what's left? One George Harutunian, a Russian instructor at UNM (i.e. an instructor of Russian) answers thusly: Leningrad, Petrozavodsk, Novogorod, Moscow (a toddlin' town), Odessa and Kiev. Plus Budapest & Prague. A charter flight leaves Albuquerque June 9, returns July 8. The \$1500 tab includes all meals, transportation, sightseeing, hotels, and dark looks from Russian customs agents. Call George, 277-2434 or 298-2229 (home).

\*\*\*

Senator Pete Domenici is guest speaker at a joint meeting of ASME, ASCE, AIAA, and ASM on Feb. 11, 6:30 p.m., Four Seasons. His speech, "Technology and Congress: What Does the Future Hold?" will summarize the ways in which scientific and other technical information is presented to the Congress. A discussion period will follow the speech. The \$6 admission includes Mexican buffet, tax, and tip. Reservations with Ed Barkocy at 4-4840 or Joe Abbin at 4-5759 by Feb. 9.

\*\*\*

Attention Highland High Graduates of 1956—The class of '56 is planning a twentieth year reunion for this coming summer. If you are a 1956 Highland graduate, or if you know of any '56 Highland graduates, please drop a line to: Class of 1956, P.O. Box 8954, Albuquerque, 87108—or call Guy Wimberly at 298-7505.

\*\*\*

The Junior Woman's Club is presenting their sixth annual "Feria de los Artesanos,"

Saturday, Feb. 21, at the Four Seasons from 10 a.m. until 8 p.m. The event will feature exhibits of more than 100 artists and craftspeople. A \$1 admission fee will be charged and all proceeds will go to local charities.

\*\*\*

The Kirtland military have stepped up the frequency of their random vehicular searches. Under this procedure you may be stopped at a gate as you enter or leave the Base, and your vehicle subjected to a fairly thorough search. If any "contraband" is found, then they'll search you. Aim of the search: illegal drugs, weapons, stolen property.

\*\*\*

Two speakers in the lecture series, "Critical Materials Problems in Energy Production," will discuss battery technology at the Kiva at UNM next Thursday, Feb. 12. Prof. Robert Huggins, Stanford University, will talk at 3:30 p.m.; Prof. Byron Steele, Imperial College, London, will lecture at 5 p.m. All interested Sandians are invited. For more information, call George Samara (5130), 4-2945.

\*\*\*

To all Sandians who donated blood in recent weeks for his teen-age son Paul, Bob Hedberg (9425) extends a heartfelt thanks. Paul suffered an accidental gunshot wound Thanksgiving Day and required more than 140 pints of blood. Although not home from the hospital yet, he is recovering.

\*\*\*

Ray Garcia (3172), former state legislator who in 1969 introduced the bill to create the Rio Grande Valley State Park, reports that another bill is in the legislature now which, if passed, will authorize \$400,000 for the park. Ray is leading the effort to gain support for the bill. If you would like to help, call 877-1562.

## Retiring



Jack England (2532)

## Credit Union Bulletin Board

**IRS Help** — A release from the local IRS office indicates that taxpayers can get help from three sources in preparing their returns: telephone service — dial 766-3401; or visit the downtown office in the Federal Bldg. (5th and Gold) to get personal assistance from a service representative; or take advantage of the many free tax publications on specialized subjects — retirement income credit, moving expenses, etc. You can get these publications by mailing in the order blank found in your tax package.

In a discussion with the local office, it was learned that many taxpayers are either not taking advantage of the \$30 tax credit or are applying the credit improperly. When you've arrived at your tax, the credit is deducted from that amount. The credit itself is \$30 multiplied by your total number of exemptions.

The more commonly requested tax forms are again available at the Credit Union.

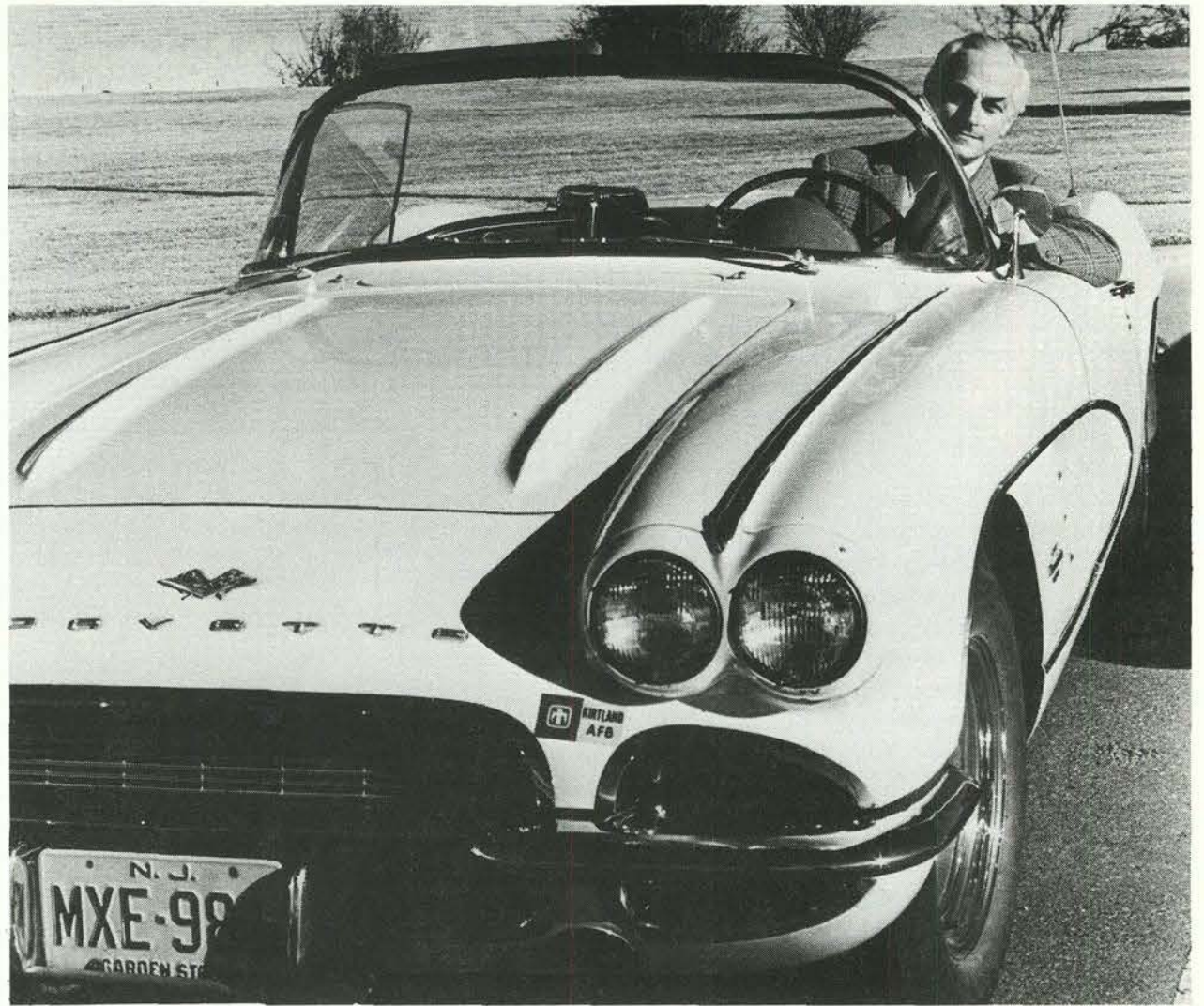
### Sympathy

To Ray Mosteller (1132) on the death of his wife in Albuquerque Jan. 19.

To Eugenio Rios (3725) on the death of his sister in Albuquerque Jan. 26.

To Jose Luna (3622) on the death of his father-in-law, Jan. 26.

To Walter Self (3623) on the death of his sister in Lubbock, Texas, Jan. 26.



MEANWHILE, back at Bell Labs in New Jersey, the temperature is a balmy 5°. Recently arrived from that location, VP Gene Reed (2000) agreed with us that his colleagues back there would certainly take vicarious pleasure in our warm and sunny weather. It was near 70° last week when this picture was taken.

## 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.

### RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Must be submitted in writing.
4. Use home telephone numbers.
5. For Sandia Laboratories and ERDA employees only.
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

- BINOCULARS, Wollensak, 6x30, \$25. Miller, 255-7716.
- 17 FT. canoe, Starcraft w/paddles, 4 life jackets; gun rack, 4 gun size w/cabinet below. Dunn, 298-4185.
- '74 MOBILE home, 12x52, fully furnished, skirted, low down payment, 4-Hills Park. Williams, 298-2768.
- GREENFIELD 22 rifle, bolt action, tubular magazine, \$35. Russell, 294-1035.
- CHAIN saws, both Sears, both operate, 1 gear-driven, heavy, \$35; 1 direct-drive, lightweight, \$50. Bush, 281-3773.
- FRAME stucco building, pitched roof, approx. 250 sq. ft., you move, \$200. King, 296-7607 after 6.
- CAMP-TRAILER, Sears, model 400, spare tire, 4" foam mattresses, sleeps 5, \$200. Martin, 869-2049.
- ACCORDION, 120 bass; portable sewing machine; old tape recorder. Johnson, 344-9369.
- TIRES, Firestone radials, w/s/wall, 165SR15, interchangeable w/560-15 to F78-15, no breaks or punctures, \$15 ea. 4 for \$45. Browning, 299-6384.
- SKI boots, ladies 6½ narrow, Koflach, \$30, used twice. Kennedy, 298-0704.

WOOD burning stove, \$90. Patterson, 877-3158.

REFRIGERATOR, Whirlpool, 15 cu. ft., ice maker, runs warm, \$75; bedroom set, \$100; spring rocking horse, \$9. Vigil, 296-3590.

DACHSHUND puppies, AKC registered, miniature/small standard, Champion bloodlines, red or black & tan. Bateman, 881-7434.

40 FT. Westinghouse dbl/oven range, \$185; Kenmore Frost-Less refrig./freezer, \$225; 1/leaf dinette set, 9'x12' braided rug, all new. Hensinger, 296-3254.

GREENHOUSE, glass, aluminum frame, 5'x9', fan, thermostat, benches. Moss, 298-2643.

1-WHEEL trailer w/new spare, \$60; camper ice box 20x25x18 rough-in, \$30. Norris, 299-4717.

TOWN & COUNTRY mobile home, 3-bdr., '65 10x56, stove & refrig. only, located in Manzano Mts., \$3000. Davis, 281-3751.

2 BLAZERS, size 36R, 1 red, 1 blue, \$20 ea., Stromberg's labels. Henning, 299-0318 after 5.

RACK for long wide pickup, 24" high, 5 solid oak slats, bolted together, painted white, \$60. Sublett, 298-1004.

THREE registered male Chihuahuas, 1 white, 2 cream, 3 wks. old, \$50 w/papers, \$35 w/out. Barnes, 877-3301.

WASHING machine, Kenmore, 3-cycle, recently reconditioned, free delivery, \$100. Watkins, 266-1844.

CAMPER wheels for 10.00-16.5 tires, 2 ea., fits 3/4-ton Chevy, GMC truck. Cook, 294-2348.

BLACK male Toy Poodle, bred & kept for show, went oversized, household broken, sell to pet home only. Roeske, 296-3946.

TWIN size maple bedstead w/Sealey mattress & box

spring, \$90; Sears white dresser & desk, \$95. Oliver, 299-5512.

23 CHANNEL C.B. RADIO, Teaberry - T Charlie One plus two 8' antennas & mounts. Vonderheide, 843-6148.

### TRANSPORTATION

'68 CHEV. Biscayne, AC, \$200. West, 281-3460.

'72 CHEV. Suburban, 4-WHD, 350 V8, PS, 10x15 Jackman rims, 11x15 Armstrong Tru-Track Lock-O-Matic hubs, \$3600. Valerio, 266-3204.

TWO std. size 3-spd. Schwinn boys bicycles, \$25 ea. Bild, 821-0119 after 5 or on weekends.

'56 FORD wagon, transmission slips, \$100. Weber, 266-9100.

'68 VW Micro bus, less than 3000 miles on rebuilt engine, new tires, battery, \$1600 firm. Rock, 299-1868.

'66 MERCURY Comet 289, auto, radio, AC, fair tires, \$400 or best offer. Kim, 294-1338 nights 883-0752 days.

'71 YAMAHA 650 X-S, \$650. McAlees, 299-0698 after 5:30.

'66 DODGE ½-ton pickup, V8, \$650. Cowham, 881-7193 weekdays after 5, 3601 Cardenas NE.

'70 HONDA 750, Windjammer fairing, crash bar & bags. Dunn, 345-6466.

'74 COURIER, radio, AC, insulated camper shell, \$2895. Gonzales, 242-6264 after 4:30.

'72 YAMAHA 250 dirt bike; 4 rims, tires & hubcaps from '69 Cutlass. Snelling, 294-5751.

'69 INTERNATIONAL Travelall, V8, 4-WD, AT, AC, PS, PB, dual tanks, positraction, radials. Caskey, 294-3218.

'70 TRIUMPH, 500cc-T100C, 1 owner, 11,700 mi., \$500. Meidal, 292-3821.

'67 AUSTIN-HEALEY, 3000 MK-111, full convertible, spoked

mags, new radials, ready to paint, \$2500. Butler, 296-8095.

'72 DATSUN 510, 4-dr., air, steel belted radials, recent tune-up, maintenance records, 44K, 30 mpg Highway, \$1800. Van Den Avyle, 898-6474.

'66 SCOUT, rebuilt 152 engine, dual gas tanks, 4-spd., 4 new tires, good body, \$1250 or best offer. Perez, 898-3002.

'75 HONDA CVCC auto., bright yellow, 4-spd., \$2800. Schubeck, 294-5666.

'71 CHEV. Kingswood sta. wagon, fully equipped, book average \$1600, sell \$1350 firm. Cano, 296-6955.

'72 NOVA Rally, V8, PS, AC, radio, Cruise Cont. Rally wheels, CB radio, reg. gas. Stuart, 265-7315 after 2.

BICYCLES, mens 3-spd., Sears 26", \$45; girls 24" Roadmaster w/basket, \$35; both w/thornproof tubes. Jones, 299-6542.

### REAL ESTATE

3-BDR., adobe construction, walled backyard, wrought iron gates, new bathroom, price negotiable, Gibson & Edith SE. Gonzales, 766-4355 or 294-5756.

3-BDR., no qualifying, large den, dbl/garage, 1-3/4 baths, built-in dishwasher, disposal, over 1800 sq. ft., marble-top bar. Slesinger, 294-0293.

### FOR RENT

AVAILABLE 2-15 to 7-15, 3-bdr., near University, all appliances, washer, dryer, AC, bills paid including yard service, \$225. Brice, 266-4807.

### WANTED

SINGLE-CAR garage door & hardware. Fenimore, 298-8052.

MAPLE dining table & chairs; twin

or dbl. size bedroom set, good condition. Hensinger, 296-3254.

RENT 2-bdr. house or apt., furnished or not, within 3 mi. of Lab, prefer yard, starting March or April. Orear, 256-1941.

INVESTOR, to buy 23 acres near Albuquerque, suitable for immediate development. Patterson, 877-3158.

ROOFTOP refrigerated air conditioner for RV camper. Berg, 898-2100.

SKI rack, prefer car top clamp type. McConnell, 255-2488.

TRADE: 13" Dart/Valiant wheels for 14", trade 2 for 1. West, 281-3460.

'70 TOYOTA, good condition, needed by May; baseball glove for right hand. Stoeber, 296-3717.

CAB-HIGH shell cover to fit '67 Ford F-100 step-side pickup, short narrow bed. Smith, 281-3430.

USED welder. Colp, 255-0228.

NEED part or full time occupant for mountain home near Chilili, board & lodging free, retired male preferred. Lumpkin, PO Box 560, Estancia NM 87016.

DINETTE set, 4 chairs preferably. Johnson, 298-2592.

USED Guinea pig cage. Larson, 299-2384.

CARTRIDGES, singles or boxes, German, Japanese, Chinese & Italian, from WW-I & WW-II, all types. Edgerly, 898-2983.

ELECTRONIC calculator, Coleman, 299-2377.

### WORK WANTED

ODD jobs for 16 yr. old boy, yard work, painting, cleanup etc., available after school. Charles, 265-8607.

COME — out tonight and get sauced. And spaghetti. Then let your ears relax with La Ultima, Yo (Ho Ho and a Dense, correction) Adent's new group, from 6:30 to 8:30. Then let it all hang out with Natural Persuasion.

AND — next Friday is Super Succulent Suppertime: roast beef *au jus*, peas with butter, potatoes with sour cream, salads with class. Masticate to the soft strums of Thomás and Marcia, then kick your heels Up Country.

JOIN — forces with your sub-twelve progeny on the 14th and Kome to the Klub for Kids' Karnival. A homemade Valentine is the admission fee with prizes for the Prettiest, the Funniest, and the Most Unusual.\* 50¢ buys 10 game tickets and a chance for prizes at each booth. Members and members' children only, please.

THE — musicians storm the Club tomorrow night. But don't worry — you'll not be repelled by the invaders. The entire Musical Arts Club will (courtesy the American Federation of Musicians) have you tapping your feet, flapping your head, and clapping your hands at their Parade of American Music. A Disney movie, *The One and Only Genuine Original Family Band*, is the evening's finale. Food too — try the new menu. Each under-twelve accompanied by parent gets a free hot dog to munch musically.

SAN ANDREAS — is the group we tried to book: they make the earth move under your feet. But we had to settle for a bunch of turkeys called Band of Turkeys. Strut (or wattle) on over to Soul Session on the 14th.

CHARITY — is just about what you get if you shop the used, but no longer used, merchandise mart at the Club. Ask a manager to show you the bargain tables — and the table bargains. Lots of stuff priced for quick sale.

\*Valentine, not kid



FRIDAY	SATURDAY
6 — HAPPY HOUR BUDGET BUFFET Adults \$2.25 Under 12 1.25 <i>La Ultima</i> NATURAL PERSUASION	7 — VARIETY NIGHT PARADE OF AMERICAN MUSIC <i>One &amp; Only Genuine Original Family Band</i> Food @ 6 Show @ 7 Free to Members
13 — HAPPY HOUR ROAST BEEF BUFFET Adults \$3.25 Under 12 1.92 <i>Thomás &amp; Marcia</i> UP COUNTRY LOBO BUS — 6:45	14 — KIDS' KARNIVAL, 11-3 SOUL SESSION 8:30-12:30 Band of Turkeys LOBO BUS — 6:45

DRIVE — your car to the Lobo games. Get delayed, dismayed, waylaid. Or take the Club's Lobo bus — no fuss, no muss, no cuss. Next departures: 6:45 on the 13th and 14th.

BE — great to be a child again, right? Especially when it comes to ticket prices. Relive those delicious days at a Commonwealth theatre when you hide your wrinkles by blowing a large bubble and hide your age by blowing only \$1.75, not \$2.50, on your ticket. They're at the Club; they're good through June; probably you'll be good through June too.

GENEROUS — travel packages now being unwrapped at the Club include Rio de Janeiro, Sugar Loaf, Ipanema; and Tahiti, Jewel of the South Pacific; and Hawaii, Maui, Kihei; and (flourish, trumpets) a Bicentennial Tour of Washington, Mt. Vernon, Williamsburg, Monticello, Philadelphia, Gettysburg, and more. Ask for the flyers with the details at the Club. Take the kids east and relive history — or go tropical and make some.

TO — get in on the latest scoops in fashions, dip into the Sanado luncheon on the 10th. They call it "Heart In Fashion," and they'll wear or see all kinds of exciting spring/summer clothes from Rena's Apparel. Mary Ann Crawford will accompany each of the member-models musically. Betty Reuscher comments; Gloria Coats coordinates; Pat Horne decorates. Beef rolladen luncheon too — all for \$3.25 (guests \$3.75). Reserve *today* with Sandra Ruth, 294-2090.

A — Mark Spitzian/Mickey Kingly spectacular at UNM's natatorium Feb. 13-15. It's the Southwest Senior Long Course and Diving Championships, and a score of swimmers and a dozen divers from the C-Club Aquatic Club will be there wet. Free. Call 255-4812 for more info.

FAULT — not the Ski Club for the fair weather. They've done everything but burn their bindings, but now they're learning cross-country skiing. They're a bit upset — in fact, there's this sign over their meeting-house door: WELCOME TO CROSS COUNTRY. Come out to the meeting on the 17th at 7:30 and learn more about the sport that's sweeping — or gliding — across America.

MORE INFO — 265-6791.

Menu Change: Feb. 20 Buffet will be fried chicken with potatoes *au gratin* and cole slaw, not tacos, etc.

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LAB NEWS  
FEBRUARY 6, 1976



SOME OF THE MUSICIANS you'll see, hear, and enjoy tomorrow night. From left, Joy Poteet, Helen Loomis, and Ginny Maak. In the margarett Trumanesque position, Ed Shoaf (3646).