

Labs Will Sponsor Ion Beam Conference

Technology is a world-wide affair and, next month, the Labs will sponsor the International Conference on Applications of Ion Beams to Metals. The Conference, to be held Oct. 2 to 4 at Albuquerque's Four Seasons Motor Inn, is also being supported by the Office of Naval Research. Co-chairmen and organizers are Tom Picraux (5111), Errol EerNisse (5112) and Fred Vook (5110).

"There have been a number of conferences on ion implantation in semiconductors in this country and abroad," says Tom, "but the application of ion beams to metals is a new research area, and this is the first such conference ever held. Sandia Labs was one of the first laboratories to become deeply interested in this area because of applications to weapons programs and to reactor safety studies." It was thus natural for Sandia to host an international conference on this subject. The Office of Naval Research is also interested because the research may lead to a greater understanding of material properties with applications to such areas as naval reactors.

Conference topics include ion implantation effects on superconductivity, alloy formation, oxidation, and implanted impurity atom lattice location. Ion damage

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OVER 125 YEARS of Sandia service are represented by Section 7518-13, the Heavy Equipment people in Area III. From left, Lloyd Kelton, with a 10/27/47 service date the senior member of the group; Paul Silva's 8/3/48 makes him the junior member, barely 25 years along; Herb Gentry, the section supervisor, joined 6/1/48; Lewis West on 5/20/48; and Sam Blaylock on 4/18/48. Why so long at Sandia? "Each of us bought a new car with a Credit Union loan — and we've never really paid off that loan," says Lewis.

LAB NEWS

VOL. 25, NO. 17

AUGUST 24, 1973

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



INTO THE FURNACE goes a boatload of semiconductor wafers. Doug Weaver does the launching. The new lab includes the most recent equipment and techniques for semiconductor fabrication.

New Solid State Development Lab

"We can build a prototype of most of the widely used semiconductors right here," says Doug Weaver who, with Bill Brown (both 2113), operates the new lab in Bldg. 802. "And we can build it right."

They spent a year visiting the most advanced semiconductor labs in the country and adopting the best features of each one for the new facility. "It's very likely one of the most flexible semiconductor labs in the country at this point — not in terms of production, that's not our game, but in terms of rigidly controlled, state-of-the-art development work," says Bill. "Each step of the process can be examined for its overall effect on the final device."

Key to the lab's superiority is cleanliness. A visit is enlightening — lab coat, head cover, plastic boots, special gloves. Then entry into a small, crowded-with-instruments room filled with the soft hum of air being moved, cooled, filtered, and dehydrated. "All the air entering the lab is filtered to class 100 clean room conditions," says Doug. "The air is replaced every 30 seconds or so; it's great for my allergy. I hate to go home at night during tumbleweed season."

The air isn't the only thing that's clean. The "boats," or fixtures that hold the semiconductor wafers in place during all

(Continued on Page Ten)

Afterthoughts

To Really Put This In Perspective--Those who publish quickly learn that much of that world out there consists of compulsive editors. They pick up typos, misspellings and the like and gleefully report them, which is fine because, if nothing else, it shows somebody is reading the stuff. But that which follows is addressed to that editor who fastens upon your split infinitive as evidence of a grammatical turpitude bordering on depravity. It's from Fowler's Modern English Usage, and I've always thought it the ultimate put-down of split infinitive freaks. "Split Infinitive. The English-speaking world may be divided into (1) those who neither know nor care what a split infinitive is; (2) those who do not know, but care very much; (3) those who know and condemn; (4) those who know and approve; and (5) those who know and distinguish.

1. Those who neither know nor care are the vast majority, and are a happy folk, to be envied by most of the minority classes; 'to really understand' comes readier to their lips and pens than 'really to understand,' they see no reason why they should not say it ... and they do say it, to the discomfort of some among us, but not to their own.

2. To the second class, those who do not know but do care, who would as soon be caught putting their knives in their mouths as splitting an infinitive but have hazy notions about what constitutes that deplorable breach of etiquette, this article is chiefly addressed. These people betray by their practice that their aversion to the split infinitive springs not from instinctive good taste, but from tame acceptance of the misinterpreted opinion of others; for they will subject their sentences to the queerest distortions, all to escape imaginary split infinitives. 'To really understand' is a s.i.; 'to really be understood' is a s.i.; 'to be really understood' is not one; the havoc that is played with much well-intentioned writing by failure to grasp that distinction is incredible. Those upon whom the fear of infinitive-splitting sits heavy should remember that to give conclusive evidence, by distortions, of misconceiving the nature of the s.i. is far more damaging to their literary pretensions than an actual lapse could be; for it exhibits them as deaf to the normal rhythm of English sentences."

There's more, and I commend Fowler to you for his lucidity and for his common sense approach to the English language. As for LAB NEWS, we are not about to forbid flatly split infinitives.

* * *

Insight--"The partisan, when he is engaged in a dispute, cares nothing about the rights of the question but is anxious only to convince his hearers of his own assertions." Socrates *js



NEW SUPERVISORS — Angie Gurule (3141-1) and Chuck Gwynn (2114).

Supervisory Appointments

CHUCK GWYN to supervisor of Computer-Aided Design and Analysis Division 2114, effective Aug. 1.

Chuck joined the Laboratories in August 1961 as a staff member in the radiation effects group, and since then his work has been in essentially the same area. For the past five years he has been involved in semiconductor device analysis.

He was awarded a BS degree from Kansas University, earned his MS under Sandia's Technical Development Program from UNM in 1963, and his PhD from UNM in 1968, all in electrical engineering. Chuck is a member of IEEE.

Chuck and his family like to camp and, in his spare time, he rebuilds player pianos. He has completed one piano and is currently working on two others. Chuck, his wife Jean, and their three children live at 7920 Charger Trail NE.

* * * * *

ANGIE GURULE to supervisor of Circulation and Technical Correspondence Section 3141-1, effective Aug. 1.

After graduating from a local business school, Angie joined Sandia in September 1952 as a stenographer and has since worked in many areas of the Labs. She has done secretarial work in standards, field test, engineering, quality assurance and technical information organizations. She was promoted to department secretary in April 1964.

Angie's husband Frank is also a Sandian a chemist in Materials and Explosive Components Division 2516. They have two daughters, Rochelle and Cyndie, ages 15 and 16. Angie says they all like to travel and she and Frank especially enjoyed the Coronado Club trip to Rio de Janeiro. The Gurules live at 4009 Van Buren NE.

Retiring



Pat Proulx (9473)

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as does Norma Taylor while
Bill Taskar takes/makes pictures
&

in Livermore Lorena Schneider does all

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Speakers

Jim Shelby and Stewart Keeton (both 8331), "Helium Migration in Alkali Silicate Glasses"; Jim Shelby (8331) and Gary McVay (5154), "Helium Migration in Solium Potassium Silicate Glasses"; Pete Mattern (8331) and M. Goldberg, K. Lengweiler and P.W. Levy (Brookhaven National Laboratory), "Non-Metals During Irradiation: The Absorption of Two Lead Silicate Glasses During and After Irradiation"; Ray Mar (8314), "The Uranium-Boron System"; 75th annual meeting, American Ceramics Society, Cincinnati, Ohio, Apr. 30-May 2.

Leroy Haggmark and Jim Mogford (both 8341), "Theoretical Studies of Techniques for Determining Surface Densities of Oxide Films on Metal Tritides," New Mexico American Vacuum Society Symposium, Albuquerque, Apr. 9-11.

Ted Dellin (8341), "IEMP Hardened Cables," Cable and Connector Symposium, Albuquerque, Apr. 17.

John Brooks (8312), "Improved Weldability of Modified A-286," American Welding Society Conference, Chicago, Apr. 5.

Hartmut Spetzler (8314), "Quantitative Holographic-Interferometry in Creep and Failure Studies," 54th annual meeting, American Geophysical Union, Washington, D.C., April 16-20.

Tony Thompson (8313), "The Dependence of Polycrystal Work Hardening on Grain Size," staff seminar, Carnegie-Mellon University, Pittsburgh, Pa., Apr. 6; technical seminar, Bell Telephone Laboratories, Murray Hill, N.J., April 9.

Michael Soderstrand (8182) and Douglas Huey (UC/Davis), "Sensitivities of Fourth Order Filters Obtained by a Low-Pass to Band-Pass Transformation," 16th Mid-west Symposium on Circuit Theory, Ontario, Canada, Apr. 12-13.

Take Note

Entertainer Jerry Lewis will host a network telethon Labor Day weekend to benefit the Muscular Dystrophy Association, an organization Sandians support through LEAP. The program will be broadcast from Las Vegas, with pick-ups from New York, Hollywood, and Nashville and can be seen locally over KNTV, channel 11, and KBHK, channel 44.

David Abrahams (8413), who set up a telethon answering center in Livermore last year, is this year's VP of the Alameda Chapter of MDAA, while his wife Jolene serves as chairman of the local telethon. They are enlisting volunteers to help at the pledge center (located at Sunol Country Club). Contact David or Jolene at 447-9386 if you're interested.

Congratulations

Mr. and Mrs. Pete Witze (8364), a son, David Christopher, Aug. 1.

THESE SECRETARIAL TRAINEES recently completed SLL's Secretarial Development Program, (from left) Brenda Wyatt, Norma Watson, and Shirley McGuire (all 8212). The one-year program includes classroom instruction and on-the-job training, qualifying trainees to become division secretaries.



LIVERMORE NEWS

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GROUNDBREAKING FOR AEROSTATICS BUILDING. VP Tom Cook (8000) turns the first earth for Sandia/Livermore's new aerostatics building. Looking on are (from left) Byron Murphey (8300), John Pearce (8250), Hilt DeSelm (8200), and George Anderson (8330). A single-story structure of 15,000 square feet, the building will house laboratories for experimentation with tritium and its compounds. Construction is expected to be finished by July 1974.

Sesame St., Upper Level

First MS Via ETV Awarded



1971, Bob was recently awarded his MS degree in EE from the University of California at Davis. Course work was

Bob Tockey, supervisor of Test Projects Division 8412, is the first employee to receive a degree through Sandia/Livermore's education television center. Attending classes since the ETV center was established in the fall of

completed under Sandia's Educational Aids Program.

Bob is enthusiastic about television as an educational media. "I found it harder to get started," he comments, "but clearly, I'd do it again. You're competing with the younger on-campus graduate students, but we oldsters did OK."

"I concentrated in two areas — statistical communications theory and systems theory primarily through state space analysis. Neither of these was taught at the time of my undergraduate work some 19 years ago."

In Bob's opinion, "ETV is better than on-campus since you have neither the distractions of the classroom nor the commute to campus — the logistics penalty, as I call it. And there's the big advantage of replay if you miss a class. Any feeling of remoteness is more imagined than real. It took very little time for instructors on campus to recognize the students down here by voice, thanks to our talk-back link with the instructor. I don't believe completely 'canned' programs could ever be as effective as campus classes."

Bob joined Sandia in 1954 after gaining his BS degree from the University of Nebraska. He worked in electron tube development in Albuquerque and, in 1956, transferred to Livermore where, subsequently, he was promoted to supervisor of the nuclear support section. He was promoted to division supervisor in 1965.

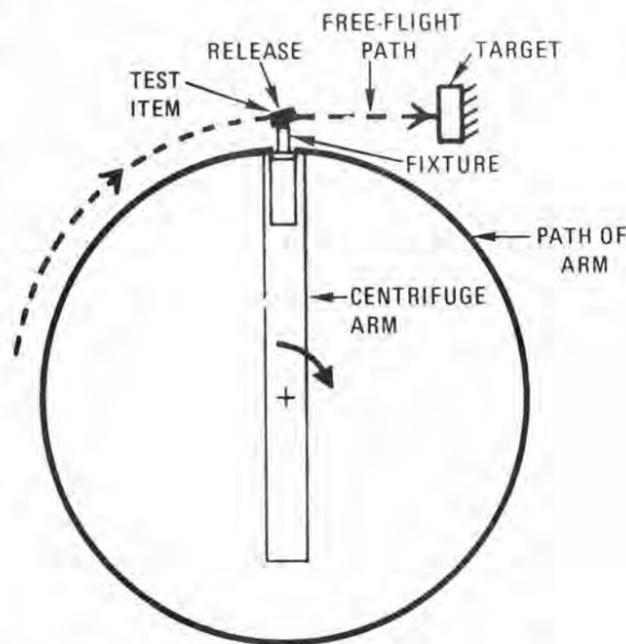
Tangential Velocity Used For Impact Testing

When David slew Goliath he used a sling, and the sling principle is now the basis of a new environmental testing technique which uses the tangential velocity of a centrifuge to impact test items into various targets. John Otts, head of Track Guns and Hydrodynamics Division 9333, developed the technique together with Don Fulton and L.D. Hubbard while working with the Centrifuge Division 9331. It is inexpensive and accurate, and impact velocities of 10 to 500 fps are repeatable within one percent.

The technique is employed on Sandia's 35.5-foot radius centrifuge, which is normally used to provide radial acceleration environments up to 250 G's. The centrifuge can support a static test weight of up to five tons and, under acceleration, an effective test weight of 450,000 G-pounds.

A cable holds the item being tested in a fixture at the end of the centrifuge arm. When the desired velocity is reached, the cable is severed by a guillotine cutter, releasing the item for a free flight into the stationary target. Trailing cables transmit impact data from transducers on the test item to the centrifuge, where signals are amplified and transmitted to tape recorders in a control room.

The test procedure may also be reversed



FREE-FLIGHT Impact Test Technique

— the target impacted into a test item — to eliminate the need for trailing cables.

More than 150 tests have thus far been conducted, impacting items ranging from 25 to 125 lbs. at 275 fps into a 20,000 lb. steel target.

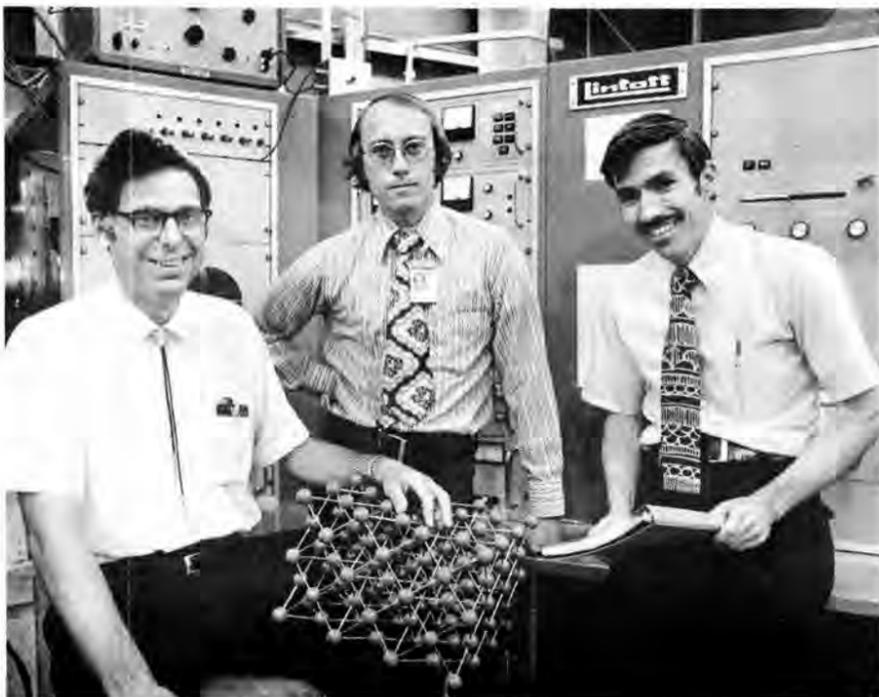
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Ion Beam Conference

effects including void production and ion beam studies of metal films will also be covered. "Over 60 abstracts from 10 different countries have been submitted for consideration," Tom says. "Forty-six were selected over and above the six invited talks. Approximately 125 participants are expected, and there will be particularly strong foreign representation from West Germany, England and France, where major research efforts are underway in this newly developing field."

Sandians presenting talks will be: G.J. Thomas (5522) and S.T. Picraux, "Sb Implanted Al Studies by Ion Backscattering and Electron Microscopy"; G.J. Thomas and

W. Bauer (8334), "High Temperature Helium Implantation of Nb, V, and Mo"; S.M. Myers and R.A. Langley (both 5111), "Implantation and Diffusion of Au in Be: Behavior During Annealing of a Low-Solubility Implant"; S.T. Picraux and F.L. Vook, "Lattice Location Studies of ^3D and ^3He in W"; J.A. Borders (5111) and J.N. Sweet (2431), "Ion Backscattering Study of WSi_2 Layer Growth in Sputtered W Contacts on Silicon"; and R.S. Blewer (2413), "Depth Distribution and Migration of Implanted Helium in Metal Foils Using Proton Backscattering." Proceedings will be published in book form by Plenum Press.



From left, Fred Vook (5110), Errol EerNisse (5112) and Tom Picraux (5111), organizers and co-chairmen of the ion beam conference being held in October. In the background is Sandia's new high flux ion implantation facility in Bldg. 884.

Speakers

H.S. Levine (5324), "A Theory for the Explosion of Zr Droplets During Combustion in Oxygen Atmospheres"; L.S. Nelson (5324), "Fragmentation Processes During the Combustion of Zirconium and Other Metal Droplets," National Bureau of Standards Seminar, July 5, Boulder, Colo.

R.R. Eaton, R.L. Fox (both 5643), and A.J. Russo (5642), "Two Dimensional Modeling of the Flow of Blast Debris from Underground Nuclear Tests," 9th International Shock Tube Symposium, July 16-19, Stanford Univ.

W.C. Burd (7624) and D.R. Morrison (UNM), "Lexicographic Correlation of Documents," Conference on Automatic Information Processing, July 16-20, Columbia, Mo.

L. Cooper (Aerotherm) and K. Putz (5628), "Generalized Ablative Flow in Gaps and Slots," Thermophysics Conference, July 17, New York City.

A.D. Swain (1642), "Shortcuts in Human Reliability Analysis," NATO Advanced Study Institute of Generic Techniques in Systems Reliability Assessment, July 17-27, University of Liverpool, England.

P.M. Richards (5132), "NMR Relaxation and Spin Correlations in One-Dimensional Antiferromagnets," Montana State University, One-Dimensional Physics Workshop, July 23 - Aug. 3, Bozeman.

J.C. King (2500) and H.H. Sander (2113), "Transient Change in Q and Frequency of AT-Cut Quartz Resonators Following Exposure to Pulse X-Rays"; J.M. McKenzie (2114) and L.J. Witt (2412), "Measurement of the Neutron Energy Dependence of Base Current Degradation"; F.N. Coppage (2115), "Experimental Neutron Damage Equivalences Utilizing Device Parameters"; B.D. Shafer and D.H. Habing (both 2114), "Room Temperature Annealing of Ionization Induced Damage in CMOS Circuits"; B.L. Gregory (2113) and B.D. Shafer (2114), "Latch-Up Studies in Silicon CMOS Integrated Circuits"; F.B. Brumley, D.C. Evans and D.L. Mangan (all 2115), "IEMP Studies of a Dielectric Filled Cavity: A Comparison of Experiment and Theory"; C.E. Barnes (5112), "Photoluminescence in Ion-Implanted CdTe"; G.W. Arnold (5112), "Ion Implantation Effects in Noncrystalline SiO_2 "; W. Beezhold and K.L. Brower (both 5112), "Electron Paramagnetic Resonance of the Lattice Damage in Boron-Implanted Intrinsic Silicon"; R.A. Burghard and C.W. Gwyn (both 2113), "Radiation Failure Modes in CMOS Integrated Circuits"; G.J. Lockwood (5226), J.A. Halbleib (5223), and G.H. Miller (5226), "Absolute Ionization Chamber Measurements of Electron Energy Deposition Profiles," IEEE Annual Conference on Nuclear and Space Radiation Effects, July 23-26, Logan, Utah.

J.M. Peek (5211), "Bethe-Born Theory for Ionization in Electron-Hydrogen Molecule Ion Collisions"; M.E. Riley (5211), "The Average Approximation in Semiclassical Close-Coupling Methods"; C.F. Melius, "Charge Transfer at Thermal Energies"; T.A. Green and M.M. Madsen (both 5211), "Electronic Eigenfunctions and Scattering Theory Matrix Elements for HeH^+ "; T.A. Green and M.E. Riley, "Strong Coupling Semiclassical Methods the Phase Corrected Average Approximation," International Conference of Physics of Electrons and Atomic Collisions, July 16-20, Belgrade, Yugoslavia.

A.L. Stevens (5133), "Wave Propagation, Spallation, and Post Impact Mechanical and Thermal Properties of Textured Beryllium," Hydrodynamic Working Group, July 19, LASL.

E.H. Beckner (5210), "Experimental and Numerical Studies of Pulsed Fusion Using Relativistic Electron Beams"; G. Yonas (5240), J.W. Poukey, J.R. Freeman, A.J. Toepfer, M.J. Clauser (all 5241), K.R. Prestwich (5245), and E.H. Beckner (5210), "High Current Density Electron Beam Application to Fusion Studies," European Conference on Controlled Fusion and Plasma Physics, July 30-Aug. 3, Moscow, USSR.

A.B. Donaldson (1543), "The Effect of Radiation Barriers on Heat Transfer Through Carbon Fiber Insulation," National Heat Transfer Conference, Aug. 5-8, Atlanta, Ga.

R.E. Palmer (5214), "Laser Fusion," May 11, Physics Department, University of Illinois.

M.L. Knotek (5155), "Fast Ion Transport in Solids," University of California Seminar, July 23, Riverside.

O.L. Wright (7220), "History of Sandia Base," July 6, Sandia Civitan Breakfast Club and July 26, Los Altos Kiwanis Club.

G.W. Hughes (9474), "The Metric System and the Citizen," July 13, Downtown Optimist Club.

T.F. Marker (6010), "The Invention Process," July 19, Duke City Exchange Club.

J.M. Hueter (3131), "Creativity"; D.L. Troy (3132), "Vocabulary Building"; C.S. Johnson (9421), "Scientific Quest for ESP," "Deceptive Use of 'Genuine Imitation' Truth in Arguments," and "Did They Understand What you Said?"; K.E. Lawson (5522), "Women in Professions," Toastmistress National Convention, July 23-25, Albuquerque.

Take Note

Sandians may enroll their pre-schoolers in the KAFB kindergarten and use the nursery services. Classes for 3½ to 4 year olds and 5 year olds will be starting soon. A schedule of services and fees is available from Mrs. Olga Borden, Bldg. T231, ext. 2795.

* * * *

Annual get-together for Sandia retirees is set for Thursday, Sept. 6, from 4 to 7 p.m. at the Coronado Club. Invitations have been mailed to some 1300 retirees and their spouses. President Morgan Sparks and Alan Pope (5600) will speak at the meeting.

Recreation Notes

FUN & GAMES

Here We Go Again — Couple of good ski trips are shaping up for January. Bob Neel (1531) is honcho on a Snowmass/Aspen trip Jan. 5 to 8, cost of \$108 includes room, bus trip, 4 days of lift tickets and continental breakfasts. Make reservations by Aug. 27 — that's next Monday. Don Schroeder (2442) is organizing a Sun Valley trip, Jan. 5 to 13. The \$150 includes bus transportation, 7 days of lift tickets and 7 nights lodging. Reservations (@ \$25) to Don by Sept. 4.

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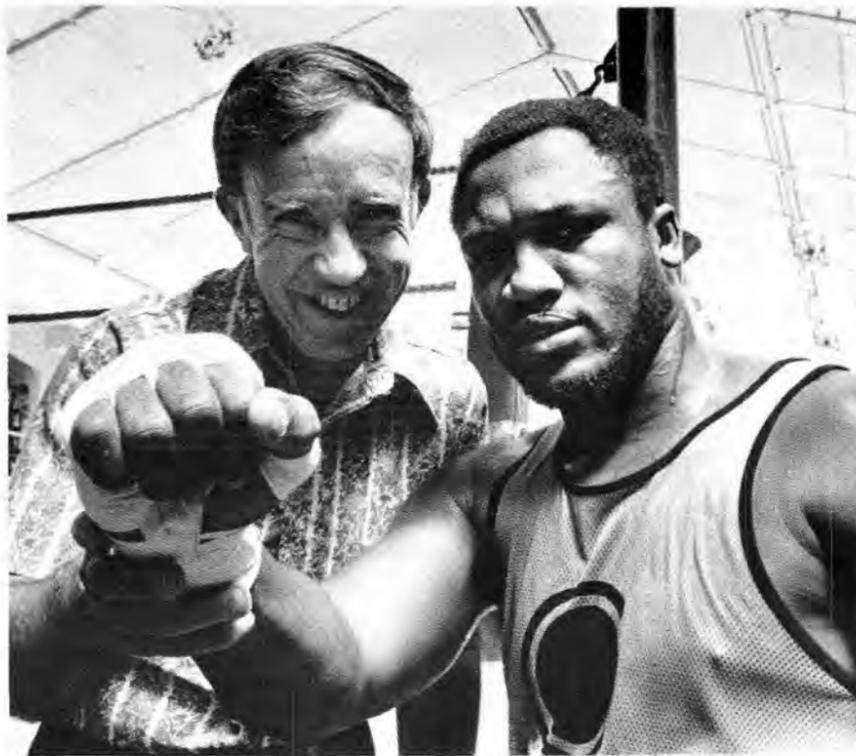
SGA — In the Par 3 Tournament held this month at Los Altos, Ann Michele (3100) was low gross, while retiree Rose Hainlen was runnerup. Lena Valerio (1111) took low net, and Emma Hollingsworth (4256) and Kathy Brady (2113) shared the runnerup position. Pat Chisholm (3141) and Alma Mischke (4152) tied for low putts.

* * * *

Sandia Bicycle Ass'n. — Tomorrow, Aug. 25, is officially proclaimed Albuquerque & Bernalillo Co. Bike Day. To mark the occasion another mass bike ride is planned, this time from Sandia High School (Candelaria and Pennsylvania NE) to the Rio Grande Zoo. It starts at 9 a.m., it's all downhill, it's easy and fun, and you'd just be sitting around anyway — so show up. On Aug. 26, there'll be a bike ride to Los Lunas; meet at 9 a.m. at Stadium and University SE. Then, on Labor Day weekend, Tom Mayer hopes a group of cyclists will be interested in a 2-3 day bike-cum-camping trip; call him by Aug. 28 if you're so inclined.

* * * *

Ultimate Macho — Rugby is a sporting contest, in a manner of speaking, that combines the worst — or best — elements of football and soccer. If you happen to have the ball, as many as 15 warriors from the opposing team may descend upon you in full cry. The season soon starts and there's a movement afoot to organize a KAFB team. Games will be held locally, usually with UNM, but out-of-towners also are planned. These are chiefly distinguished by the ingestion of incredible amounts of beer. Call Chuck Holmes (61-3062), Pat Bailey (61-2373), or Bob Hindy (61-2755) if you wish to be a party to this madness.



PAUL CHAVEZ usually works in Machine Shop Division 7145, but for the last few weeks he's been busy organizing and promoting the Foster-Fourie fight. En route he ran into this customer who, we are told, is friendly. Recognize him?

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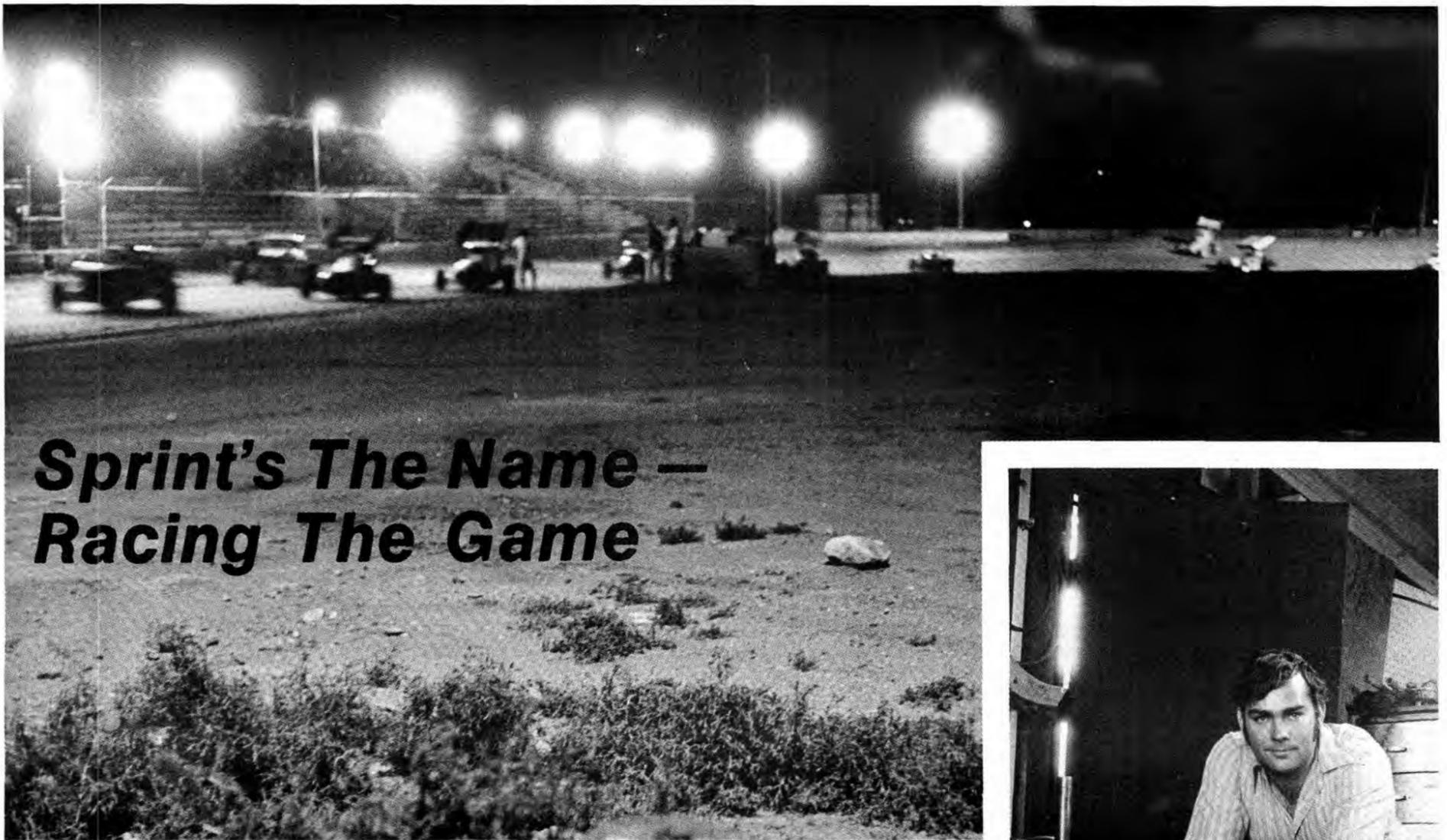


"YOUR LOS LUNAS and Belen members are going to like these," says Leo Sanchez, owner of Sanchez Charter Coach, to Bill Bristol, Credit Union manager. "Each pass is good for twenty rides plus the two free ones that Bob Martin (2115) over there talked me into. And I've taught driver Ray Behymer behind you how to punch the passes properly. Thanks for handling them, Bill."

* * * *



THESE SANDIANS have been in Honolulu attending the American Legion Convention, part of a delegation of 150 from Albuquerque. Bob Jaramillo (7133), Charlie Monroe (7554), Hermond Lacey (2122), and Shary Holmes (7222) are up front. In second row are Mike Zownir (7144), Sol Chavez (7146) and Flavio Gonzales (7221). All are members of the Drum and Bugle Corps.



Sprint's The Name — Racing The Game

Every Friday evening at sundown, a ritual is performed on an isolated stretch of the East Mesa. White-suited men, looking like acolytes of the ritual, hover concernedly over their charge, probing here, murmuring, listening closely. One speaks, another replies, litany-like. All is intense.

At a signal, the preliminaries cease. The acolytes withdraw and the high priest dons the trappings of his station. First he pulls a white stocking-like garment over his head. It covers all save his eyes. Finally, he inserts his head into a white plastic helmet that more than anything else resembles the headgear Sir Launcelot favored when he was having a tiff with the Black Knight. Gloves are pulled on and he stands ready to discharge the rites of his office.

This is the driver. Clambering into his race car through the network of roll bars somewhat approaches the difficulties the knight-in-armor must have had in mounting his horse. Finally in and seated, the driver is strapped in place by his attendants with an elaborate system of restraints. He and the car are ready to go.

A Sprint race car engine is a finely tuned contraption that produces four to five

hundred horsepower on a diet of nitro-methane fuel. Since the car weighs only 1800 pounds, and since the gear arrangement is starkly simple — either in gear or out — the speed spectrum may accurately be described as two-fold: fast and very fast. Once started, usually by a push, the Sprint car is much like a spirited race horse impatient in the starting gate. Snorting and bucking, it wants to go.

Sprint car races are a melée of ear-splitting noise, dust, spin-outs, startling acceleration down the short straightaways, and surprisingly few injuries. Technique is all, and the driver whose sole qualification is his heavy foot quickly discerns his inadequacy.

For whatever reason, Sandians partake of Sprint car racing in disproportionate numbers. Some 20 drive, or mechanic, or officiate. One almost expects to see that thunderbird against the background of Sandia blue booming around the track. We found Shawkeet Hindi's (3147) decoration of his Sprint car the most fanciful — along the side in both Arabic and English lettering the legend "The Flying Arab." Photos here show activity on a recent Friday night at Speedway Park. • js



TERRY OTERO (7134) is one of the half dozen or so owner/driver/mechanics from Sandia. Other Sandians participate as officials.



SPRINT CAR drivers and mechanics gaze intently at the opposition during a heat. Several heats are run before final 35-lap event.



SPRINT cars approach 70 to 80 mph in straightaway.

Letters to the Editor

On Buying American Automobiles

In response to H.C. McIlroy's letter (8/10/73) urging each citizen to invoke the Buy American Act when it comes to selecting the family car, I submit he identified only a symptom and not the true problem. I submit also that the switch to autos of foreign manufacture by the American public is the logical outgrowth of the continued inability of the American automobile industry to properly respond to the true needs and legitimate wishes of the American market.

At a time when each salaried person strives to receive a dollar's worth of product for each dollar paid, our own auto industry continues to offer ill-designed, partially assembled products. I have often thought the United Fruit Company could take lessons from Detroit on how to increase its lemon production.

Just when the nation is awakening to the perils of an energy crises, the latest American cars consume the greatest quantity of fuel.

During the same period that our citizens were being urged to ask what they could do for their country, the auto industry decided to react to one individual critic by hiring a private detective to investigate the critic's sex life. The one thing Mr. Nader is not, is a sex maniac.

In summary, the responsible American car buyer does not always buy a product just because it happens to be wrapped in red, white, and blue.

s/ John Williams - 4113

Mr. H.C. McIlroy raises a valid question: Can we afford foreign cars? (Lab News August 10, 1973.) In Colorado my family once made a good profit raising angora rabbits for their fine grade of fur. This profit dropped, then disappeared altogether with rising farm costs and a reduced market price for the fur. We were told that foreign growers produced quality fur at lower prices. We couldn't increase quality so we got out of the business.

Seems like this happened to the electronics industry. At first who would believe that Japanese electronics were superior to ours yet cost less? Only in computer technology do we still lead. I wonder, for how long? Italian shoes, Korean made boots and Taiwan made clothes are as good or better than many domestic makes, and Americans purchase all of these things in ever increasing numbers. American products are being run off the market, I believe, because of the reduced quality of our goods at a higher price.

As to the automobile. I want a consistent 25 miles of driving for one U.S. gallon. I hope the car steers and brakes well. I hope it has a little more room than a V.W. Bug. I get this now with a second hand foreign car. When Detroit builds one and I can get it second hand I'll again drive Detroit iron. If we all buy Detroit gas hogs that's all Detroit will build. The real question may be: Can we afford to buy American cars?

s/ Baron Brumley - 2115

P.S. Does Mr. McIlroy own: A transistor radio, a record player, hi-fi equipment or color T.V., foreign made clothes (check labels carefully), a Swedish typewriter, a Japanese motorcycle, Japanese binoculars, Japanese camera, or Japanese telescope?

P.P.S. Think the American way won't work? Consider Timex watches, a family owned corporation that has run out the foreign "cheap labor" products by substituting Yankee ingenuity!

BB



SERVING on Community Council board of directors are Tom Hoover (1514), Ed Domme (2632) and Luke Heilman (9500).

Our Town

Three Sandians Serve on Community Council Board

The Community Council of Albuquerque is the planning arm of the United Community Fund. Information gathering about Albuquerque's human needs — food, shelter, counseling, health, recreation — is perhaps the most important function of the Community Council's staff and 27-member board of directors.

Three Sandians — Luke Heilman (9500), Ed Domme (2632) and Tom Hoover (1514) — serve on the Council's board.

"In addition to surveying and determining needs," Luke says, "the Council catalogs the community's resources to fill them. This includes government agency services as well as the volunteer agencies of the UCF. Finally, this mass of data has to be evaluated and priorities established. A major effort along this line is culminating this month — the Council is publishing another community survey of health, welfare, recreation and related services with recommended priorities."

Another effort actively underway is a program evaluation of the 34 member agencies of the United Community Fund. Both Ed and Tom are involved in this effort which includes preparation of the questionnaire, followup interviews with agency officers and staffs, and evaluation of results.

"The 28-page questionnaire completed by each agency requires them to 'bare their soul' so to speak," Ed says. "We look at services, the numbers of people involved, the costs, the neighborhoods and areas served and the composition of the agency's board — does the agency serve the south valley, for instance, and its board members live in the heights? This survey is being conducted at the request of the UCF board to evaluate agency programs. Times continually change, needs vary and the people who make decisions need information."

Tom Hoover is one of the men who make decisions. As a state legislator (Republican, District 27, nine years) Tom finds the data generated by the Council invaluable in relating the city's needs to state programs.

The Council also initiates action, helping to organize the resources of the community to meet a demanding need.

Several years ago, the alcoholics problem in Albuquerque was a nightmare. The courts were full of people with a problem, a continuing problem, and no adequate facilities existed to help.

Through the efforts of the Community Council, funds from a number of sources — city, county, state, federal, volunteer contributions — an Alcoholic Treatment Center was established at St. Joseph's Hospital. The Center now treats 5000 patients a year, and it has evolved into part of GATE (General Addictions Treatment Effort). GATE operates on a \$1.6 million budget and is effectively treating both alcohol and drug addiction.

Continuing functions of the Council include:

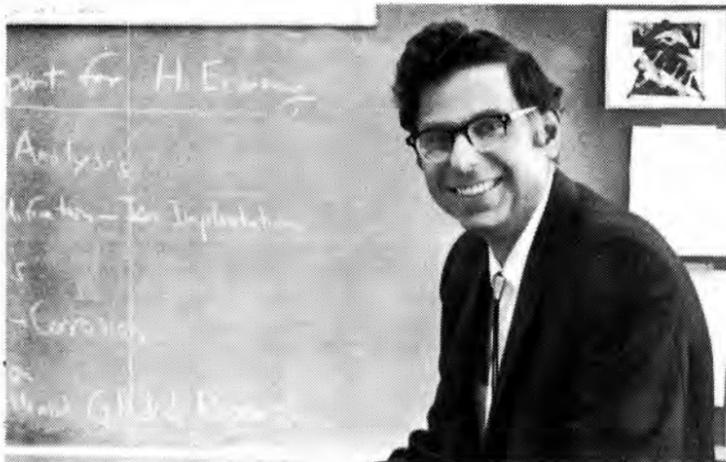
—Publishing the Directory of Community Services, a listing of health, welfare, manpower training, educational, recreational and related services in Albuquerque with names, addresses, phone numbers.

—Central Information Service. Call 842-0180 if you have questions regarding any health or welfare service in the city.

—Voluntary Action Center. Matches volunteers with agencies that can use their talents. Also, during the Christmas season, the Council provides names of needy families.

—Continuous consultation with private and voluntary agencies, governmental bodies and individuals working in the fields of health and welfare.

—Educational efforts to stimulate and involve citizens in meeting community needs.



Fred Vook - 5110

15



Paul Bahr - 2317

20

MILEPOSTS

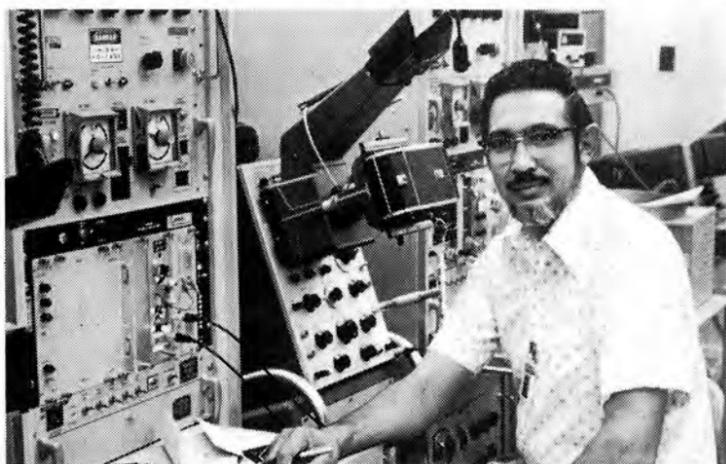
LAB NEWS

August 1973



James Craig - 2514

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Wm. A. Sanchez - 7134

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Charles Nidever - 2442

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Charles Dunn - 7517

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Theodore Bryant - 2411

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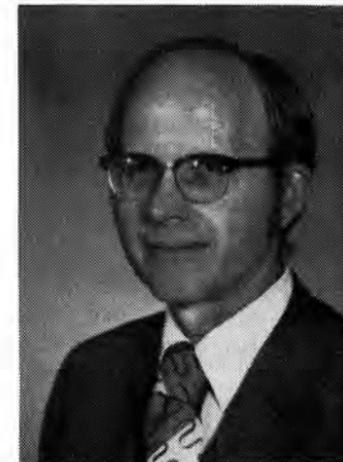
Howard Viney - 1130

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Andrew Myers - 7146

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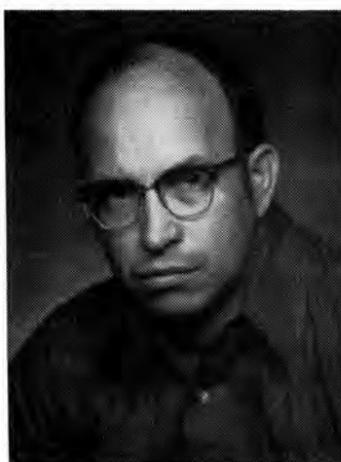
William Jemison - 2342

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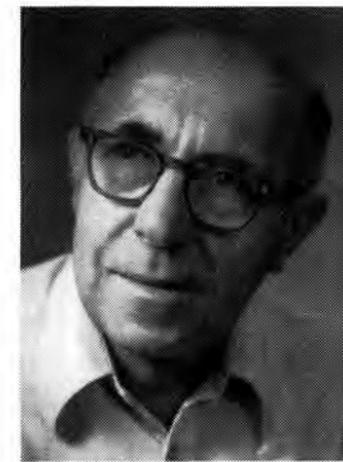
Merrill Jones - 9531

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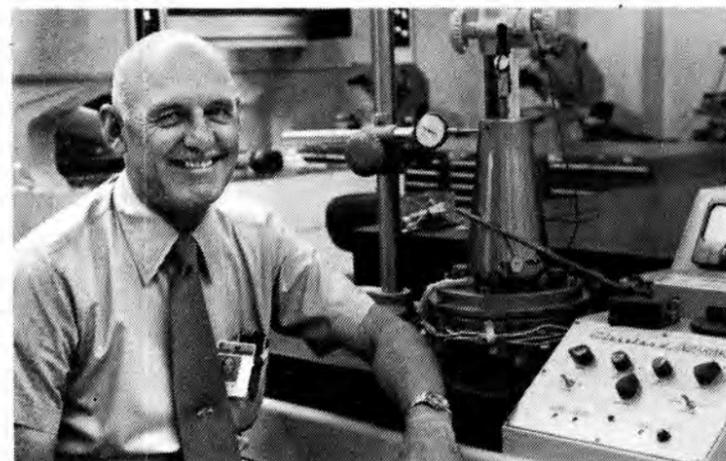
Dale Hill - 7611

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Chet Tarne - 8183

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Harold Riley - 7113

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Al Harrison - 8257

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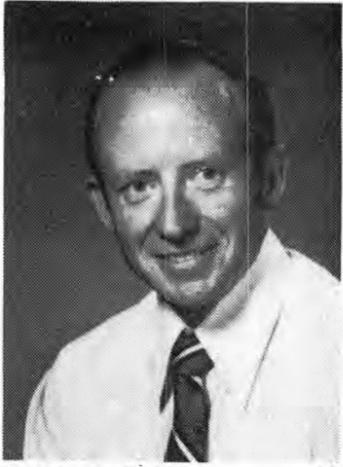
Norm Toly - 8431

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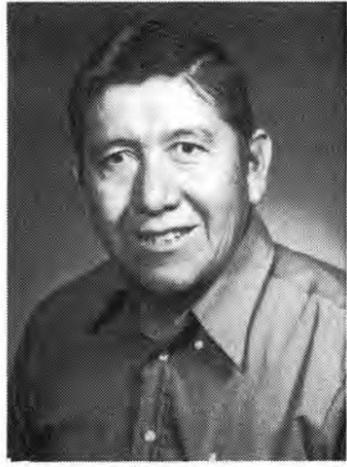


Charles Grassham - 9342

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Paul Jesse - 7111 15



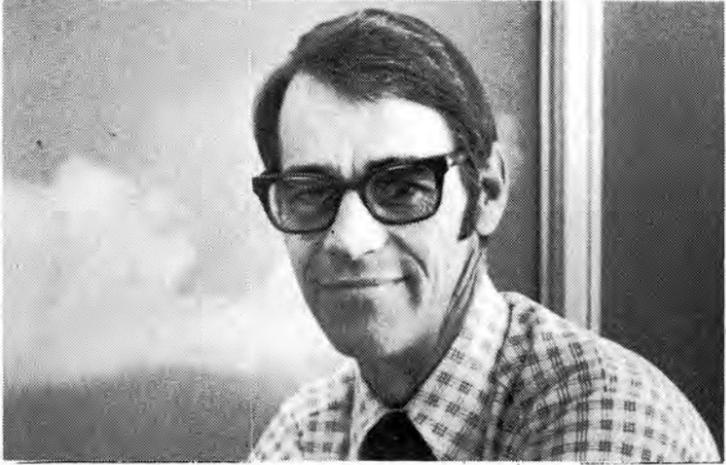
Robert Lefever - 5154 10



Patricio Lerma - 7518 20



Jim Uhl - 5114 15



Merril Robinson - 2415 20



Timothy Ristine - 7624 10



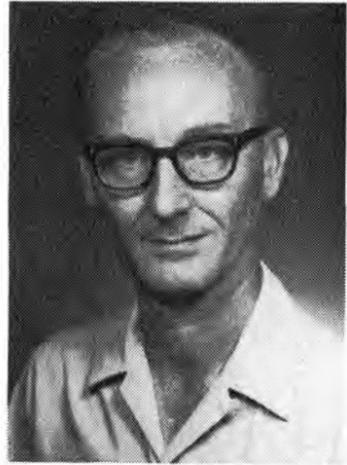
Robert Courtney - 5511 10



O. B. Tjeltweed - 1536 20



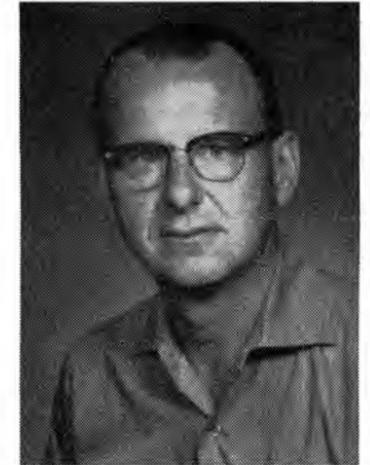
Homer Wilhelm - 7518 25



Robert Hughes - 2441 15



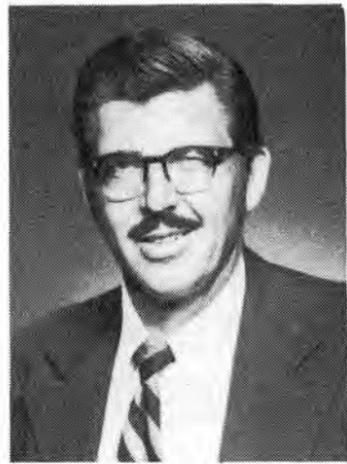
Mike Heck - 2326 10



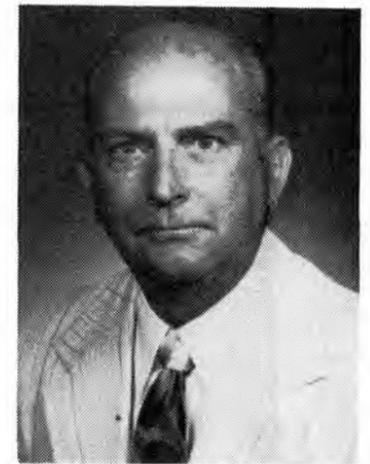
Robert Jeffrey - 1231 20



Lloyd Alpaugh - 3151 15



Thomas Hill - 1553 20



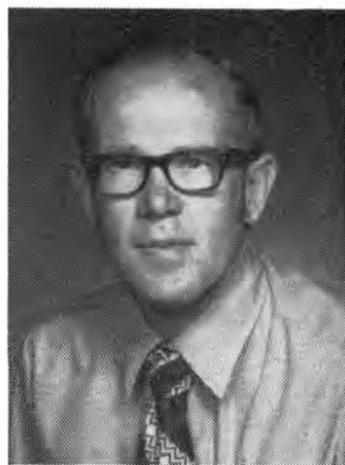
John Piper - 5725 25



C. A. Lowry, Jr. - 9532 25



David Paschall - 5532 15



C. B. Stillwell - 4753 20



Gordon Boettcher - 2414 20

LABS Engineer Named VP/SME



Ed Roth of Exploratory Projects Division 5712 has been elected International Vice President of the Society of Manufacturing Engineers. Ed has been a member of SME's Board of Directors since 1969, served as national Secretary in 1971, and as National Treasurer in 1972. His specialty is tolerancing, tooling, gaging and inspection, and he has written numerous papers on these subjects.

He was 1966 recipient of the SME Gold Medal award for outstanding technical publications. He has written two books, *Functional Gaging*, and *Functional Inspection* and has contributed to *Fundamentals of Tool Design* and *The Tool and Manufacturing Engineer's Handbook*.

The new VP will help direct the international activities of SME, which now has more than 40,000 members in 40 countries. Purpose of the Society is to advance scientific knowledge and increase productivity in the field of manufacturing engineering, and to apply its resources to research and to the publication of information relating to manufacturing engineering.

Ed is a Registered Professional Engineer and a Certified Manufacturing Engineer. He is a member of SME's Albuquerque Chapter 93.

Continued from Page One

New Solid State Lab

processing, are made of ultrahigh purity quartz; the aluminum that's used for the final metallic coating is the purest that can be purchased, 99.9999 percent pure; and everywhere you see a pipe or tube coming into the room (it's totally self-contained), you see a filter capable of screening out impurities down to the 0.5 or 0.2 micron level (depending on the liquid or gas being filtered).

An eight-tube diffusion furnace, capable of sustaining a $1000^{\circ}\text{C} + \frac{1}{4}^{\circ}$ temperature over a 20-inch length, dominates the room. It's kept clean too; the high purity quartz process tubes are flushed with hydrogen chloride gas on a regular schedule.

* * * *

The lab permits fabrication, from wafer through final assembly, of prototypes of the most sophisticated kinds of semiconductors. Sandia thus gains knowledge of what is needed when specifications for a semiconductor are being drafted. The limited staff is an asset; unlike industry, where one person is limited to a single process step, both Doug and Bill understand the entire processing sequence.

"We urge Sandians with semiconductor problems to get in touch with us," says Bill. "We can offer processing and design help both in what can be done in industry and in our own process lab — then when it's time to order commercially, we'll be able to show how it's done." • bh

Transportation Committee

Instead of Talk About Smog — A Plan of Action



Hawkinson



Vandevender



Thacher



Bader



Winblad

"You start off with a simple premise. From the standpoint of smog the city's going to hell in a handbasket. And I don't know a single Albuquerquean who doesn't deplore this. So this group of Sandians has been getting together once a week during their lunch hour to develop a program under which Sandia and its employees can, working together, take effective action to reduce pollution. By reducing pollution, you also work on the related problems of energy consumption and traffic congestion."

Al Winblad (4732) is the speaker, and the other people on the pretty much self-appointed Labs Transportation Committee are Ben Bader (1537), Bruce Hawkinson (3162), Phil Thacher (9532), and Sharla Vandevender (4732). Working since last October, the group has developed (and, in some cases, implemented) a number of recommendations, some obvious, some not so obvious. Among them:

- better bus service. Already the number of Sandia specials has gone from two to six. They can now load and unload in the Tech Area, and shuttle buses are providing service between Areas I and III/V.
- rewarding car poolers. The most recent incentive here is the reserving of good parking areas for car poolers.
- encouragement of non-vehicular modes of commuting — bicycling and walking.

Management support for the Transportation Committee's work has been strong and positive. Sandia Labs as a corporate citizen of Albuquerque wants a clean environment. Morgan Sparks has this to say on the subject:

"The President's Energy Message of June 29 directs all government agencies — and Sandia qualifies in this case — to reduce energy consumption by 7% this fiscal year. The same directive asked all of us as citizens to reduce our energy consumption by 5%. Sandia will encourage such reductions both on the corporate and the citizen level.

"But even without the prodding of the Presidential directive, I feel that reducing fuel usage — and the reduction of air pollution that accompanies it — are worthwhile objectives which deserve Sandia support and encouragement."

The Transportation Committee plans a new car pool service for matching drivers and riders, more bus routes, the development of easier and safer commuter routes for bikers, and maybe even the development of incentives for walkers. It's an action-oriented group. Bruce, the group's chairman, notes: "We're working in a complex area with many social implications, but it's clear that Sandia can and should take steps to reduce our own 80% lone ranger figure. I see no reason why we should not serve as a model to other employers in the area. We intend to move ahead, and we welcome the ideas of our fellow Sandians on this subject."

Authors

G.A. Carlson (5323) and K.W. Henry (8314), "Technique for Studying Dynamic Tensile Failure in Liquids: Application to Glycerol," Vol. 44, No. 5, JOURNAL OF APPLIED PHYSICS.

J. Chang, D.W. Swain and L.P. Mix (all 5242), "Time-Resolved Measurement of an Electron-Beam Distribution Function," Vol. 44, No. 5, JOURNAL OF APPLIED PHYSICS.

C.W. Harrison, Jr. (2126) and D.C. Chang, "Compatibility of Annular Slot Receiving Antenna Theories," Vol. EMC-15, No. 2, IEEE Transactions on Electromagnetic Compatibility.

L.S. Nelson and N.R. Richardson (both 5324), et al,

"Effects of Oxygen and Argon Atmospheres on Pendant Drops of Aluminum Oxide Melted with Carbon Dioxide Laser Radiation," Vol. 5, No. 2, HIGH TEMPERATURE SCIENCE.

J.N. Olsen (5213), G.W. Kuswa (5242) and E.D. Jones (5214), "Ion-Expansion Energy Spectra Correlated to Laser Plasma Parameters," Vol. 44, No. 5, JOURNAL OF APPLIED PHYSICS.

B. Stiefeld (9351), "A Strategy for the Use of a Minicomputer-Based Test System as a General-Purpose NDE Laboratory Tool," Vol. 31, No. 6, MATERIALS EVALUATION.

M.R. Scott (2642), "A Method for Obtaining Bounds on Eigenvalues and Eigenfunctions by Solving Non-Homogeneous Integral Equations," Vol. 10 (1972), pp 9-22, COMPUTING.

J.G. Fossum (2112), "A Bipolar Device Modeling Technique Applicable to Computer-Aided Circuit Analysis and Design," Vol. ED-20, No. 6, IEEE Transactions on ELECTRON DEVICES.

S.M. Myers (5111) and A. Narath (5000), "Pulsed-Nuclear-Magnetic-Resonance Study of GdP, LaP:Gd, and LuP:Gd: Dynamics of a Heisenberg Paramagnet," Vol. 7, No. 11, PHYSICAL REVIEW B.

S.T. Picraux (5111), "Disorder Annealing in III-V Semiconductors After Ion Implantation at Low Temperatures," Vol. 17, Nos. 3-4, RADIATION EFFECTS.

G.D. Simmons (5120), "A Generalized Converse to a Lemma of L. Lovasz," Vol. 24, Nos. 1-2, ACTA MATHEMATICA.

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

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Deadline: Friday noon prior to week of publication unless changed by holiday.
A maximum of 125 ads will be accepted for each issue.

RULES

1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Laboratories and AEC 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

14' BOAT, 35hp motor & trailer, heavy duty tilt trailer, windshield, boat cover, elect. start, skis, etc. \$625. Perryman, 294-7040.

'72 MOBILE HOME, 14x60, large 2 bdrm., all appliances, extras, near Base, Wyoming SE. McClure, 294-1912.

'72 MOBILE HOME, 12x52, 2 bdrm., appliances, \$1350 down & assume existing payments at \$68 per month. Thomas, 298-0961.

MAPLE BDRM SUITE, double dresser w/wood framed mirror, twin beds can be bunked, ladder & guard rail, mattresses, box springs, \$145. Brown, 296-1121.

8' HYDROPLANE, homemade, \$50; 20hp Mercury outboard, \$60; 9x12 tent used once, \$70; folding playpen, \$4. Falacy, 344-9548.

ARISTOCRAT Lo-Liner 15' furnace, spare tire; bowling ball, bag, shoes. Rakoczy, 256-0433.

OMEGA D2V enlarger, \$275 w/lens; Super-8 sound camera & recorder, \$225; 2 Super-8 movie cameras: \$250 & \$200; 3 electronic flashes: \$25, \$30 & \$80. Berman, 296-5640.

TAPPAN electric range w/eye level oven, base cabinet, \$50. Campbell, 268-8445.

HUNTING BOW, 46 lb., left handed, w/sight, alum. handle, tuned, tested, guaranteed for year. Stevens, 299-6086.

MOVING SALE, Aug. 25-Sept. 6 p.m., bed, sofa, power mower, chandelier, refrigerator, freezer, dryer, etc. Lauger, 296-3197.

TRAVEL TRAILER, 14', elec. brakes, axle skids, jacks, 2 spares, radio, butane stove, oven, light, 110v & 12v lights. Harty, 877-0291.

FIGURE ICE SKATES, Sears insulated, lady's white, man's black, both size 9, used six times. \$5 each. Larsen, 296-0327.

RABBITS, fryers & does. Robinson, 296-2753.

RANGE HOOD, fan, Miami-Carey, 30", white, \$13; oak library table, 28x42", \$60; 5-ft. shelf, \$20. Dolphin, 265-4029.

BRAIDED RUG, dark blue. Rivera, 268-3627.

21" COLOR TV, Beagle puppies,

undercounter dishwasher, baby crib, walnut coffee table. Chandler, 296-3323.

SLIDE PROJECTOR, \$25; recliner, \$10; modern wall clock, \$10; baby car seat, \$10; boy's baby clothes. Yanez, 296-0804.

SHOT SHELL reloading equipment & supplies, cheap. Baxter, 1610 Bayita Lane NW, 344-7601.

BABY CLOTHES, girl's age 6-18 mos., diaper bag, pail, curtain stretcher, 35mm Omega enlarger, misc. photo equipment. James, 294-6837.

BUNDY FLUTE, \$100; new 3-ft. prehung exterior door, \$25; '64 Saab. Workhoven, 281-3246.

WOOD LATHE, 12" Craftsman w/tools, \$90. Eaves, 11500 Tomasita Ct. NE.

RIFLE, Marlin lever action, model 336A, cal. 35 Rem. recoil pad, checkered, Lyman peep sight & case, \$80. Lisotto, 298-6211.

CAMPER, 8' cabover, slide-in, self-contained, \$850. Parker, 299-1485.

WHEEL CHAIR, collapsible, adj. arms & legs, reclining back, chrome plated, \$200. Baczek 255-3429.

STUDENT CLARINET, case, music stand, \$50. Schuster, 255-5970.

TRUNK, 32x18x20, w/lift out tray. Rowe, 296-6295.

VARIETY of household furnishings & appliances, rock bottom prices. Mattina, 299-7060.

BED w/mattress, 65" long, for child to age 10, underneath storage space, \$25. Beatty, 299-3429.

REMINGTON 30.06 bolt action rifle, used one season, \$85. Marquez, 344-4771.

KWIK 8' raise-up camper, stove, ice box, water tank, sleeps two, \$425. Will trade for trailer camper or small car. Lackey, 898-5175.

TRUMPET, Olds Ambassador, \$75. Anderson, 299-5447.

ENCYCLOPEDIA Britannica, '59 edition, yearbooks through '65. Hock, 256-0276.

VIOLIN, 3/4 size, used 2 semesters, \$45. Voss, 294-8057.

MUNTZ COLOR TV, 21" w/stereo record player & radio, \$300. Baldonado, 264-7469.

MINOLTA 16mm camera, auto exposure, \$15; Scott LK48B stereo amplifier, 48 watts, \$50. Eagan, 299-9630.

STANLEY 4" industrial belt sander, \$100. Kjeldgaard, 296-2212 after 5:30.

SCUBA tank, backpack, US divers regulator, \$100. '66 Suzuki 150cc road twin, \$240. Carlson, 299-6610.

POODLES, born 8/2/73, can adopt 9/15, miniature blue mother, toy silver father, show quality, AKC. Leenhouts, 299-7856.

REFRIGERATORS, both work,

\$25 each. Benedict, 2936 Santa Clara SE, 255-6637.

FIFTY DOLLAR gift certificate for Mitchell camper parts, \$35; jr. golf club set, \$20; western saddle, \$125. Harley, 898-0594.

CLARINET, B-flat Buffet Evette model, \$90. Sinnott, 299-1300.

DISHWASHER, portable; 3-speed bike. Gabaldon, 266-0028.

'69 CAMPER, 8' kit, blue & gold interior, \$900. Zimmerman, 898-0452.

PARROT, half moon, 3 years old, cylindrical cage, \$25. Barnaby, 265-4353.

FRENCH HORN, Olds Ambassador, ancient but good, \$150. Plumlee, 281-3224.

LARGE WOODEN BAR, \$30. Pearlman, 299-8032 after 5:30.

BOAT FORM, hull form for 14', New Zealand designed, lightweight, high perf catamaran. York, 265-1601.

FIFTH WHEEL Mitchell trailer, 26', AC, TV, self-contained, \$5000; '71 Ford pickup available. Runyan, 255-6719.

TRANSPORTATION

'71 CHEVELLE SS, 454 V8, 4-speed, air, 8-track, AM radio, low mileage, below book. LeRoy, 296-2953.

'69 LOTUS Europa, yellow, 33,000 miles. Abel, 296-6089.

STREET ROD, '23 Model T bucket, 283 Chevy engine, AT, white vinyl top, \$1200. Aragon, 266-5168.

'65 TR4, new top, recent V&R, good tires, paint. Smith, 296-3342.

'65 RAMBLER American, 4-dr. 6 cyl., standard shift, \$225. Perea, 255-6902.

'65 PONTIAC GTO, 2-dr. hardtop, 3-speed Hurst shifter, bucket seats. Piraino, 255-5126, evenings.

'70 HONDA 350 CB, adult ridden, 2 Bell helmets, \$500. Calvelage, 298-1560.

'68 AMBASSADOR 2-dr. hardtop, PS, PB, AT, AC, \$850. Tucker, 344-9228.

'68 HONDA CB350, street model, adult owned and ridden, 13,500 miles, luggage rack incl., \$395. Schkade, 293-7453.

'71 HONDA 350 SL, 5000 miles, best offer over \$325; '69 Dodge Polara, PS, AT, AC, 380 CID, 54,000 miles, \$1150. McCampbell, 298-8211.

OLDS Cutlass S. 1970, 2 dr, PB, PS, factory air, 16,000 miles, \$2450. Kepler, 298-5652.

LAND ROVER, 4wd, winch, full cab, dbl roof, radio, heater, 1966, \$1675. Donaldson, 255-4024.

BIKE, boy's Schwinn 2-spd, \$15; skis, 2 pr. Head 360's, 210 and 180 cm, no bindings, \$35 each pr.; portable typewriter, Royal, \$15. Reynolds, 299-5157.

26" GIRL'S bike w/thorn-res tubes, \$18. Wyant, 298-0371.

'73 YAMAHA Enduro Street and trail. Deely, 344-5486.

'69 CHEV. pickup, 1/2-ton, under warranty, below NADA at \$1595. Tucker, 877-1140.

'66 DUCATI, 250cc Scrambler, new tires, asking \$190. Butler, 296-8095.

'70 HONDA SL-100, 2600 miles, \$285. Hawn, 299-7835.

'68 OLDS Vistacruiser wagon, AC, PS, PB, new radials, one owner, \$1300. Stirbis, 299-5363.

'68 FORD F-100, 8 cyl, Styleside 6-1/2' AT, new tires, \$900. Harrison, 296-7880.

SCHWINN Varsity 10-spd man's bike, 27", chrome fenders, upright handlebars, \$90. Garrison, 256-7267.

'72 HODAKA Super Rat MX, \$380. Smaller, 299-8413.

'73 PEUGEOT Prio 10-spd 23" bike, sew up tires, \$175 incl \$15 chain & lock. Ryan, 299-5433.

KAWASAKI cycle, 175E, 2700 miles, \$415 w/ helmet. Snyder, 266-3198 after 6.

'63 PONTIAC Tempest, cheap; Penney's auto AC, \$85. Ericksen, 898-2208.

'71 HONDA, 125cc ST, \$400. Henry, 256-9567.

'63 DODGE Dart, 225 CID, 6-cyl, AT, AC, \$300. Wriggle, 298-2264.

'65 HARLEY Sportster XLCH, \$1500 invested, asking \$1000. Weatherbee, 869-2849.

'71 VW Bus, new tires, headers, AM/FM radio w/rear speakers, camper bed, maint. record available, \$2195. Kohut, 298-0695.

'63 VW Bug, \$390; camper cabover, pop-up top, 7' long, sleeps 3, \$900; Heathkit boonie bike, \$50. Beasley, 298-3398.

LADY'S bike, 26", 3-spd, \$35; typewriter, 711 Remington elect office compact, \$150. Mancuso, 299-4279.

'64 JEEP Wagoneer, 4wd, needs trans work, \$600 or best offer. Benedict, 255-6637, 2936 Santa Clara SE.

REAL ESTATE

CABIN in Manzanos, 45 mins. furnished, knotty pine int. fp, well, fenced, 1/2 acre. low down payment. Arnold, 898-1467.

2.59 ACRES wooded mountainside near Chama, view, good investment for vac home, make offer. McAtee, 298-7725.

'73 DODGE MOTORHOME, all extras, daily and weekly rates, winter rates after Sept. 1, 20% off. Fox, 266-6606 or 299-5736.

3-BDRM house, NE Heights,

close to schools, \$160/month, first and last plus \$100, available Sept. 1. Shaut, 299-8569.

LARGE 2-BDRM furnished, AC, near base, pets, \$135 plus lights, lawned enclosed area. Aragon, 266-8597.

3-BDRM house, NE, new carpet, stove, ref, AC, patio, walled yard, \$175, first and last plus \$50 DD. VanderLaan, 255-3093.

OR LEASE, two acres gardening land. Pino, 242-9553.

FOR LEASE, 4 bdrm, 3-bath home in 4-Hills, dbl garage, fp, den, carpeted, no pets, \$350/month, dep. req. Smith, 298-7365.

WANTED

USED SEWING machine, any kind in good condition at reasonable price for charity project. Bontrager, 281-3427 after 6.

CHAIN LINK fence, prefer 72" high, walk-thru gate & post for same, concrete blocks 8 X 6 X 16. Gholson, 299-2663.

PERSON to do light housework weekends. Strascina, 298-8189 after 5.

WOODWORKER to rebuild roof supports in Model A. Davidson, 766-7432.

MATURE FEMALE German Shepherd for good home in mountains. Souder, 281-3121.

15" WHEELS, 5 each, GM 5-hole bolt pattern. Baxter, 344-7601.

SOMEONE to work on Go-Kart. Walsh, 344-3771.

PINT and/or half pint canning jars. Houston, 255-4658.

'71 OR '72 Toyota or Datsun station wagon. Roth, 877-4997.

WORK WANTED

RETIRED employee desires clientele for auto tune-up maintenance at your home, 40 yrs. exp., satisfaction guaranteed. Hayes, 299-1200 for appointment.

BABYSITTING, dependable, experienced, good with infants. Tami, 299-1048.

QUALIFIED high school student teaching piano for \$1.50/half hour, references. Halbleib, 296-2682.

LOST AND FOUND

LOST — key ring w/approx 10 keys, Sandia Credit Union disk att; man's wire frame sunglasses; personalized checkbook; man's sunglasses, black. LOST AND FOUND, 264-3441, Bldg. 832.

FOUND — Lady's black umbrella; man's Timex watch; Rx sunglasses, brown frames. LOST AND FOUND, 264-3441, Bldg. 832.

Western Barbeque Tomorrow

HAPPY HOURS — Tonight, oriental food will be spread for the buffet, Paul Plus Two will be on the bandstand, and Yolanda Adent entertains in the main lounge. On Friday, Aug. 31, French food tops the buffet, the Four Keys play for dancing while Barbara Clark holds the main lounge. On Sept. 7, the menu is German food, Ernie and the Saints make the happy music, and Denny Gallegos plays the main lounge.

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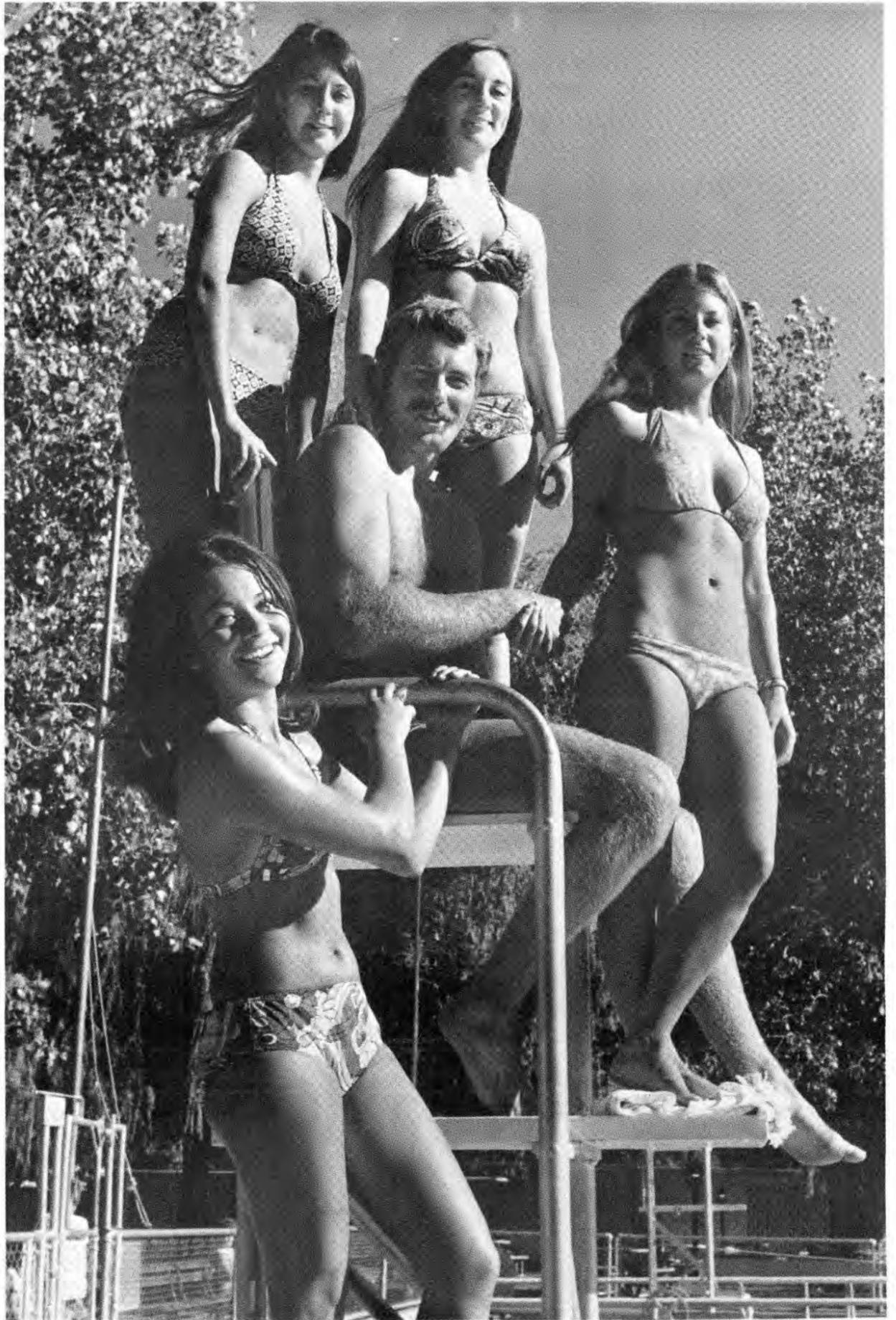
TOMORROW NIGHT the patio area will be swinging as Adler and Sinclair sing and Club Manager Jim Schultz spreads a western barbeque. Later, the Country Road will play for dancing in the ballroom.

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TRAVEL NEWS — Enthusiasm is building for the Club's Caribbean Cruise set Jan 4-11, 1974. It will work this way: Fly DC8 jet from Albuquerque to San Juan, Puerto Rico, and there board the RHMS Amerikanis and cruise in luxury to La Guaira (port of Caracas, Venezuela), Grenada, Barbados, Guadeloupe, St. Thomas and back to San Juan to fly home.

The package includes inflight meals and beverages, three gourmet meals plus midnight buffet daily aboard ship, topnotch entertainment on board, sightseeing and a luncheon in San Juan and round trip transfers between airport and ship in San Juan.

The trip is open to members and guests. Prices start at \$503 per person (double occupancy) depending on cabin choice. Final payment is due Oct. 5. The trip is limited to 150 persons.



LIFEGUARD Buddy Mynett hates to see the end of swim season but all good things end sometime. Closing of the Club's triple pools will be observed with an all-day party on Labor Day, Sept. 3. Happy Hour prices will be in effect from 11 a.m., and the Albuquerque Parks and Recreation Band will present a concert on the patio from 1 to 4 p.m. Clockwise from lower left are Dorothy Sanchez (AEC), Joyce Sanchez (4711), Yvonne Sandoval (7324) and Kathy Pogna (AEC). Buddy's the one with the mustache.



**BIKES
NEED BRAKES
TOO....** 

Events Calendar

Aug. 24-26, Aug. 31-Sept. 1 — Albuquerque Civic Light Opera, "Sweet Charity," Popejoy Hall, 8:15 p.m. (Also Aug. 26, 2:15 p.m.)
Aug. 24-26 — "Everything in the Garden," Corrales Adobe Theater, 8:30 p.m.
Aug. 24-26 — "A Shot in the Dark," Old Town Studio, 8 p.m.
Aug. 25 — N.M. Mt. Club, map reading class, bring USGC Quad Tijeras, ruler, pencil; meet Blue Cross, 8 a.m.
Aug. 26 — N.M. Mt. Club, Capillo Pk, 6 miles, Western Skies, 8 a.m.
Aug. 26 — "Wozzeck," KHFM Opera of the Week, 6:40 p.m.

Aug. 28 — San Augustin Fiesta, Isleta Pueblo.
Aug. 31-Sept. 3 — Fiesta de Santa Fe.
Sept. 1-3 — N.M. Mt. Club, backpack to Rio Grande Pyramid peak, call Gary on 266-9544 by Aug. 29 for reservations.
Sept. 2 — San Esteban Fiesta, Harvest Dance, Acoma Pueblo.

A FEW SEATS are still open on both Mazatlan trips as a result of last minute cancellations. If you are interested in either trip — Nov. 5-12 or Nov. 12-19 — call the Club office (265-6791) immediately. Cost of the super package is \$216 (double occupancy).