

QUALITY IMPROVEMENT AWARDS — Ten Sandians were recently recognized for their contributions to improving the quality of weapons work within the DOE development and production complex. Award recipients and others participating in the ceremony at the Technology Transfer Center were (front row, from left) Ralph Fox (5113); Bob Hymer, assistant manager of the Office of Development and Produc-

tion at DOE's Albuquerque Operations Office, who presented the awards; Dick Prairie (7220); Sandia President Irwin Welber; T. J. Williams, Jr. (2361); Jim Culpepper, Deputy Manager of DOE's Albuquerque Operations Office; Charles Tapp (5140); and Don McCoy (5111). In back row: Dave McCarthy (2526), Norm Baker (5122), Jerry Smith (2564), Paul Wilcox (2515), and Ed Hart (2513).

DOE Quality Improvement Awards

Sandians Cited for Outstanding Contributions to Quality

Ten SNLA employees recently received DOE Quality Improvement Awards for their contributions to improved quality in the weapon program.

Award winners were named following a rigorous selection process in which the production plants nominated people from their own ranks and from laboratories that participated in their programs. Plant managers screened the nominations and submitted their selections to DOE for further screening. DOE made final selections, and itself made nominations. Fewer than half of those nominated were selected for awards.

The awards were presented by Bob Hymer, assistant manager of the Office of Development and Production at DOE's Albuquerque Operations Office, during a ceremony at the Technology Transfer Center.

The ten SNLA employees:

DICK PRAIRIE (7220), nominated by Allied-Signal's Kansas City Plant for his proposal for a new approach to acceptance testing and sampling and for his use of statistical analysis as a management tool.

Because the new approach to acceptance testing and sampling proposed by Dick promises fewer scrap parts, shorter flow time, and better characterization of outgoing quality, it is being implemented for the W88 warhead for the Trident II missile and other program components.

Dick has long promoted the intelligent use of statistical analysis, a method of examining the variability exhibited by all products and processes to determine whether a variation is a signal that some-

thing is wrong, or is simply part of the expected variation.

PAUL WILCOX (2515), nominated by Monsanto Research Corporation's Mound Plant for his role in discovering why a spin rocket motor on the B83 bomb failed during lot qualification testing and fostering cooperation between the Labs and the production plant to resolve the problem.

By taking a broad view of the problem, Paul was able to assess the requirements and constraints of "next users." He also provided a perspective that

enabled the investigating team to demonstrate the probable cause of the failure and incorporate improvements to reduce its recurrence.

Paul has been a key player in the development of pyrotechnic products and places great emphasis on producibility in the design stages.

ED HART (2513), nominated by Monsanto Research Corporation's Mound Plant for sponsoring the retrofit of W76 and W78 timers with new detonators and for encouraging interaction between the

(Continued on Page Eight)



LAB NEWS

VOL. 40, NO. 14

SANDIA NATIONAL LABORATORIES

JULY 15, 1988

Shot Heard Round the World

HERMES II Reaches 30,000th Shot

During a severe rainstorm, the HERMES II electron beam accelerator in Tech Area V was fired for the 30,000th time. It was 6:30 p.m. on July 5.

Nearly half a world away, Pace VanDevender, Director of Pulsed Power Sciences 1200, listened to

the shot — and the celebration accompanying it — on a telephone in his hotel room in Karlsruhe, West Germany, where he was attending the BEAMS '88 Conference. For Pace, it was 2:30 a.m. on July 6

(Continued on Page Two)

SNLA's Top Gallon-Givers

Among them, five Sandians have amassed an enviable blood-donation record; collectively, they've given 76+ gallons over the years.

If there were such a thing as a 20-gallon hat, Stuart Barth (3426) would be wearing it (see LAB NEWS, Nov. 6, 1987). Not too far behind Stuart (between 14 and 15 gallons) are Carol Kaemper (21-1), Wendell Jones (1832), Ted Baggett (3155), and Charles Karnes (400).

"We appreciate the loyalty and continuing support of these givers," says Gretchen Cody of United Blood Services, "and the support of all other Sandians who have donated in the past."

See Story on Page Four.



"THE SHOT WENT OFF as reliably as ever," Venky Narayanamurti (1000, left) tells Pace VanDevender (1200) as the two, via a transatlantic phone call, celebrate HERMES II's 30,000th shot. Jim Powell (1230) had earlier provided a shot countdown for Pace, who was attending a conference in West Germany.

Antojitos

More on the Bikers Bold -- Says the letter-writer: "Those riders who try to intimidate other bike riders [see this space in May 20 issue] are probably the same ones who want drivers to treat them as operators of another vehicle, then turn around and totally ignore driving laws when it's not convenient for them -- run right through stop signs, drive on the wrong side of the road, cut through traffic, etc.

"These riders are their own worst enemies. They make someone who would respect their rights, like me, totally ignore their rights because they totally ignore mine and the rules of the road! When they end up run over, I will certainly have no sympathy. I suggest that if these bikers wish to be treated like vehicles, they act like vehicles."

I have no quarrel with your premises -- lots of asinine bikers out there follow traffic rules only when convenient, then whine when they're not respected as fellow commuters. But your conclusion -- ignore their rights and feel no sympathy when they're run over -- is equally asinine. Cool off (or chill down, depending on your age). Apart from the ethical and legal issues, consider the "hassle factor" involved in any motoring mishap.

It's not your job to exterminate the idiots. (Time, Fate, Chance, and Mother Nature have a way of dealing with that problem.) Take out your frustrations on your golf clubs or your Ouija board.

* * *

June "Good Guy" Award goes to Bill Casey (6233). While driving on O Street west of Wyoming on June 16, he saw a jogger fall. "I've got two rebuilt ankles myself, thanks to old soccer injuries, so I knew about that kind of fall," he reports. He put the jogger into his car and drove him to the Base Gym for ice-pack applications on his sprained ankle.

"It was a severe sprain," says the afflicted athlete, Dave Macfarlane, a civilian employee of KAFB. "The quick treatment really helped me recover much faster than if I'd had to wait for someone to call an ambulance."

* * *

Apropos "Apropos" -- Okay, sharp-eyed proofreaders, I misspelled it as "apropo" last issue. No excuses. Well, maybe one: It's French, of course, a language whose spelling has little relationship to its pronunciation and less to its meaning. Anyway, somewhere between concept and implementation, I lost my s.

* * *

Now Let's Attack Our Western Brethren -- Attention, directors of Sandia Livermore's Directorate Challenge: Next year don't have a race category entitled "Most Unique Entry." "Unique," like "dead" and "pregnant," is an absolute -- something is either unique or it isn't. "A little unique," "sort of unique," "more unique," and "most unique" are verboten. (Hope I got that one right; I can't spell German either.)

* * *

It's a tough life, but somebody's got to live it.

●BH

Spare Your Wastebasket

If you're about to retire or leave the Labs, don't toss your historically valuable records.

Corporate Historian Necah Furman (3141-2) is looking for audiotapes, records, and photos. Call her on 6-9619.

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Fun & Games

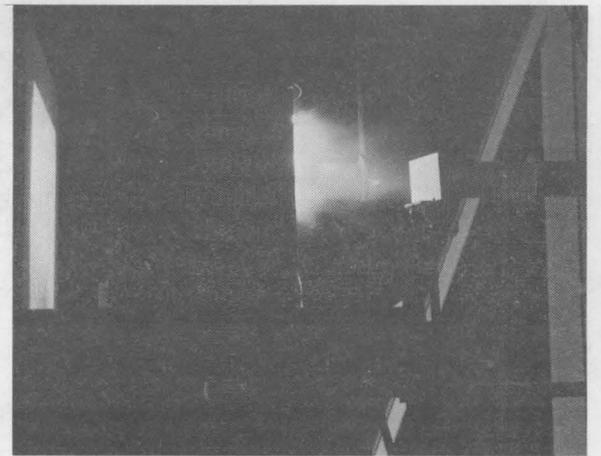
As part of the AT&T team, six Livermore Sandians competed in the recent Bay Area Corporate Relays at the Stanford Stadium. The team took fourth place.

Jim Reitz and Joe Treml (both 8144) ran outstanding 5Ks. Jim's time was 16:19 for a first in his age group; Joe finished eighth in his age bracket with a 20:53 time. Jim then ran a three-quarter mile on the Sub Master's Relay team that finished second overall. He finished the day with a 2:15 time in the half mile on the winning Master's Plus Relay team. Joe also competed on the Senior's Relay with a 1:17 time on the quarter miler.

Alex Hamza (8343) ran a 5:08 mile, a three-quarter mile on the Pyramid Relay, and two miles on the Distance Relay. The AT&T team finished fifth of eight in the Pyramid.

In the shot-put competition, Jeff Johnson (8272) threw an over-40-footer on his first put, but it was ruled a foul. He came back with a 39 foot 6 inch follow-up put that counted.

Bob Powers (8435) ran the half mile and mile on the Pyramid and Distance Relays with Alex.



30,000th SHOT -- Milton Clauser (1261) designed the test to provide a better understanding of what happens when a high-energy, high-current electron beam (such as those from HERMES II) strikes large quantities of explosives. This photo, taken a week earlier, shows that such beams can indeed initiate an explosion. Results from the series of tests should assist in defining requirements for Sandia's electron-beam DEW (directed-energy-weapon) programs.

(Continued from Page One)

HERMES II

as he offered his congratulations to the five-man HERMES II crew and to Jim Powell, manager of Simulation Technology Department 1230.

"It was the most incredible rain I ever saw," says Johann Seamen, supervisor of Area V Operations Sec. 1236-1, in whose bailiwick HERMES II is located. "But we got out our industrial-strength mops, and the shot went off on schedule."

Now 20 years old, HERMES II had an original design life of 1000 shots. But the old workhorse is still going strong. "In fact, it's 70-percent booked through 1991," says Johann. "It did get some renovation in 1981, when its 10-megavolt Marx generator was rebuilt; in early 1985, we redid the 'oil farm' that stores the 150,000 gallons of mineral oil used as a dielectric in the machine, and we overhauled its data acquisition system this year."

"I'm really pleased to work with HERMES II," says Larry Choate, supervisor of Simulation Applications Div. 1233. "I did my first Sandia experiment on it in 1976 and have continued that association for the past dozen years. More important, it remains a valuable tool in the Sandia radiation-facility collection. Its gamma ray simulation capabilities make it useful in weapon-effects testing and in both basic and applied research."

Six Shots a Day

HERMES II is one of the most heavily used accelerators in the country, according to Gerry Zawadzka, supervisor of STL Operations Div. 1236. Simple arithmetic shows that it's been used for an average of six shots every working day for two decades.

"It's really remarkable for a pulsed-power device to work so reliably for so long," says Venky Narayanamurti (1000). "That reliability is a compliment to the original designers and to all those who've worked with the machine over the years."

Two of those HERMES II designers, Ken Prestwich (1260) and Dave Johnson (1245), were present for the 30,000th shot. They were also involved with building HERMES III, which came on line recently (LAB NEWS, March 25, 1988) and which will eventually replace its namesake. "I just hope HERMES III can last as long and be as valuable as HERMES II," notes Ken.

After the milestone shot, the Pulsed Power folks involved with HERMES II over the years and the experimenters involved in this shot celebrated with cakes and camaraderie.



Catalytic Igniter Performance Improved

After two years of research, Larry Thorne (8357), Joanne Volponi (8353), and Bill McLean (8360) have dramatically improved the performance of an igniter that, without electrical power, can ignite and burn off the potentially dangerous quantities of hydrogen that might be produced by a "loss-of-coolant" accident in a nuclear reactor.

A prototype version of the igniter was developed at SNLL as a part of a larger program funded by the Nuclear Regulatory Commission (NRC) at Sandia for hydrogen control studies (LAB NEWS, May 23, 1986).

During a severe reactor accident, hydrogen gas can be generated and released in the reactor's containment building if enough of the water that normally covers the reactor's fuel is lost, allowing the fuel to overheat. Then, steam inside the reactor vessel would react with the zirconium alloys in the fuel cladding, producing zirconium oxide and releasing hydrogen.

Since the atmosphere inside the containment vessel is normally air, the highly flammable hydrogen could ignite if some initiating event (a spark, for example) occurs. If a significant amount of hydrogen ignites, the resulting fire or explosion could produce pressures that might damage the containment building.

At present, several US reactor containments have electrically powered glow-plug igniters to help prevent hydrogen buildup. But, in the case of a power failure that involves both the main power source and the diesel-powered backup supply (or damage to the power cables that feed the glow-plugs), there is no backup igniter system. The Sandia-designed catalytic igniter is intended to provide this backup without requiring an electrical power supply.

The igniters would be distributed in locations throughout the containment building to ignite hydrogen-air mixtures as lean as 5.5 percent hydrogen — well below the concentrations at which a hydrogen-air mixture is explosive.

Works Even When Wet

Recent improvements also allow the igniter to operate in very damp environments, even if the igniter itself is dripping wet. As originally designed, the Sandia igniter was composed of a platinum-coated ceramic honeycomb with long, thin platinum wires attached to it. That design had a serious limitation — the honeycomb would not operate properly when wet, and loss-of-coolant environments are expected to be wet with condensing steam and water spray.

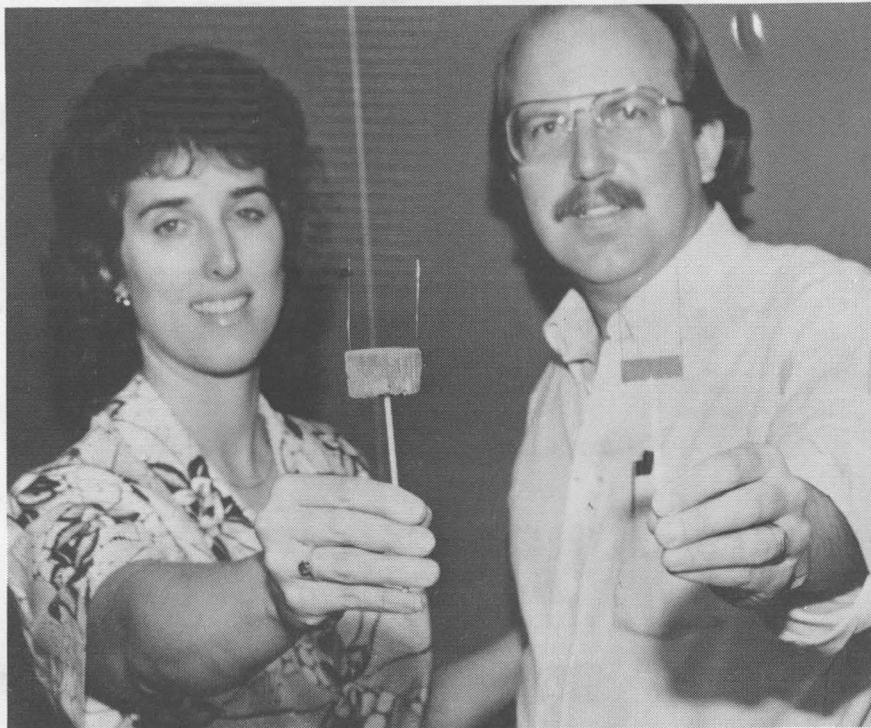
To solve this problem, Larry and Joanne replaced the honeycomb with a fin made of a wetproof catalytic screen developed by Atomic Energy of Canada, Limited (AECL). The Chemical Engineering branch of AECL initially invented wetproof catalysts for applications related to Canada's heavy-water reactors.

"The wetproof material is a fine-mesh, stainless-steel screen coated with a hydrophobic film impregnated with fine platinum particles," Larry explains. "We used this catalytic screen to fabricate a fin-type igniter that is smaller than our original design, and is likely to be less costly to produce because it requires only a few — and inexpensive — parts."

"The new igniter performs better under both dry and wet conditions than the original igniter," Larry adds. "Typical ignition delay times for the new igniter are less than one minute."

In the new igniter design, two 2.5-inch-long, 0.005-inch-diameter platinum wires are attached to the waterproofed catalytic fin. As hydrogen and air pass by the fin, the platinum particle coating catalyzes the heat-releasing reaction between oxygen and hydrogen, raising the temperature of the fin and the attached wires. When the fin has boosted the temperature of the wires to 60-80 degrees C, the catalytic reaction on the wires accelerates, raising the temperature of the wires further.

This exothermic (heat-releasing) surface reaction continues until the wires reach the gas-phase ignition temperature near 600 degrees C. At this temperature, the wires are hot enough to act like a match



OLD AND NEW catalytic igniters — Joanne Volponi (8353) holds the original honeycomb model; Larry Thorne (8357) holds the new design, featuring a smaller fin.

and ignite a flame that burns the hydrogen in the containment vessel.

"In a sense, the device relies on a synergistic effect," says Joanne. "Neither the fin nor the platinum wires by themselves will produce ignition. However, we have combined the operational characteristics of the two components to produce a reliable igniter."

Larry, Joanne, and Bill are listed as co-inventors on the patent, awarded to DOE for the catalytic igniter on May 3.

Take Note

Several Sandians were involved in the Alameda County Fair at Pleasanton this year. In addition to those who entered their roses, photographs, baked goods, and handicrafts in competition, four Sandians worked as volunteers during the two-week event. Carole Price (8524) served as a judge for the keyboarding competition in the Vocational Olympics, Dick Finn (8272) and Steve Schwegel (8271) judged mechanical drawings, and Barry Schrader (8522) demonstrated turn-of-the-century letterpress printing in the antique equipment building.

* * *

Julie Uribe (8360) recently received two scholarship awards from Chabot College. She was one of five students receiving the Chabot Foundation scholarship, and one of eight getting the Alpha Gamma Sigma (Theta Chapter) scholarship.

Power Outage Means 4-Day Weekend

Sandia Livermore employees and their counterparts across the street at Lawrence Livermore National Lab got an unexpected four-day July 4th weekend when a Thursday evening (June 30) power outage and fire at LLNL's main electrical switching station shut down both labs for four days.

The Computing Center at Sandia powered down without incident or damage when the outage occurred, and emergency power generators kept essential equipment operating in all areas.

The only damage reported over the holiday weekend was a leak in a generator fuel filter that dumped diesel fuel onto the floor of the Security Building (968). The spill required the Security Communications Center to move into temporary quarters in Bldg. 911 from Saturday afternoon to Monday night while the spill was cleaned up.

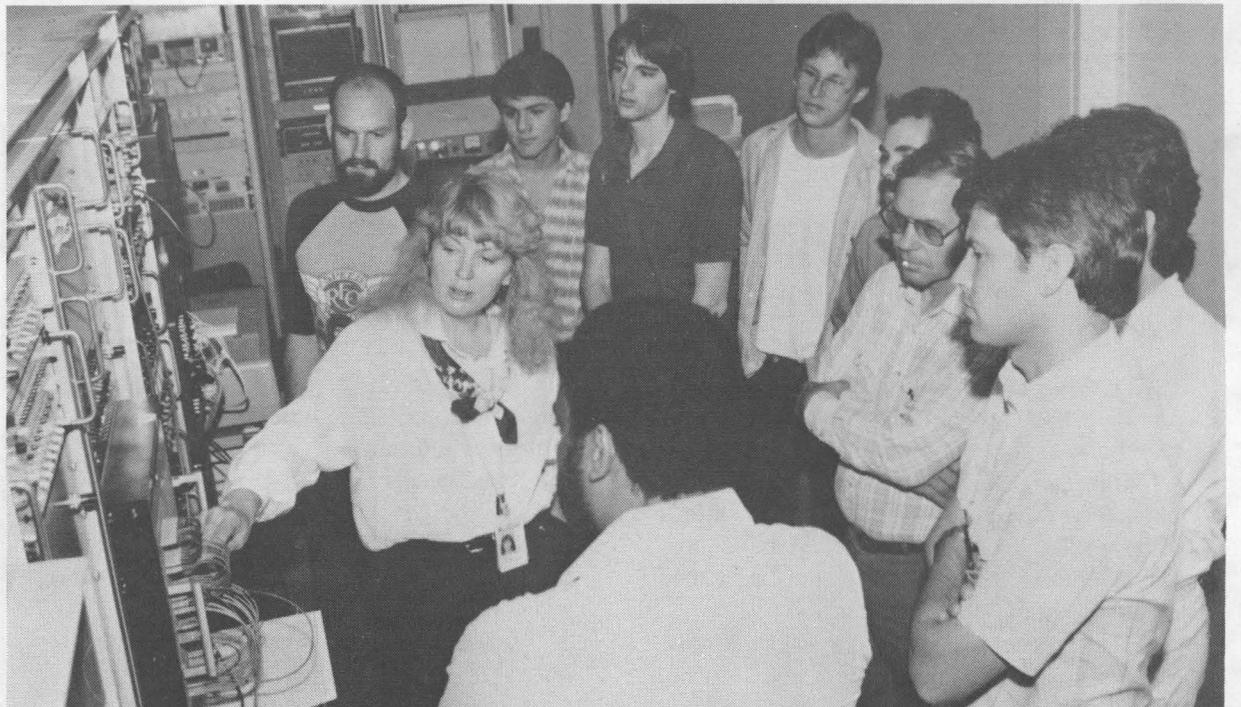
This was the first forced shutdown of the two labs since the January 1980 earthquake that sent all employees home for half a day.



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ALICE JOHNSON-DUARTE (8283) recently explained the operation of the Vibration Lab in Bldg. 914 to advanced students from Chabot College's electronics technology program. They also toured the firing facility in Bldg. 973 where Jim Mitchell and Bernie Bernal (both 8283) gave them a briefing and demonstrated an explosives test. Later, David Rosenzweig (8522) briefed them on job-seeking techniques. The tour was coordinated by Ed Talbot (8283) at the request of Gary Svihula, head of the program at Chabot.

BLOOD DONORS get blood pressure and temperature checks as part of the pre-donation procedure. Here, UBS technician Darlene Thomas (left) checks out Phyl Wilson (3162), aka basic chicken.



Tale of a 'Basic Chicken'

Writer Details Donor Experience

I admit it. I'm what you call your "basic chicken."

The thought of a visit to the dentist's office makes my gums cringe. Boarding a plane to fly off to the Middle East is a thrill I can well do without.

Given that background, why did I head for Bldg. T-13 on a recent Tuesday morning to donate a pint of blood? Well, quite frankly, giving blood is one thing that's never scared this otherwise basic chicken; I've been doing it since my college days — more years than I care to remember.

I realized, as I recently talked with coordinator June Aydelotte (3543) about Sandia's blood donor program, that I hadn't donated any of the red stuff for a while — and decided it was time.

Losing the Habit

I'm not the only procrastinator. June speculates that one reason Sandia's blood donation totals, following a national trend, have decreased over the past few years is that "people get out of the habit [of donating]." Those words hit home; I'm in that category. That's why I resolved to be at Bldg. T-13 the next Tuesday morning between 8 a.m. and noon — the time each week that United Blood Services (UBS) people come to the Labs to collect donations.

With LAB NEWS photographer Gerse Martinez in tow, I hit the door at 9 a.m. First, I was asked to read a brochure that includes an "informed consent" section (info on blood donation safety precautions, how you'll feel after donating, the tests on blood you donate). The brochure also contains information about AIDS, including a description of those who are at increased risk of catching or spreading AIDS — and unobtrusive ways to disqualify yourself from donating if you feel you may be in that high-risk group.

Next, I had a brief interview with UBS donor technician Darlene Thomas concerning my current

health status ("good," I told her), and was asked to complete a short donor health record (sample questions: Have you ever had hepatitis — or cancer? Surgery in the past six months?). Then I read aloud a statement certifying that I'd read the brochure and that I believed it was safe for me to donate blood. My last step in the pre-donation procedure was to sign the donor health record.

(At that point, as a potential donor, you're given one last — and totally confidential — chance to disqualify yourself if you feel that for some reason your blood should not be used: You're asked to select a bar code sticker — one indicates "for transfusion," the other, "not for transfusion" — and affix it at the bottom of the donor health record.)

After Darlene checked my temperature, blood pressure, pulse, and hemoglobin level (all OK), I headed for the couch, where UBS technician Frank Ohmberger hooked me up to the collection apparatus; from then on, it was all up to me. (I'm always amazed that squeezing a small piece of plastic pipe in my fist, then relaxing the grip, then squeezing again provides such an efficient pumping arrangement!)

Punch-and-Cookies Time

Ten minutes later, the process was over; my pint of blood was "in the bank," so to speak. Then it was punch-and-cookies time with some of the other donors.

As Gerse and I headed back to the LAB NEWS office, this basic chicken felt pretty good about the events of the last half hour. Who knows? That ten minutes of blood-donating time may have saved a life . . . or several (see "Demand for Blood Increases").

In eight weeks — the time required between donations — I'll be back to give it another shot. ●PW

'Catch-22' Time

Demand for Blood Increases During Summer

Summertime is "Catch-22" time for the United Blood Services donor program, according to Gretchen Cody, who's Kirtland AFB donor resource specialist at UBS.

"Many of our regular donors go off on vacation, so the supply level drops," says Gretchen. "At the same time, unfortunately, accidents and emergencies — events that very often create a demand for blood — never take a vacation.

"With more people on the road during the summer, the probability of accidents actually goes up," Gretchen continues. "So there we are: faced with decreased supply and increased demand — creating a situation that occasionally nears crisis proportions. That's why we make a special appeal for voluntary donors at this time of year."

UBS, a nonprofit organization, provides blood and blood products to 41 hospitals throughout New Mexico and southern Colorado. (Ten of the hospitals are in Albuquerque.) UBS collected 54,747 units of blood during 1987 to meet area patients' needs, and estimates a 56,000-unit requirement in 1988.

One pint of blood may help as many as four people, Gretchen notes. It's not like the old days, she says, when blood often was transfused as "whole blood" (just as it came from the donor). Now, depending on patient needs, blood may be separated into several different components:

- red blood cells (for surgery patients);
 - plasma (to stabilize shock and burn victims);
 - platelets (for treatment of cancer patients);
- and
- cryoprecipitate (which contains a blood-clotting factor that's used to treat hemophiliacs).

An estimated 60 percent of US citizens will need blood or blood products sometime during their lifetimes. "However," says Gretchen, "just five percent of US citizens donate. Obviously, we'd like to see more people share the load."

The need is clear. Consider giving "the gift of life" any Tuesday — blood-drive day at SNLA. (Donation locations vary; get details on time and place from the *Weekly Bulletin*.) The process doesn't take much time (see "Basic Chicken" story), and there's no question — those few minutes are *top-quality* minutes.

Donation Decline: Partly Based on Unfounded Fears

Nationwide, voluntary donations to community blood supplies have declined over the past several years. Sandia's blood donor program has followed that trend.

"We've seen our total donations drop from 1932 pints in 1977 — our peak year — to 1295 pints in 1987," says June Aydelotte (3543), Labs blood donor program coordinator. (Incidentally, during that peak year of 1977, SNLA's on-roll population was approximately 6300, in contrast to the 7300 on roll last year. Individual donors in 1987 numbered about 600, slightly more than eight percent of SNLA employees.)

June speculates the decrease stems from a variety of reasons. Faithful donors retire, for one. "At the same time, though, we've seen many new-hires join the blood-donating ranks," June says, "so retirees can't account for all of the drop.

"Previously, our population shift to the south may also have affected donations," June adds. "When the blood drive was always in

Bldg. T-13 [just south of Medical], it meant a longer trip for people who work in Bldgs. 821, 823, and other sites on the south side of Area I. That's why we now alternate locations between Bldgs. T-13 and 822."

Most recently, of course, the AIDS scare may have contributed to the decline — unnecessarily. Unfortunately, when people think of blood and needles, they think of AIDS — and jump to the conclusion that giving blood will put them in danger. Nothing could be further from the truth, says Gretchen Cody of United Blood Services.

"There's absolutely no chance of contracting AIDS — or any other infectious disease — during the donation process," Gretchen says. "All the materials used — swabs, needles, blood bags, and so on — are sterile and are used only once."

And besides, what "basic chicken" (see main story) would fly into an unsafe situation?



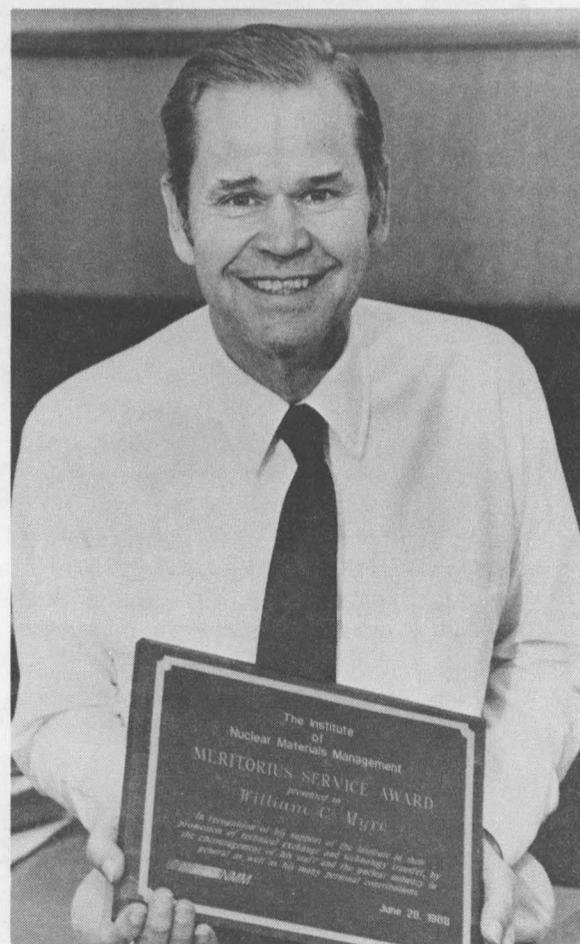
JUNE AYDELOTTE (3543), coordinator of Sandia's blood donor program, says the Labs' peak year for blood donations was 1977 — when there were 1000 fewer employees on roll. Here, she holds a "life-giver" certificate, awarded by UBS to donors as they move to a higher-gallon total.



IN THE GOOD OLD SUMMERTIME, Administration Bldg. 800's landscaping is at its best. Those well-trimmed shrubs and the meticulously tended lawn are no accident. Willie Lucero (7813) gives the area year-round TLC, and he's ably assisted during the summer months by a couple of Youth Opportunity Trainees (YOTs).



14th ANNUAL SANDIA SUMMER SCIENCE PROGRAM recently ended. SSP supported 31 Sandians who (collectively) teach four-week classes in physics, math/computer science, materials science, electronics, and energy resources to 46 selected sophomores and juniors at Bernalillo, Highland, and Valley high schools. "The program's primary goal is to give students with little exposure to science an appreciation of the rich career choices available in the field," says Jim Shorty (3510), SSP coordinator. Here, Florencio "Yaz" Aragon (5113) helps Melanie Garcia (left) and Martina Montoya build AM radios as part of the electronics class at Bernalillo High School.



FIRST SANDIA RECIPIENT of the Institute of Nuclear Materials Management's Meritorious Service Award is Bill Myre, former Director of Nuclear Security Systems 5200 and now Director of Monitoring Systems 9200. Bill was cited for his decade-long support of INMM's programs in improved physical security and nuclear-materials containment and surveillance technologies (areas in which Sandia is the nation's lead lab), and for his encouragement of the technology transfer involved in putting those technologies to work. The award was presented at INMM's annual meeting in Las Vegas last month.

Horner Goes Down Under Down Under

Retiree Larry Horner petted potato cods, ogled octopuses, and evaded eels, but his task was to dally with damselfish in three weeks spent on the Great Barrier Reef.

He was part of a research team studying sex changes in damselfish at Lizard Island Research Station off the coast of Queensland, Australia.

A member of Earthwatch, a non-profit, privately funded organization that sponsors research projects, Larry learned about the damselfish project from *Earthwatch* magazine. He could have chosen an expedition based on life sciences, arts and humanities, physical sciences, or social sciences, rather than marine studies.

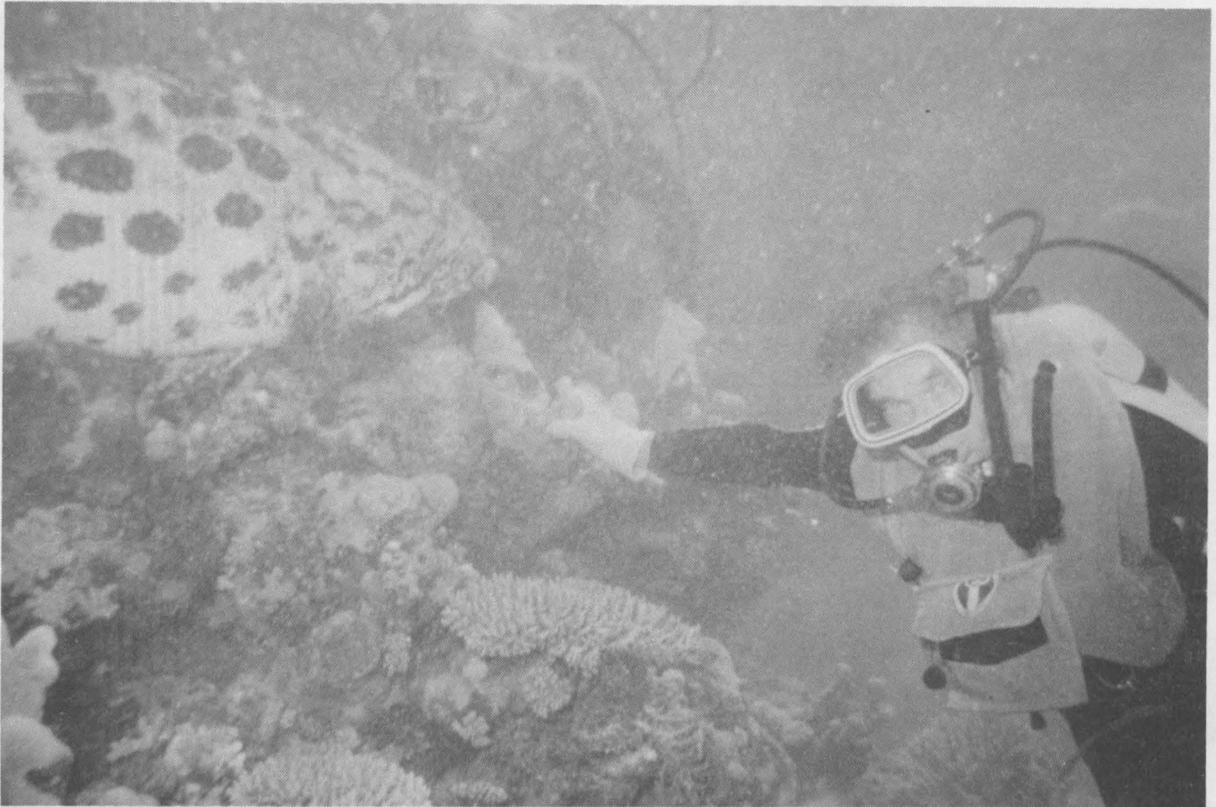
Larry (who retired in 1983 after 14 years in component development, field test, quality assurance, and military liaison) is an Earthwatch veteran. His first expedition was a real cliff-hanger — for several weeks in 1986, he helped study endangered sea birds that live in cliffs on the Isle of Rhum in the Hebrides chain off the coast of Scotland.

Missed the Boat

“Australians are so laid back,” Larry says. “People in the ‘land of mañana’ could take lessons from them.” He rode a train from Sydney to Cairns, Queensland, jumping-off point for the boat trip to Lizard Island, getting there on a Friday afternoon. Radio service to call the Lizard Island Research Sta-



DAMSELFISH DETECTIVE ABBY SCHWARZ headed research project on the Great Barrier Reef. Fish in the photo are a species similar to damselfish.



DID SOMEONE RING THE DINNER BELL? Hungry potato cod checks Larry's outstretched hand for food.

tion was not available. On Fridays, public offices close and radio service goes off the air at noon.

He soon found a room for the weekend at a hostel, which turned out to be a great place to meet people of all ages from all over the world. He finally reached the island on Monday.

Lizard Island Research Station is involved in six permanent projects in marine biological research and other shorter projects. “Although there is a resort on the island, the research area is a protected environment — no sport fishing,” Larry says.

Lizard Island gets its name from meat-eating lizards called sand goannas (relatives of the komodo dragon). They're found only on the island.

Abby Schwarz, a professor of marine biology at the University of Vancouver, was in charge of Larry's project. This was the second year of her field research. Larry was part of the fourth team (the final capture team) to participate in this year's project. Other members of Larry's team were Canadian student Suzanne Dion, New York attorney Rhett Currier, and Fergus Neilson, a Scots management consultant living in Australia. Larry was the oldest team member.

Some Skill Required, But Not Much

Although no special skills are required for most Earthwatch projects, Larry had to prove he had diving experience for this project. The volunteers provided their own diving equipment except for weight belts and tanks.

You're expected to “learn as you go” on Earthwatch expeditions. “Boy, do you ever!” says Larry.

He helped count fish, identified them from their markings, and helped capture them for study.

Workdays at the research site off Granite Point began at 9 a.m. All beaches on the main coast were closed because it was box-jellyfish (sea wasp) season, so the divers had to wear wet suits and gloves (also helpful when coming upon poisonous coral and sea urchins).

Damselfish are about three inches long and belong to the wrasse family. Some are aggressive and in general have a great deal of curiosity. Maori wrasse bite and ram, sometimes a problem for the divers.

When Girls Will Be Boys

One project objective was to determine the structure and distribution of a population of *Dascyllus reticulatus* (damselfish) at Lizard Island, including the sex composition (male, female, intersex) of the groups in that population. Schwarz's study began with the discovery that there were many more females than males in naturally occurring groups of damselfish (a protogynous hermaphrodite; that is, functional females may transform into functional males).

“All damselfish start out as females,” he says. “The dominant female changes to a male if the ‘herd bull’ [Larry's description] dies, then the next largest, and so on.” Another objective was to find out the origin of the males who inhabit newly settled groups. Did fish migrate from one site to another? Larry says the team's observations support that theory.

One primary task was to capture individual fish

Executing an Ear

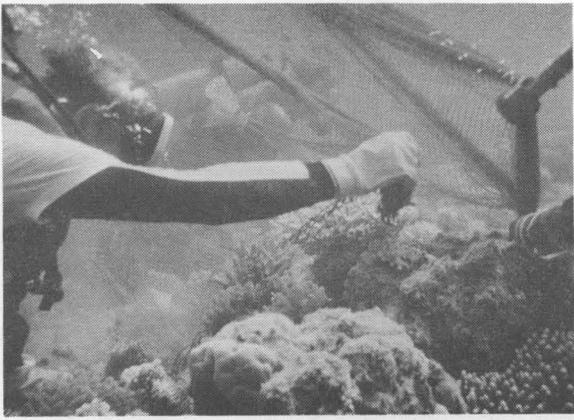
The total outlay for Larry Horner's trip to Australia, including a side trip to Australia's rain forest and his share of the expedition's cost, was about \$3000. The average Earthwatch expedition cost-share donation runs about \$1200, but ranges from \$900 to \$2000 depending on the expedition and where in the world it is.

All donations to Earthwatch are tax-deductible, but side-trip expenses while on an expedition are not. Academic credit is available. Transportation costs are added to the cost-share to determine total trip outlay.

Earthwatch sponsors more than 100 research expeditions (approved by the Center for Field Research) each year all around the world. Some are even close to home, like the Homol'ovi

LARRY HORNER (ret.) and Rhett Currier relax in a boat on the way back to Lizard Island.





PART OF LARRY'S JOB was to anesthetize and net damselfish marked the year before. Captured fish were dissected at Lizard Island Research Station laboratory to determine gender and reproductive state.

from the 163 that were captured and marked the previous season. Acrylic dye was injected subcutaneously into the fish in codes to identify individuals. There were about 65 colonies of fish in the research quadrants. Each fish was then returned to the site from which it had been captured. Sixty fish were collected at the end of the study period — a good percentage of recovery, according to Larry.

Researchers stunned fish to be captured with anesthetic from a spray bottle. To find out what stage of transition they were in, the captured fish were dissected at the lab on Lizard Island.

Marooned on A Reef

There were adventures as well as research. At the lowest tide of the year, team members went out at 2 a.m. for a walk along the reef between Palfrey and Lizard Islands. "We lost track of time and the tide came in. We had to swim back," Larry says. "The only light came from the research station, and we had to fight the tide moving us toward the reef. You could swim that distance in the daytime without being afraid because you could see the shore, but it's real scary out there in the dark."

Feeding the Fishes

On fun dives, the research team divers fed chicken scraps to potato cod, which can grow up to 10 feet long and weigh several hundred pounds. "They're placid enough to eat out of your hand," Larry says. "You could even touch them and pet them, though they don't really like it.

"There are incredible numbers of ocean life. I was amazed to find there were so many kinds of coral," he says. He saw an octopus on his "check dive." He also saw manta rays gliding along the bottom and a seven-ft. bronze whaler shark. "They could be a menace, but we really didn't have any apprehension about that kind of thing. I did get too close to a brown moray eel once, and Abby cautioned me to back off.

"I consider the trip to Lizard Island to be one of the adventures of a lifetime; people dream of jobs like this," Larry continues. "It's a great vacation, and we hope we did some good in terms of scientific knowledge too." ●JW



GLORIES OF GENIGRAPHICS were celebrated at a conference attended by 50 members of government agencies nationwide that use Genigraphics equipment to generate computer-assisted artwork for presentations, and by key people from the Genigraphics Corp. Sandia, one of the more advanced users of the equipment, hosted the conference, organized by Denise Archuleta, supervisor of Computer Art Sec. 3155-3. Here, Mitzie Morrato (3155-3) checks out one of the displays; behind her, John Aragon (also 3155-3) and Alice Baltz (contractor employee) discuss the conference. Mitzie and Tom Salazar (3155-3) were Sandia winners in the Genigraphics-created-slide competition.



REPRESENTING SANDIA this year in the celebrity calf-penning event at the annual community Livermore Rodeo Week preview was Rick Wayne (8400). He is in checkered shirt astride the "old gray mare" getting instructions on how to hold on to the saddle horn and reins while awaiting his turn to ride into the arena. A team of two experienced Livermore Rodeo riders "assisted" him in his task of separating and penning calves in the prescribed time. Although bovine containment was not achieved, Rick's primary goal — staying on his horse — was accomplished.

Congratulations

To Kathy and George (1234) Baldwin, a daughter, Anne Elizabeth, June 22.

To Amy (1523) and Jeff (9132) Gilkey, a daughter, Nyssa, June 27.

To Annette and Steve (5160) Hatch, a daughter, Maren, June 30.

To Eleanor and Daniel (6422) Lucero, a son, Gabriel, June 30.

To Yolanda (2154) and Mark Smith, a son, Vincent Scott, July 2.

Sympathy

To Steve Ortiz (9216) on the death of his father in Los Lunas, May 28.

To Sandi Ryburn (6422) on the death of her father in Oregon, June 16.

To Sharon Sargent (6427) on the death of her mother-in-law in Midland, Tex., June 27.

To Ron Iman (6415) on the death of his father in Logan, Kans., June 28.

watch Expedition

II archeology project in Arizona.

Larry's planning more expeditions. He's currently considering a polar research expedition to Heyss Island in Franz Josef Land in the Soviet Union north of Siberia and the Arctic Circle for his next Earthwatch project.

Anyone ages 16 to 85 can become a member of Earthwatch by sending a \$25 contribution. You must be a member to join an expedition, but nonmembers may obtain expedition briefings. Teachers use them in classroom discussions, and armchair travelers can visit faraway places without leaving their homes.

If you'd like to talk to Larry about an expedition or find out more about Earthwatch, call him on 821-0099.

Quality Awards

labs and the production plant during early phases of the program.

The retrofit programs will save the cost of building totally new timers for the W76 warhead for the Trident I and W78 warhead for the Minuteman III. Ed will continue this type of work for the limited-life components on the W80 warhead for the Tomahawk Missile and Air-Launched Cruise Missile and W79 warhead for the 8-inch artillery projectile.

He has also worked closely with Mound's quality and production groups to generate production specifications for these programs. The interaction Ed encourages between design lab and production plant during early phases of the programs reduces the number of specification exchange releases (SXR) and promotes development of new component designs that incorporate easily produced features.

JERRY SMITH (2564), nominated by General Electric Neutron Devices (GEND) for his role in solving problems affecting neutron tube yields and for championing the use of laser welding.

With Jerry's assistance and direction, a number of chronic problems were successfully resolved at GEND, resulting in higher yields and significantly fewer SXR. Jerry spotted a number of design/process incompatibilities that had required repeated SXR. Eliminating these incompatibilities has allowed better drawing definition, improved product flow, less scrap, and significantly fewer SXR.

Jerry has also championed the use of laser welding in the production of neutron tubes, a process that is further improving product quality and production yield.

DAVE McCARTHY (2516), nominated by General Electric Neutron Devices (GEND) for his role in improving yields and reducing deviations in radio isotopic thermoelectric generator (RTG) products.

Dave identified numerous deviations in practically all areas of RTG processing and design that, collectively, had generated as many as 600 SXR in a single year. Many of the deviations were repetitive and did not degrade long-term function or fit. Dave's practical approach and dedication to the goals of GEND's product team enabled GEND to reduce the number of SXR through more realistic design criteria and solid process improvements. With Dave's assistance, the number of SXR was reduced to a record low of 114.

T.J. WILLIAMS, JR. (2361), nominated by DOE's Albuquerque Operations Office for his service as co-chairman of the Packaging Advisory Board and as quality coordinator for 2300.

The Packaging Advisory Board (see LAB NEWS, Jan. 29, 1988), re-established in 1986 to help on packaging problems needing resolution before a weapon enters production, is composed of specialists in materials, packaging, and analysis. Its reviews have contributed to the prevention and correction of problems, producing a higher quality product by building quality in from the very beginning.

As quality coordinator for 2300, T.J. wrote the 2300 Development Quality Plan, which describes the activities required to complete a successful development program.

Quality Is Not Expensive

Hymer: Poor Quality Is Expensive

"The people selected for DOE's Quality Improvement Awards have made a difference — a measurable difference," says Bob Hymer. "They did more than just talk about the importance of quality — they went out and did something about it."

"In the process, they demonstrated that in our weapons work we are learning something that top-rate Japanese industries have known and practiced for more than thirty years: Improving and simplifying design and production processes lead not only to a higher quality product, but to lower costs as well."

"The principle that improving quality can actually reduce costs has been especially difficult for American companies to grasp," he notes. "The few companies that have grasped it — Ford, Corning, and Xerox, for example — are gaining a competitive advantage at a time when the competitive position of American companies, generally, has reached the proportions of a full-blown crisis."

"Company managers who have finally understood the true connection between cost and quality are using that knowledge to create new management systems aimed at improving all work processes in every area of the business," he continues. "They are finding the problems, errors, complexities, and waste, and getting rid of them. They know that poor quality — not doing things right the first time — leads to rework, inspection, scrap, and waste — and that these costs must be passed on to the customer."

Quality Improvement Process

"Unlike businesses in the private sector," Bob continues, "we don't fret about profit margins in the nuclear weapons development and production complex. But we are — and always

have been — concerned about quality and costs. We're well aware that the costs of poor quality in our weapons work get passed on to all of us as taxpayers."

That's why, he says, the DOE Albuquerque Operations Office created the Quality Improvement Process (QIP) in 1983. QIP is specifically aimed at reducing the costs of weapons work by continuously improving quality.

"We've learned that it's not quality that's expensive, it's poor quality that's expensive," says Bob. "And, as the people receiving these awards show, we too are working at finding waste, getting rid of it, and keeping it out."

"Each of the award recipients has been responsible in some way for the success of QIP in reducing the cost of poor quality — in weapons work parlance, the cost of nonconformance — within the weapon development and production process."

The weapons complex defines the cost of nonconformance as the sum of the costs of production scrap, rework, and administrative costs associated with SXR (engineering releases authorizing the use of a specific quantity of product that does not completely meet its original specifications).

"Since 1983 the QIP initiative has reduced the amount of nonconformance by about 40 percent," notes Bob. "As a result, in FY87 the DOE production complex delivered the highest percentage of on-time parts at the lowest loss rate in its history. And, so far in FY88, we've further improved delivery rates to an all-time high and reduced nonconformance to a record low."

"That's why I consider people selected to receive these awards celebrities in the truest sense of that word."

T.J. has also worked with Allied-Signal to develop firing set designs capable of being manufactured with high quality and attendant low losses.

RALPH FOX (5113), nominated by Oak Ridge Y-12 Plant for his role in reducing deviation and costs in the B61 program.

By taking a broad view of the B61 bomb program, Ralph was able to relax tolerances and minimize reject parts without jeopardizing the reliability of the weapon.

NORM BAKER (5122), nominated by Pantex for his role in improving and simplifying production processes for the B61-3/4 and B61-7 bombs.

Norm's excellent drawing sets for both programs made relatively trouble-free assembly procedures and processes possible. He combined numerous re-acceptance specifications to facilitate reprocessing and disposal of residue materials. And he provided detailed production-operation flow diagrams that greatly facilitated the preparation of program planning documents.

CHARLES TAPP (5140), nominated by DOE's Albuquerque Operations Office for his work with Allied-Signal's Kansas City Plant and Pantex to

reduce the number of SXR on telemetry systems.

In 1987 Department 5140 began a number of design initiatives to make future telemetry systems more producible and to reduce the large number of SXR on Sandia Albuquerque telemetry systems. Charles's leadership has been instrumental in reducing the number of SXR with corresponding quality and cost improvements.

DON McCOY (5111), nominated by DOE Albuquerque Operations Office for his role in negotiating with DoD and others for simplifying the requirements and design of the B61-6/8.

Don's successful negotiations with DoD for changing the design of the B61-6/8 bombs by deleting some components and incorporating their functions into existing components achieved a cost saving of \$5 million. An additional \$3 million was saved by retrofitting B61-6/8 bombs with components returned from B61-3/4 bombs. Don has made a notable commitment to incorporating effective designs that are simpler and cheaper to produce.

Six SNLL employees — Norm Toly (8271), Pete Royval (8445), Al Reichmuth (8445), Don Starkey (8162), Morris Mote (ret.), and Jerry Hunting (8162) — received awards at Livermore in March. ●DR

Fun & Games

Flag Football — All interested team representatives and individual players are invited to attend the Sandia Football Assn. (SFA) organizational meeting on the patio of the Coronado Club on July 20 at 4:45 p.m. The association sponsors intramural flag football with minimal-contact rules. For more information, contact Phil Federico (9114) on 4-8894 or Emil Kadlec (5141) on 4-1059.

* * *

Golf — An SGA Open golf tournament was held at Ladera Golf Course on June 18 and at the Arroyo Del Oso Golf Course on June 19. Format was individual play for the Open championship. Here are the results: A Flight — low net, Charles Adams (1522); low gross, Leon Chapman (ret.); B Flight — low net, Gene Marquez (7400); low gross, Ken Flynn (7262); C Flight — low net, Jay Tidmore (3722); low gross, Ed Salazar (ret.); and D Flight — low

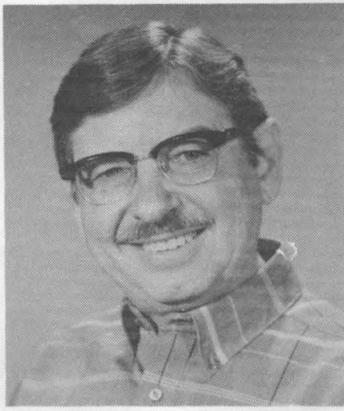
net, Joe Perea (2543); low gross, Mark Retter (7253).

There were four flights for the longest drive at each golf course. Winners at Ladera were: A Flight, Leon Chapman; B Flight, Bob Wood (5122); C Flight, M. J. Chavez (ret.); and D Flight, George McClafflin (3437). Winners at Arroyo Del Oso were: A Flight, Gary Schuster (2153); B Flight, Ken Flynn; C Flight, Dan Williams (7841); and D Flight, George McClafflin.

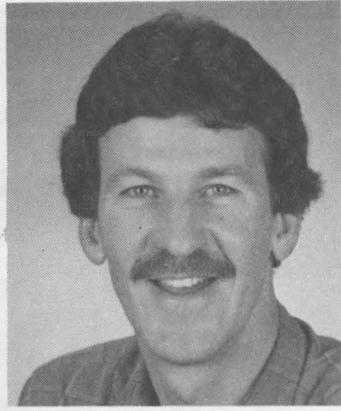
MILEPOSTS

LAB NEWS

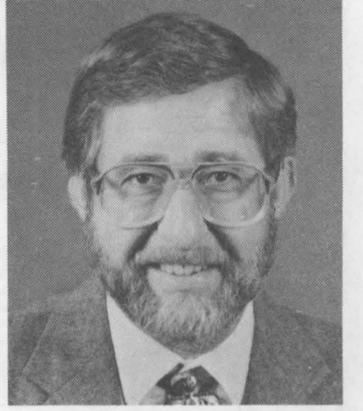
JULY 1988



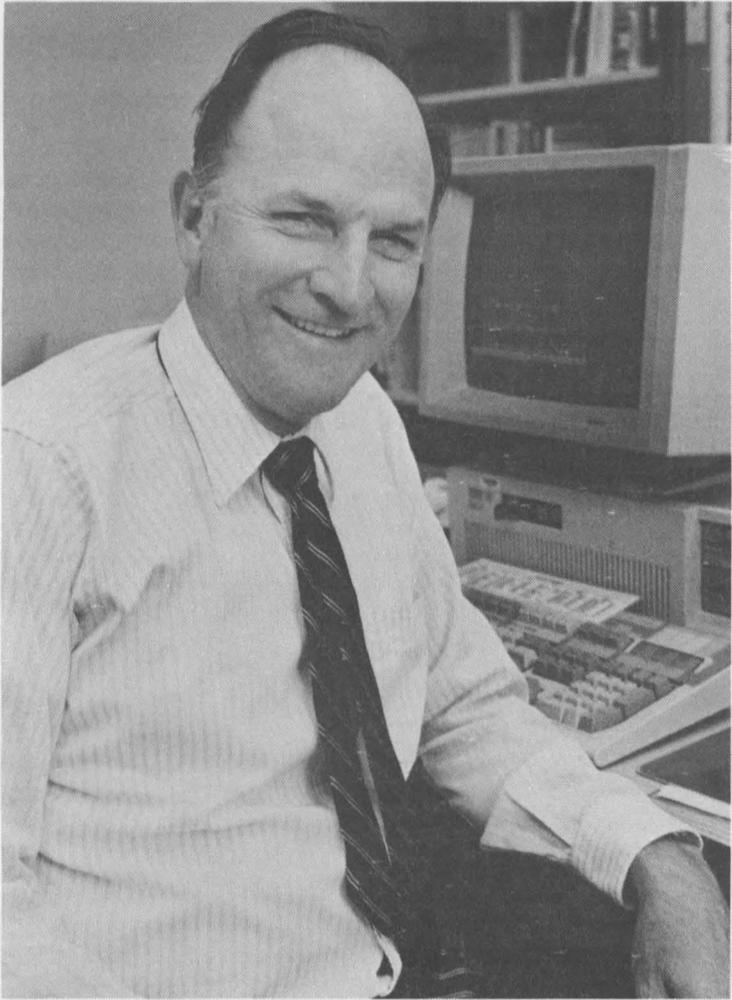
John Smith (2858) 30



Tim Sage (8314) 20



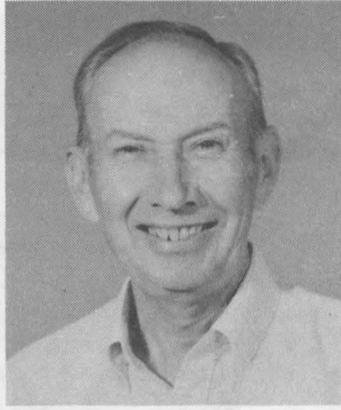
Billy Sanders (8363) 20



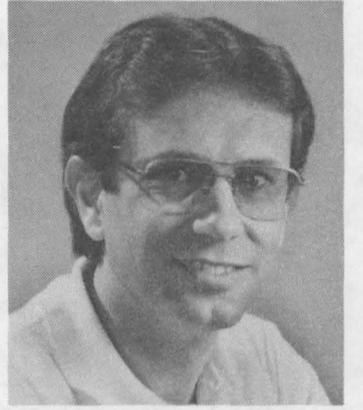
Charles Karnes (400) 25



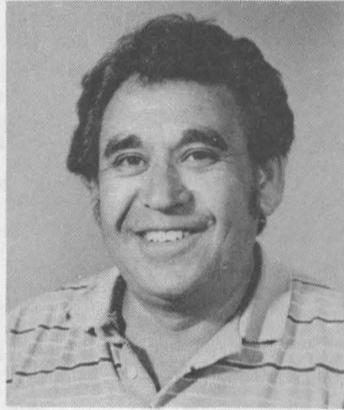
Ferd Thome (8531) 30



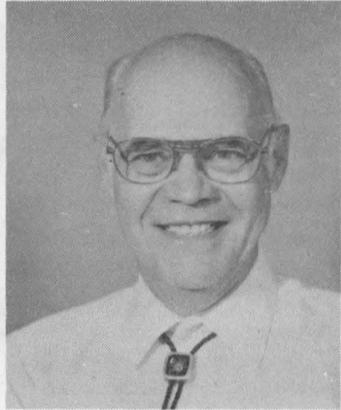
George Treadwell (7213) 35



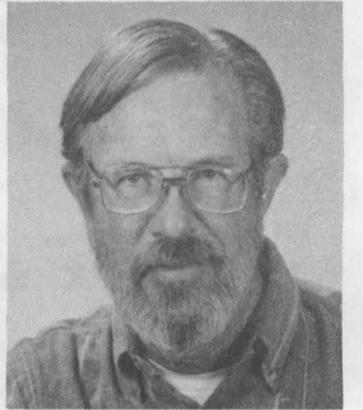
Curtis Specht (8445) 20



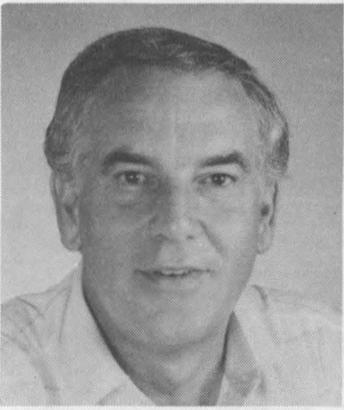
Dean Campbell (7818) 20



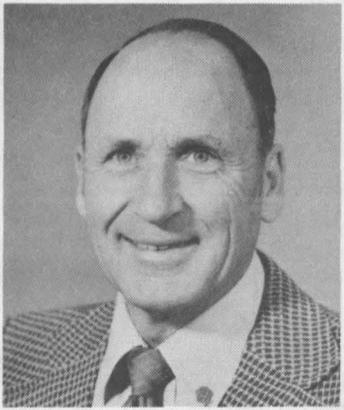
Bob Baker (5121) 35



Hal Short (8231) 30



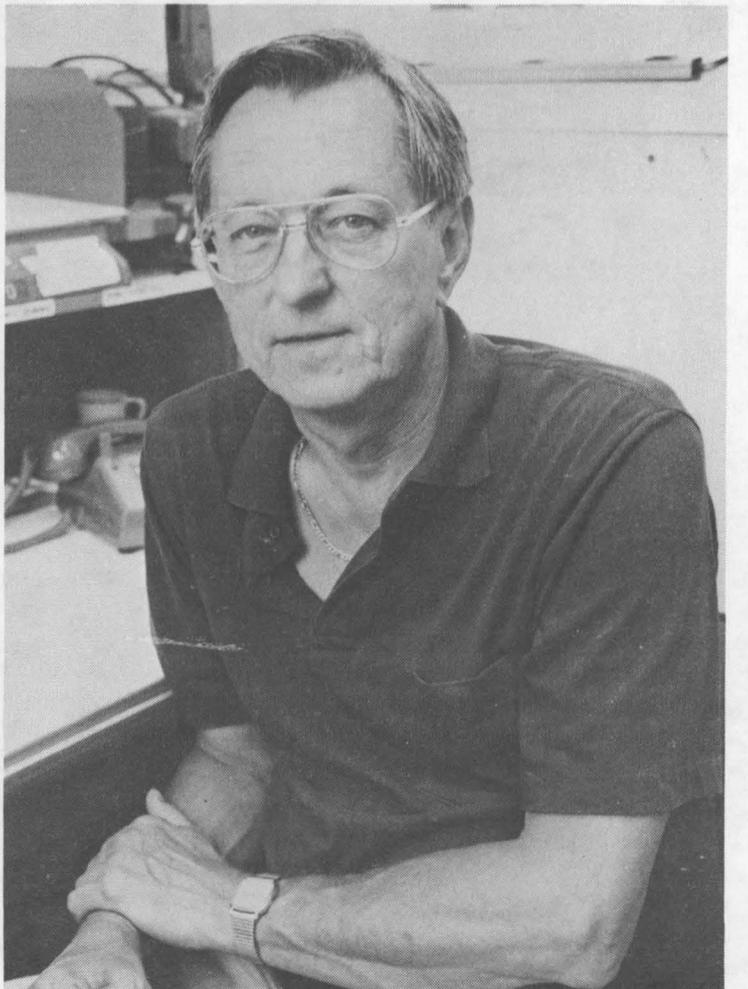
Larry Brown (8162) 25



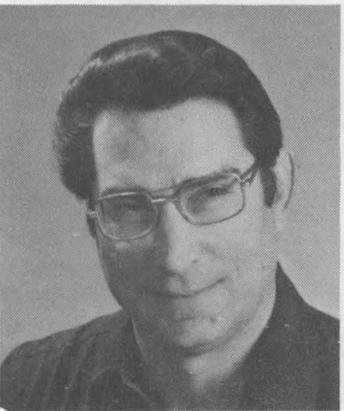
Connie Coalson (7535) 30



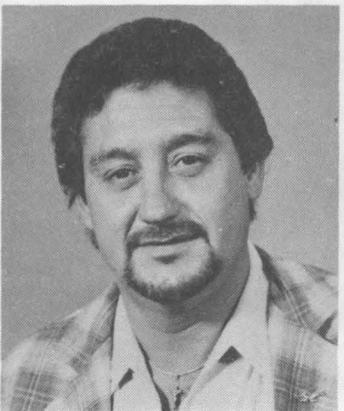
Jim Wright (8150) 30



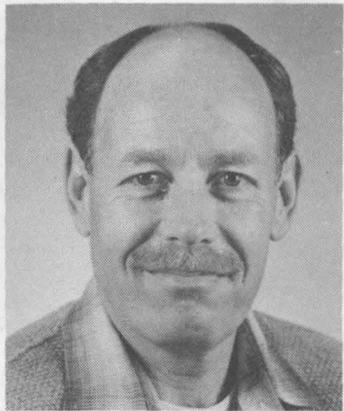
Len Kracko (7125) 30



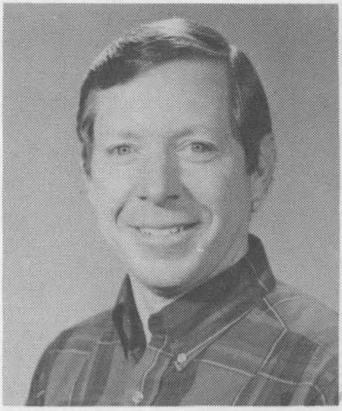
Larry Hoffa (8271) 20



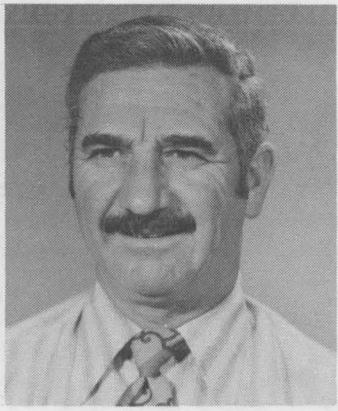
Ernest Aguilar (3424) 20



Lynn Zirkle (8141) 25



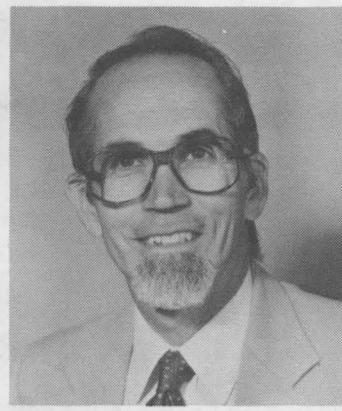
Hovey Corbin (7526) 20



Lawrence Gallo (5248) 25



Leonard Parsons (7264) 35



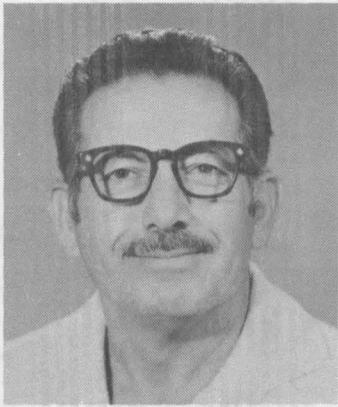
Bob Graham
(DMTS, 1131) 30



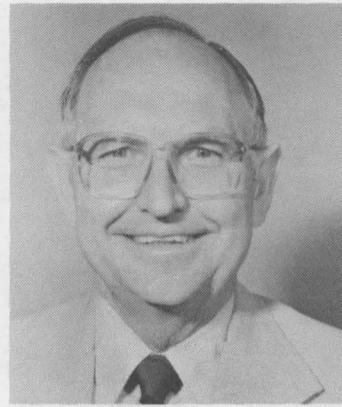
Bob Dougherty (8270) 30



Dale Ruth (2116) 25



Laudente Gallegos
(3154) 20



Otis Cox (130) 25



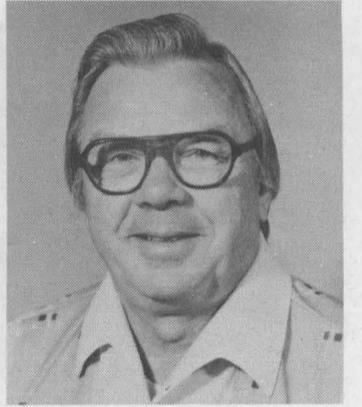
Jack Reed (7111) 40



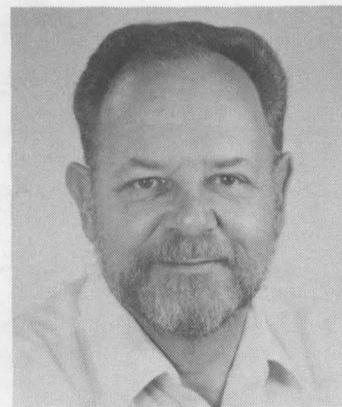
Don Benton (8281) 35



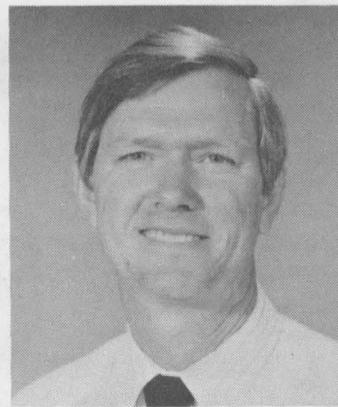
David Overmier (5144) 25



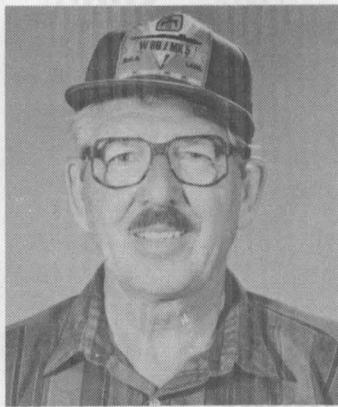
Ron Johnson (9141) 30



Jim Duggar (8131) 30



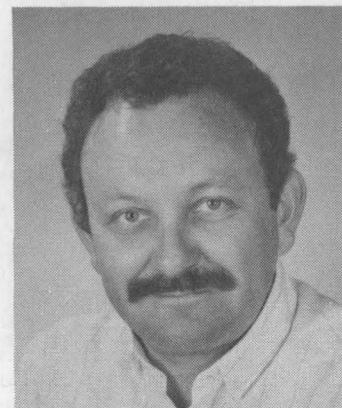
James Martin (5248) 25



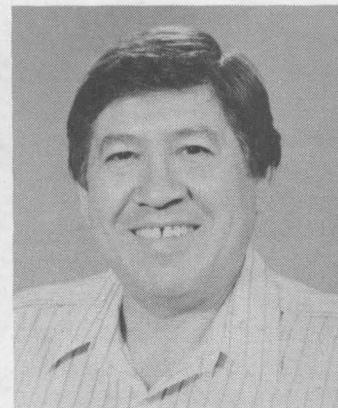
Thomas Hill (5152) 35



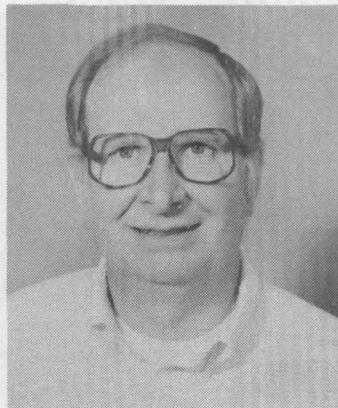
Mary Ann Melo (7120) 35



Danny Mitchell (8163) 20



Henry Martinez (7485) 20



Garry Ogle (7123) 30

Retiree Deaths

Clifford Baxter (72)
John Kay (74)
Willard Neese (83)
Juliet Abeyta (62)
Mabelle Weaver (86)
Richard Turnbough (59)
Maynard Sanders (65)

March 31
April 15
April 17
April 26
May 3
May 5
May 16

John Blythe (70)
Donald Cole (74)
Michael Gregory (74)
Louis Frenkel, Jr. (67)
Charles Ross (89)
Roy Furrow (80)

May 16
May 19
May 26
May 27
May 31
May 31

Manuel Vallejos (75)
Theodore Forcum (84)
Lawrence Colson (78)
Jose Garcia (65)
Kathryn Wright (79)
Raymond Summer, Jr. (78)
Woodrow Littrell (71)

June 1
June 5
June 7
June 20
June 23
June 25
June 28

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

1. Limit 20 words, including last name and home phone.
2. Include organization and full name with each ad submission.
3. Submit each ad in writing. No phone-ins.
4. Use 8 1/2 by 11-inch paper.
5. Use separate sheet for each ad category.
6. Type or print ads legibly; use only accepted abbreviations.
7. One ad per category per issue.
8. No more than two insertions of same ad.
9. No "For Rent" ads except for employees on temporary assignment.
10. No commercial ads.
11. For active and retired Sandians and DOE employees.
12. Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

SEARS TREADMILL, \$150; sewing machine, \$50; cassette recorder, 8-track; radial tires, on Toyota chrome wheels. Cooper, 881-1329 or 888-0967.

BASKETBALL HOOP, \$10; Ford 302 CID clutch, pressure-plate and disc balanced, from '70 Mustang, \$35. Brion, 298-1761.

CAMPER, '83 Komfort Lite 5th wheel, 20', dual wheels, \$7200 OBO. Molina, 299-8718.

LAWN MOWER, reel type, \$10; CB antenna for home base, \$10. Hughes, 265-1698.

SUPER-SINGLE WATER BED, complete, \$100; collector's dollhouse, unassembled; more. Johnson, 298-6469.

WOMAN'S DIAMOND WRISTWATCH, appraised at \$2600, sell for \$1200; white Miliken carpet, 12' x 7', \$16.95/ yd. retail price, sell for \$60. Chandler, 883-8975.

ELECTRICAL FIXTURES: contemporary 10-light chandelier, \$50; gold-color hall and swag fixtures, \$20/ea. Miller, 299-2194.

PIT BULL PUPPY, brindle, AKC-registered, purple ribbon, \$75. Marshall, 255-6017 or 883-7336.

METAL STORM DOOR, 36", white, sliding glass and screen, \$25. Olbin, 275-2681.

EVAPORATIVE COOLER, 2400 CFM, 2-spd. fan w/pump, \$85. Puccini, 255-0568.

"LITTLE TYKES" PLAYHOUSE, 40" x 44" x 46", w/table, chairs, telephone, cost \$170, sell for \$75 OBO. Macha, 298-6583.

.32-CAL. WINCHESTER, model 94, pre-war, \$225. Bronkema, 821-2119.

.22-CAL. MARLIN RIFLE, model 39, \$150; .22-cal. Remington rifle, model 66, \$75; Walther P-38, steel frame, \$325; M1 Grand rifle, \$225. Greene, 299-4163.

'84 COACHMAN TRAVEL TRAILER, 22', sleeps 4, AC, self-contained, \$6500. Witkowski, 299-6402.

HP-17 BUSINESS CALCULATOR, \$55; thermal printer, 82240A, \$75; HP-41 wand, \$75; infrared printer module, \$40; x-memory and home management modules, \$25/ea. Walston, 299-5024.

TWO "DIE FLEDERMAUS" TICKETS, Santa Fe Opera, July 22, \$56/both. Miller, 255-7716.

QUEEN-SIZE SOFA BED, earth tone; wood/glass coffee table and end tables; rust-color upholstered rocker; \$300. Daut, 255-2529.

EXERCISE BIKE, \$35; 46" x 34" woven-wood window covering, \$35; 42" x 70" sliding shower doors and frame, \$25. Estrada, 823-1704.

MARCY WEIGHT FITNESS SYSTEM, wall-mounted; Class III receiver for Ford van. Burchett, 299-1689.

FOUR-GAL. BUCKET, janitorial-style, w/foot-controlled wringer for string mops, used once, cost \$45, sell for \$20. Barr, 821-5870.

SEARS POWER-SPRAY CARPET CLEANER, \$50 OBO. Erickson, 299-6824.

COMMODORE CM-141 COLOR MONITOR, C2N cassette, 1541 disk drive, RS232C cartridge, C64 power supply, more, \$300 cash. Boyd, 821-4780.

44-MAG. RUGER SUPER BLACK-HAWK PISTOL, stainless steel, 7" & 10" barrels, pachmayr grips, holster, brass, 70 rounds, reload kit, \$425. Asprey, 296-6673.

BRUNSWICK POOL TABLE, 3-1/2' x 7', w/balls and cues. Wymer, 294-0605.

TRASH COMPACTOR, \$165. Marron, 345-4006.

TEAC REEL-TO-REEL, needs recording head, \$100 OBO. Smith, 275-8185.

QUEEN-SIZE MATTRESS AND BOX SPRING, Sealy Posturepedic Prestigious, \$250. Colgan, 883-2713.

SPINET PIANO, Kohler-Campbell, \$425. Aronson, 898-8893 after 6 or leave message.

RED BORDER BLOCKS, 8" x 5-1/2" x 7-1/2", cost 60¢ ea., 53 for sale at 40¢ ea. Lambert, 344-9012.

GARAGE DOOR, 9', metal, w/all hardware, \$75; 40" GE electric stove, double oven, white, w/meat thermometer. Salazar, 255-1301.

ELECTRIC LAWN MOWER, Black & Decker, 18", used twice, \$115. Smith, 881-3580.

CAMPER TRAILER, 18', tandem axle, sleeps 6, refrigerator, stove, sink, toilet, shower, AC, heater, \$2700 OBO. Bailey, 821-4394.

SANYO QUARTZ TURNTABLE, needs stylus, \$75. Cox, 892-2906.

DOG CARRIER, airline-approved, 25" x 30" x 37", \$35; 12 crystal water goblets, \$1/ea.; misc. frames. Perkins, 293-9231.

WATER BED, Hibernation series, mirrored headboard, padded side rails, heater, \$175 OBO; Zenith console B&W TV. Coffin, 292-7224.

JET SKI, '84 model 440, new motor and paint, and new two-ski trailer, \$2100/both OBO. Fisher, 298-0526.

KING-SIZE WATER BED, w/heater, \$70. Liguori, 266-1668.

BLACK WALNUT, 200 board ft.; 4' x 8' x 1/4" walnut plywood; Mason and Sullivan grandfather clock movement and plans; woodworking books. James, 294-6837.

FOUR-BURNER HOTPOINT COOK TOP, \$25; range hood, 42", \$12; AM/FM stereo w/speakers, \$20; all items OBO. Rudolph, 298-0941.

AIRLINE TICKET, Albuquerque to Tampa, one-way, Aug. 9, \$25. Hudson, 298-3935.

EZ-LIFT CAR WHEEL-CHAIR CARRIER, \$200. Shelby, 292-4605.

QUEEN-SIZE SPLIT ELECTRIC BED, adjustable, \$750. McKee, 344-7550 or 892-7751.

UTILITY TRAILER, 4' x 5' bed, 2' sides, 2" coupler, off-highway hauling, \$100; log chain, 5/16" links, \$15; 2-burner Coleman stove, \$20. Hughes, 299-6674.

GERMAN SHEPHERD-CROSS PUPPY, 3 months old, short coat, free to good home. Rex, 344-6552.

ALL-TERRAIN RADIAL TIRES, 15", on 31x10.5 white Jackman rims, fits Chev. truck, \$400; temporary electric pole w/all boxes, \$150. Courtney, 1-864-3184.

S&W .45-CAL. REVOLVER, model 1955, oak case, cleaning kit, holster, \$450. Cusenbary, 839-9387.

TYPEWRITER, "98", Smith-Corona Super 12 electric, changeable ribbon cartridges. Lynch, 298-7817 after 6.

TEAK WALL UNIT, 3-piece, \$120; utility trailer, 4-1/2' x 9' x 18", \$150; Craftsman bench-top band saw, \$70; 20-gal. aquarium, w/fish, \$25. Peterson, 266-9524.

LEADER OSCILLOSCOPE, dual-trace; Bell & Howell power supply/signal generator; woman's diving wet suit, size 9-10, includes john, jacket, and hood. Gonzales, 266-2302.

BRIGGS & STRATTON LAWN MOWER, reel type, \$120; lawn spreader, \$15. Chaves, 892-9765.

FIBERGLASS BOAT, 35-hp motor, first \$1100 cash. Weber, 293-8196.

TRAILER DRAPES, Holiday Rambler, 7 pairs, brackets and rods, recently cleaned, \$30; detachable cab-mounted wind deflector, \$25. Gregory, 344-1436.

MAN'S BOWLING SHOES, size 8-1/2 D, \$10; figure ice skates: man's size 8-1/2, woman's size 8, \$15/ea. Walkington, 842-1938.

BALDWIN ORGAN; Mustang bucket seats, \$75; metal top for Jeep CJ-5, \$100; tow bar for Ford Ranger, \$75; 5 tires/wheels, 700x16, \$100. Haines, 281-9179.

CATS: 1 Siamese mix, 1 white/tiger, all shots, spayed, free. Sype, 255-3365 after 5.

TABLE, CHAIRS, COUCH, antiques, miniblinds, drapes, garage sale, 12404 Morrow NE, July 16, 8 a.m.-5 p.m. Pike, 292-5080.

BEDDING: queen-size comforter, ruffle, shams, pink tones, \$40; twin-size comforter, sham, throw, duck print, \$25. Kallio, 296-4516.

BEDROOM SET, 6-piece, solid mahogany; doors: 36" exterior, 32" interior, \$7/ea.; door jamb, \$7. Aragon, 881-4795.

GENETICALLY DIVERSE PUPPIES, 6 weeks old, mother is chow and shepherd, \$20/ea. Weiss, 821-8256.

THERMOS POP-TENT, canvas, sleeps 3, \$25; trailer hitch, \$20. Bennett, 298-1142.

BABY ITEMS: crib, mattress, car seat, carrier, diaper pail, clothes, walker, more. Kohler, 294-7150.

EGA-WONDER CARD, can be used with any software or any monitor anytime, \$199. Mogford, 898-1416.

AKC POMERANIAN PUPPIES, born May 31, \$300. Montano, 891-0921.

TRANSPORTATION

'86 CHEV. CAMARO IROC, red exterior and interior, power everything, T-tops, 30K miles, \$13,500. Valerio, 822-1901.

'87 VW JETTA GL, white, 14.5K miles, AC, AM/FM cassette, sunroof, 4-dr., \$9900. Pompeo, 828-2463.

WOMAN'S 10-SPD. BIKE. Cooper, 881-1329 or 888-0967.

THREE GIRL'S BIKES. Johnson, 298-6469.

'73 LINCOLN MARK IV, new starter and battery, \$1475. Tippy, 298-3758.

'75 SILVER LINE BOAT, 140-hp inboard/outboard. Garcia, 299-8778.

'86 KAWASAKI 80 DIRT BIKE, \$650. Olbin, 275-2681.

TWO SCHWINN BICYCLES: 20" boy's 5-spd. Collegiate, \$25; 22" boy's 10-spd. Continental, \$25. Henderson, 884-8309.

'87 CHEV. SUBURBAN SILVERADO, 4x4, extras, \$21,000 invested, sell for \$17,995 firm. James, 294-6837.

'79 CHEV. MONZA, 50K miles, \$1150. Syler, 299-2941.

TWO 10-SPD. MEN'S BIKES, 24", \$50 and \$45. Estrada, 823-1704.

'74 MUSTANG II, V-6, AT, AC, rebuilt engine and transmission, \$1000 OBO. Kearns, 898-4122.

'85 TOYOTA CELICA SUPRA, white, 5-spd., AC, power sunroof, windows, and locks, tilt, cruise, 68K miles, \$9850. Hesch, 268-6122.

'80 HONDA CB 650, 5K miles, \$1000. Esquibel, 867-5341 after 7.

'77 OLDS. SW, stereo, CB, PB, tilt, PS, PL, overhauled engine, transmission, and brakes, \$1425. Asprey, 296-6673.

'83 HONDA ACCORD, 3-dr., 5-spd., 81K miles, blue, AC, AM/FM, cruise, original owner. Hays, 897-1335.

'73 FORD COURIER PICKUP, rebuilt engine, \$800. Harstad, 298-6551.

'71 OLDS. DELTA 88, white, 2-dr., AC, \$600. Puccini, 281-5915 or 255-0568.

'87 TOYOTA PICKUP, AT, camper shell, \$6900. Smith, 275-8185.

SCHWINN LE TOUR LUXE 10-SPD., 25", bags, panniers, pump, more, \$175. Eley, 255-2617.

'81 CHEV. CHEVETTE, 39K miles, 4-spd., AC, \$2900. Edrington, 292-4831.

'77 MOBILE TRAVELER MOTOR HOME, 18-1/2', rear dinette, 79K miles, \$7000. Butler, 292-8823.

'80 SCIROCCO, stereo system, new tires, \$2200 OBO. Colgan, 883-2713.

'85 CADILLAC SEVILLE, loaded, blue, \$15,000 OBO; '82 Toyota pickup, LWB, AT, AM/FM, AC, \$3600 OBO. Gallegos, 294-0233.

'46 CHEV. COUPE, 53K miles, partly disassembled, but complete, no rust, \$2500 OBO. Wilson, 299-1480.

'76 VEGA NOMAD SW, 3-spd., new battery, one owner, 72K miles, \$600. Case, 291-8964.

'78 CHRYSLER LeBARON, 4-dr., AT, AC, 91K miles, blue w/white vinyl roof, \$1250. Brannan, 293-7529.

'87 DODGE SHADOW, hatchback, PS, PB, AC, AM/FM stereo, 10.4K miles, tilt, cruise, rear defroster, \$8000. Liguori, 266-1668.

'83 DODGE COLT, 4-spd., dual-stick, 4-cyl., new radial tires, 48K miles, AM/FM stereo cassette, \$3000. Still, 296-5506 after 7.

TWO BOY'S 24" 10-SPD. BIKES, girl's 24" 10-spd. bike, \$30/ea. OBO. Rudolph, 298-0941.

'85 GMC JIMMY S15, 4-WD, V-6, 5-spd., PS, PB, AC, tilt, AM/FM cassette, Sierra package, below book, \$10,500. Cusenbary, 839-9387.

'85 PONTIAC FIREBIRD, repo, AC, 5-spd., PS, PW, cruise, tilt, sunroof, AM/FM stereo cassette, bids accepted through July 31, we reserve the right to refuse all bids subject to prior sale. SLFCU, 293-0500.

'87 NISSAN STANZA X-E, 5-dr., loaded, 60-month/60,000 extended warranty, \$10,500 OBO. McKee, 344-7550 or 892-7751.

'85 SUBARU XT COUPE, turbo, loaded, power package, AM/FM cassette, removable sunroof, new bra, \$7500 OBO. Gonzales, 266-2302.

'80 DATSUN 200SX DELUXE, 5-spd., AC, AM/FM, power mirrors and antenna, 63K miles, \$2200 OBO. Jensen, 294-3316.

YAMAHA RAZZ MOTOR SCOOTER, 50cc, 180 miles, \$550 OBO. Jones, 293-0440.

'72 BMW, 75/5, new battery, extras, \$1395 OBO. Black, 293-2755.

'80 FORD F-100 PICKUP, short bed, 3-spd., 6-cyl., economy model — no PS, PB, or AC, \$2250. Morrow, 281-9607.

GIRL'S BICYCLE, Topsider, 20" wheels, basket. Weiss, 821-8256.

'78 DODGE PICKUP, \$2000. Montano, 891-0921.

REAL ESTATE

20 ACRES MOUNTAIN LAND, within Cibola National Forest boundary, off So. 14, 35 miles south of Tijeras, trees, water. Zawadzkas, 884-8956.

2-BDR. MOBILE HOME AND LOT in Lake Isabella, Calif., all utilities, landscaped, fenced, paved streets, \$27,500. Dewhirst, 619-379-2093.

2-BDR. MOBILE HOME, '83 model, 14' x 64', 1-1/2 baths, AC, appliances, more, Four Hills. Helling, 294-0582

leave message.

3300-SQ.-FT. HOME ON 1 ACRE, NE, indoor pool, horses, La Cueva High School district, appraised at \$179,900, sell for \$165,000. Baker, 294-3334.

4-BDR. FAMILY HOME, 1/2 acre, 3-3/4 baths, tile roof, 3400 sq. ft. heated, 5200 sq. ft. covered, garage, 12616 Piru SE, \$185,000. Aragon, 294-4275.

4-BDR. HOME, Academy Hills, FR, DR, LR, 2150 sq. ft., landscaped. Klavetter, 821-0513.

2 ACRES IN BOSQUE FARMS, on river, paved road, utilities to property line, irrigation rights, one side fenced in pipe, restrictive covenants, \$23,000/acre. Sanfin, 869-6584 after 6.

2-BDR. MOBILE HOME, '83 Kaufman/Broad, 14' x 70', Four Hills Mobile Home Park, front kitchen, 1 bath, shed, patio, \$18,000. Burstein, 821-6688.

2-BDR. TOWNHOME, 1-3/4 baths, 1590 sq. ft., 8' x 20' solar-heated exercise pool, sunroom, double garage, shop, more, \$96,000. Rainhart, 821-3690.

3-BDR. HOUSE, City View Estates, 1500 sq. ft., 1-3/4 baths, great room, pantry, 700-sq.-ft. patio w/grill, \$95,000. Gwinn, 299-7167.

2-BDR. MOUNTAIN HOME, on 5 acres, off the Zuzak exit on I-40, 25' trees, views, water, \$70,000. Johnson, 415-443-9418.

3-BDR. MOBILE HOME, '73 Spartan, central AC, 2 porches, 2 baths, carport, furnished, \$15,000 OBO. Bronkema, 821-8044.

500 ACRES in Manzano foothills on So. 14, proven water, terms, sell all or part. Bozone, 242-8295.

3-BDR. CUSTOM BRICK HOME, w/security system, 2 baths, den, covered patio, electronic sprinklers, assumable loan. Simonson, 296-2713.

3-BDR. HOME, Taylor Ranch, 1-3/4 baths, den w/FP, cul-de-sac, \$83,900. Sullivan, 897-1123 or 898-7101.

2-BDR. MOBILE HOME, '83 Fleetwood, 14' x 70', 2 baths, carport, covered porch, fenced-in area, family section of Four Hills, \$16,000. Bailey, 296-2609.

4-BDR. HOME, 1/2 acre, Cedar Crest, solar-assisted, family room, formal LR/DR, 2300 sq. ft., attached double garage, \$139,700. Broyles, 281-1917.

2-OR 3-BDR. HOME, Ridgecrest area, 1-3/4 baths, FP, 1400 sq. ft., \$72,000. Zazworsky, 268-2552.

3-BDR. HOME, 1 acre, Bosque Farms, country kitchen, 1-3/4 baths, 2-car garage, 3-stall horse barn, \$108,000. Mitchell, 869-6816.

2-BDR. MOBILE HOME, 1 bath, w/3-bdr. and greenhouse add-ons, 5 acres, horse facilities, storage sheds. Navarro, 764-9727.

WANTED

SANDIANS helped by a United Way agency and willing to provide info for LAB NEWS stories supporting ECP campaign. Walerow, 844-7841.

GOOD HOME for calico cat, spayed female, < 2 yrs. old, all shots. Hawkinson, 281-1281.

PORTABLE PLAYPEN w/carrying case. Cooper, 299-1848 leave message.

FEMALE ROOMMATE, 6 blocks from base, 3-bdr., 2 baths, hot tub, \$350/mo. plus 1/2 utilities. Gonzales, 266-2302.

NON-WORKING GASOLINE ENGINE on chain saw, lawn mower, welder, or generator. Dunn, 296-4904.

WORK WANTED

BABYSITTING, in vicinity of Raven Rd. (off So. 14), by responsible teenager, will also do housework. Thomen, 281-4194.

Tonight on the Patio: Cook Your Own Goose (Well, Not Exactly)

GRATE EXPECTATIONS are yours when you show up at "Cook Your Own Steak (or Fish)" night this evening on the patio. Choose a T-bone or New York steak — or halibut or salmon — to burn just the way you like it. Dinner includes baked potato, vegetable, and optional salad bar. Afterwards, be among the first to hit the new portable dance floor (under the stars) and shuffle the night away to the c/w tunes of those famous Isleta Poor Boys (8 p.m.-midnight). The kitchen hands have to know how much cattle-rustling and fish-poaching to do ahead of time, so help them out with a reservation call (265-6791).

A SPIFFIER C-CLUB'S in the cards as a result of the renovations that began this week and continue until Nov. 1. The interior upgrade affects the lounge, dining room, and ballroom — so activities usually held in those places will move outside to the prettiest patio area in the West. That includes Friday night dinners and dancing, bingo night, lunches, happy-hour time, etc., etc. Note: The patio bar opens at 4:30 p.m. each weekday; on Saturdays, purchase your favorite libations from noon to 5.

Mexican Buffet on Patio

Every lunch time, Monday through Friday, a new a la carte Mexican buffet — chicken fajitas to homemade flour tortillas, tacos to tamales — graces the patio from 11 to 1:15. The regular lunch line is available too, of course. Come to the Club for alfresco dining at its best.

COOL POOL, HOT PIZZA — Every Wednesday night this summer is family fun night on the patio until 8 p.m. (two are coming up July 20 and 27). Grab the swimming suits and enjoy a cool dip in the pool and a night out of the kitchen. The snack bar and grill are open all evening, and feature everybody's favorites: pizza, burgers, hot dogs — you get the picture. Regular admission rates: free for pool-pass holders, \$1.50 for members w/o passes, and \$2.50 for guests.

NEXT BINGO BLAST is on tap for next Thursday (July 21) in the covered-patio area. First game starts at 6:45 p.m. (cards available for purchase at

5:30). Enjoy reasonably priced soup or sandwiches before the action starts. Bring the rabbit's foot along; it may help you win one of the sensational door prizes, or to strike it rich during the gaming. And bring a friend too; there aren't any guest fees during July.

SPEAKING OF GAMING, the T-Bird card sharks go back at it on July 28, starting at 10 a.m. If you haven't yet joined this wild bunch of retirees, you're really missing something! (By the way, head dealer Jim McCutcheon is the wildest of the wild — you should have seen him in Mazatlan last November.)

ITALIAN NIGHT on the patio next Friday (July 22) features veal parmigiana or spaghetti, served up with garlic bread, salad bar, and a free (!) glass of wine. Bring the family, because kids under 12 get a smaller portion of spaghetti for just \$1.50. Sonny & Co. provides the dance music from 8 p.m. to midnight.

HEAD FOR THE HILLS: That's the motto of the T-Bird Roadrunners, as this bunch of big wheels takes off later this month for Cripple Creek, Colo. (July 24-31). More info from wagon masters Duane Laymon (822-1749), Tom Brooks (344-5855), or Joe Shelby (299-4605).

AIN'T IT FUNNY HOW TIME SLIPS AWAY — and it is, if you're planning to sign up for these two Club-sponsored trips:

Rocky Mountain High (Aug. 27-Sept. 4) — That's the *Canadian* Rockies, as if you didn't know. This one's a chance to soak up some spectacular scenery, enjoy a couple of boat cruises and a snow coach tour, relish some mighty fine meals, and bring home mountains of memories (and memories of mountains). Cost is \$876/person (double), with a \$300 deposit when you sign up. Final payment's due on July 27.

Grand (Canyon) Gratification (Aug. 8-15) — Close up and personal: That's your look at the Grand Canyon, as your boat floats down 280 miles of the mighty Colorado River (from Lee's Ferry to Lake Mead). The tab of \$750 covers all meals on the river trip and bus transportation back to Lee's Ferry. For more info or to reserve your space, call trip leader John Shunny (ret.) on 265-1620.

Take Note

Bill Snyder (6500) was recently appointed by Mayor Ken Schultz to the Albuquerque Science Museum Advisory Committee.

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Tony Chen (1523) was recently named a Fellow of the American Society of Mechanical Engineers (ASME). The Fellow grade is awarded to members with at least ten years active engineering practice who have made significant contributions to the field.

* * *

The relationship between science and art is the theme behind "Natural Forces," an exhibit of oil paintings by Craig Hudson (ret.) on display this month at the Mount Angel Abbey Library in St. Benedict, Oreg.

Retirement Planning

Fred Lancaster of New York Life Insurance Co. presents another seminar on retirement planning on July 20 at 5:15 p.m. at City Center (6400 Uptown Blvd. NE), Suite 590 West. If you plan to attend the session, call Fred on 883-5757.

Events Calendar

July 15-17 — "Treasures of the Past, Heirlooms of Tomorrow," a quilted-art exhibition sponsored by the NM Quilters' Assn.; 10 a.m.-6 p.m. Fri.-Sat., 12 noon-4 p.m. Sun.; Flower and School Arts Bldgs., NM State Fairgrounds, 293-6356.

July 15-23 — "Under Milkwood," classic play by Dylan Thomas about life in a Welsh fishing village; 8 p.m. Fri.-Sat., 2 p.m. Sun.; Rep East (educational arm of the NM Repertory Theatre at 3211 Central NE), 260-0331.

July 15-24 — "Good Evening," comedy revue by Peter Cook and Dudley Moore, witty satire in the Monty Python vein; 8 p.m. Fri. & Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

July 15-24 — "Barefoot in the Park," Neil Simon comedy about a newlywed couple's first two weeks together; 8 p.m. Fri.-Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

July 15-28 — "Man's Point of View," art from a man's point of view; 8:30 a.m.-5 p.m. Mon.-Sat. (open until 8 p.m. Wed.); South Broadway Cultural Center, 848-1320.

July 15-Aug. 31 — "Dinosaurs in Action," exhibit of four mechanical dinosaurs: adult and juvenile triceratops, brontosaurus, and tyrannosaurus; 10 a.m.-5 p.m., NM Museum of Natural History, 841-1374.

July 16 — Summerfest '88, Chinese Night: food, entertainment, and arts & crafts; 5-10 p.m., Civic Plaza, 768-3490.

July 16-Oct. 10 — "Spectacular Vernacular," traditional desert architecture from West Africa and Southwest Asia, exhibit circulated by the Smithsonian Institution Traveling Exhibition Service; 9 a.m.-4 p.m. Mon.-Fri., 10 a.m.-4 p.m. Sat.; Maxwell Museum of Anthropology, 277-4404.

July 17 — Arts in the Parks: mariachi bands, Ballet Folklorico, the Gunfighters, other entertainment; 1:30-4:30 p.m., Old Town Plaza, free, 764-1525.

July 20 — Exhibit opening, "New Mexico's Seacoast": humid-environment foliage, undersea world, dinosaurs, and an Evolator trip back through 70 million years to a seacoast setting in which dinosaurs thrived; 9 a.m.-5 p.m., NM Museum of Natural History, 841-8837.

July 22-Aug. 6 — "A Little Night Music," romantic musical comedy presented by the Albuquerque Civic Light Opera Assn.; 8:15 p.m. Fri.-Sat., 2:15 p.m. Sun.; Popejoy Hall, 345-6577.

July 23 — Summerfest '88, Middle Eastern/Carpathian Indian Night: food, entertainment, and arts & crafts; 5-10 p.m., Civic Plaza, 768-3490.

July 24 — Arts in the Parks: Mariachi Tenampa, Al Hurricane, Redwine, and Mexican fiesta dance group; 1:30-4 p.m., Old Town Plaza, free, 764-1525.

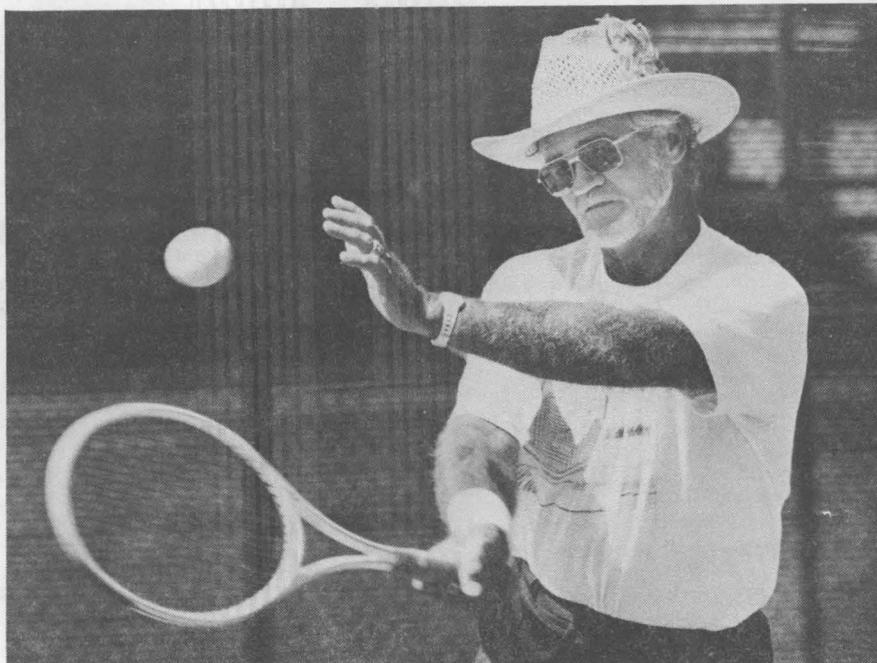
July 28-30 — "The Emperor's New Clothes," children's play presented by the Albuquerque Children's Theatre; 10 a.m. & 2 p.m. Thurs.-Fri., 1:30 & 3:30 p.m. Sat.; Rodey Theatre, 888-3644.

The Empire Moves Back



Don't tell Fay Wray but the Empire State Building has moved 120.5 feet to the northeast, according to the National Ocean Survey. The group says its measurements locate the great building more accurately than previous methods. We hope this doesn't mean a survey now is going to start telling all the rest of us that we've really been somewhere else all these years.

Wall Street Journal



TENNIS, ANYONE? Don Ansel, who teaches children's a.m. classes at the C-Club courts, is also available to give others advice on how to improve their net profits (individual or group lessons). Give the pool office a call (266-5587) for more info on time-slots available, fees, etc. Don's certified as a tennis instructor by both the US Professional Tennis Assn. and the Professional Tennis Registry of the USA.