



BOND CAMPAIGN — Security Inspector Karen Davis raises Savings Bonds flag atop Bldg. 800. Labs-wide Bond campaign gets underway next week. Goal is 95% participation vs. present 87%.

## Some Thoughts on Bonds

by Glenn Fowler (1000), State Chairman for U.S. Savings Bonds

To buy bonds — or not — is a subject most people approach with minds pretty well decided in advance. I'd like to talk here to those who neither are enthusiastically for their own personal purchase of Bonds nor adamantly opposed — to those who are fence sitters.

It's simplistic to urge that each of you purchase Bonds for your own financial welfare. The merits of Bonds versus other investments should be examined by you in a very hard-headed way in terms of your own personal objectives.

Consider this factor, however. Many people have no savings plan whatever, some for good reason and others for no good reason — they've just never got into the saving habit. Even in our rapidly changing world, few will dispute that to save is good. It's simply a matter of being provident, to have some defense if a financial emergency arises. (I happen to believe that more saving and less buying would cool inflation.)

To save through the purchase of Bonds is perhaps the least painful method of setting aside a portion of your income. The amount which you designate for Bond purchase, be it little or great, is withdrawn from your paycheck automatically and applied to that purchase. For you, the purchaser, there are no mechanics or procedures — no visits to the bank, no calls to the broker, etc. The process could hardly be simpler and, by signing up for Bonds, you are pursuing a bona fide savings program. And, as you begin to accumulate Bonds, I think you will be pleasantly surprised by their tax-deferral features.

One other note. We at Sandia consider ourselves a part of private industry and rightly so. Yet it's clear that Sandia's funding derives entirely from the federal government. If you believe — as I do — that Sandia is doing important work in the weapons and energy fields, then I believe you will also be concerned for the fiscal health of your country. The Savings Bonds program is a key element in our government's finances, and I urge you to lend it your support.

*Glenn A. Fowler*

# LAB NEWS

VOL. 31, No. 8

APRIL 20, 1979

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

## Savings Bonds—Tax Aspects Really Work To Your Favor

When Joe Randall's aunt died and left him \$5000, he looked around and decided to invest the windfall in CD's (Certificates of Deposit), which offered a handsome 8.33% annual yield. Joe was vaguely aware that he wouldn't realize *all* of that 8.33% because of federal and state taxes but, like most of us, he didn't delve into the matter too deeply and was happily content with what he perceived to be a good investment. But let's assume Joe makes about \$25,000 and has a wife and two children. Then the melancholy fact is that Joe's CD's aren't returning 8.33% — it's more like 5.6% after taxes. And if he made an additional \$10,000 annually, then the return would drop even further, down to 4.5%.

Would he be better off in Savings Bonds? That depends on a number of factors, but one thing is clear: if Joe is financially able to defer redeeming his Bonds until after retirement, then he will most likely gain a yield on the Bonds of 6%, a yield not eroded by federal and state taxes. Besides being exempt from state income tax, Savings Bond interest income is

deferrable on federal tax returns until the Bonds are redeemed. Held until retirement when personal tax liability is significantly reduced, the Bonds can be a tax-free (or almost tax-free) investment.

The table below was prepared by the Labs Savings Bonds Committee, chaired by Bill Kraft (1410). It compares the current rate of return of Bonds, when using the tax-deferrable option, with several other common low-risk investments. The "Annual Yield After Taxes" columns assume tax brackets of 25%, 33%, and 46% for each of the three income categories; the tax bracket figures represent a combination of federal and state tax and presuppose a family of four claiming the standard deduction of their tax returns.

Type of Investment	Annual Yield Before Taxes	Annual Yield After Taxes		
		\$15,000 Annual Income	\$25,000 Annual Income	\$35,000 Annual Income
U.S. Savings Bonds "T+" Certificates	6.0%	6.0%*	6.0%*	6.0%*
(\$10,000 minimum for 6 months)	9.5-9.8	7.1-7.3	6.4-6.6	5.1-5.3
Certificate of Deposit (\$1,000 minimum for 8 years)	8.33	6.2	5.6	4.5
Sandia Credit Union Share Account	6.0-6.25	4.5-4.7	4.0-4.2	3.2-3.4
Tax Free Municipal Bonds (\$1,000 minimum)	5.5	5.5	5.5	5.5
Savings & Loan Passbook Accounts	5.25	3.9	3.5	2.8
Bank Savings Accounts	5.0	3.7	3.3	2.7

\*For those cases where a tax liability exists after retirement, the effective annual yield of Savings Bonds will be lower. For example, assuming a post-retirement tax bracket of half of that before retirement, the effective annual yield of Bonds held for 25 years, is 5.59%, 5.45%, and 5.18% respectively for each of the annual income categories above.

**Bond Drive Starts Monday**

# Afterthoughts

A matter of credibility--The nuclear community, of which Sandia is a member, endures a curious distinction in the world of science and technology. It can best be illustrated by example. Let a civil engineer make a public statement to the effect that the aging George Washington suspension bridge across the Hudson River in New York remains safe for vehicular traffic, and the public generally accepts such a statement without a murmur. And believes it. Or, in another and more personal sphere of science, if a urologist tells you following examination that you've got kidney stones and he's going to have to get them out surgically, you'll flinch and you may even get a second opinion. But you'll probably come around eventually.

That which is happening here, of course, is that the rational person comprehends that we live in a complicated world and concedes that in areas beyond his expertise he has no choice but to rely on the informed judgment of someone who does know something about the subject.

Now we come to that curious distinction borne by people who happen to be expert in matters relating to nuclear power. Let such an expert make a public statement on the subject, be it on waste disposal, or on nuclear vs coal-fired generating plants, or on the Three Mile Island accident, and the observable reaction to the statement ranges from howls of outrage and disbelief from the professional anti-nukes, to media coverage that seizes upon the most melodramatic and "worst possible" elements in the statement while ignoring the balance of what was said, to--at best--a pervasive skepticism by more thoughtful people.

I feel sorry for those nuclear scientists and engineers who have devoted a large portion of their adult lives to gaining knowledge on a complicated subject, only to now find themselves beleaguered and suspect. It's a no-win situation for them and, tragically, it may also be a no-win situation for the entire country in the long run.

\* \* \*

"As of this moment, nuclear power production in this country equals the nation's total power production in 1947--only 31 years ago. That is a very significant amount of nuclear power now being produced and it makes it even more clear that nuclear power is simply a fact of life. Yet still large groups of protestors and the media, generally, speak of, write of it as if it were something impending, threatening, debatable." --Oak Ridge, Tenn. Oak Ridger, Nov. 22, 1978

\* \* \*

But will it cuddle up?--We are pleased to report a bulletin from the American Tarantula Society of Bellingham, Washington, setting forth the group's purpose: "To provide the opportunity for professionals and lay men to share their knowledge of the tarantula spider; to encourage the study of the tarantula as it gains popularity as a pet; and to eliminate misunderstanding concerning the tarantula." We have ATS's address if you need it. \*js

## LAB NEWS

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## Credit Union Reporter

The Credit Union is now offering 26-weeks (182 days) Money Market Share Certificates paying the latest six months Treasury Bill rate (for the week ending Apr. 18, 9.57%). The minimum amount is \$10,000. Dividends are computed on a day-in to day-out basis on the actual dollar value and paid at maturity. Federal regulations prohibit compounding of interest, and a substantial penalty is assessed for early withdrawal. It is anticipated that sufficient funds for the specified dividends will always be available; however, Federal regulations prohibit payment of dividends in excess of available earnings. Each member's account (includes regular share accounts, Share Certificates and Money Market Share Certificates) is insured to \$40,000 by the Administrator of the National Credit Union Administration. Contact the Credit Union for additional information.

## Supervisory Appointment



**NORMAN SCHWENTOR** to supervisor of Machine Repair and Tool Crib Section 1485-1, effective April 1.

Norman joined the Labs in December 1975 as a journeyman machine repairman. Before Sandia, he had been in the machine repair field for 12 years, obtaining journeyman rank at the Cadillac Company in Detroit. Norman is currently working toward an ME degree at UNM. Off the job, Norman enjoys woodworking, skiing, dirt biking, golfing and gardening. He and his wife Shirley live in the NW valley.

## Events Calendar

- April 20-21 — Garden Fair - Open Show/Sale, Albuquerque Garden Center, 299-0811.
- April 22 — April Iris Society Show, Albuquerque Garden Center, 2-5 p.m.
- April 23-28 — UNM Theatre Arts: Evening of One-Act Plays, 8 p.m., Experimental Theatre, Rodey Theatre, 277-4402.
- April 27-28, May 4-5, May 11-12 — "A Little Night Music," musical, 8 p.m. Tiffany Playhouse, Sheraton Mercado, Old Town.
- April 28-29 — Santa Fe: Spring Show and Sale, Eight Northern Pueblos, Artists and Craftsmen, 90 exhibitors, De Vargas Mall.
- April 29 — Music Vesper Series: Frances Robertson concert, 4 p.m., First Methodist Church, 4th & Lead SW.
- April 29 — Brass Extravaganza, Renaissance to 20th Century, First United Presbyterian Church, Sanctuary, 8 p.m., 215 Locust NE.
- April 29 — UNM Music Department: UNM Jazz Bands Concert, 8:15 p.m., Rodey Theatre.
- May 1 — Maxwell Museum of Anthropology Lecture Series: "Navajo Sandpainting — the Newcomb Collection," 7:30 p.m., Presbyterian Professional Center, 201 Cedar SE.
- May 4, 6 — "Othello," (Gene Ives, 4330, as Iago), Albuquerque wopera Theatre, 8:15 p.m., Popejoy.

## Congratulations

To Jamie Wiczer (5133) and Ellen Winter (daughter of Charlie Winter, 400) married April 8.

To Richard Graham (2452) and Carmen Powell married March 31.

## Supervisory Appointments

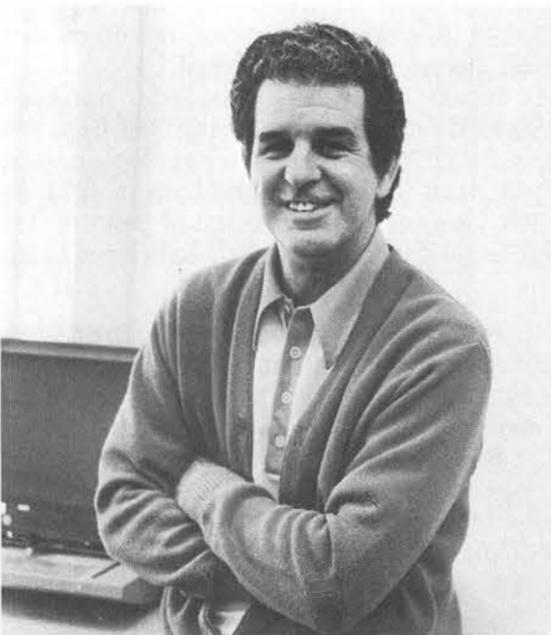


**BILL THOMPSON** to supervisor of Plant Engineering Division II 8255, effective April 1.

Bill has been a member of the plant engineering staff since joining Sandia Livermore in 1961. As SLL's civil structural engineer in both design and planning, he has worked on all new plant facilities. He has also been the project engineer for such construction as the computer center and research buildings 967, 970 and 975. His new division is responsible for the Labs on-site plant design.

Bill earned a BS in civil engineering from State University of Iowa in 1953. Before Sandia, he was a test engineer at the GE/Vallecitos research nuclear reactor and a civil engineer at the Idaho National Reactor Test Station.

Off the job, Bill enjoys fly fishing, fly tying and gardening. He, his wife Trese, and their daughter live on Adams Avenue in Livermore. They also have four grown sons.



**BERNIE DUNNE** to supervisor of Drawing Reproduction and Micrographics Section 8273-2, effective April 1.

Since coming to Sandia Livermore in 1967, Bernie has worked in mail and document control, micrographics, plant maintenance, and product record organizations. The past three years he has been a procurement coordinator in development support.

Bernie has an AA degree in business administration from San Joaquin Delta College and studied at Stanislaus State University in Turlock, Calif. His leisure time activities include golf and water sports, especially swimming and boating. He and his wife Maria live on Coronado Way in Tracy. The Dunes have three grown sons.

# LIVERMORE NEWS

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APRIL 20, 1979



EDUCATION was the subject of discussion during a recent SLL visit by Dean Barbara Mertes of Chabot College and Irv Batz, Student Personnel Services Director. Dean Mertes is shown with Bill Spencer (center, 8100), who is SLL's representative on the Sandia Education Committee, and Marlin Pound of Training Division 8214.

## Take Note

Tennis? Players at all skill levels are encouraged to enter SLL's Spring Tennis Tournament scheduled for May 5 at the Granada High School courts. Format will be round robin flights with flight winners playing for championship trophies in three categories: men's, women's and mixed doubles. Participants may compete in two categories since the mixed matches will not be played until the regular doubles are completed. Find a partner and call Mike Ferrario (8272), ext. 2827, or Steve Peglow (8451), ext. 2924.

Combustion Sciences Department 8350 attracted a host of foreign visitors early this month. In one week, the department briefed two representatives from Volkswagen, Germany; two from Renault, France; two from Mitsubishi, Japan; and nearly a dozen Europeans from a university, industry, and government coalition interested in US studies on reducing emissions from coal-fired power plants.

## Pat Childers New Art Association President



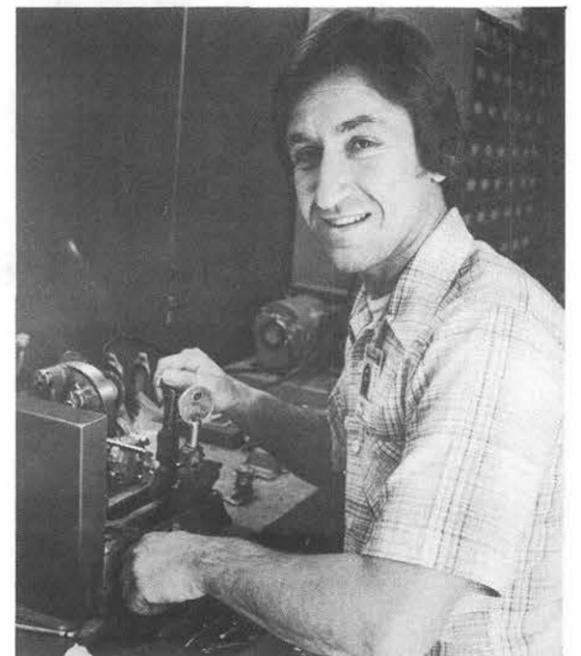
Artist Pat Childers (8266-1) is the newly elected president of the Livermore Art Association. As president, she also heads the board of directors of the LAA Gallery which offers sales and rentals of local artists' works in Livermore's Carnegie Building (Third and "K"

Streets).

Active in the LAA since 1970, Pat has held various offices and has chaired many art-related events. She has studied with several well known Northern California artists and was named "Artist of the Month" in 1976.

An artist who works almost exclusively in oil and watercolor, Pat says she finds painting "most relaxing." Her paintings have been shown at Livermore's Festival of the Arts, the Lodi Grape Festival as well as in exhibits sponsored by LAA.

Pat invites those interested to an upcoming LAA event, the seventh annual "Art in the Vineyard," set for May 27 at the Concannon Winery.



SLL'S NEW CERTIFIED LOCKSMITH is Tommie Bryant (8261). Tommie graduated recently from Golden Gate School of Locksmithing, which he attended under Sandia sponsorship, and replaces Bob Piper who retires in May. The 240-hour training course covered not only the basics but all aspects of locksmith technology.

## Sympathy

To Pat Eicker (8326) on the death of his father in Denver, March 13.

To Ollie Olivotti (8412) on the death of his father in Merrill, Wis., March 10.

# Help Wanted: Yours — To Cut Labs Energy Use

When you leave work to go home this afternoon, will you remember to turn off the lights?

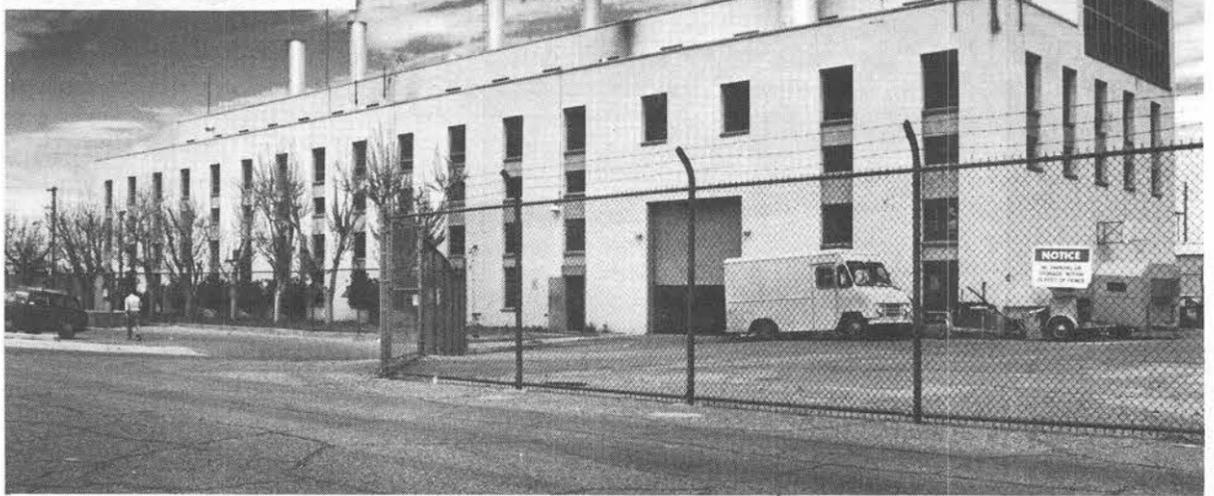
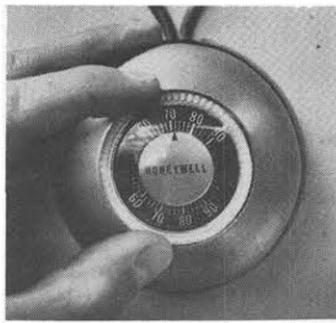
It's time for lunch and you're heading for class. Have you switched off the exhaust fan in your lab?

You're in your Bldg. 802 office and you suddenly need that tab run you left in Bldg. 880. Will you walk over to pick it up? Or perhaps jump into the company car to make the trip?

These are small matters, perhaps, but Sandia Labs now has more than 7,000 employees, and if each of us tends to be careless in these matters the resultant wastage is costly both in terms of money and of energy. The obverse is true as well: if each of us is careful in these matters, the resultant savings can be considerable.

For Sandia, and for the country, energy conservation is going beyond rhetoric to become the indispensable element, the *sine qua non* of our energy programs. And, in line with President Carter's recent address to the nation on the energy crunch, DOE has directed its contractors to immediately reduce the consumption of electricity and petroleum based fuel by 5% (further downstream: 10%) and vehicular mileage by 10%.

Both Plant Engineering (3600) and Plant Services (3420), which has responsibility for the Motor Pool, have already developed



ENERGY — We're running out, and Sandians are urged to take steps in their offices, labs and work shops to make sure no energy is wasted. Ultimate Labs-wide aim is 10% reduction in energy usage.

programs to meet these DOE goals. Sandia Livermore is similarly involved. The thrust of the programs is, simply, to lessen usage of energy-consuming equipment — reduced lighting, curtailed heating and cooling, reduced vehicle usage.

While some energy conservation can be realized by Labs-initiated actions, meeting

DOE's mandated goals will take our individual efforts. Discussing this, Ward Hunnicutt, Director of Plant Engineering, has this to say: "It's clear that the success of this additional energy conservation effort depends upon cooperation — yours and mine. Remember — turn off and turn down. We must conserve energy."

## Take Note

David Smallwood of Vibration and Shock Division 1542 has been awarded the Institute of Environmental Sciences Irwin Vigness Award. Selection was based on a paper presented on a subject pertinent to the field of dynamic shock. David's paper, "Multiple Shaker Random Control With Cross Coupling," was the choice of the awards committee.

\* \* \*

Gale Sutton, a UNM grad student in psychology, is looking for a few Sandians to participate in a research project on the criminal trial process. The volunteers will be shown a videotape of a trial, then be formed into juries and asked to reach a verdict, or simply asked about their attitudes and opinions of the trial. Total time required will be about five hours, and trial sessions will be scheduled at the convenience of the volunteers. If you'd like a little insight into the legal process, call Gale Sutton at 277-4025 or leape a message for her at the UNM Psychology Department, 277-4121.

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As part of a national effort to raise money for the 1980 Olympics, the Albuquerque Figure Skating Club is hosting a Skate-a-Thon tomorrow at Tingley Coliseum Ice Arena from 10 a.m. to 10 p.m. Admission is by donation, either your own or by check from sponsors. Donations are tax deductible and checks should be made out to the U.S. Olympic Committee. Even non-skaters can participate, since there's an exhibition of free style skating and ice dancing scheduled from 4:30 to 5 p.m.

A 51-year old scientist, Ian Ross, has been elected President of Bell Laboratories. He succeeds William Baker, who has been elected Chairman of the Board. Bell Labs has about 18,200 employees at 16 locations in eight states. Ross joined the Labs in 1952. In 1968, he was elected President of Bellcom. He has been executive VP at Bell Labs since 1976.

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A seminar, "Plague Control," is scheduled for presentation May 2, 12 noon, in Bldg. 815, by Sgt. Allen Nelson of the KAFB Veterinary Service. Environmental Health Department 3310 is sponsoring the seminar in cooperation with the Air Force. Data collected by the KAFB vet services indicate that plague is present in a number of wild animal species on KAFB, including rats, mice, rabbits, ground squirrels and coyotes. With a few precautionary measures, individuals may greatly lessen their chances of contracting the disease.

\* \* \*

Bus notes: the routing of the Wyoming-Sandia bus has been changed because of barricades in Academy Acres. In the morning the bus goes north on McKinney, east on Harper, east on Burleson, south on Truchas, east on Academy and south on Wyoming. The evening route follows this in reverse.

\* \* \*

Attention all technical women: come to the salad-dessert potluck dinner on Monday, April 30 at 6 p.m. Questions? Call Dale on 4-6733.



BE A QUITTER — You can still sign up for Medical's Stop Smoking Program, which is set for the four weeks running from April 24 through May 17. Meetings will be held Tuesdays and Thursday, from 3:30 to 5 p.m. Sign up by calling Arlene Price, 4-1057, or Phil Cheromiah, 4-3993.

## New Minicomputer Network Set for Tonopah Test Range

If you've ever looked through a telescope, you know how difficult it is to "zero in" on a target because your view of the world has been reduced to a tiny pinhole. Reference points are excluded. You could search for a long time, for instance, trying to get a closeup look at a running deer. The longer the telescope, the more magnified your image, but the field of view becomes smaller.

The tracking cameras at Tonopah Test Range are essentially astronomical telescopes. Focal lengths are 298.5 centimeters (117.5 inches) and 596.9 centimeters (235 inches) — very long lenses indeed. These instruments photograph weapon development tests — test units dropped from jet aircraft — at speeds approaching Mach 2. It is a formidable task to keep the test unit centered in the film frame and to follow it from release to impact. It is even more difficult to follow a projectile fired from an artillery piece. Camera operators of Tonopah Test Range Department 1170 do it routinely. Providing a crisp, clean image of the entire test on movie film is a matter of pride.

This film, exposed at many hundreds of frames per second, together with electronically recorded telemetry data, is invaluable to weapon development groups. It is the "proof of the pudding" or a record of failure — a place to learn where to start over.

It is the *raison d'être* for Tonopah Test Range.

Here's the way the image on the film is obtained:

As the aircraft approaches the Range, radars track it and transmit position data to the central computer. The aircraft location is then computed for each of the tracking telescopes or cinetheodolites, and this information is transmitted to each camera station where servo motors are actuated to position and focus the telescopes. Aircraft location information is computed 10 times each second. After acquisition of the target, the computer maintains focus of the cameras while the operators manually take over tracking control. It is a job requiring considerable judgment and skill.



BOB FINNELL (1172), left, and Mike Bakos (1171) discuss automated positioning of TTR camera stations by a new minicomputer network. New system will be operational by the end of the year.

Bob Finnell of Range Modernization Division 1172 has spent more than a year designing and programming a minicomputer network to better perform the computing part of the tracking task.

Improvements include:

- enhancement of the radars' raw tracking data by filtering and smoothing techniques;
- inclusion of corrections for the earth's curvature;
- increasing the data rate by a factor of 10 (the cameras are directed to move 100 times a second instead of 10);
- provision for additional tracking stations, with target vector calculations made by minicomputer at each station;
- an expanded capacity for off-range

operations; by enabling direct communication from radar to the tracking stations, bypassing the central computer, tests may be conducted anywhere with mobile equipment.

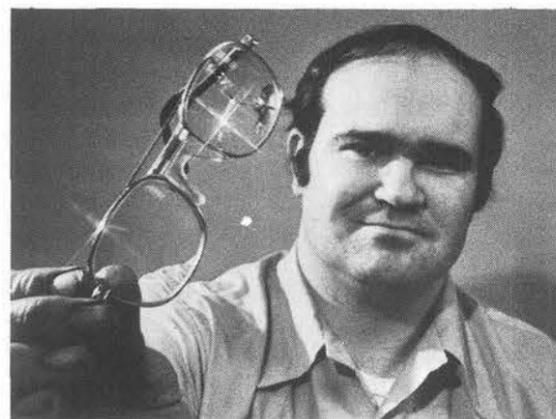
Thirty TI 990/10 minicomputers will be incorporated into the network. All minicomputers function with respect to a central reference point on the Range which may easily be moved for an expanded operation. It is a simple matter to "dial in" new location data when mobile stations are moved.

The program includes a built-in calibration system and a computer check of all drive circuits. Radars may be calibrated using designated stars as reference points.

Two of the minicomputers are currently installed. The entire network is scheduled for completion by the end of the year.



HE'S CLEANING UP ... but Ben Armijo of Reclamation & Custodial Division 3426 would like a little help in the Labs-wide campaign to clear out clutter, trash and unneeded material in the Tech Area. The stuff should be returned to General Stores, storage or reclamation, as appropriate, and if you need assistance you can reach Ben on 4-7785; Joe Maldonado, 4-7859, and Adolpho Sanchez, 4-1574, are additional contacts.



SAFETY GLASSES prevented serious eye injury to Bob Cox (1482) recently while he was buffing an engine valve in his home workshop. A small particle of carbon or a loose wire (Bob isn't sure) from the buffer shattered one lens of his safety glasses. A machinist at Sandia for nine years, Bob wears safety glasses when working with machinery — at home or on the job.



How do you type a fugue? Ask Charlie Carmichael out in San Francisco. He's invented a new instrument that crosses a typewriter with an electronic organ. Anybody, says Charlie, can play a recognizable song right off the bat and a touch-typist can turn in a virtuoso performance. "It's not for professionals," says Charlie, "but for people who always wanted to play music but never could."

## Two Wheels Are More Fun Than Four

In 1962 I bought a used BSA Gold Star motorcycle and started driving it to work at Sandia. This morning, driving my Honda cycle in to the Labs, I contemplated my 17 years of cycle commuting. In the course of those years I've been cold, wet, sand blasted and wind blown. But it's all been fun — at least compared to sitting inside an automobile — and it's been a cheap way to get to work. And, contrary to myth, I haven't been hassled by automobiles, quite possibly because I make it a point to keep both a most respectful distance and attitude, on which more later.

This is an article about the pros and cons of motorcycle commuting. If your automobile is delivering nine miles per gallon, and you elect not to join a car pool or ride a bus, and you wonder when gas will hit a dollar or more per gallon, then perhaps you've already thought about a motorcycle, even if fleetingly. I'll not recommend here that you get a bike (as motorcyclists call their mounts) nor, for that matter, that you not get one. Rather, I'll try to give you a view of the subject that will help you make up your own mind.

First, the paramount consideration: safety. It's clear and unequivocal that, mile for mile, you're less safe on a bike than you would be if you rode those miles in a car. But all of life is risk-ridden, and the real question is how much additional risk does one incur through motorcycle riding? I can't give you a quantitative answer to that because the degree of additional risk is pretty much a function of how you choose to comport yourself on your bike. To my mind, the accident statistics are significantly skewed by the crazies of motorcycling — the very young (mentally & chronologically), the helmetless, and the humanoids to whom a motorcycle is a conveyance of macho.

In my 17 years' experience, I've had only one accident: coming to a stop at a rain-soaked intersection, I absent-mindedly applied the front brake a shade too hard (bikes have separate front and rear brakes). The front wheel spun and twisted on the wet pavement and down I went. Fortunately, no one was following and the extent of damage was the sore hip on which I had crash landed.

In the context of commuting, I believe that cycle riding can be reasonably safe. Consider these factors:

— the mature rider, commuting daily, learns his route in intimate detail — where a pothole awaits, where the school bus makes its turn, and so on. Thus, he is less likely to face unpleasant surprises of the type that produce accidents.

— commuting is generally a daytime thing. Cycling safety studies rate visibility of the cyclist as a key element; obviously, one sees a cyclist better in the day than at night. Further, the cyclist himself sees better, and drunken drivers are generally creatures of the night.

— when the weather turns sour, a sensible rider doesn't ride. If I'm already at work with my cycle and it begins to rain, I leave it here and hitch a ride home or take the bus.

— finally, and perhaps most important, the sensible rider drives defensively. I never challenge, never glare, never arouse ire by weaving in traffic, never make gestures — it simply is kind of dumb to arouse anger or competition in someone who has two tons of automobile compared to your few hundred exposed pounds.

If you've gone this far and remain unfazed, then let's talk about the machines



**DON'T BE FRIGHTENED** — it's only mild-mannered editor John Shunny (LAB NEWS) astride his Honda. Helmet has chin guard plus flip-up bubble visor. Hands are protected in cold weather by naugahyde envelopes that attached to handlebar. Fairing deflects wind blast off rider. Author of accompanying article on cycle riding, Shunny has been riding the machines for 17 years.

themselves and the kind of bike you might want for commuting. Take a stroll sometime through one of our motorcycle parking lots — you'll see a much wider spectrum of choice in motorcycles than you will see in the automobile lot, with the extremes represented by something like a 90 cc (engine displacement) Honda and a 1300 cc Harley (like those driven by policemen and usually referred to as a "hog.") The Honda 90 weighs maybe 200 pounds, is comfortable up to 40 or so mph, costs about \$750, gets at least 80 miles per gallon, has a kick starter, and is a thoughtfully designed machine. The Harley weighs 800 or more pounds (don't ever drop one), can zoom to 100 mph in third gear, costs \$5000, might get 40 mpg, has an electric starter, and is also thoughtfully designed (but more from the standpoint of producing revenue for the manufacturer). And there's a myriad of bikes between these two extremes.

In terms of a purpose, such as commuting, bikes tend to be evaluated according to engine displacement. For simply coming to work and neighborhood driving, the Honda 90 is fine if you stay off the freeways, which are a form of Russian roulette for any cycle, however powerful. If you prefer a bike on which you can cruise in the 50-60 mph range, with occasional forays to 60-70 mph, then you need an engine displacement of 350 to 400 cc, possibly greater if you are a big person. From 500 cc up, it's largely a question of whether you wish to go 100 mph, 125 mph, or more. Cycle manufacturers are engaged in the same puerile horsepower race that we witnessed in the 60's in automobiles.

Prices for 350 to 400 cc bikes, new, run up to \$1500. But look at used bikes too. For a number of reasons, motorcycling sees many apostates: people take it up, then stop. So low-mileage used bikes are available and relatively abundant. Your friendly Credit Union makes

loans toward the purchase of cycles and there's even a cycle "blue book," available in the Credit Union to check out values.

Let's assume you've taken the plunge and now have your very own Banzai 400. What are your immediate needs? Number one is cycle knowledge and experience. Be sensible and gain the knowledge quickly by signing up with the Base Motorcycle Safety Course (Mr. Rhine, 4-1771). You need experience so that the machine, its operation and stopping, are all so familiar that you do the right thing automatically if an emergency develops. A bike is deceptively simple to operate — it's when you suddenly see a patch of ice looming up on the road ahead that you begin to appreciate the subtleties of safe cycling.

A helmet, of course. The more helmet, e.g. full face, the more protection. ("Full face" helmets cover both skull and chin area.) And clothing and gloves, not only for warmth but also to protect your hide if you do take a tumble and slide along the pavement. Leather is fashionable in some cycle circles, but ski clothing does nicely. In the summer it becomes a choice between comfort and safety.

You also need a fairing or windshield on the front of the machine. I can hardly ride a bike that doesn't have one — winter or summer. The wind blast, even at a modest 50 mph, is incredible, and smacking into an insect at any speed is painful and can be dangerous. Finally, reviewing what I've told you above, I realize that motorcycling may sound just a little formidable. But this derives from my concern that you be aware of all the negative aspects, and I haven't really gotten down to the heart of the matter: what's the best reason for cycling? Well folks, it's not the economy, it's not the parking, it's not the convenience. After 17 years, I still cycle because it's exhilarating, a challenge and, in a word, fun.

# Nuclear Fuel Shipping Cask Patented

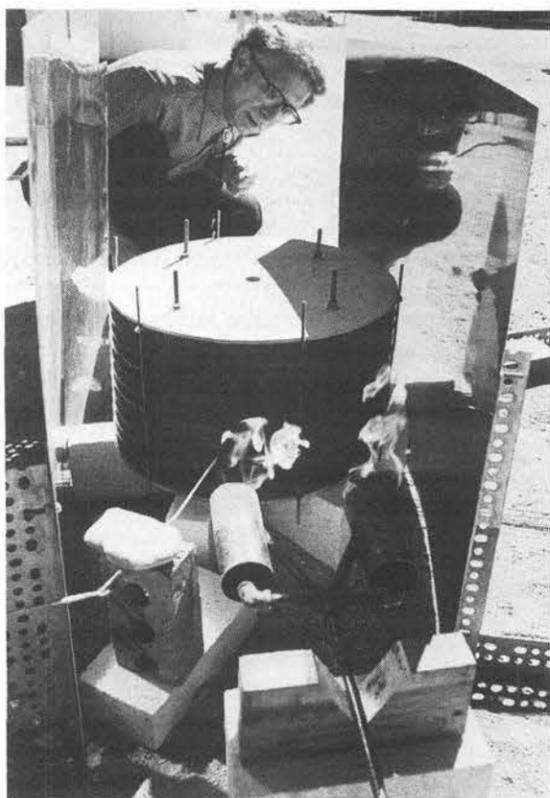
DOE has been awarded a patent for a fire resistant nuclear fuel shipping cask. Inventors are Marvin Moss (5842) and Dick Heckman (2151).

"The problem," Marvin says, "was to design the cask so that the fuel-generated heat inside the radiation protective cylindrical cask could be dissipated while protecting the integrity of the container from an accidental fire outside the cask. We were working against the 'worst case' scenario — a shipping accident in which the cask is tossed into a ditch filled with burning fuel."

The inventors modeled the problem on a computer and investigated a number of solutions before building a prototype quarter-scale model cask.

"Cooling fins are an ideal way to dissipate internal heat," Marvin says, "but they also provide a direct path for outside heat to penetrate to the interior. Our solution was to design a series of expandable bimetal bands to fit between the fins. These overlapping bands expand when subjected to high temperature external heat all the way to the outside circumference of the fins and form, essentially, another protective shell around the cask. After the fire, the bimetal bands cool and retract to their original dimensions. In this way, expelling of internal heat continues. The bimetal bands are formed from stainless steel and Kovar."

The inventors performed a number of tests of the scale model prototype, and the design performed as expected.



MARVIN MOSS (5842) examines test setup of a fire resistant nuclear fuel shipping cask. Torches, foreground, simulate heat of a high temperature fuel fire.



We always knew there had to be a place left for radio, but running in tandem with TV had never occurred to us. A recent survey in Chicago showed 74 percent of those who watch Chicago Bear games on TV turn off the sound and catch the play-by-play on radio. Why? "TV commentators tend to let you watch the action rather than telling you what's going on," explained one radio exec. "Nonsense," said a radio sports announcer, "It's how people get even with Howard Cossell."



LEADERS from the black community attended a Coronado Club luncheon with President Sparks, VP Ray Powell (3000) and Bob Garcia (3500) last week. Among the thirty in attendance were, from left, Cortez Williams, Exec. Director of Development of Research & Human Services; Carol Stamps, VP National Council of Negro Women; Pres. Sparks; Anita Edmon, Director of EOB, S. Broadway Ctr.; and Ivory Alexander of Exploratory Radar Development Division 2345.



SCIENCE YOUTH DAYS — Nearly 200 young people from high schools in Albuquerque and surrounding areas came to Sandia last week to tour Labs facilities. Here Bob Schuch of Beam Source Application Division 4232 explains X-ray converter target used in association with Hermes II accelerator. Students participating in the tour have evinced interest in scientific careers.

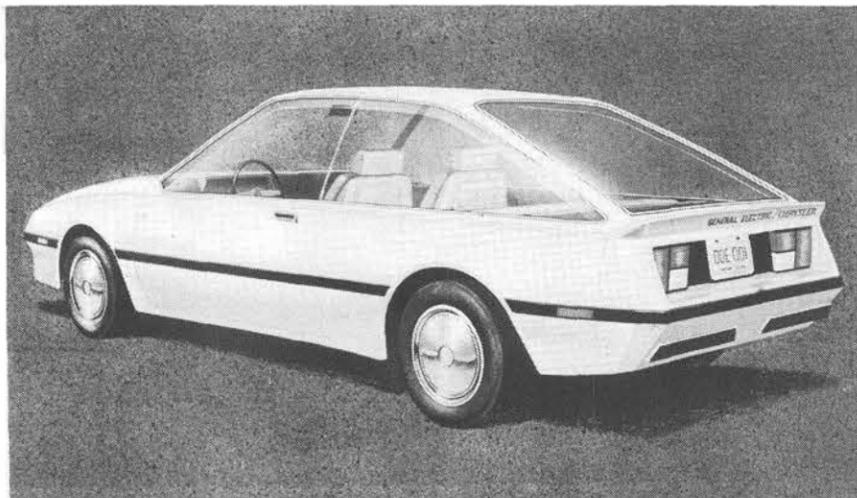
## Sympathy

- To John Tenbrink (4338) on the death of his mother in Dodge City, Kans., March 30.
- To Al Hall (1485) on the death of his mother-in-law in Albuquerque, April 2.
- To Muriel Iverson (1522) on the death of his mother in Washington, Utah.
- To Arlen (2650) and Calla Ann Pepmueller (3140) on the death of his father in Albuquerque, April 1.
- To Gerry McCoach (4722) on the death of his father-in-law in Kansas, March 31.
- To Jim Day (3332) on the death of his father in O'Donnell, Texas, April 1.
- To Tony Lopez (3411) on the death of his son in Albuquerque, April 7.

## Death



Carl Wiseberg, a staff assistant in Controllers & Switches Division 2337, died in an automobile accident April 9. He was 57. Carl had worked at the Labs since 1956. He is survived by his wife and son.



THE GE ELECTRIC



THE GARRETT HYBRID

## The Status of Electric and Hybrid Vehicles

*Editor's Note — Dick Bassett (2354), builder of two electric cars (LAB NEWS, Sept. 27, 1974 and Oct. 7, 1977) maintains a continuing interest in electric vehicle development. He attended the Fifth International Electric Vehicle Symposium last fall and at a recent seminar presented "An Overview of the Status of Electric and Hybrid Vehicles." The following is a summary of that presentation.*

\* \* \*

So where are the electric cars? As gasoline prices increase and supplies become limited, it's obvious that we need them. Several programs are underway that are bringing the electric car a little closer to widespread use.

In 1976, the Congress approved programs providing for the research, development, testing and evaluation of new electric and hybrid vehicles. (The "hybrid" combines electric and mechanical energy features.) In a second program, approved in 1978, more funds are authorized, and it includes financial incentives to demonstrate the commercial feasibility of electric and hybrid vehicles (EHV).

Specifications for the electric vehicle were outlined as follows:

**Performance** — suburban driving range of 120 km (75 miles), capacity of four adults, cruising speed of 90 km/h (55 mph), passing speed of 100 km/h (60 mph) and acceleration

from zero to 50 km/h (zero to 30 mph) in nine seconds.

**Cost** — (in 1975 dollars) \$5000 initially with a life cycle operating cost of \$0.09 km (\$0.15 mile) over 10 years.

Feasibility studies (sponsored by DOE) are complete; two contracts (at \$6 million each) for development of prototype electric and hybrid vehicles have been let and work is underway.

GE is developing the electric vehicle, while the hybrid is under development by Garrett/Airesearch.

The GE electric vehicle (see illustration) has contemporary styling with a low drag exterior. A DC motor, which drives the front wheels through a fixed-ratio transmission is used. Speed is controlled by means of field and armature choppers; regenerative braking is employed. GE-developed power transistors are used, with solid state logic, power supplies and converter all in a GE "power module." Eighteen batteries (improved lead acid) are packaged in a tunnel extending from the engine area to the rear compartment.

The Garrett electric hybrid (see illustration) incorporates a flywheel to provide boost power for acceleration and hill climbing. Braking energy is stored in the flywheel. The effect of the flywheel is to reduce battery drain and, thus, to extend battery life.

Further, the acceleration capability is not diminished by discharging of the batteries.

Eighteen batteries, also improved lead acid, run length-wise from the front of the car under the passenger compartment. Power goes to the rear wheels. The body is made of fiberglass-reinforced plastic for lightness.

The power train consists of two DC motors, each rated at 21 kW, and a flywheel, plus gearing and controls. One motor drives the rear wheels, the other the flywheel during startup and at low driving speeds. The flywheel motor is also associated with the transmission to transfer energy in or out of the flywheel as required.

The flywheel itself features a composite rim made with epoxy/fiberglass and epoxy/kevlar. To reduce wind drag, it operates in a moderate vacuum. Approximately 59 cm (23 inches) in diameter, the flywheel operates up to 25,000 rpm, representing at total energy store of 1000 watt-hours. If the flywheel is already at maximum rpm, braking energy is shunted to the batteries instead of the flywheel.

Final assembly of both GE and Garrett test vehicles is scheduled for sometime this spring.

In these demonstration projects the aim is to find markets where electrics and hybrids can be used, and plans are for fleet owners, small companies and individuals to operate up to 10,000 vehicles during the next seven years. DOE has selected five firms to participate in the initial demonstration. They include AT&T, Consolidated Edison of New York, the Long Island Lighting Company, E/AV Distributors, and Disney World in Florida. In addition, more federal agencies will be using the electrics. The Post Office is currently operating a fleet of 383 AMC electric Jeeps. Future demonstrations will involve 600 vehicles, then 1700, and, finally, an additional 7500 through FY 84.

Private firms are also developing electric vehicles: the AMC/Gould postal van, the "Batronic Truck" by Batronic Truck Corp., the "Endura" and "Maxima" by Globe-Union, the "Electra-Van" and pickups by Jet Industries, the "Town Car" and "Runabout" by Copper Development, the "Electrovette" and GMC van by GMC, the "Pacer" by Electrical Vehicle Associates and many, many others.

With electric vehicles, you can't even start without batteries. Exciting and promising programs are underway for their improvement. The ultimate goal is an energy density 10 times greater than that of present lead acid batteries.

The electrics are coming — of that there is little doubt.



DICK BASSETT (2354) occasionally drives his home-built electric Vega to work (when he can talk his wife out of it). It's a high performance (60 mph with quick acceleration) vehicle with limited range (35 miles on a charge) and costs between 1¼ and 3 cents per mile, depending on fuel adjustments and electric rates.

# feed back

*Q. An article in a recent Parade magazine indicated DOE's interest in company-sponsored van pools. Is Sandia doing anything about van pools?*

A. The Employee Transportation Committee has been watching the van pool movement with considerable interest since its inception at 3-M about six years ago. The Committee thinks the time is right for van pools at Sandia and is now working with one group of employees who have expressed positive interest in forming such a pool. Unlike 3-M, Sandia is not, strictly speaking, a private concern able to spend its own private funds for such purposes. Consequently, the Transportation Committee is researching methods and procedures for van pools that represent minimum risk and maximum benefit to the participating employee. Please bear with us — we will keep Sandians posted on this subject in the LAB NEWS.

/s/ Jeff Gammon  
Chairman, Employee  
Transportation Committee

*Q. How about some more bike racks for Bldg. 836?*

A. The landscaping project between 835 and 836 will be completed by mid April. We are ordering additional bicycle racks and will place them to fit in with the landscaping.

R.W. Hunnicutt-3600

*Q. Some time ago, I asked the question, "Why NOS?". At that time, I was told that the PDP-10 was being given up as part of the price of updating the computer area generally.*

*I now find that not only did the old PDP-10 not leave Sandia, but another new, better one has been purchased.*

*Are we now allowed to use either of the PDP-10's on a timesharing basis? Or are we still stuck with NOS?*

A. When we decided to replace the DEC PDP-10 with NOS as the timesharing system, we recognized that the change would have a substantial negative impact on some users. Nonetheless, we felt then and feel now that this decision was the best one for the Laboratories as a whole. Once the decision to move to NOS was made, the Computing Directorate declared the PDP-10 to be surplus, which allowed any other government organization to acquire the machine, including another organization within Sandia. At the same time, Microelectronics Directorate 2100 realized that the central scientific computers would not be able to provide the combination of fast turnaround and large amounts of memory required for the design of integrated circuits. Their analysis indicated that an upgraded PDP-10 would be a solution to their problems. With the approval of the Sandia Computer Committee, they applied for the PDP-10 and were awarded the system by DOE Headquarters. So, while the system did not physically move,

ownership passed to 2100. As you noted, they have upgraded the system. However, the PDP-10 is dedicated to circuit design work within 2100 and is not available for timesharing use by others. For the present, you are stuck with NOS.

You may be interested to know, however, that the Sandia Computer Committee has created an Ad Hoc Task Force on Interactive Computing, headed by J.C. Crawford, 2500. This task group has been considering the future of timesharing at Sandia Albuquerque and will make its recommendations to the Computer Committee in the near future. Once their recommendations have been reviewed and accepted, we will let you and the rest of our computing community know in which direction our timesharing systems will be heading.

L.E. Hollingsworth-2600

*Q. When the wind blows from the canyon, the east side of Bldg. 802 is barely habitable. Why not install storm windows?*

A. Cold winds out of the canyon certainly are a problem — in several other buildings as well as Building 802. We installed storm windows on the north side of the east wing of the first floor last winter. There is a current contract for the second and third floors and the north wing. These additional storm windows will help next winter. DOE does provide some energy conservation funds for projects with good economic justification. We are providing the storm windows with operating funds.

Our new buildings are being designed to be much more energy efficient than Building 802. The new Safeguards Lab will have fewer windows which will be double glazed, will be well insulated and will need little, if any, supplemental heat when occupied in the winter time. People, lights and equipment will provide sufficient heat for most days of the winter.

R.W. Hunnicutt—3600

*Q. (from SLL). I've noticed many items in trash bins for salvage or reclamation and I am told much of this is sold to junk dealers or given to schools, etc. Would it be possible for a sales outlet to be set up so that employees could buy these items?*

A. We've avoided setting up a sales yard at SLL because of the high administrative costs of such an operation.

Scrap metal is sold to a salvage company while old furniture, laboratory equipment, etc., which is not wanted by other DOE agencies, the Department of Health and Welfare, or the schools, is delivered to the Navy salvage operation at Alameda. This Navy facility does maintain a sales office for public use.

Arlyn Blackwell - 8200

## Retiring



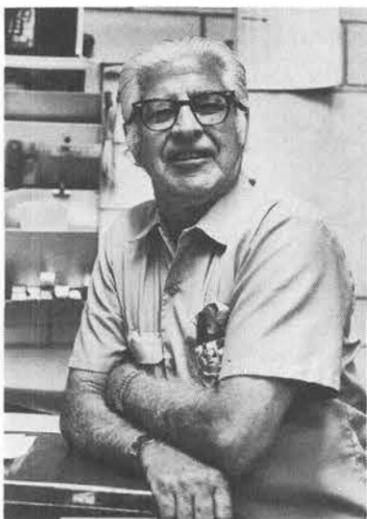
Lonnie Johnson (3742)



Dave Berry (2345)



Mahlon Baker (2551)



Jose Garcia (3612)



Jim Reece (2456)



David Gonzales (1474)



Toy manufacturers, worried that the Federal Trade Commission may go through with their threat to ban TV advertising on kiddy shows, are already planning new sales devices — like Saturday matinees for the kids that will cost a buck admission. Their plan is to sandwich in their commercials among the cartoons and short subjects. This is the best reason we've ever heard for cutting off a kid's allowance.

# MILEPOSTS

## LAB NEWS

APRIL 1979

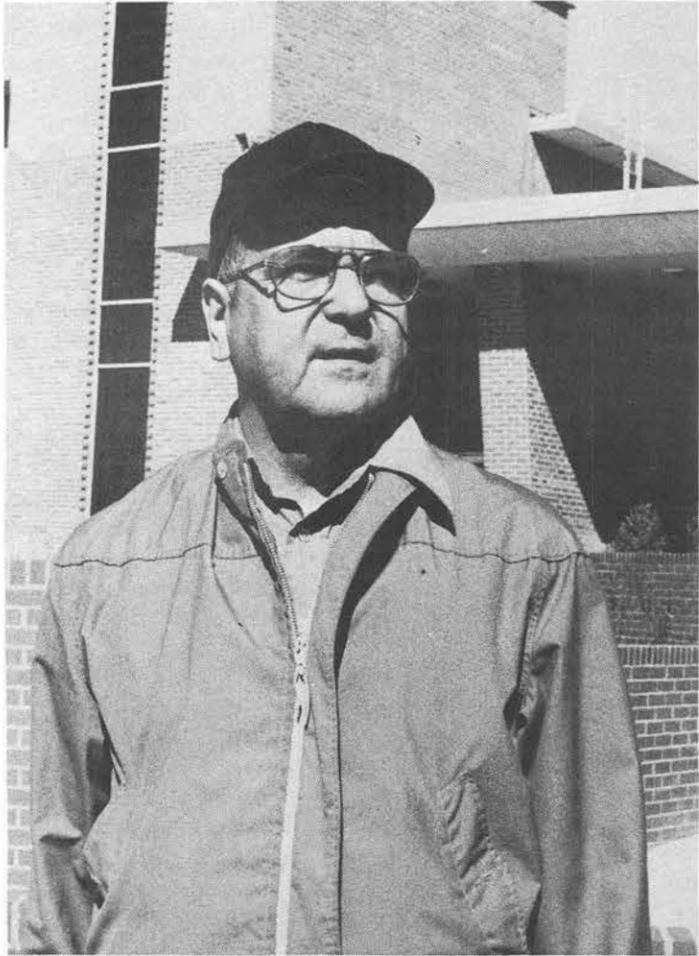


Norman Ollman-3411 30



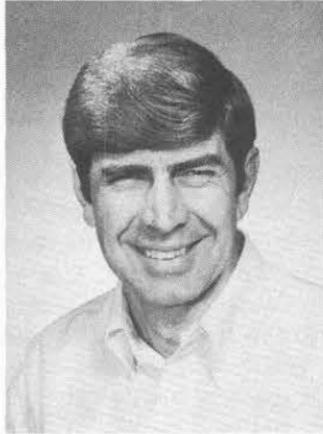
Erminio Mata-3432

15



Isaias Gutierrez-3426

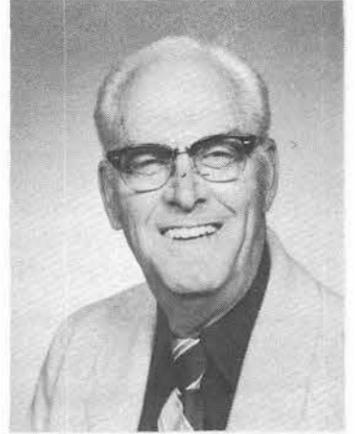
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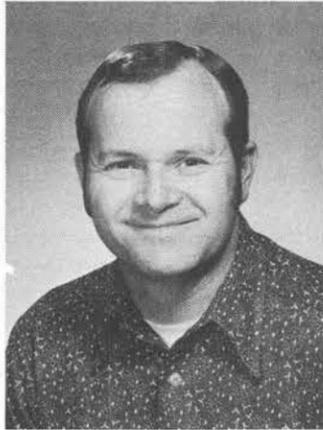
Don McBride-5634 10



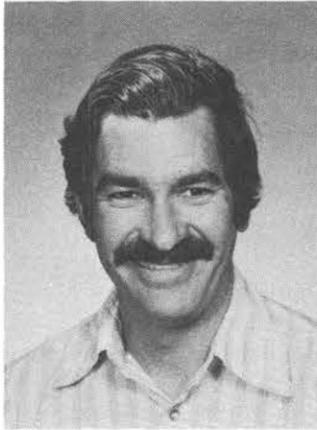
Arnie Bentz-1582 30



Dale Massey-1127 30



Joe Honest-2454 10



Don Tipping-1759 10



George Revels-1471 25



Joe Sanchez-3424 30



Martha Burress-1762 15



John Cowie-1556 20



Jim Doggett-1542

20



Clarence Washington-1244

15



Lynn Harris-2323 10



Ray Arvidson-1423 30



Oscar Goodwin-3171 25

# FUN & GAMES

**Biking** — For many of us, it's the time of year to resume biking to work. We have some heartening news for bikers approaching Sandia from the southeast quadrant. The military plan to pave the path leading from just inside the Gibson Gate across the school yard into the military housing area. If you're wondering how to get to the Gibson Gate in the first place without risking life and limb, most bike commuters enter Gibson Blvd. at Indiana (about two blocks west of Louisiana) and head for the curb lane. Traffic has slowed down or stopped at that point as it awaits entrance to the Base.

You can still enter this weekend's (Sunday) Tour of the Rio Grande Valley — the Century. It starts from the UNM campus at 6:30 a.m. and some 500 bikers are expected. We have entry forms at the LAB NEWS

office, though you can sign up Sunday morning too (but get there early).

\* \* \*

**Running** — Entry forms are also available at LAB NEWS for the Indian Pueblo Cultural Center's 1st annual 4-mile run on April 28. The course goes along 12th St. to Candelaria, then to Rio Grande and back on Indian School. Cost is \$4; T-shirts, yes.

\* \* \*

**Zooing** — Weekend hours at the Rio Grande Zoo have been changed, and it is now open from 10 a.m. to 7 p.m. on Saturdays and Sundays.

\* \* \*

**Volleyball** — A release from

Albuquerque's professional team, the Lasers, carries a schedule of 40 games — 20 here and 20 away. First game here is with Denver, May 18. Home matches will be played at the Civic Auditorium. For tickets or further information, call the Auditorium on 842-8311.

\* \* \*

**Handgun training** — The Labs Rifle and Pistol Assn. is repeating its basic handgun training for women. Call Dave Overmier on 4-3436 for information.

\* \* \*

**Swimming** — Young swimmers with a yen to swim competitively should get in touch with the Coronado Aquatic Club. They've got a few openings and are accepting applications from both beginning and advanced swimmers. Info from Dave Waymire, 4-1175, or Jim Morley, 4-8041.

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

### CLASSIFIED ADVERTISING

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

#### RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. 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

KINGSIZE gold velvet headboard, \$75; custom drapes (child's), 47x70", \$45; Gerry carrier, \$10; bicycle carrier, \$5. Dupree, 294-1835.

TYPEWRITER, Royal std., 1910 model, best offer. Miller, 281-3189.

LOUDSPEAKERS, 1 pair Celestion UL-10's, cost \$600, sell for \$350. Jones, 298-8492.

SEARS POOL, above ground, 18' dia., 4' deep, complete w/filter, chemicals, cover & access, \$300 or best offer. Wilcoxon, 296-8295.

TWO 5-way speakers, walnut cabinets, \$225 or best offer. Wilcoxon, 821-1621.

PIMENTEL concert guitar, solid rosewood, handcrafted inlay, other special features, hard shell case included, \$750. Lutheran, 299-5011 or 294-6943, evenings.

PICTURE WINDOW, 9'x4' alum. framed w/sliding panels & screens, \$20. Woods, 296-4741.

CUSTOM BELT MASSAGER, 1/6 hp motor, all steel unit w/heavy base made of wood, \$50. Bourgeois, 298-2346 after 5:30.

GREAT DANE PUPPIES, 12 wks. old. Schalles, 877-5873.

DBL. BED w/bookcase headboard, complete, \$50; baby bed w/mattress & bumper pad, \$50. Smith, 821-6863.

SEARS EXERCYCLE, \$60; GE elec. knife, \$6; lawn edger, \$10. DeLollis, 299-5384.

BABY CRIB w/innercoil spring mattress, \$40. Reif, 299-2665.

DOG shipping crate, Sky Kennel, 16"x24"x18", \$15. Hendrick, 296-2163.

AM-FM-8-TRACK car stereo, \$40; old gum machine, \$20; Tomasville dining table & 6 chairs, solid pecan, \$650. Bailey, 268-9583.

CAMERA, Nikon-F2 body, \$300. Martinez, 262-0839.

3 STROLLERS, umbrella type, \$10 ea.; 51 pcs. assorted Blue Calico dishes, bowls, teapot, cups, saucers, \$100. Jercinovic, 255-8027.

RADIO CONTROLLED airplane, complete w/OSMax engine, 6-channel MRC transmitter & receiver, ready to fly. Fisher, 881-8072.

BALDWIN Orga-Sonic concert organ

w/better quality Leslie speaker, solid walnut cabinet & bench, \$750, consider offer. Lyon, 299-9423 or 884-8515.

VOLKSWAGEN luggage rack for bug or beetle, \$24. Semn, 821-2846 after 5:30.

19" COLOR TV, port. w/stand, \$150; water skis, adults & childrens. Chandler, 296-3323.

GE TRASH COMPACTOR, \$115; Olivetti port. typewriter, \$15. Guttman, 243-6393.

POWER MOWER, rotary, \$30. Shipley, 298-2433.

CITRINE PENDANT, clear yellow stone mounted in solid gold w/14k gold chain, \$135. Schmidt, 299-7305.

'73 24' STARCRAFT travel trailer, thermostat controlled heat & AC, completely self-contained, \$4850. Smith, 299-1981.

FRENCH HORN, Holton Farkas double nickle plated, case, accessories, \$800. Kerr, 299-7527.

TRAVEL TRAILER, 17 1/2' self-contained, rear bath w/shower, sink, toilet; might take 8 1/2' pickup camper in trade. Ludwick, 296-6447.

GIBSON SG custom electric guitar & case, \$500; speaker cabinet w/15" Jensen, \$55; two .22 rifles w/scopes. Baca, 296-8474.

NEW HORSE SADDLE, used 1 day, Sim-Co 1977 Professional Rodeo Cowboy Assoc. Sanchez, 877-0326.

SOFA, 8', antique gold, Naugahyde, loose cushion back & seat, \$150. Howard, 299-7723.

AUTO AC, fits Subaru, \$125. Stevens, 884-7984.

AM CAR RADIO, fits GM pickup & most cars, \$25. Torres, 265-7194 after 6.

TWO GOLD CARPETS, short shag, 10 x 12 1/2' & 13 x 13'. Adams, 821-5801.

TWO 10X15 Mohawk Mountaineer light truck tires, \$60. Saunders, 265-2254.

EXTENSION PLATFORM rear bumper for pickup camper. Gordon, 296-6375.

BROWNING auto. shotgun, model light 12, 12 gauge 2 3/4" mag. vent rib, made in Belgium, \$425. Jewett, 898-4440.

APT. SIZE Sanyo auto. washer; Hoover elec. clothes dryer. Callahan, 821-6016.

20" BOYS BIKE; elec. brake controller for trailers; folding walker for invalids or elderly; small canvas tent. Stoever, 296-3717.

ALUM. SCREEN DOOR w/frame & fittings, 32" wide, \$15. Laskar, 299-1024.

HORSE TACK. Traver, 294-2138.

DINETTE SET: 42" round table w/2 leaves, 6 padded swivel chairs, brown, rust, avocado & white, \$125. Iman, 299-6500.

MICHELIN X steel belted radials, 165x13 (w/tubes), \$10 ea., 4 for \$30. Lipkin, 881-6038 after 5.

RCA 23" color TV, dk. Danish modern console, divided 9" speakers, \$210; adjustable bed frame on casters, \$10. Stang, 256-7793 after 5.

POOL, 24' diam., 4', filter, ladder & misc. parts, \$400. Puccini, 255-0568.

YARD SALE: misc. household, quality clothing, jewelry, junk, April 19-21, 8 a.m.-6 p.m. Miller, 883-6986.

STARCRAFT tent trailer, Starmaster 8, \$1975. Swanson, 886-8650.

WHIRLPOOL port. dishwasher, \$50; pink & white ruffled dbl. bedspread; yellow dbl. bed dust ruffle. Holt, 294-6928.

SEARS Kenmore washer & dryer; Tappan dishwasher; Sears Craftsman push mower; \$25 ea. Oliver, 299-5512.

12-STRING GUITAR, Yamaha FG-230, w/case, \$125. Riley, 821-6431.

APACHE TENT TRAILER, small car can easily pull, sleeps 4, has spare tire, \$225 firm. Riggan, 268-1961.

HONDA car work shop manual for '73-'74; spare wheel and tire for Honda car 600-12. Roody, 1-832-4767.

WROUGHT IRON furnishings, Mexican: sconce w/5 lights & glass/iron shades, \$60; entry table w/marble top, 1'w x 3'l, \$40. Stevens, 299-6086.

A.M. CAR RADIO, 12 volt, removed from VW Bug. Speaker not included, \$10. Laval, 898-9112.

### TRANSPORTATION

'77 CHEVROLET 9-pass. van, 6-cyl., AT, AC, PB, PS, all glass radials, loaded gas, 19,000 miles. Olson, 268-2227.

'74 OLDSMOBILE Custom Cruiser strn. wgn., loaded, new radials, \$2650. Strassel, 298-3816 after 6.

'73 CHEV. Impala, 2-dr., 350 V8, PB, PS, AC, new steel belted radials, \$1600. Black, 299-3369.

'71 PONTIAC Trans-Am, 400 CID, 4-spd., new upholstery, orig. paint, stereo, \$2950. Daut, 255-2529.

MARGAY go-kart w/Mac engine, complete w/elec. starter; Honda 125cc engine w/trans. & clutch. Burchett, 294-8592.

SUZUKI TC 90cc trail bike, 816 miles. Baca, 265-2881.

'66 CADILLAC convert., gold. Moody, 292-2975 after 5.

F-100 FORD, 4-spd., w/insulated shell, boat rack, AC, 52,200 miles, \$1800. Shepherd, 299-9066.

'74 PINTO, AT, 26,500 miles, \$1300. Rael, 298-7751 after 5.

'77 ASPEN wgn., V8, AT, AC, PS, PB, cruise control, AM-FM-8 track, loaded, new radials, \$4350. Gillett, 281-5466.

'63 CORVAIR 4-dr., steel radial tires, orig. owner. Kerr, 299-7527.

'64 PONTIAC GTO, 4-spd., tri-power. Prevender, 299-5253.

SAILBOAT, 16' Hobie Cat, fully equipped trailer including sale tube & storage box, many spares.

Shurtleff, 299-0401.

DUNE BUGGY, street legal, fiberglass body, convertible top, mag wheels, chrome trim & roll bar, \$2000. Perryman, 294-6113.

'74 GMC Suburban, new paint, tires, transmission. Percival, 299-0535.

'78 FORD pickup w/CB & antennas, LWB, ST, V8, R&H, under warranty. Rodriguez, 883-8424.

SLOOP, Aquarius 23', roller furling sails, custom trailer, galley, head, 6 hp Evinrude, sleeps 5, many more extras, \$5600. Allen, 296-6453.

HONDA MT250 Elsinore, new piston rings, points & plugs, \$450. Holt, 294-6928.

'72 DATSUN 510 SW, AC, AM-FM, city experience: 21mpg, recent diagnostic check, maintenance records. Atkins, 298-5762.

'74 PLYMOUTH Duster, AC, PB, PS, AT, 318 V8, VT, AM/FMS, 46,000 miles, below NADA book. Cabe, 255-0225.

'74 DODGE VAN, Sportsman, 318 CI engine, 2 fuel tanks (57 gal.), AC, R&H, alarm system, carpeted, bench seats fold for bed, captain chairs, book \$4300, asking \$3500. Zacuskie, 881-4086.

### REAL ESTATE

TWO MOBILE HOME LOTS, Elephant Butte Estates, paved road, electricity, telephone, water system, warrantee deed, \$4500 ea. Urquhart, 281-3937.

'78 14x70 MOBILE HOME, 2-bdr., 2 full baths, fp, landscaped, skirted, near base. Sanchez, 299-4258.

ENERGY SAVER HOME, 21 mos. old, many extras, 1344 sq. ft., 5 mins. from Sandia. Quintana, 294-8930.

4-BDR., 3 baths, lg. den w/fp, patio, newly decorated, close-in location, assume 8 3/4% loan w/low equity, \$64.5. Beyers, 265-4555.

'72 12x50 MOBILE HOME, furnished, AC, skirting, storm windows, \$6000. Thomen, 292-1215 after 5.

'75 MOBILE HOME, Craftmade, 14x72, 2-bdr., 2 bath, appliances, located 4 Hills Park. Krumm, 294-4495 after 5.

VALLEY HOME, privacy, view, 3-bdr., den, DR, insulated, 3 porches, hot water baseboard heat, 5.3 acres. Roth, 877-4997.

SHARE PURCHASE & RETIRE: 160 acres private la d surrounded by National Forest, SW Utah, ideal star heating, gardening. Maak, 294-3207.

LAND for home or trailer, 10 acres, NE of Los Lunas. Hitchcock, 294-5153.

FROST RD., 5-bdr., 3 bath, den, bar-room, 2 fps, lg. kitchen w/built-ins, formal LR, sun deck, tile roof, horse facilities, 5 acres, REC, \$170,000. Browne, 881-3772.

LOS ARBOLES NW, 3-bdr., fp, formal DR, irrigated 2/3 acre, basement, garden, orchard, small barn, live-

stock permitted. Madsen, 344-9970.

ON CUL-DE-SAC: backyard access, landscaped, 4-bdr., 2 baths, w/marble vanities, kitchen built-ins, bay window, c/patio, Montgomery & Tramway, \$64,000. Byers, 298-8326.

LANCER MOBILE HOME on 2 1/2 or 5 acres, 22'x24' garage w/workshop, attached sun room 12'x22' on S side, many extras, located 8 mi. SE of Edgewood. Roody, 1-832-4767.

### WANTED

CARPOOLER from Sandia Heights South, Unit 6, if possible. Bando, 292-2452.

SMALL BUTANE tank (10 lbs.); elec. meat smoker. Day, 881-2664.

CAMPER JACKS for a small camper. Quintana, 294-8930.

STEEL CASEMENT WINDOWS: 1 approx. 3'x6'w; 1 approx. 3'x4'w. Sandy, 299-0120.

WISH to borrow French instructional tapes or cassettes, especially Berlitz Swain, 265-0098.

FIREBIRD OR CAMERO, prefer '67-69, mechanical condition not important. Prevender, 299-5253.

NON-SMOKING BOWLERS for mixed summer & fall leagues, Tuesdays at 6:30. Long, 296-2590.

BASKETBALL backboard, goal, must be in good shape @ and pole to mount it on. Cook, 869-6921.

HOME for two small female dogs, 8 yrs. age, good health, all shots. Binder, 299-2937.

### FOR RENT

LG. 2-bdr. lux. townhouse, 2 1/2 baths, 2-car garage, fp, swimming pool, BBQ, pvt. yard, ref., walk-in closets, \$390/mo. King, 298-2628.

HOUSE in NE (Eastridge) available 8/1/79-9/1/80, 3-bdr., 2 baths, all major appliances, trailer access, consider renting partly furnished, \$375/mo., inc. water. Reif, 299-2665.

4-BDR., 1 3/4 + 1/2 bath, den w/fp, dbl. garage, near Comanche w9 san Pedro, \$425/mo., \$400 DD. Holt, 294-6928.

NEW 2-bdr. unfurnished townhouse apt. near Central & Tramway, view, \$235/ho. plus elec. & \$100 deposit. Berg, 296-2695.

UNFURNISHED HOUSE, 4 blocks from Wyoming Gate, 3-bdr., 1 bath, garage, fenced yards, \$250/ho., \$100 DD. Martinez, 293-2301.

### LOST AND FOUND

LOST — 3 keys (1 Datsun key), Photogray tri-focals w/brown frames, leather billfold w/brown binding, blue notebook.

FOUND — Sunglasses w/red-white-blue frames, tri-colored change purse, small gold screw-back earring, tri-focals w/black frames, gold finish chain necklace. LOST AND FOUND, Bldg. 832, 264-1657.

**Coronado Club Activities**

# Casino Night Set Tomorrow

TONIGHT at Happy Hour beef kabobs top the buffet menu while the Neil Porter Trio plays for dancing. Next Friday, April 27, Jeanne Rich and Friends will be on the bandstand, veal cordon bleu on the buffet spread. A style show from Marcy's will be presented by Flair models at 6:30 p.m. Call the Club office, 265-6791, by mid-week to reserve buffet tickets.

ALSO TONIGHT retirees will get together in the Eldorado Room starting at 4:30 p.m. Bob Banks will entertain while the goodie tray is passed.

TOMORROW the Club's annual Casino Night blast starts at 7:30 p.m. Pay a \$2 admission charge at the door and get a bundle of play money plus a chance for a free trip to Las Vegas. The drawing will be held during the evening. Black jack, craps, roulette, wheel of fortune and other games of chance will beckon. Elton Travis plays for dancing from 8:30 to 12:30. Super sandwiches will be available. It's Las Vegas on the Rio Grande.

SIGN UP for swimming lessons tomorrow at the Club office from 9 'til noon. Member parents must register their youngsters.

TRAVEL DIRECTOR Ed Neidel shows movies of Germany and Octoberfest at Travelogue Night Tuesday, April 24, at 7:30 in the main ballroom.

Ed also has package deals to Mexico, Las Vegas, Europe and Hawaii which can save you a bundle. See him in the lobby tonight between 6 and 7.

SINGLES — The Single Mingle group has arranged a special event at Westgate Theatre's production of "Tom Jones" on



SKIP DOUGHERTY is the new Coronado Club Recreation Manager responsible for after-hours sports programs and special events. Skip, a retired U.S. Army Infantry major, served in Viet Nam and most recently at Fort Huachuca. He was a member of the U.S. Olympic teams in Tokyo in 1964 and in Mexico City in 1968, competing in the 5000 and 10,000 metre running events. He has wide experience in organizing and directing Army and community sports activities. His wife and three children will join him soon in Albuquerque.

FRIDAY	SATURDAY
20 — HAPPY HOUR Beef Kabobs <i>Adults \$5.55</i> <i>Under 12 \$2.75</i>  NEIL PORTER TRIO - - - - <i>Retiree Party 4:30</i> <i>Eldorado Room</i>	21 — CASINO NIGHT  <i>Games 7:30-10:30</i> <i>Elton Travis</i> <i>8:30-12:30</i>  Members \$2 Guests \$3
27 — HAPPY HOUR Veal Cordon Bleu <i>Adults \$5.20</i> <i>Under 12 \$2.60</i>  JEANNE RICH & FRIENDS  <i>Style Show 6:30</i>	28 — TEEN DISCO 8-11  Ricci Dustin

Wednesday, April 25, at 6:15. Ten bucks covers dinner, the play and tips. Call Mabel, 4-5431, or Hazlet, 4-9481, for reservations. Coming up at the May 4 Single Mingle is an appearance of Paul McManus, professional handwriting analyst.

## Bonds & Sandians

- 87% of Sandians take Bonds.
- Most of these (3518) buy at least one Bond per month.
- Last year, Sandians invested \$1,665,393 in Bonds.
- The average investment by Sandians is \$225.05 per year (which works out \$18.75 per month — the cost of one Bond.)
- If you're among the 1,271 Sandians investing \$10 to \$15 per month in Bonds, consider going to \$18.75. Remember — your monthly allotment doesn't gain interest until it reaches \$18.75.



STYLE SHOW — Gigi Blachly is one of the Flair models scheduled to present a collection of spring fashions from Marcy's during Happy Hour at the Coronado Club Friday, April 27. Rosario Ayres is coordinator.

## Authors

S.J. Lambert (4511), "Geology and Mineral Deposits of Ochoan Rocks in Delaware Basin and Adjacent Areas," December 1978, NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES CIRCULAR 159.