LAB NEWS

VOL. 24, NO. 9 APRIL 28, 1972

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

Invention By Don Sharp Patented by WE

Western Electric Company was recently granted a patent for a new way to make precision photomasks for thin film and silicon integrated circuit applications. Inventor is Don Sharp, supervisor of Technology Development Division 1436.

Conventionally, microcircuits are made very similarly to the way photographic prints are made. Light is projected through a negative onto a light-sensitive surface which is then chemically developed into a positive image. For microcircuits, the negative is called a photomask and the light sensitive surface is usually a silicon substrate coated with a layer of photoresist. The image is small — line widths are typically one-thousandth of an inch or smaller. Great precision is required in the exposure and fabrication processes.

Because film masks are dimensionally unstable and easily scratched, glass and chromium are used to make the photomask. This resembles a tiny lantern slide. It is dimensionally stable but reflected light, bouncing between the silicon and metal mask during exposure, tends to blur line edges.

Don's invention is an improvement over the conventional method of making photomasks. He uses tantalum on glass to form the basic photomask and then adds a layer of tantalum oxide. This oxide layer is carefully adjusted to a thickness whereby a process called destructive interference prevents reflection of unwanted light during exposure. The tantalum oxide layer absorbs it.

Don joined Sandia Laboratories last August coming here from WE's Engineering Research Center in Princeton, N.J., where he was a research leader.

Blood Donor Program Response Excellent

Blood donors, take note. Vern Henning reports that the response to the Labs' blood donor program, described in the last issue of LAB NEWS, has been excellent. Nearly 1400 have signed up, and Vern states that these will be scheduled for donations during May and June. If you missed the story and are interested (donors receive Bloodplan insurance for themselves and their families), give Vern a call on ext. 7336.

VIKING LANDER picks up fingerprints of Charles Herndon (*9310*) as George Norris (*9484*) looks on. Lander is being balance tested at Sandia.

Few Steps In Between

Today Sandia, Tomorrow Mars

Visiting Sandia on its way to Mars from Denver is a Viking lander. Part of the Viking spacecraft, it's at Sandia for a sort of preflight physical – in this case a series of balance tests. Next stop is White Sands Missile Range where it will undergo a series of drop tests simulating its eventual (1976, if all goes as planned) soft landing on Mars.

The Sandia Technical Project man in charge is Charles Herndon (9310) who works with George Norris (9484) in designing and performing the balance tests.

The 2000-pound lander is thus an entry, not a re-entry, vehicle. Constructed for NASA by Martin Marietta, it must be carefully balanced with the precise amount of counterweight (3 lbs., 2 oz.) in precisely the right location (1.41 inches off center) to assure the desired float-onto-Mars characteristics. A parachute and retrorocket system will also assist it through the thin Martian atmosphere after its separation from the Viking orbiter.

Why Sandia? Sandia has the tools and talent to perform the balancing job.

Why White Sands? Here the lander will be attached to a balloon filled with 135 million cubic feet of helium for a ride to 110,000 feet. Then its own rockets will carry it to 160,000 feet, an elevation which approximates the atmosphere it will see in floating toward the surface of Mars. Careful observation of its descent will allow necessary modifications to be made before the actual trip.

Why the Viking mission? The mission seeks answers to such questions as: How did our solar system form and evolve? How did life originate and change? What are the changing processes which shape the environment of earth? The Viking lander and its orbiter will explore the Martian surface and atmosphere surrounding its landing site, listen to the planet's interior, take panoramic pictures, and perform a series of geophysical, meteorological, and physical properties experiments.

The mission schedule calls for launch from Cape Kennedy in August or September 1975. The landing should occur some 11 months later after a trip of some 460 million miles Viking is taking the scenic route. • bh

Afterthoughts

Another Endangered Species--Not so many years ago, it was pretty well accepted that a man who worked in an office wore a white shirt--whether he was president or shipping clerk. The shirt was a kind of totem of respectability, and it signified your embracing or, at least, acquiescing in The Code. Well, that part of the code is changed today and the white shirt is an endangered species. You still see them, but less and less. So who cares? An irony related to the demise of the white shirt is the gradual assimilation by the establishment of the very mode of flamboyant dress that earlier had been looked upon as youthful aberration. Flared slacks, longish hair, mod boots and the like are now endemic; which shows, I guess, that the peacock instinct in males was always there but simply buried deeply.

* * *

Not-A-Bad Definition--"Democracy is the recurrent suspicion that more than half of the people are right more than half of the time." Elwyn Brooks White in World Government and Peace

* * *

Say A Lot In A Little Space (Laconic Description Award)--OK bikers, you've had your little trip from Rhodes to the Zoo--12 miles, downhill, for the Earth Day thing. We've just gotten the schedule from the Velo Sport Cycle Club and its economy of expression is dazzling, not to mention the events themselves: "May 14--Meet at Madrid at 9 a.m. Race to Sandia Crest about 40 miles. 3 to 5 hrs. time est. Very difficult. Need food and liquid." (Some of us would need something more than that.) And "June 4--Meet at Ideal Cement Plant at US 66 and S. 10. Race to Mountainair and back to Pine Flats. Approximately 100 miles. Very difficult. 5 to 7 hrs." •js

Project Refer: Open For Business

Back in January LAB NEWS described a project being undertaken by George Elliott (3251) which consisted of arranging for people in different occupations to talk on a person-to-person basis with students who have shown interest in their occupations. Called Project Refer, the idea is to give a young person some first-hand insight into the career he may be considering.

George stopped by recently to report that the initial drive to build up a file of names vs occupations has done well, and that the master list now contains the names and occupations of more than 700 people — many of them Sandians. We studied the list and it indeed demonstrates that there are all sorts of ways to make a living. A few occupations selected at random: phone directory artist, president credit bureau, computer programmer, author for horse magazine, hardware sales and service, restauranteur, attorney, mortuary public relations, oceanographer, machinist, realtor, fishing biologist and many, many more.

Copies of the Project Refer list are now in the hands of counselors at city high schools, and George is anxious to get the word out that this service is now available — Sandia parents take note. If you have a youngster in junior high or high school have him or her drop by the counselor's office to eyeball the list of occupations. Talking with a person who does the work of possible interest is more meaningful than simply reading that person's job description.

Incidentally, George is still collecting names and occupations and is particularly interested in getting more Refer volunteers from the skilled trades. Call him on ext. 4455 if you are interested.

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&
in livermore lorena schneider does all

Credit Union REPORTER

A Grim Note Relating To Home Improvements

Following his recent LAB NEWS column about the Credit Union's granting Title I loans for home improvements, Bill Bristol received a memo from the Federal Housing Administration. Subject: lead-based poisoning in the home. Portions of it are quoted below.

"(We) . . . are engaged in a joint effort to eliminate the problem of lead-based paint poisoning in the home — a hidden but potent killer and mental crippler of children.

"Lead-based paint, flaking off the walls and woodwork of old houses and apartments, can be a lethal meal for a child suffering from a condition called 'pica.' This is an abnormal tendency to eat non-food materials and occurs in children mainly between the ages of one and six. Experts are currently uncertain whether the condition is due to a biological or psychological need.

"Lead poisoning is described as a 'hidden' killer because the public generally — and parents specifically — can't recognize its deadly qualities. Also, its symptoms at the outset, vomiting and loss of energy, resemble those of comparatively innocuous diseases. The child can absorb doses of lead over a period of time before showing signs of poisoning. But a few chips a day, over a period of months, can bring death or permanent brain damage.

"Paint exceeding 1% in lead content by weight should not be used on any exposed interior surfaces or exterior elements and surfaces readily accessible to children — desks, stairs, porches, railings, doors, windows, etc."

The message is clear. If your program of home improvements includes painting, check out the lead content of the paint that will be used on surfaces accessible to children.

Credit Union Statements

As part of its normal audit procedure, the Supervisory Committee recently mailed statements to members with account numbers from 0 to 2999, and 4000 to 4999. If your account number is in one of these series and you have not received your statement, please notify Karl Waibel (4117), committee chairman.

BILL LASKAR, Lab News photographer, caught this interesting juxtaposition of the new and the old at Kirtland — a C-47, otherwise known as a DC-3, and a couple of hot fighters — Phantom jets used by the Air Force Thunderbirds. DC-3 goes back to mid-30's.

LIVERMORE NEWS

VOL. 24, NO. 9 LIVERMORE LABORATORIES APRIL 28, 1972

Retiring

Tony Luna (*8257*)

Take Note

Doug McMillan (9125-1) has been elected president of the Sandia/Livermore Employees Golf Club for 1972. Other officers serving with him are Ollie Rohrback (8431), treasurer, and Emily Joiner (8212), secretary. One tournament each month, as well as weekly twilight league during the summer months, has been scheduled again this year.

The first tournament of the year was played at Las Positas Golf Course. Al Derby (8264) shot a net low score of 69 to win the first place trophy. He tied with John Barnhouse (8421) who lost the trophy on a hole-by-hole comparison of scores. Joe Inzerilla (husband of Jan Inzerilla, 8323) and John Lindman (9125-1) tied in the "fewest putts" feature of the tourney, and Ollie Rohrback took the flagstick award.

* * * *

Cliff Selvage, manager, Information Systems Department 8180, was guest speaker at a recent monthly meeting of the Hayward Kiwanis Club. He discussed, "Sandia: Its Mission and Objectives."

Gold Prospecting — A Hobby That Could Hit It Big for Three Sandians

"We have a great hobby, plus good potential for making anywhere from $1 to $100,000," says Victor Krause (8421), who owns a 40-acre mining claim on the Feather River in Northern California.

For a number of years, Vic and co-workers Kirby Hammond (8422) and Don Sadler (8421) have been working the claim for periods of three or four weeks during their vacations. The three say that actually they've only been maintaining the claim and keeping up the assessment by panning and skin diving for gold. It seems they also find the area ideal for fishing, hunting, and camping and living the outdoor life.

"The first year we went in with some wet suits and a small air compressor," says Don. "With no dredge at all, just by skin diving, we dug up three ounces of gold in a half hour. Later we built a small dredge that operates much like a vacuum cleaner, suctioning up rocks, boulders, etc., which in turn are put through a sluice box to separate the gold. We've now purchased a Corvair engine and are building a larger dredge."

So far, the three haven't made much money on the gold. They claim the largest nugget they've found was over an ounce — about 5/8 inch in diameter by 3/16 inch thick. (The "flowergold" is very fine and must be recovered with mercury or a cyanide process.) All three are keeping most of what they've discovered as mementos, although there is evidently a ready market. When Don's wife took one of the nuggets to a jeweler to have it made into a ring, the jeweler wanted to buy what was left in the nugget bottle.

The trips definitely are not all fun, however. There are many hardships and each year the three have experienced some bad luck. The river in that particular area is a narrow canyon with 60 degree walls up both sides; so, all of the equipment and supplies must be carried in. Located about 15 miles from the town of Quincy, it takes an hour and a half to get to the claim by jeep over a trail that goes straight down the side of the mountain. Vic says that "The trail is so steep that when walking out you can touch the ground in front of you. It runs through a national forest and more and more the vegetation is crowding in. On one occasion the jeep broke down and it took us 14 hours to walk out. Another time, we had a couple of flat tires and the only way to get out with the equipment was to stop every three or four minutes and pump up the tires. Since then we've been using more than one jeep."

Kirby comments that they've found they can live with the rattlesnakes, and can fight off the crawdads in the water, but if a forest fire ever came through they could never get out. "The flames would burn up the oxygen and we'd suffocate in the canyon."

"And there are other dangers," adds Vic. "One morning we were having breakfast after a heavy rain during the night, and as we looked up on top of the ridge we could see the trees moving. A huge boulder, weighing 25 to 30 tons, came sailing down and landed in the river right across from our camp. Luckily it missed us, but all of us got a good bath.

"Another problem that has developed recently is claim jumping. The claim jumpers have cleaned up the upper part of the river, presumably by coming down river in the spring before we can get in through the trail because of the snow. You can see where they have dug big new holes in the river bed.

"As soon as the snow melts this year, we plan to go in and scout a little lower on the river, past what looks like a punch bowl (where the river widens into a large area like a pool). This is an even more rugged and isolated spot with access only by raft."

Vic sums it up this way. "Gold prospecting is an exciting adventure. The biggest thrill comes when you've dredged down to bedrock, and as you're working away, nuggets appear in the hard clay like diamonds or stars in the sky. You sit there with a pair of tweezers, picking up nuggets and putting them in a bottle." • ls

SKIN DIVERS Kirby Hammond (*8422*), left, and Don Sadler (*8421*) operate a small portable dredge and sluice box prospecting for gold. Although the portable dredge has its limitations and is used primarily in prospecting, it is more versatile and easier to transport than heavier equipment used in mining operations.

Savings Bonds Offer Distinct Advantages for College, Retirement

Each year when the annual Savings Bond drive starts at Sandia, LAB NEWS tells you about the advantages of buying Bonds. We've done this for a long time now and most employees are convinced — the percentage of participation has been as high as 90 percent and it now stands at 72 percent.

A new drive starts next week and you'll be receiving literature that has the word on why you should buy Bonds.

The best reasons, however, are these: Bonds offer distinct advantages in any long range savings program, and their purchase is beneficial to the government. Sandia exists on government funds, so the conclusion is obvious.

On the personal side, the benefits are much more concrete. We talked with Marty Martegane, retired Sandia security inspector, and John Garcia, schedule clerk with Remote Areas Maintenance Division 4518, who both have specific goals in mind with their Savings Bond programs.

Marty was a security inspector at Sandia for 21 years, almost to the day. He retired last September and he's got it made. His retirement income is adequate for a comfortable living. His house is almost paid for and he's building a vacation cabin near Silver City and the Gila Wilderness.

Marty and his wife Alice go camping or fishing about every weekend in the summer. In Albuquerque, their life is filled with activities with friends and family, especially with their two small grandchildren.

"When I was 55," Marty says, "I started buying a Bond a month. After a few years they started to pile up and I realized that this was the best way for me to supplement my retirement income, so I started buying a Bond a week. I wish I had started 20 years earlier. Payroll deduction is an easy way to save. And somehow I'm more reluctant to cash a Bond than withdraw money from the Credit Union."

Last January Marty cashed in enough Bonds to buy a new VW camper vehicle, a slick job outfitted with all the necessities for his jaunts into the boondocks to collect rocks.

"The great part about the Bonds is this," Marty says, "I had earned a lot of interest on those Bonds but I will not have to pay any tax at all on this income. Interest earned on Bonds is not subject to state taxes and, since I'm retired, the income will be less than the standard deduction."

Marty plans to use his Bonds for things like the camper — special purchases that will mean more activities during his retirement. He's convinced that Bonds are a great investment. His VW camper and the trips he takes are making his retirement exciting. "If I hadn't bought the Bonds back when I was working," he says, "I'd be staying home now."

* * * *

John Garcia is buying a Bond a month for a specific purpose — his son James. "Jimmy" is a 13-year-old youngster attending McKinley Junior High School. He reads medical books for fun.

"Jimmy hopes to be a doctor," John says, "and I say that's great. I started buying a Bond a month in his name about 11 years ago. About five years ago, when Freedom Shares were offered as part of the Bond program, I signed up for two Bonds a month. These are for Jimmy's college education."

John feels that Bonds are the best way to save for college because of the high interest rate that Bonds pay — 5½ percent if kept to maturity — plus the fact that the income is tax exempt if the youngster's total income is less than $1700 during the year he cashes the Bonds. In 1973, total income can be as much as $1750 before income tax is due.

JOHN GARCIA (*4518*) has bought Bonds each month for 11 years to send his son Jimmy to medical school.

"This tax advantage gives Bonds the edge over any other kind of savings plan for college," John says. "In addition, the Bonds can be used if cash is needed for emergency situations or to take advantage of business opportunities. I cashed some Bonds to buy some income property which will also contribute to Jim's education."

* * * *

Other Sandians buy Bonds for other reasons. Whatever your reason, they are absolutely safe (replaced at no cost if lost, damaged or stolen), the return is guaranteed, and tax is not due until the Bond is redeemed. Payroll deduction makes purchase automatic and painless. A small monthly deduction adds up to a big savings program quickly. •dg

MARTY MARTEGANE, retired Sandia security inspector, bought this camper vehicle with Savings Bonds.

Law Day Banquet Set Monday, May 1

Monday May 1 is Law Day and lawyer Ed Lenard (6000) states that a luncheon in observance of the day will be held at noon at the Officers Club, KAFB East. Speaker will be Justice Montoya of the New Mexico Supreme Court. Call Ed on ext. 8900 for information and reservations. Cost is three dollars and tickets may be purchased at the Club door.

LAW DAY 1972

Reminiscing once about his long and distinguished career in the law, the late Felix Frankfurter pointedly recalled how a dispute over a legal question with a colleague on the Harvard Law School faculty had ended.

"You take law awfully seriously," his friend chided him.

Yes, Professor Frankfurter replied quietly, "That's one accusation against which I plead guilty without reservation."

"I do take law very seriously," he maintained, "because fragile as reason is and limited as law is as the expression of the institutionalized medium of reason, that's all we have standing between us and tyranny of mere will and the cruelty of unbridled, undisciplined feeling."

Unquestionably, the rule of law underlies our entire social, economic and governmental structure. Under it, men and women can buy and sell, marry, express their personal opinions, and engage in a vast array of other activities with the assurance that their contracts will be enforced and their liberties protected.

Law Day is not a day set aside for lawyers, but was established by the Congress to encourage every citizen to think anew of the central role of law in our society. The law, as Daniel Webster said, "has honored us, may we honor it."

Promotions

John E. Cronin (7122) to Technician (Special Coatings)

Eugene M. Gilbert (5411) to Computer Facilities Clerk

Herman Kaneshiro (7123) to Platemaker

Terry V. Kirk (3184) to Mail Clerk

Catherine W. Young (3141) to Librarian

Take Note

Meeting Notice: Office and Professional Employees International Union will meet May 11 at 7:30 p.m. at 141 B Wyoming NE.

* * * *

Marshall Tippy (3513), a Chief Communications Technician in the Naval Reserve, has been awarded the Navy Achievement Medal ". . . For professional achievement in the superior performance of his duties as Counselor and Training Administrator, Naval Reserve Security Group Division 8-17. . ." Marshall, a WWII veteran who saw action in the Pacific, has been associated with the Naval Reserve since the mid-50's.

* * * *

Jack Hueter (3134) recently conducted a one-week Value Engineering training workshop at Las Vegas, Nev., for people from Holmes and Narver, Reynolds Electrical and Engineering, and AEC Nevada Operations Office. The program included presentations by W.D. Smith, Assistant Manager, Office of Engineering and Logistics, AEC/NVOO; and H.D. Cunningham, Vice President and Deputy General Manager, REECO.

Jack also conducted a VE orientation for 40 members of the management staff of the Oklahoma City Works of Western Electric.

* * * *

Bruce VanDomelen (1913) was recently elected to another one-year term as chairman of the Western Interstate Nuclear Board (WINB). The Board, representing 11 western states, fosters the orderly application of nuclear technology in furthering regional development consistent with environmental protection.

STUDENTS from El Rito Technical Vocational School in Espanola visited Sandia on April 12. Here they watch Foster Tennant (7121) pull some miniature tubing as Willard McCormick (left), retired Sandian who teaches at El Rito, hopes everything works out OK.

* * * *

From more than 100,000 entries, a color slide by Joe Laval (3163) was selected as a second place winner in an international photo contest sponsored by Nikon, Inc. The slide was taken in Venice last summer after a rainstorm and showed gondolas, the canal, and late evening light on medieval building facades. Prize for the second place win is a Nikkormat camera and Nikon lens.

* * * *

Herman Stein (5112) will present "Similarities of Ion-Implantation-Produced Centers in Silicon and Germanium" at a meeting of the 5100 Staff Seminar May 9. The seminar meets Tuesdays at 8:30 a.m. in Rm. 201 of Bldg. 806.

Recreation Notes

FUN & GAMES

The Sandia Golf Association held its Season Opener Low Handicap Tournament at the UNM South Course on April 8. Ed Stang (9241) was the winner with a 76 gross (67 net) and a spectacular 34 on the tough front nine. Ed needed only 12 putts on the front nine holes which included six one-putt greens. He finished the 18-hole round with a total of 30 putts. Gerald Smith (1442) took low gross honors with a 74 round.

SGA's High Handicap Tournament was held the same day at Los Altos. Ted Garcia (5411) went home with the trophy with a low net of 58, while Gene Lisotto (7612) was a close second with a 60.

* * * *

Cliff Taylor (7626) has been reappointed State Commissioner for New Mexico by the Amateur Softball Association. The announcement, made from ASA Headquarters, cited Cliff for an outstanding job in organizing and promoting the statewide ASA program in 1971.

NO ONE ever accused the Tech Area grounds of any more than a sort of functional beauty, but this is too much. Trash dumped carelessly near dumpsters is unsightly and, given our spring breezes, is likely to get wide distribution. If dumpster is filled, try another one — they're close to each other.

Variable Annuity Unit Value

May	1.747
April	1.751
Average 1971	1.628

BOB GREGORY (1933), technical program chairman for the 1972 IEEE Annual Conference — "Nuclear and Space Radiation Effects" — to be held in Seattle on July 24-27, studies the summaries received (more than 140) for consideration as presentations at the meeting, while secretary Kathy Brady accepts more of same from mail girl Tessie Barrett.

Family Day Preview

When you and your family show up on Saturday May 13 for Family Day you'll get a brochure — a tour guide — that tells you what's where, but you may want to do a little preliminary planning since there will be such a large number of exhibits. Here's the latest rundown on the "Class A" exhibits:

Sponsoring Organization	Exhibit	Location	Comment
1200	Computer Controlled Flight of Aircraft Controlled by Operator Stick with Target	836	Visitors will be able to fly a simulated airplane using a joystick.
1400	Hybrid Microcircuit Technology Display	828	Miniature world of micro-electronics is on display with emphasis on electronic packaging techniques.
1600	Display and Demonstration of Seismic Intrusion Detectors	892/188	Electronic devices used to sense earth vibrations to detect the presence of personnel or vehicular traffic.
	Movie Production Area for Weapon Training	892	
	Display of Palomares Weapon Case	892/189	The weapon that was raised out of the sea off Spain after a long search.
1700	Spacecraft Sterilization Decision Model DNA & Virus Experiments Bacteria Display Vacuum Probe Display Clean Room Display Mathematics & Thermoradiation	Clean Rm. Tr.	These exhibits depict some of Sandia's research and development activities related to the NASA Planetary Quarantine Program. They involve the application of microbiology and mathematics to spacecraft sterilization.
	Interactive Computer Graphics Display Sandia Image Digitizer Display Voice Pattern-Plot and/or Display Pattern Recognition Display	806/131,159	Exhibits show vocal and graphical input to the computer, graphical display from the computer and pattern recognition.
3100	Continuous Movies	815	Sandia-related films.
3300	Laboratory Hazards Engineering Control of Hazards Personnel Protective Equipment Accident and Injury Statistics	869/Foyer	Pictures relating to Health Physics and Industrial Hygiene activities both here and at the Nevada Test Site. The host will be available to escort you through the Industrial Hygiene and Nuclear Radiation Laboratories.
5100	Electro-Optics Display	806/201	The Cerampic: actual storage and erasure of photographic images in the solid state device while projecting the images on a viewing screen will be shown.
	Single Crystals Display	807/3111	Single crystal growth by the Czochralski method will be demonstrated.
5200	Demonstrate Annular Core Pulse Reactor Operation	6580/111 (Area V)	A nuclear reactor in operation at 300 kW. At this power the Cherenkov radiation, or blue glow, will be clearly visible.
	Tour of Kiva to see Sandia Pulse Reactor (Reactor not operated)	6590	Operation of the 30,000 pound shield door and storage of the reactor in its shielded pit will be demonstrated.
	Gamma-Ray Source-Slides Exposed	6580	Souvenir glass slides exposed and discolored by gamma ray energy.
	Hermes Display	6596	The large Hermes II and REBA pulsed radiation sources may be viewed and will be explained.
	Remote Handling Equipment	6580/107	Visitors may try their hand at remote manipulation using a pair of master slave manipulators.
5300	Fabrication of Composite Materials	805/320	Embedding filaments of very high strength and stiffness into ductile metals by plasma spraying the metal onto the filaments.
	Making Spheres With CO_2 Laser	807/2096	Forming microspheres by melting tip of a spinning metal rod with focused emission from CO_2 laser.
	Filament-wound Carbon/Carbon Composites	840 /HiBay	All-carbon composite materials consisting of a substrate of carbon filaments wound in a particular array and a carbon matrix formed by the chemical vapor deposition of carbon from a hydrocarbon gas.
5400	Viewing of Operation of Major Computers	880/Annex	Includes three large- and three medium-scale computers.
	Operation of Peripheral Area	880/Annex	Computing equipment used in support of major computers.
5500	Scanning Electron Microscopy	805/124	A relatively new instrument designed to provide an enlarged view of a small area of solid specimens and to display the view on cathode ray tubes.
	Electron Microprobe	805/308-314	Uses a focused electron beam to generate X-rays in an unknown sample. The X-rays can then be analyzed to find out the composition of the sample.
	X-Ray Fluorescence Spectrometer	805/308-314	Spectrometer wavelength data provide a means of qualitative identification of elements in a sample; the line intensities are directly related to the amount of the element present.
	X-Ray Diffraction Facility	805/308-314	Use of X-Ray diffraction techniques to characterize materials nondestructively and to investigate the atomic structure of matter.
	Chemistry Lab	805/302-306	Includes several exhibits.
	Microcombustion Furnace	805/302-306	A specialized furnace in which the products of combustion — and often the identity of the sample material — may be determined
	Atomic Absorption	805/302-306	A new method for determinating the concentration of metallic and semimetallic elements in solution or solid samples.
	Specific Ion Electrode	805/302-306	Measure the concentration of specific elements in solution.
	Gas Permeation in Metals	805/302-306	Measuring diffusion and permeation rates of gases in metals.
7100	High Bay Shop Open for Demonstrations of Various Machines and Glass Blowing	840/HiBay	Demonstrations of machining and glass blowing and several exhibits.
7400	SNAP Hardware Display	880/115	Models of four Radioisotopic Thermoelectric Generators (RTG's) used in various space missions.
	Dynamic Foam Tester Demonstration	892/So. HiBay	The technique of determining the capability of foam to cushion or to provide shock mitigation.
	Non-Destructive Explosive Test	892/So. HiBay	Demonstrations of the capability of the bridge wire in a blasting cap to transfer heat to the surrounded explosive material.
	Spring Tester	892/So. HiBay	Life testing of springs such as normally found on screen doors is demonstrated.
	Computer and Plotter Display	892/So. HiBay	Translation of raw data to a histogram and comparison to a normal statistical distribution.
	Physical Standards Lab	805/110	Equipment for measuring length and mass standards to the highest accuracy levels attainable with present day technology.
7500	Closed Circuit Color TV Display	632	Visitors can view themselves on color TV monitors.
7600	Micrographics Exhibit	802/B-10 & B-16	Conversion of engineering drawings to microfilm and aperture cards.
9100	NTS Photographs & Closure System	880/37	Photographs, drawings, and samples typical of Full Scale Test activities at Nevada Test Site.
9200	Grey Room	880/87	Displays testers, environmental chambers, an optical calibrator, as well as actual satellite hardware.
	Rocket Payloads	892/So. HiBay	Strypi and other Sandia-designed vehicles are on display.
9300	Movie "Environmental Testing at Sandia"	6587 (Area 3)	Continuous showing.
	Radiant Heat Demonstration	6530	Heating to several thousand degrees to simulate reentry heating.
	Plasma Jet Facility	6536	Facility computer control system will be demonstrated.
	Vibration Test Facility	6560	Electrodynamic shakers will be used to project a voice simulation.
	5000' Sled Track Facility	6741	Rocket sled shots are scheduled at 10, 11:30, 1:30 and 3.
	Ramp Test Facility — Box Car Bumping		Simulation of railroad switchyard impacts.
9400	Ultrasonics & Radiography Lab	860/130,142	X-ray and neutron radiographs of a variety of test objects.
	Holographic Laboratory	860/123W	Laser holographic display with low-light level camera and real-time video output in operation.
	High Voltage Radiography Display	6636 (Area 3)	10-million-volt linear accelerator and Californium-252 neutron radiography system will be on display.

Retiring

Dorothy Ham (3142)

Steve Edwards (7651)

John Russell (7141)

Angela Hopkins (*7412*)

Charles Johnson (7143)

Praised by Sandians

International Meet on Hydrogen In Metals

The study of the effects of hydrogen on metals has become a major research effort in many countries and, recently, an international meeting on the subject was held. Al Switendick, supervisor of Solid State Theory Division 5151, and George Perkins, supervisor of Applied Physics Division 1413, are enthusiastic about the meeting held at the Nuclear Research Center in Julich, Germany last month. Both Sandians presented papers, and they report that some 200 people – representing 15 countries – attended.

Following his presentation, "Electronic Energy Bands of Metal Hydrides – Palladium and Nickel Hydride," Al and three other speakers were invited to visit the Max Planck Institute at Stuttgart. Al participated in a two-hour seminar on hydrogen in metals presenting a talk entitled "Electronic Properties of Metal Hydrides: A New Theoretical Model." He also gave the same talk at Orsted Institute, University of Copenhagan.

George's paper, co-authored by Dave Begeal (1413), was "Permeation and Diffusion of Hydrogen in Ceramvar, Copper and Ceramvar-Copper Laminates." George volunteered the comment, "In my opinion, Al's paper was the best one presented. It represents a real breakthrough and will change the methods of interpretation of working with metal hydrides." After the meeting George spent several days at the Atomic Weapons Research Establishment in England.

Well Now Lookyhere . . .

Every second Friday afternoon, the LAB NEWS staff assumes its defensive stance and waits for the phone calls — "Where's my ad?" "You've misspelled my name," and the like. Those who publish papers philosophically recognize that this is part of the game. It is nice, though, to get that which follows — a genuine, unsolicited testimonial. The author is diffident about our using his name, so it's omitted.

"John —

Too often one confines his 'letter to the editor' to the negative. While I don't read every word of the "Slab News," as we lovingly call it, I do find myself picking it up during the weekend.

For example, it makes pleasant reading at lunchtime Saturday, along with a bowl of chili and a glass of beer. At that point, one is not ready for heavy reading, but is ready for in-depth treatments of adobe houses, Cord cars, the cable site, etc. all expertly illustrated with Bill's fine pictures.

No longer does one have the 'Readers Digest' feeling that things are too condensed, largely due to space limitations brought on by a fixed number of pages. The printing seems easier to read to my aging eyes, and for the most part the articles, mercifully, are not 'cont'd on p. 4.'

The writing is light hearted, yet thoughtful and incisive. The aura of breastbeating seems to be a thing of the past — again mercifully.

My subjective opinion is that you and your staff are doing a fine job and maybe even enjoying it along the way."

Events Calendar

April 27-29 — Rodey Theater presents "Brecht on Brecht," a potpourii of Berlin theatre songs and scenes from the plays of Germany's master playwright, 8:15 p.m., Popejoy Hall.

April 29-30 — 7th Annual Heights YMCA Invitational Swimming Meet at Valley Pool.

April 30 — YWCA Art Auction, 316 Fourth St. SW. Exhibit on view from 12-4 p.m. Auction begins at 4. Works donated by N.M. artists. Proceeds provide YWCA Campership.

May 20-21 — YWCA chartered bus trip — Lincoln, Gran Quivira National Monument, Quari State Monument, Ruidoso Downs, Cloudcroft. Deadline for reservations: **May 4.** For more information, 247-8841.

Speakers

R.J. Detry (5422), S.B. Gasser (5425) and A.J. Arenholz (5428), "Current Approaches to Computer Performance Measurement Hardware/Software/Simulation," ACM Winter Meeting, Feb. 11, El Paso.

G.J. Thomas (5522), "The Effects of Gases in Metals," Rocky Mt. Chapter of the Electron Microscope Society of America, March 24, Denver.

J.A. Schatz (1772), "On Nonrepetitive Sequences," Math Association of America, March 24-25, UNM.

D.A. Nissen (1913), "A Solid Electrolyte Thermal Battery," Dept. of Chemistry Seminar, March 28, UNM.

T.S. Rathke and M.H. Woodward (both 9344), "Automation of Velocity Gage Calibration," Seventh Transducer Workshop, April 4-6, Albuquerque.

B. Morosin (5152), "Crystal Structure of 2,6-Bis (Bromomethyl)-1, 4-Diphenylpiperazine," and "Structure of Beryllium Acetylacetonate Solved by Tangent Refinement Method," American Crystallographic Association, April 4-7, Albuquerque.

W.D. Brown (1933), "Semiconductor Device Degradation by High Amplitude Current Pulses," Reliability Physics Symposium, April 4-7, Las Vegas, Nev.

V.L. Dugan (1734), "Controlling Microbial Inactivation Environments," Region III IEEE Conference, Univ. of Tenn., April 10-12, Knoxville, Tenn.

R.T. Meyer (5324), "On the Role of Hydrocarbons in the Emission of Particulate Carbon from Graphites During Pulsed Laser Heating," AIAA 7th Termophysics Conference, April 10-12, San Antonio, Texas.

W.A. Von Riesemann (1541), "Evaluation of Solution Procedures for Material and/or Geometric Nonlinear Structural Analysis by the Direct Stiffness Method," AIAA/ASME/SAE 13th Structures, Structural Dynamics & Materials Conference, April 10-12, San Antonio, Texas.

R.L. Park (5331) and J.E. Houston (5332), "The Measurement of Chemical Shifts by the Soft X-Ray Appearance Potential Technique," Div. of Petroleum Chemistry Symposium, American Chemical Society, April 13, Boston.

R.C. Reuter (1542), "Prediction and Control of Macroscopic Residual Stresses in Hoop Wound, Fiber Glass Rings"; B.L. Butler (5313) and S.F. Duliere (5522), "Relation of Carbon Fiber Axial Thermal Expansions to Their Microstructures"; J.C. Swearengen (5165) and T.R. Guess (5314), "Techniques for Determining the Mechanical Properties of Composites Having Strong Filaments and Weak Interfacial Bond Strengths"; and J.D. McClure (1542), "Half-Ring Bending Tests of Filament Wound Carbon Material," ASTM Conference, April 12-15, San Antonio, Texas.

R.D. Jones and R.L. Chiburis (both 9215), "Solar Radio Emission Spectral Observations from the Vela 4B Satellite," 1972 USNC/URSI-IEEE Spring Meeting, April 13-15, Washington, D.C.

R.W. Russell (9343), "Lost But Not Forgotten," March 21, Boy Scout Troop 189; March 22, Xi Kappa Alpha Chapter, Beta Sigma Phi; March 24, Ideal Cement Company Employees Meeting, Albuquerque.

G.J. Simmons (1721), "Inequivalent Sets of Two^n Two-Level Orthogonal Functions," Symposium of Applications of Walsh Functions, March 28, Washington, D.C.

J.A. Borders (5111), "Research in Ion Implantation and Ion Backscattering at Sandia," Naval Research Labs, March 30, Washington, D.C.

E.J. Graeber (5525), "X-Ray Structure Determination," March 23, UNM Medical School.

T.R. Guess and W.R. Hoover (both 5314), "Fracture Toughness of Two C-C Composites (CVD Felt and CVD Filament Wound with ATJ-S Graphite Base)"; E.R. Frye (7123), "Effects of Heat Treatment on Filament Wound CVD Carbon"; R.M. Rayner (7123), "Filament Volume Determination," and "Variable Tension Control"; R.E. Allred and D.M. Schuster (both 5314), "Notched-Charpy Toughness of Discontinuously Reinforced Composites"; D.W. Ballard (9461) and O.J. Burchett (9462), "Status Report on NDT of Filament Wound Structures"; W.R. Hoover and R.E. Allred (both 5314), "Impact Behavior of Borsic-Al Composites"; R.H. Ericksen (5314), "Comparison Between the Creep Behavior of Brittle (B-Al) and Ductile (Be-Al) Composites"; T.R. Guess (5314) and J.C. Swearengen (5165), "Mechanical Behavior of Stainless Steel-Aluminum Composite Cylinders"; M. Moss (5314), "Fabrication of Filament Reinforced Metals by Hot Roll Bonding," and R.E. Allred and W.R. Hoover (both 5314), "Recent Development of the A-Al Ring Stiffener," 16th Meeting of the Filament Winding Working Group, March 29-30, Los Alamos.

G.J. Simmons (1721), "A Linear Partitioning of the Known Solutions to Four Combinatorial Problems," Southwestern Section meeting, Mathematical Association of America, March 24-25, UNM.

G.W. Brassell (5315) and K.B. Wischmann (5511), "Mechanical and Thermal Expansion Properties of a Particulate Reinforced Polymer," Southern California Section Regional Technical Conference (RETEC), March 27, Los Angeles.

W.A. Von Riesemann (1541), "Computation and Solution Procedures for Nonlinear Analysis by Combined Finite Element-Finite Difference Methods," and VonRiesemann with D.W. Lobitz (1544), "Development of a Piston Configuration to Fracture a Prestressed Glass Plate," National Symposium on Computerized Structural Analysis and Design, George Washington Univ., March 27-29, Washington, D.C.

J.A. Borders, G.W. Arnold (both 5111) and R.E. Whan (5522), "Influence of Mechanical Deformation on Ion-Channeling Yields in Single Crystal Silicon"; R.G. Kepler (5510), "Two Photon Absorption in Anthracene Crystals"; C.H. Seager, D. Emin (both 5134) and R.K. Quinn (5154), "Electrical Transport Properties of the AsTeGe Chalcogenide Glasses"; D. Emin and C.H. Seager (both 5134), "Small Polaron Formation in Some Chalcogenide Glasses"; J.E. Schirber (5150) and G.M. Beardsley (5151), "Compressibility of Cs Determined from Pressure Dependence of Fermi Surface Cross Sections"; R.C. Powell (formerly 5510) and Z.G. Soos (Princeton), "Time Dependent Energy Transfer Rates"; R.A. Graham (5134), "Third and Fourth Order Longitudinal Elastic Constants of Fused Quartz, X Cut Quartz and Sapphire"; W.B. Gauster (5325), "Experimental Determination of Gruneisen Parameters of Polymers"; J.G. Curro (5511), "Calculation of Gruneisen Parameters for Amorphous Polymers"; G.E. Laramore (5151), "Inelastic Low Energy Electron Diffraction (ILEED) as a Probe of the Electronic Excitations of Solids"; A. Narath (50), "Orbital Paramagnetism of Localized Nonmagnetic Impurities"; W.J. Brya, P.M. Richards and R.R. Bartkowski (all 5152), "Application of Moments to Light Scattering in Antiferromagnetic InF_2"; R.R. Bartkowski (5152), "A New Calculation of the Antiferromagnetic Ground State"; G.E. Laramore (5151) and C.B. Duke (Univ. of Ill.), 'Extraction of the Geometrical Structure of Adsorbed Monolayers from Energy Averaged LEED Intensity Profiles"; G.E. Pike (5152), "A.C. Conductivity of Scandium Oxide"; J.P. Van Dyke (5151), "Pseudopotential Parameterization of the Mg Fermi Surface"; P.D. Thacher (5153), "Origin of the Linear Electrooptic Effect in Ferroelectric Lead Lanthanium Zirconate Titanate Ceramics"; B. Morosin, P.S. Peercy (both 5152) and G.A. Samara (5130), "Phase Transitions in Linear Chain Compounds"; R.T. Johnson, Jr. (5134) and R.K. Quinn (5154), "Thermally Induced Surface and Bulk Electrical Effects in Ge-Te Based 'Memory-Type' Amorphous Alloys"; H.T. Weaver (5154), "Nuclear Resonance of Adsorbed Helium"; S. Myers, Jr. (5151) and A. Narath (50), "NMR Study of the P Hyperfine Interaction in Paramagnetic CeP"; G.A. Samara (5130) and P.S. Peercy (5152), "Pressure and Temperature Dependences of the Static Dielectric Constants and Raman Spectra of TiO_2 (Rutile)"; P.S. Peercy (5152) and G.A. Samara (5130), "Pressure Dependence of the Brillouin and Raman Spectra of Ferroelectric $BaTiO_3$"; G.J. Thomas (5522) and W. Bauer (8331), "Helium Implantation Effects in Palladium at High Doses," American Physical Society Meeting, March 27-30, Atlantic City, N.J.

D.M. Tendall (9150), "Seismic Signal Comparison for an NTS Earthquake with Nuclear Detonations"; M.L. Merritt (9150), "The Reaction of Shallow Surface Waters to Ground Shock"; W.R. Perret (9111), "Cannikin Close-In Ground Motion and the Motion Induced by Milrow," Spring National Meeting, Seismological Society of America, March 30-April 1, Honolulu.

J.E. Schirber (5150), "Pressure Studies of the Fermi Surfaces; Electron Transitions," BYU Seminar, March 8, Provo, Utah.

D.W. Ballard and B. Stiefeld (both 9461), "Computer-Based Thermographic Displays and Real-Time Techniques," Spring ASNT Convention, March 13.

L.E. Lamkin (7100), "The Sandia Pressure Safety Program," Texas Safety Conference, March 21, Dallas.

J.N. Olsen (5213), "The Use of Lasers in Nuclear Fusion," Lecture at Univ. of Tenn., April 3-7, Tullahoma, Tenn.

K.T. Kavanagh (5165), "Nonlinear Equations in a Non Academic Environment," Brown Univ., Providence, RI; Cornell Univ., Ithaca, NY; Univ. of Alabama, Huntsville; Texas A&M, College Station, April 5, 6, 10 and 11.

Reader Reaction to Car Pool Service

We quote below portions of a letter from Dave Coy (1226). We welcome this and other reactions to our attempt to get some of the cars off the streets. Write CPS Central, Div. 3162, Bldg. 802. The letter:

"Efforts to reduce automobile use through car pools, cycling, etc. are commendable . . . However the total solution will never come through voluntary means . . . A more practical means of solving the air pollution problem exists and can (indeed *must*) be implemented through federal legislation in the near future if we expect to continue to inhabit the planet Earth.

"This plan would limit the total engine displacement of all motor vehicles produced or used in this country. Further, it would set standards for maximum allowable fuel use rates per mile for each vehicle class. Present pollutant emission standards would probably need to become more severe. . .

"Suppose the maximum allowable engine displacement for passenger cars were to be set at 100 cubic inches and the fuel use rate . . . were set at a minimum of 30 miles per gallon . . . These measures alone could well reduce total atmospheric pollutants produced by automobiles to less than one-half the current amounts. A more immediate means would be to tax motor vehicles severely for engine displacement in excess of 100 cubic inches. Two dollars per year for each cubic inch above 100 might just do it."

Let's see — the old Mustang's got a 351 cubic inch engine — 351 minus 100 equals 251 times $2 — omigod.

For Sandia Commuters

Busing — Different Ways of Doing It

City buses — ugh. Oh, they're generally in pretty good shape. And the drivers are usually courteous. And, except maybe during rush hours, they're generally on time. But it still takes a long time to get to Sandia by bus. It's that stopping every other block that does it. Wouldn't really be so bad if it weren't for that constant stopping.

How about an express bus? With a route starting somewhere near your home. With a route that doesn't stop on every corner — or any corner.

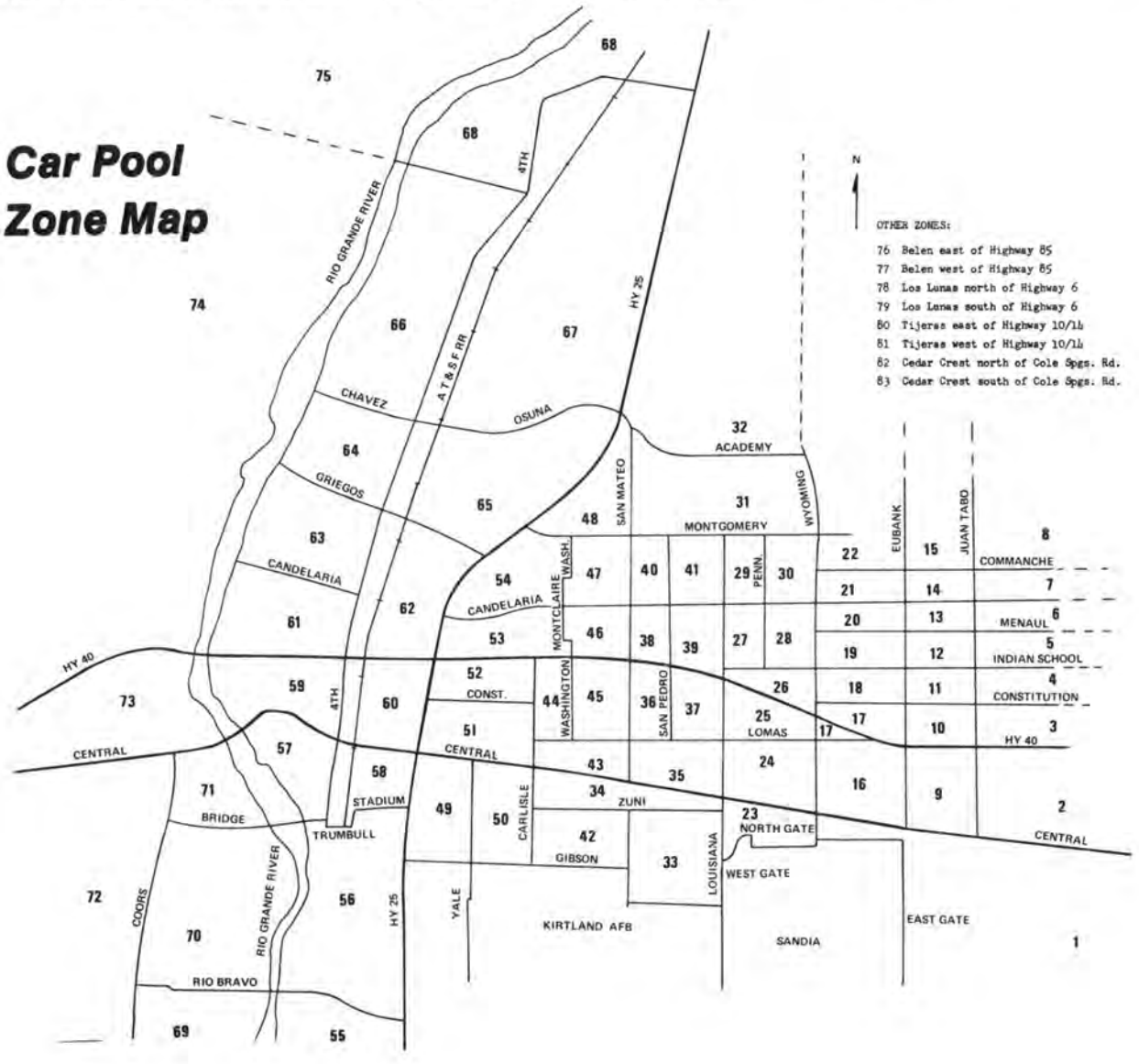
Such a bus would load every morning at a location with plenty of parking space (a shopping center or some city property, perhaps), and then go non-stop to the Labs. If the pick-up point were close enough to your home, you could walk or bike; otherwise you'd drive or be driven to the pick-up point and ride the bus from there. Advantage: you avoid (and reduce) traffic, calmly read your paper during the ride, and have the satisfaction of knowing you're doing your bit to reduce pollution. In the evening, you'd be desposited back at the starting point, again enjoying a non-stop ride.

If you're interested, send LAB NEWS your name, organization, home address, and zone number — the car pool map is reproduced in miniature somewhere here. If enough people from your area share your interest, arrangements with Albuquerque Transit will be made.

* * * *

A really elegant mode of commuting faces a slight design problem which may well be amenable to solution by some Sandia engineer. Needed: a bus or bus-and-trailer combination upon which a cyclist would load bike and self at the pick-up point, proceed to Labs and pedal off to his/her work location. No automobile involvement whatever, and you've got wheels when you get here. If you have some ideas, let us know what your conveyance looks like. Address CPS, Div. 3162. • bh

Car Pool Zone Map



Another Oldest, Established, Etc. Car Pool

We hereby acknowledge that Sandia's oldest car pool is not the one shepherded by Al Beck (1731), as reported in our last issue.

We now believe — at least until we get new evidence — that the title belongs to Alvarado Torres' (7154-1) Carro don Valentin (the valiant car), out of Belen for 21 years. The pool has: 1) covered 420,000 miles and used up four cars; 2) never been late (well, almost never — a couple of blizzards slowed them down); 3) never been in an accident; and 4) developed a reputation for punctuality — Beleners set their clocks by Torres' arrival at the homes of his riders. These include Gilbert Leyba (7131), Marty Quintana (5411), and Fermin Vallejos (4514).

The pool has been as large as 10 people. The number fluctuates as riders move, marry, change work hours, retire, or die. Or form their own car pools — Torres calls his the grandpappy car pool for its having sired half a dozen progeny.

Well, anyway, Beck's car pool is probably the Labs' oldest, established, permanent, *greater Albuquerque* car pool.

IF LAB NEWS were the contest type, we could ask readers to figure this out. No, it's not some creepy, crawly thing in a phosphorescent frenzy. Hint: we found it at the end of a roll of film. See p. 10 when you give up.

Authors

L.C. Bartel and L.R. Edwards (both 5132), "Effect of Pressure on the Ferromagnetic Transition of $MnAs_x$-Sb_{1x}," Vol. 5, No. 3, PHYSICAL REVIEW B.

J.P. Hickerson (5535) and R.W. Hertzberg, "The Role of Mechanical Properties in Low-Stress Fatigue Crack Propagation," Vol. 3, No. 1, METALLURGICAL TRANSACTIONS.

S.T. Picraux (5111), "Ion Channeling Studies of Epitaxial Layers," Vol. 20, No. 2, APPLIED PHYSICS LETTERS.

R.W. Rohde (5531), "The Dynamic Yield Behavior of Annealed and Cold - Worked Interstitial - Free Fe-0.17% Ti Allow," Vol. 3, No. 1, METALLURGICAL TRANSACTIONS.

C.W. Harrison, Jr. (1426), "Generalized Theory of Impedance Loaded Multiconductor Transmission Lines in an Incident Field," and "Reducing the Response of Single-Phase Transmission Lines to Electrical Noise," May issue, IEEE Transactions on ELECTROMAGNETIC COMPATIBILITY.

B.L. Hulme (1722), "A New Bicubic Interpolation Over Right Triangles," Vol. 5, No. 1, JOURNAL OF APPROXIMATION THEORY.

L.C. Beavis (1413), "Oxygen Permeation Through Silver," Vol. 43, No. 1, THE REVIEW OF SCIENTIFIC INSTRUMENTS.

D.E. Ramaker (5234), "One-Center Two-Electron Integrals Arising in Electron-Ion Scattering Calculations," January issue, JOURNAL OF MATHEMATICAL PHYSICS.

M.R. Scott (5222), "The Relationship Between Two Variants of Invariant Imbedding," February issue, JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATION.

J.W. Reichardt (1413), "The Kinetics of the Hydrogen-Titanium Reaction," February issue, JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY.

D.M. Darsey (9344), "Calibration of Systems by Dynamic Response Analysis," Vol. 10, No. 3 (1971), ISA TRANSACTIONS.

B.W. Duggin and R.I. Butler (both 9321), "Use of Manganin Gages to Measure Sweeping-Shock Pressure Loads," Vol. 10, No. 3 (1971), ISA TRANSACTIONS.

C.G. Murphy, O.J. Burchett and C.W. Matthews (all 9462), "Strain Analysis of an Aluminum Cylinder by Holographic Interferometry," Vol. 10, No. 3 (1971), ISA TRANSACTIONS.

B. Morosin (5152) and J.E. Schirber (5150), "Linear Compressibilities and the Pressure Dependence of the Atomic Positional Parameter of As," Vol. 10, No. 3, SOLID STATE COMMUNICATIONS.

C.B. Norris (5112), "Carrier Recombination and Trapping in Heteroepitaxial Si/Spinel," Vol. 20, No. 5, APPLIED PHYSICS LETTERS.

C.L. Olson (5241), "Spatial Electron Cyclotron Damping," Vol. 15, No. 1, THE PHYSICS OF FLUIDS.

E.J. Shipsey (5234), "Calculation of Transition Probabilities for Collinear Atom-Diatom Collisions with Nonpairwise Interactions," Vol. 56, No. 3, THE JOURNAL OF CHEMICAL PHYSICS.

W.D. Smith and C.E. Land (both 5153), "Scattering-Mode Ferroelectric-Photoconductor Image Storage and Display Devices, Vol. 20, No. 4, APPLIED PHYSICS LETTERS.

O.J. Burchett (9462), "Analysis of Techniques for the Inspection of Structures by Holographic Interferometry," Vol. 30, No. 2, MATERIALS EVALUATION.

E.D. Graham (1931) and J.R. Hauser (N.C. State Univ.), "Effects of Base Doping and Width on the J-V Characteristics of the n^+-n-p^+ Structure," Vol. 15, No. 3, SOLID-STATE ELECTRONICS.

E.J. McGuire (5234), "Photoabsorption Cross Section of Titanium to Cobalt," Vol. 33, No. 3, THE JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS.

J.K. Rice (5215) and F.W. Bingham (5233), "Natural Widths of Kinetic-Energy-Loss Distributions in O^+ -Ar and O^+ -Ne Collisions at 50-200 keV," Vol. 5, No. 2, PHYSICAL REVIEW A.

N.C. Anderholm (5214) and R.R. Boade (5323), "Laser Induced Stress Waves in Quartz Phenolic," Vol. 34, No. 2, JOURNAL OF APPLIED PHYSICS.

J.R. Asay (5132), "Determination of Material Relaxation Properties from Measurements on Decaying Elastic Shock Fronts," Vol. 43, No. 2, JOURNAL OF APPLIED PHYSICS.

R.L. Courtney (5511) and S.F. Duliere (5525), "The Catalytic Graphitization of Naphthalenediol and a Urethane Foam — A Feasibility Study," Vol. 10, No. 1, CARBON.

D. Emin (5134), "The Energy Spectrum of an Electron in a Periodic Deformable Lattice," Vol. 28, No. 10, PHYSICAL REVIEW LETTERS.

M. Moss, W.L. Cyrus and D.M. Schuster (all 5314), "Properties of Filament-Reinforced Plasma-Sprayed Alumina," Vol. 51, No. 2, AMERICAN CERAMIC SOCIETY BULLETIN.

D.W. Swain (5243), "Ionization of a Background Gas by a Weak Relativistic Beam," Vol. 43, No. 2, JOURNAL OF APPLIED PHYSICS.

J.P. Van Dyke (5151), "Matrix Elements in Interband Optical Transitions," Vol. 5, No. 4, PHYSICAL REVIEW B.

W.F. Hartman (1541), M.J. Forrestal (9324) and J.C. Bushnell (9462), "An Experiment on Laser-Generated Stress Waves in a Circular Elastic Ring," March issue, pp 119-123, JOURNAL OF APPLIED MECHANICS.

M.J. Forrestal (9324), G.E. Sliter (Stanford Research Inst.) and M.J. Sagartz (9324), "Stresses Emanating from the Supports of a Cylindrical Shell Produced by a Lateral Pressure Pulse," March issue, pp 124-128, JOURNAL OF APPLIED MECHANICS.

G.J. Simmons (1721), "On Palindromic Squares of Non-Palindromic Numbers," Vol. 5, No. 1, JOURNAL OF RECREATIONAL MATHEMATICS.

N.S. Gillis (5151) and T.R. Koehler (IBM, San Jose, Calif.), "Phase Transitions in a Model Ferroelectric," Vol. 5, No. 5, PHYSICAL REVIEW B.

W.B. Gauster (5325), "Elastic Constants and Gruneisen Parameters of Pyrolytic Graphite," Vol. 25, No. 3, THE PHILOSOPHICAL MAGAZINE.

N.J. Magnani (5531), "The Effect of Chloride Ions on the Cracking Behavior of U/7.5 wt% Nv/2.5 wt% Zr and U/4.5 wt% Nb," Vol. 42, No. 3, JOURNAL OF NUCLEAR MATERIALS.

O. Milton (5331), "Pulsed Flashover of Insulators in Vacuum," Vol. 7, No. 1, IEEE Transactions on ELECTRICAL INSULATION.

B.W. Marshall (5644) and W.G. Tiederman (Okla. State Univ.), "A Capacitance Depth Gauge for Thin Liquid Films," Vol. 43, No. 3, REVIEW OF SCIENTIFIC INSTRUMENTS.

J.W. Reed (5644), "Attenuation of Blast Waves by the Atmosphere," and "Air-blast Overpressure Decay at Long Ranges," Vol. 77, No. 9, JOURNAL OF GEOPHYSICAL RESEARCH — OCEANS AND ATMOSPHERES.

E.J. McGuire (5234), "Atomic M-Shell Coster-Kronig, Auger and Radiative Rates and Fluorescence Yields for Ca-Th," and "M-Shell Auger and Coster-Kronig Electron Spectra," and with S.W. El Ibyari and W.N. Asaad (American Univ. in Cairo), "The Auger Transition Rate in the Mixed Coupling Scheme," all in Vol. 5, (1972) PHYSICAL REVIEW A.

R.G. Easterling (1643), "Approximate Confidence Limits for System Reliability," March issue, JOURNAL OF THE AMERICAN STATISTICAL ASSOCIATION.

Congratulations

Mr. and Mrs. Chuck Carson (1214), a son, Chad, Feb. 22.

Mr. and Mrs. Lyle Kruse (5323), a son, Robert Conrad, March 30.

What Is It?

What is it? (see p. 9) The mark of static electricity as the adhesive strip at the tag end of the undeveloped film is removed.

HRC Project

Bob Garcia, Joe Danclovic Help Find Jobs for Unemployed Vets

Twenty-three Viet Nam veterans, many of them members of minority groups, got jobs in recent weeks as a direct result of efforts by Bob Garcia (3230) and Joe Danclovic (3131).

Bob is president of the Albuquerque Human Resources Council which, with the Veterans Administration, American Legion, U.S. and State Employment Agencies, sponsored three training sessions for veterans. Subject of the sessions: the initial employment interview. Joe, a member of Sandia's training staff, conducted portions of the sessions. Both men volunteered their time.

"There are about 3000 unemployed Viet Nam veterans in Albuquerque," Bob says, "so this training was an attempt by the Council to get possible employers together with prospective employees. Representatives of the firms that are members of the Council attended and helped with the training. In 23 cases, they found men for positions they were trying to fill."

"The initial interview is critical for anyone seeking employment," Joe says. "Our training is aimed at showing the vets what to expect during the interview and how best to sell their experience and skills. About 150 veterans have participated thus far — many of them young men with no work experience beyond their military service. And they want to go to work."

The training sessions are just one of the activities of the Human Resources Council. The Council conducts a vocational guidance seminar for school counselors which better acquaints them with current employment trends: it sponsors the "living witness" program that encourages students to remain in school and to become qualified for meaningful employment: and it undertakes seminars for first-line supervisors that elucidate the problems inherent in hiring and supervising the hard-core disadvantaged.

BOB GARCIA (*3230*) conducts a training session for veterans as part of a Human Resources Council project.

"Obviously, the goal of the Council is equal employment opportunity," Bob says. "Member firms are pledged to support a broad program of hiring, training, promotion and compensation of employees on the basis of individual qualifications and merit. We have about 40 member firms at the moment and we are working to increase this membership to 100 by the end of the year."

•dg

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

RULES
1. Limit: 20 words
2. One ad per issue per person
3. Must be submitted in writing
4. Use home telephone numbers
5. For Sandia Laboratories and AEC employees only
6. No commercial ads, please
7. Include name and organization
8. Housing listed here for rent or sale is available for occupancy without regard to race, creed, color, or national origin.

FOR SALE MISCELLANEOUS

50 CC SUZUKI basket job, not crunched, just used, $20. Frasier, 299-6933.

REM. MODEL 700 ADC 30-06 with Redfield 3x9 VAR scope, carrying case & sling, $150. Ellis, 298-4769.

CHAIN SAW & guard, Sears heavy duty, $160; tire chains, V-bar reinforced w/tighteners, $17.50. Harris, 266-2269 after 5.

ELEC. lawn edger; Indy 500 race car set; 5-gal. metal Jerry can w/holder; soap box derby wheels and axles; inner tubes, truck & car. Zucuskie, 268-3105.

TABLE, 24"x20" folded, opens to 36" long, walnut color plastic top. Rowe, 296-6295.

24" GIRL's bicycle, $20; 20" window fan, 2 spd., reversible, $10. Snyder, 268-0679.

GAF Super 8 movie camera, projector, storage reel, color movie film including processing, home movies book; won, never used, $100. Smith, 299-7151.

'71 22' Beechwood motor home, $8395; can be seen at KOA 12400 Skyline Rd., site 96. Armijo, 242-5139.

SAVAGE .32 auto.; hi-std. .22 HDM target auto.; lg. gold leaf mirror; old iron safe; old powder horns. Smitha, 299-1096.

TENT, umbrella, 9x11, poles & pegs included, $20. Looney, 255-7349.

CENTER-PULL drapery traverse rod, 122" to 220", all necessary hardware included, $8. Smith, 299-6873.

DAYBED, dark green floral. Bierly, 255-9017.

ELEC. floor scrubber & polisher, used twice, $5. Kavet, 299-1793.

CAMPER clampers, heavy duty, used one month, cost $32, sell for $16. Scott, 299-3412.

MINIBIKE w/3HP B&S engine & special chrome hydraulic front fork bumper carriers included, $110; 2-spd. Schwinn 26" bicycle, $25. Hart, 299-8832.

ANTIQUE 12-piece dining set; twin Victorian marble top end tables. Riggs, 255-5725.

POODLE PUPS, 2 brown females, 1 black female, 1 black male. Péwé, 298-7067 after 5.

KITTENS, 8 wks. old, free to good homes, Berglund, 255-3988.

14' ALUMINUM BOAT, trailer, 7.5hp motor, less than 10 hrs. on motor, life preservers, spare tire, current license, $450. Tolmie, 296-4332.

BUILT-IN OVEN, clean, good working order, GE, $50. Winter, 296-3584.

GIRL's 24" Husky Camero bicycle, $15. Sullivan, 298-0148.

FREE 1½ - ½" smooth rock, also rough fist-sized rocks, you haul; 18' sectional flagpole, $6. George, 299-9101.

ELECTRIC edger & trimmer, 1 HP motor, w/100' extension cord, sears, used once, $35. Davis, 299-2661.

SIX-PIECE matching Samsonite luggage, $75; Smith-Corona port. typewriter, $35. McKelvey, 865-9280.

ZEISS Contaflex beta single lens reflex camera w/flash, $55. Moyer, 268-1166.

FRIGIKING, auto air conditioner, complete, under dash mount, used 2 yrs., $75, hardware for Falcon-6 installation free. Cranfill, 298-3194.

WEST HIGHLAND white terrier puppies, AKC, excellent pedigree. Young, 296-1963.

SPESCO 38 spec. revolver, S&W frame/weight, S&W holster rig, cart case, cuff case & cuffs, belt, keepers, nightstick & holder. Kirchmeier, 344-5783.

21" WESTINGHOUSE B&W TV; metal cabinet, 25" wide x 23" deep x 36" high, blond finish, $25. Burbank, 299-1460.

FRIGIDAIRE, white, 11 cu. ft., has freezer compartment, opens from left, $35. Lewis, 299-7217.

'71 HONDA CL 175, adult driven, garaged, 3000 miles, $525; A.B. Dick Mod. 420 mimeograph machine, manual, $50. Benson, 268-9727.

FIREPLACE SET, consists of stand, shovel, broom & poker, heavy brass handles. Wood, 256-7394.

RIFLE, 22 cal. Mossberg, 18-shot, w/strap, $20; Coleman 2-burner camp stove, $10. Hole, 255-1444.

UMBRELLA TENT, 9x9, $35. Klein, 294-0888.

WINCHESTER Model 12 shotgun, 12 ga. 30" v/rib, spec. wood; Browning O/U shotgun, 12 ga. 28" v/rib, custom stock. Hubbard, 299-7818.

GE refrigerator, 11.6, $50; bedroom suite, complete, $75; dinette, 5-piece, $15; Chihuahua male & female, $20 ea. Sanchez, 299-5658.

HONDA 750, fairing, luggage rack & backrest, will take Honda 350SL in trade, $1100. Bland, 298-8459.

4 TIRES, E78-14, 14,000 miles. Brown, 296-5949.

NEW Hamilton Beach mixer, $10; new elec. can opener, $5; new fluorescent desk lamp, $5, used typewriter, $20. Berg, 266-2058.

18" B&W Sears port. TV, $25, DeVargas, 299-0477.

TRUNDLE BEDS, mattresses & springs; walnut buffet. Harley, 898-0594.

BUESCHER alto E-flat saxophone, Bierly, 296-6430.

'71 KAWASAKI 500 Mach III, 6500 miles, customized paint, extra chrome, over$1300 invested, sell for $875. Shaffer, 242-6507.

WHIRLPOOL refrigerated air conditioner, window-mounted, 6000 BTU/hr., $90; lg. parrot cage, $10; clothesline posts & wire, $5. Hammond, 296-7795.

MOHAWK receiver, Apache transmitter w/SB10 complete, $125; 3 lengths 4" CI soil pipe, covered gas pipe, other plumbing supplies. Day, 265-2319.

15' LARSON; 70 hp Mercury outboard motor, w/trailer, spare, make offer. Tucker, 255-5335.

HITCH, heavy duty, for 1970 Maverick, $12. Stephenson, 299-3914.

PATTY BERG golf driver & putter. Michele, 243-5174.

LONG single bed, $30; creative playthings rocking chair, $5; toy chest, $4; old hi-fi components, make offer Beardsley, 255-5313.

NAVAJO RUG; ladies concho belt; Jeep engine & trans., want Winchester Cal. 32-20. Zaluga, 344-1564.

ALUMINUM row boat w/car top rack, capacity 425 lbs., $45. Metzgar, 242-1028.

FACTORY BUILT motorcycle trailer, carries 2 cycles, McVay, 299-3359.

CAMPER, 10' cabover f/lwb, ice box, sink, 3-burner butane stove, water tank w/12v pump, cabinets & storage, custom built for family of 6-8, $1245. Drago, 255-6727.

SWING SET: includes slide, chair swing, 2 reg. swings that need new chain, seats, $7. 3208 Texas NE, Erickson, 298-4416.

FOR SALE CARS & TRUCKS

'67 VW BUS, 9 passenger. Tessler, 296-1025.

'70 BONNEVILLE sta. wgn., 22,000 miles, lots of extras, any offer between average retail & average trade in book values considered. Vittitoe, 299-9298.

'68 VW, $100 under NADA. Westman, 255-6048.

'70 VW BUG, yellow, AM/FM radio, best offer over $1395. Verardo, 865-9449 or 255-6385 after 5.

'68 VW BUG, new brakes, radio, $900. Gonzales, 242-6264.

'67 EL CAMINO ½-ton truck, 4-spd., trans., R&H, bucket seats, chrome seats, truck bed cover. Watson, 268-1517

COMPLETE TRAVEL PACKAGE, 26' Fan luxury trailer, AC, bath; Jeep, super Wagoneer; EazLift hitch, sway control. Knapp, 282-3192.

'69 VW BUGS: vinyl interior, undercoating, 17,000 miles, $1395; and 23,000 miles, $1295. Kobs, 298-9133.

'66 BEL AIR sta. wgn., white w/green interior, air, AT, $775 (under book). DeHaan, 268-6120.

'65 MUSTANG coupe, one owner, $725. Butler, 296-8095.

'63 DODGE Custom 880, PS, PB, factory air, V8 engine, tinted glass, wsw tires, $375. Bozone, 299-2986.

'68 CADILLAC Sedan DeVille, AM/FM stereo radio, radial tires, 45,000 miles, $2950. Reed, 299-7425.

'69 FORD Torino GT fastback, 351 cu. in., 2 barrel, AC, AT, power disk brakes, PS, $1800. Parmley, 299-9129, after 5:30.

'62 CHEV. pickup truck, ½-ton Big-6 motor, std. trans., 8ply tires. Schneider, 296-2487.

'68 MUSTANG V8, 3-spd., $1400. Brown, 299-0315.

'59 CHEV. pickup, 6-cyl., 3-spd., $295. Tiefa, 299-2763.

'70 PLYMOUTH Duster, 24,000 miles, slant 6, AT, power disc brakes, 2-dr., metallic green, $1600. Dawkins, 242-3507.

'56 CHRYSLER Imperial. Make offer. Hindi, 299-8996.

'52 GMC BUS, good except needs short block, $400. Holley, 898-1777.

TRUCK, Dodge ½-t, 6-cyl., 3-spd., insulated shell, extra gas tank, new 6ply tires, 28,000 miles, $2200. Singleton, 299-1613.

'65 VOLVO 1800 2-dr. sport model, AC, R&H, OD, needs work, book: $1600, sell for $1000. Sundberg, 299-2134 after 6.

'62 FORD Galaxie, V8, AC, radio, PS, $400 or best offer. Kelly, 268-2235 after 7.

'68 VW, completely overhauled, new brakes, Lobley, 344-7942 after 7.

FOR SALE REAL ESTATE

BRICK 4bdr., den w/fp in stone wall, landscaping-waterfall, fishpond, sprinklers, lg. patio, picnic & play areas, refrig. AC & electronic filter. Constant, 296-1431.

LOT in Paradise Hills Knolls Addition, on cul-de-sac. Brown, 296-5949.

TWO-YR.-OLD Holiday Park 4-bdr. home, LR, DR, FR, garden kitchen, $31,500. Johnson, 298-9926.

FOUR HILLS, view, landscaping, privacy, 3-bdr, 1¾ baths plus ½, den, dual fireplace, $39,500. No agents. Will trade. Butler, 242-5398 or 298-2893.

WORK WANTED

HIGH SCHOOL student w/pickup will haul trash, do odd jobs, available Tues., Thurs., Fri. after 3 p.m., and weekends. Brian. 255-6727.

WANTED

EQUALIZER HITCH for camping trailer, 350 or 450 lbs. tongue load. McClelland, 296-3661.

FAN, old fashioned 4-blade, slow rotating, like used in old time ice cream parlors. Bassett, 898-1840.

AUTOMATIC transmission, 2-spd. which will mate with a Ford or Mercury 332 cu. in. engine, must be in excellent condition. Kupper, 298-7720.

SANDIA SUMMER HIRE (Ariz. St. U. ME prof.) desires 3 or 4-bdr. furn. home for approx. period 6/7-8/25. Exc. Abq. refs, contact D.P. Aeschliman (5642) or Prof. D.L. Evans directly at (602) 965-3938.

USED TRUCK tire, size 750x20 for lt. duty off road use, must be cheap. Souder, 282-3121.

UTILITY TRAILER, good condition. Vandevender, 298-5097 after 5:30.

GULBRANSON ORGAN, any size or style. Hayes, 298-4682.

FURNISHED house for visiting Prof. on summer employment, June 24-Aug. 19, 3 sons, ages 1, 2, and 8. Cano, 264-1265 or 296-6955.

TABLE TENNIS TABLE, need fold & roll model. Fugazzi, 299-1279.

RIFLE/SHOTGUN, .22/.410, over/under, Savage Mod. 24. Devlin. 282-3112.

TOPOG MAPS — hikers & fishermen: let's get together & place order direct to US GS. Get maps for 30 cents (vs 75 cents) if we have a lg. order; I have the index maps for Western states. Westman, 255-6048.

WOOD SHAPER & bits in good condition; miter box w/11 pt. or 12 pt. backsaw. Nelson, 867-2746.

LIGHTWEIGHT 13 to 14' alum. fishing boat w/3 seats & beam width of 56" or less; also 6-10 HP outboard motor. Leeman, 299-9149 after 6.

FOR RENT

2-BDR. unfurnished apt., newly decorated & carpeted, near Los Altos-Grant school & Los Altos golf course. Quinn, 299-9171.

3-BDR., 2 baths, 2 fireplaces, big den, 1 yr. lease $315/mo.; deposit $150. 2706 Tenn. NE, Chavez, for appointment 255-1585.

LOST AND FOUND

LOST — Slide rule w/name on one corner, Sandia charm bracelet w/10 & 15-yr. charms, key ring w/6 keys — lost between Gate 4 and Fire Station. LOST AND FOUND, tel. 264-2757, Bldg. 832.

FOUND — Motorcycle key No. 8364, sun glasses w/brown frames. LOST AND FOUND, tel. 264-2757, Bldg. 832.

Reminder

Daylight Saving Time will be in effect from 2 a.m. Sunday, April 30, until the last Sunday in October. Turn your clock ahead one hour.

Soul Session Tomorrow

NO ONE KNOWS what's going to happen at Coronado Club Happy Hours. Here are the ingredients for tonight: A new group called "The Prisoners" will be wired into the bandstand. What does this mean? Smiling Jim Noonan, Club manager, will spread southern fried chicken for the buffet. Will he keep smiling? Denny Gallegos and guitar will entertain in the main lounge. How many fair maidens will lose their cool? In the meantime, special Happy Hour prices (cheap) will prevail. Can Joe the bartender keep up with the demand? Can the north end crew hold the fort? Who will escort the Hollywood starlet?

AND NEXT WEEK, May 5, Frank Chewiwie will be on the bandstand. Roast beef, the Club is famous for it, will be the buffet feature. Yolanda Adent and piano will be in the main lounge conducting a singalong. Some of us will celebrate Cinco de Mayo and others will just celebrate Friday. TGIF, ole!

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TOMORROW NIGHT a Soul Session thing is happening. This is where a great rock band creates a sonic disturbance, strobe lights flash, Happy Hour prices prevail from 8:30 to 12:30 and super sandwiches are available. Admission is free to members while guests pay $1. If this is your kind of stuff, Soul Sessions are the greatest thing in life. If not, people-watching still makes it worthwhile. Folks you have known for years – serious type engineers, scientists, accountants and even purchasing people – act about 16 years old. Not even Dr. Jekyl can top that.

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FORTY MEMBERS have signed up for the "transportation-only" trip to Europe scheduled June 18-July 8, according to travel director Bud Wheeler (3251). This means that the trip will go, Bud says, and 10 additional seats are available. The $280 price includes flight from Albuquerque to either Shannon, Ireland, or Brussels, Belgium, and return from London three weeks later. The fee should be paid at the Club office right away.

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FAMILY VAUDEVILLE NIGHT is scheduled Saturday, May 13, and will feature a variety show by youngsters of the Albuquerque Light Opera billed as "The Stars of Tomorrow." This talented group has performed in various Light Opera productions and have now put together an entertaining show of their own. The movie will be a Walt Disney feature called "Toby Tyler." Happy Hour prices will prevail and super sandwiches will be available starting at 6 p.m. Admission is always free to members and families.

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A FEW SEATS remain on the Club's package tour to Mazatlan, Mexico, June 7-15, according to Chet Fornero (4361), Club president. This tour differs from those in the past in that guests and relatives of Club members are eligible. Price of the nine-day package, which includes all transportation, baggage handling, luxurious accommodations, breakfast and dinner each day, a cocktail party, plus an extravagant "Fiesta Night," is $249. Registration will be accepted through May 5, Chet says, and final payment is due in the Club office on that date.

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NEW OFFICERS of the Sanado Club will be installed at a dinner dance at the Club Saturday, May 6. They are Dorothy Lazarus, president; Tommie Gustafson, 1st VP, Virginia Willems, 2nd VP; Barbara Gunderson, 3rd VP; Carol Larson, 4th VP; Maurine Romme, 5th VP; Joyce Barkocy, secretary; and Pat Hamlet, treasurer.

JOANNE ACHEN (*1341*) will be one of the models wearing hot pants, swim suits and other spring fashions from Omar's Boutique during a noon hour style show at the Coronado Club Thursday, May 4.