



SANDIA LAB NEWS

VOL. 21, NO. 16, AUGUST 1, 1969

Analog Goes Mod

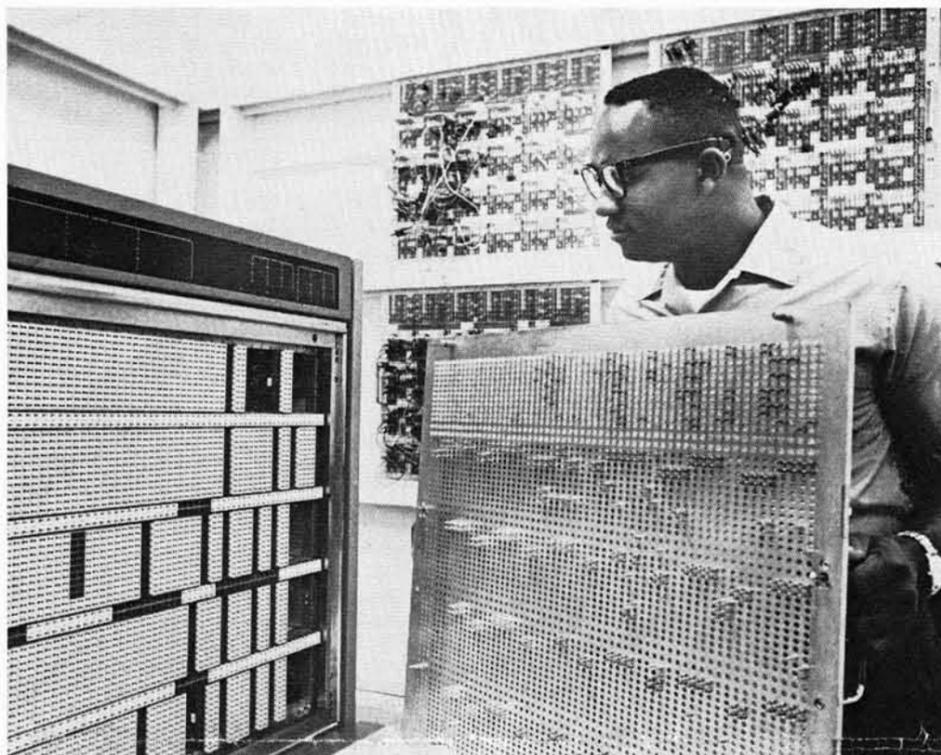
EAI-680 -- Sandia's New Computer With Hybrid Option in Its Future

A recent significant addition to Sandia's computer capability is Electronic Associates EAI-680, a modern, medium-scale, solid state analog computer. Principal use of the new computer will be in connection with the Analog and Hybrid Simulation Project headed by Craig Jones (9422). The new system, located at the Bldg. 880 Central Computing Facility, replaces one which had been in continuous service for over 12 years.

In addition to a somewhat expanded complement of analog components and peripheral equipment, the new EAI-680 contains a repetitive operation or "repop" capability and parallel digital logic. The latter feature is of particular importance in providing effective programmable control of the complex processes required for problem solution. These characteristics have greatly extended the capabilities of analog simulation at Sandia. Moreover, the EAI-680 can, in the future, be incorporated into a multi-console "hybrid" configuration. A true hybrid computer consists of a digital computer, an analog computer, and interface gear which allows the analog and digital subsystems to "talk" to each other. Hybrid computers combine and extend the digital's superiority in the areas of control and precision and the analog's advantage in speed. The present EAI-680 analog system represents an important element in the evolution of a major hybrid facility at Sandia.

Scientists and engineers began experimenting with hybrid computers over a decade ago. Today, hybrid computation is a rapidly expanding technology, able to cope with a new range of problems and to provide less expensive solutions to existing ones. Although analog/hybrid computation is only one of the many scientific computing and applied math activities in which the Mathematical Computing Division 9422 is involved, Al Iacoletti, division supervisor, indicates that the hybrid area is potentially one of the most important to Sandia.

Al states, "Analog computers provide the fastest, cheapest, and most effective computation for many scientific and engineering problems, especially those formulated in terms of systems of ordinary differential equations, both linear and non-linear. Partial differential equations generally require a digital or hybrid computer for their solution, although certain types can and are



ANALOG PATCH PANEL which contains a program is held by Craig Jones (9422). This panel fits into the console of the EAI-680 analog computer (on the left). Other patch panels with programs are stacked in the background.

being solved on our analog computer."

Typical problems being solved on the EAI-680 are those relating to the behavior of electronic circuits, vibrating mechanical systems, missile trajectories, heat transfer processes, and control system simulations. Parameter optimization studies, complete six-degree-of-freedom trajectory problems, partial differential equations, and complex system simulations constitute some of the more promising areas for hybrid computation.

Although just recently accepted officially, the EAI-680 analog computer has already been used to solve a number of technical problems. One of these, from Mechanical Design Division 7214, involved the simulation of an attitude control system for a sounding rocket. Occurring si-

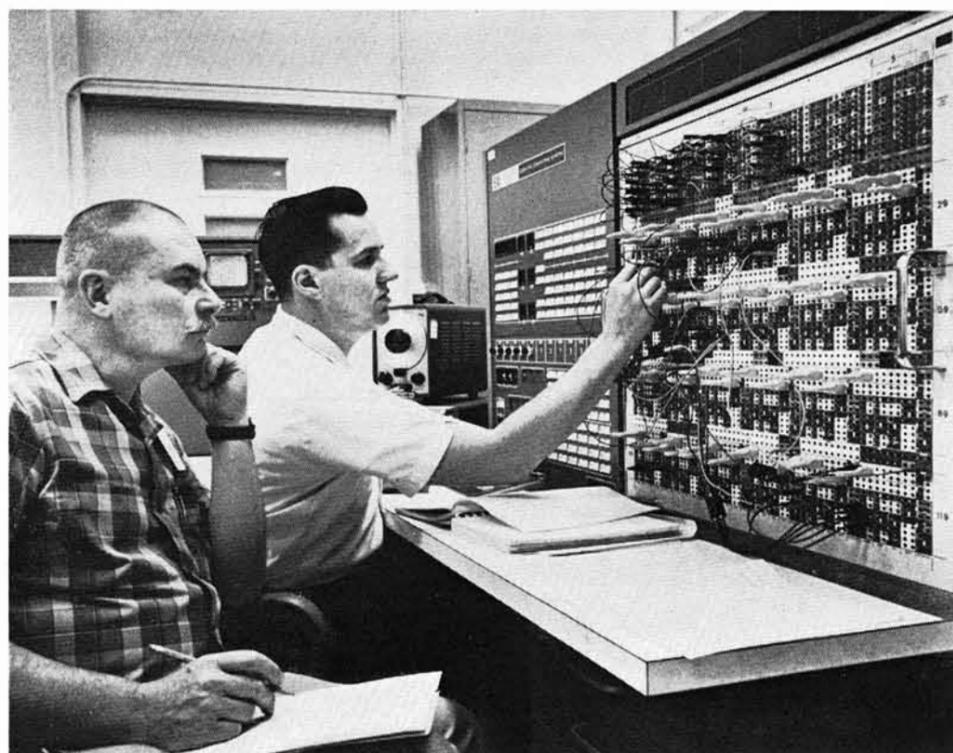
multaneously in the system were high frequency components associated with the rotation of the missile and low frequency components reflecting the slow rate of change in the missile's attitude. In addition, very high speed switching was required to represent the action of stabilizing jets.

"With this analog computer," project leader Craig Jones sums up, "solutions were produced at least 15 times faster than by the corresponding digital simulations on the CDC-3600. We also realized a valuable increase in man-machine interaction." Al adds, "For design problems in general, this interactive capability is vital. Programmable parallel logic and automatic repetitive operation make the EAI-680 particularly useful on these problems."

Other recent simulations performed on the EAI-680 include a roll control design using rolamite principles for the Exploratory Systems organization, a guided parachute study for the Aerothermodynamics Directorate, and simulation of a time delay for the Product Data Systems Development organization.

Craig and others assigned to the project — Jim Allensworth, Ron Domres, Steve Petty and Fred Wyatt — are immediately concerned with broadening the application of modern analog computation to the various technical problems of the Laboratories. In addition to this technical, staff-level support, increasing effort is being devoted to the comprehensive evaluation of hybrid techniques. Because Sandia's staff is largely digitally oriented, a continuing seminar on analog computers is being given to acquaint engineers and programmers with what analog computers can and cannot do. These seminars are also effective in familiarizing the staff with the growing list of professional, computer related services offered by the Computing Directorate.

Craig notes, "As Sandia's computing capabilities increase, we will be solving larger and more complex problems corresponding to more exact physical models. Considering the cost per solution of today's problems, cheaper methods must be found to solve future problems. We believe this computer is part of the answer."



JIM ALLENSWORTH (left) and Ron Domres (both 9422) are at the EAI-680 console with the patch panel in position. In the background are sine-wave generator, oscilloscope, and plotter.

ASME Honors Willis Whitfield For Clean Room

One of the highest honors won by a Sandian, the American Society of Mechanical Engineers' Holley Medal, has been awarded to Willis Whitfield (1742) for his concept of the laminar flow clean room principle.

Election to the select group of recipients puts Willis in the company of such men as Henry Ford, Ernest Lawrence (cyclotron), Carl Norden (Norden bombsight), and Edwin Land (Polaroid).

The gold medal, which has been awarded since 1924, will be presented during ceremonies in November.

In an ASME publication, qualifications for receiving the award are described: "The Holley Medal is bestowed only on one who by some great and unique act of genius of an engineering nature has accomplished a great and timely public benefit . . . The achievement should be of such public importance as to be worthy of the gratitude of the nation and to call forth admiration of engineers."

The laminar flow clean room, used to eliminate airborne contamination within closed spaces, has become an essential tool in the space program and in electronics, microbiological control, medicine, and many other areas.

Labs Tested Nuclear Heaters Left on Moon by Apollo II

Two cup-sized radioisotopic heaters analyzed and safety tested at Sandia Laboratories are part of the instrumentation left on the moon by astronauts of Apollo 11.

Function of the heaters — each providing 15 thermal watts of energy — is to keep the seismic "moonquake" instrumentation warm and operational during the extreme cold of the two-week lunar nights. As the temperature of the moon's surface drops to 300° F below zero, the heaters will be warmed to a cozy 65 degrees below zero — within the operational range of the instruments.

The heaters were designed and built by Mound Laboratory which is operated for the AEC by Monsanto Research Corporation.

Sandia's safety evaluation produced aerothermodynamic information which helped engineers at Mound Laboratory arrive at the final design. Safety questions were answered by mathematical computations backed up by testing of models and components in Sandia's environmental testing facilities.

The shape of the heaters and the path and velocity through space were used to determine the heat, pressure, vibration and shock which they might experience. In turn, the design of the package itself — particularly its ability to withstand shock and heat — was analyzed to ensure that it could survive these conditions.

Dynamic shock machines, rocket sleds, reentry arc tunnels and other facilities in Sandia's environmental test area were used to obtain this test data. Heater packages were "reentered" in a supersonic stream of gas which subjected them to temperatures approaching 3500°F. The packages were also accelerated by rocket sleds into a variety of targets to determine their ability to survive.

J. P. Banas Paper Presented at Polish Symposium

J. P. Banas (1733) and Andre Vacroux, associate professor at Illinois Institute of Technology, were co-authors of a paper which the latter presented last month in Warsaw, Poland.

The paper was entitled, "Optimal Discrete Control of Time Lag Systems," and was based upon research carried out by the Sandian while working on his doctoral degree. The Fourth International Federation on Automatic Control meeting, June 16-21, attracted delegates from 33 countries. Some 70 papers were presented.

Megabucks Saved

\$4.7 Million 'Profit' Shown By Cost Improvement Program for FY '69

These days nearly everyone worries about ways to save money. Included in the worriers are a number of Sandians who found ways to save a total of \$4,688,055 during the past fiscal year.

This figure was compiled by the Cost Improvement Policy Committee headed by Charles Barncord (7600). In an annual report, the Committee cited 72 individuals for ideas which either saved money outright or offered ways to avoid spending money without impairing efficiency or jeopardizing Sandia's mission.

The ideas ranged from a way to use a salvaged cylinder and thus save \$169, to design of a cable adapter which last year resulted in savings of more than one and a half million dollars. The latter item was developed by Bert Neumon (2641), George Volda (2643) and Francis Daut (2634). The adapter reduces the cost of a cable component from several thousand dollars to less than 60 dollars.

Reuben Minter (7621), cost improvement coordinator, says that every cost improvement idea submitted by Sandians is thoroughly investigated. When the worth of the suggestion is established, the committee presents the originator with a citation that becomes part of his personnel file.

The cost improvement program was established at Sandia in 1959 in organization

2000. In 1965, the program was expanded to include the entire Laboratories, and since that time savings of nearly \$25 million have been reported.

Reuben says that cost improvements are gained in many ways — innovations in equipment and test procedures, use of salvaged or surplus materials, improved operational techniques, etc. "We also take into account safety and accident prevention practices," he says. "Sometimes we can't assign a dollar value to an idea, but it nonetheless proves to be valuable to the Laboratories."

Other significant cost savings suggestions submitted during the past year are those by: Art Finlayson (7635), Dave Bickel (7343), and Don Bauder (formerly 7344) — use of excess Little John rocket motors; Gene Nielsen (formerly 4116), Joe Chavez (4610), and Ray Beall (4613) — modification of a purchasing program; and Frank Ross (2444) — use of surplus electrical components.

Reuben urges Sandians who have a cost savings idea to contact him for assistance in preparing a cost improvement report. He stressed that cost savings ideas need not involve large sums of money to be of interest to the AEC. "It's the accumulation of many small savings that account for most of the total dollar savings."



MILLION AND A HALF DOLLAR CONNECTOR—That's the sum reported saved by the design of this cable connector. The savings was reported under Sandia's Cost Improvement program which has verified savings of nearly \$25 million since 1965. Shown above are Reuben Minter (7621), coordinator of the program; Charles Barncord (7600), committee chairman; George Volda (2643), and Bert Neumon (2641). George, Bert, and Francis Daut (2634) are credited with design of the money-saving cable connector.



LA FIESTA de la clase Espanol—Members of the out-of-hours Spanish III class were treated to a Mexican festival recently at the Placitas home of student Bob Sharp (4541). In addition to Spanish guitars and dancers, a program of talks, skits and songs was put on by the class. The dancers are Mona Lisa and Loretta Sanchez, nieces of instructor Rudy Baca (4541). Two hundred and twenty-five students are enrolled in 11 Spanish classes offered by Sandia out-of-hours program this summer.

Retiring



Donald Goodrich of Physical Standards Division 7451 retired yesterday after more than 17 years at the Laboratories. He was employed by Sandia in January 1952 as an inspector and transferred to his present job about eight

years ago.

Don and his wife will maintain their residence in Albuquerque at 500 Palisades Ct. NW, where they will continue to devote considerable effort and care to their flower gardens. Before Don joined Sandia, he was a commercial grower for local florists. Other plans include lapidary work. "I cut and trim the rocks and my wife has the plastics know-how so that we come up with some unusual rock mosaic pictures," Don says. The Goodrichs have a son at Sandia (Don W. — 4233) and a daughter in San Francisco.

Don is taking early retirement primarily "to be able to have time to do all the things I've planned for years. Sandia has such a wonderful retirement plan that I can afford — not just financially but also mentally — to retire early. It's a frame of mind that insures a pleasant future."

Charles McNeely Named Assistant Manager for Albuquerque Operations



Charles McNeely is the newly-appointed Assistant Manager for Administration of the AEC's Albuquerque Operations Office. He had been Director of the Finance Division since July 1961. He succeeds Charles Campbell,

who recently was named Assistant Manager of a newly-created Office of Logistics for AEC/ALO.

The Office of Administration includes the Classification and Technical Information Division, Nuclear Materials Management Division, Organization and Personnel Division, Security Division, and the Headquarters Services Branch.

Mr. McNeely has been with the AEC since the agency was formed Jan. 1, 1947, having been employed at Los Alamos in 1946 as Chief, Budget and Accounting Branch, Manhattan Engineer District. In 1948, he was named Deputy Director of the AEC's Finance Division at Los Alamos, transferring to Albuquerque when the Commission's office was moved here in 1951.

Supervisory Appointments



EARL WANGERIN to supervisor, Plant Accounting Division 4153, effective July 1.

A Sandian since 1959, Earl has worked in the Accounting Methods Division and in the Auditing Department. In 1962, he was promoted to section supervisor of Accounting Methods and in 1964 became a senior auditor in the Auditing Department. He has been involved primarily with internal auditing and is a Sandia coordinator with the general accounting auditors of AEC and WE.

Before joining Sandia, he was comptroller for a manufacturing firm in Rochester, Minn., and an accountant with the Pillsbury Mills in Minneapolis.

He has a BBA from the University of Minnesota.

Earl is an Air Force veteran of both World War II and the Korean conflict. An aerial navigator, he served in the European theatre in 1943-45 and in France during 1951-52.

Earl and his wife Koleta live at 6704 Barber Pl. NE.



KARL WAIBEL to supervisor, Systems Integration Division 4117, effective July 1.

Karl joined Sandia in 1959 and worked for several years in the Auditing Department and the Budgeting Division. In 1961 he became a senior auditor and in 1964 moved to the Fiscal and Logistics Activities Division. He later transferred to Management Information Systems Division where he has been until his present promotion. In 1968, he was promoted to systems coordinator.

Before joining Sandia, Karl was an auditor for two years with a Certified Public Accountant firm in Denver.

A graduate with a BS in accounting from the University of Denver, he was elected to the Beta Gamma Sigma scholastic fraternity. He currently is a member of the supervisory committee to the Sandia Laboratory Federal Credit Union.

From 1952-56, Karl served with the Navy as an aviation metalsmith in an air combat squadron.

Karl, his wife Marie, and their three children live at 3509 Pitt NE.

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Authors

M. J. Sagartz and M. J. Forrestal (both 1223), "Transient Stress At A Clamped Support of A Circular Cylindrical Shell," June issue, JOURNAL OF APPLIED MECHANICS.

Sympathy

To Merritt (4233) and Dorothy (4363) Hummer for the death of his mother in Huntington, Ind., July 14.

To Elmer Smith (4574-2) for the death of his mother in California, July 16.

To Leona Chosa (4332) for the death of her father in Konawa, Okla., July 17.

To Bill Doyle (3511) for the death of his father July 18 in Ontonagon, Mich.



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LIVERMORE NEWS

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LIVERMORE DEVELOPMENT COMMISSION co-chairman Leo Gutierrez (8100), center, answers a question posed by a citizen concerning the proposed redevelopment of Livermore's downtown district, as he appears on KYTE's public affairs program, "Pipeline." With him are LDC co-chairman Dr. John Shirley and Althea Ball, moderator for the radio program.

Concerned Sandian

Leo Gutierrez Works for Better Downtown Area in Livermore

What is the Livermore Development Commission? How does the City Council feel about the relocation of a railroad line? Just what will the property owner's assessment be? Is there a possibility of a major department store locating in Livermore after redevelopment?

These are questions of import for all Sandians at Livermore, but for Leo Gutierrez, Director of Systems Development 8100, they have had a special meaning for the last few years. From his earlier work with the City Planning Commission to his present appointment on the Livermore Development Commission, Leo's concern has been the preservation of the downtown area of Livermore as the city's central business district.

His involvement with civic affairs in Livermore is a long one, and since moving here from Albuquerque in 1956 he has been active in the Livermore Student Education Loan Fund and the Livermore Area Recreation and Park District. In both of these organizations, Leo has served in an executive capacity.

Now he is co-chairman of the Livermore Development Commission with Dr. John Shirley and the two recently appeared on the public affairs program "Pipeline," sponsored by local FM radio station KYTE, to answer questions about downtown redevelopment.

The public was invited to phone in questions regarding the background, plans, and economics of the Commission's proposed redevelopment of Livermore's central business district.

Formation of the Commission in the summer of 1967 was prompted by the report of a research firm which indicated that steps must be taken to prevent the "general decline" of Livermore's downtown area. The report emphasized that the entire redevelopment effort was dependent upon relocation of the Southern Pacific Railroad tracks which would involve a grade separation and four underpasses.

"Plans also include estimates for beautification and additional parking facilities," Leo adds.

He comments that one of the main advantages of the proposed redevelopment is that the railroad relocation results in the opening up of land—from 60 to 100 acres. "This land is close enough to downtown to benefit the whole community, and it offers easy access, good roads, and underpasses to get to it. We can't promise development, but I understand that there are two developers of shopping centers who are interested in locating here."

Several of the questions phoned in dealt with cost. When asked if this is really a one-time assessment, Leo answered, "It's true that additional taxation can continue, but really, the \$1,700,000 assessment proposal is a one-time charge. The average for a home owner would be on the order of \$58.50 which he can pay off and that is the end of it. On the other hand, financing could be handled by selling bonds and paying over a 15-year-period, in which case he would pay about \$5.80 per year."

Leo says that the Commission has the concurrence and financial commitment of the railroads, and he is quite confident of the Public Utilities Commission appropriation. Now the local citizens must be sold on the idea of raising their share of the \$1,700,000 needed for the work. A public hearing for creating an assessment district will soon be held by the City Council.

With respect to the role of the Public Utilities Commission, Leo notes that "each year about \$5,000,000 is allocated through PUC for underpasses. It is matched locally, and in the case of Livermore, the PUC pays 44 percent, so our share is 44 percent, and the railroads by law have to contribute 12 percent. A lot of California cities, of course, have gone for underpass structures and have applied to the PUC — Los Angeles, Emeryville, San Jose. But this is a unique project, and I don't think any other city in the state has had the opportunity to get four underpasses at one time and thereby to realize the economies in doing it all at one time."

Background reports and literature, as well as a model of the redevelopment and relocation program, may be seen at the Chamber of Commerce office in Livermore. Meetings are planned throughout the community and information brochures will be available.

Leo concludes, "whether we live here or work here, or both, Livermore and its urban health matters to us at the Labs. I for one will continue to try to make it a better place in which to live and to work."

Monthly Announcement of Livermore Centennial Events

EVENTS FOR AUGUST

- Aug. 9 Airman's barbecue at Livermore Airport
 - Aug. 10 Centennial air show
 - Aug. 10 Industrial and agricultural exhibits at Livermore Airport (including exhibit by Sandia Laboratories Livermore)
 - Aug. 30-31 Far Western parachute meet
- Details about events are available from the Centennial Office in the Chamber of Commerce building, tel. no. 447-1626.

Take Note

New officers for the 1969-70 season of the Livermore Valley Chapter of the California Society of Professional Engineers include Joseph Lennon (8332) who will serve as a director. Other Sandians who were appointed to committee posts for the year were Dick Wilhite (8251), chairman of Professional Relations Board, and Les Peterson (8128), a member of the Public Relations Committee.

Ken Dolan (8341) is presenting a technical paper, "Non-local Energy Deposition in Silicon by Energetic Photons," at the annual Institute of Electrical and Electronics Engineers' conference on Nuclear and Space Radiation Effects to be held at the University of Pennsylvania July 8-11.

John Anderson (8155) won the eighth annual El Toro Perpetual Trophy Race held recently at Turlock Lake by members of the Thunderbird Sailing Club at Sandia Laboratories Livermore. Ten boats participated in the single-handed race. El Toro is the term applied to an eight-foot-long class of sailboat. The boat was developed in 1940 as a result of a series of "bull sessions" held by a San Francisco boating club.

Ben Aiken (8233) shot a low net of 65 to win the first place trophy in the Sandia Employees Golf tournament played on the Cypress Course at Sunol Golf and Country Club June 28. Ralph Morrison (8153) came in second with a net score of 66.

In the "fewest putts" feature, Alan Skirrod (8172) finished in first place and Moe Houk (8161) placed second. Elmer Smith (8151) was closest to the pin in the hole-in-one contest.

The Alameda County Welfare Department is organizing volunteers to assist some of its welfare clients through tutoring, emergency child care, personal service such as transportation for medical care or looking for housing, and friendly visiting of old or disabled people. Spanish interpreters are also needed.

If you live in the Livermore-Amador Valley, Newark, Fremont, or Union City area and would like to help in your local community, call social worker Robert Murnane at the Fremont Welfare Office, 792-4600, ext. 209.

Sympathy

To Dorothy Schroeffer (8251) for the death of her mother in Amarillo, Texas, July 11.

To Sy Mayer (8124) for the death of his father-in-law in Los Angeles, July 9.

Supervisory Appointments



WILLIAM ORMOND to supervisor of Affirmative Action, Compliance, and Personnel Records Division 8217, effective Aug. 1.

Bill joined Sandia Laboratories Albuquerque in December 1965 and worked as a job analyst in the compensation organization for three years. In December 1968, he transferred to Livermore where he has been the Equal Employment Opportunity (EEO) coordinator.

Previously, Bill was employed as a bio-assayist in industrial hygiene and safety at the Argonne National Laboratory in Chicago from 1961-64. He served as a lieutenant in the U.S. Army Chemical Corps from 1956-61 and is currently a captain in the U.S. Army Reserve.

He graduated from Morgan State College in Baltimore, Md., in 1956 with a BS degree in chemistry, and received an MBA degree in research management from the University of Chicago in 1965. He has also attended Howard University, Roosevelt University and the University of New Mexico.



EVELYN FOOTE to supervisor of Secretarial and Clerical Development Section 8212-1, effective July 16.

Evelyn has held various assignments in the personnel organization since joining Sandia Laboratories Livermore in 1958. She began as a graded personnel vouchering and clearance clerk. Later, she was a senior clerk (assignments), and in June 1959 was promoted to staff assistant administrative, responsible for pre-employment testing and employee housing. In 1962 she became a personnel representative, and at the time of this promotion her assignment included secretarial orientation and training and local recruiting of the Youth Opportunity Program employees.

She is a graduate of Kinman's Business University, Spokane, Wash., and has done course work at Chabot College, University of San Francisco, and the University of California-Berkeley in personnel management.

Mrs. Foote was a Dale Carnegie graduate assistant in the Bay Area from 1963-64. Since January, she has been serving on an Advisory Committee on Vocational Education to the Board of Education of the Livermore Valley Unified School District.

Mrs. Foote resides at 1253 Anza Way, Livermore. She has a daughter who is a senior student nurse at Kaiser Foundation School of Nursing in Oakland.

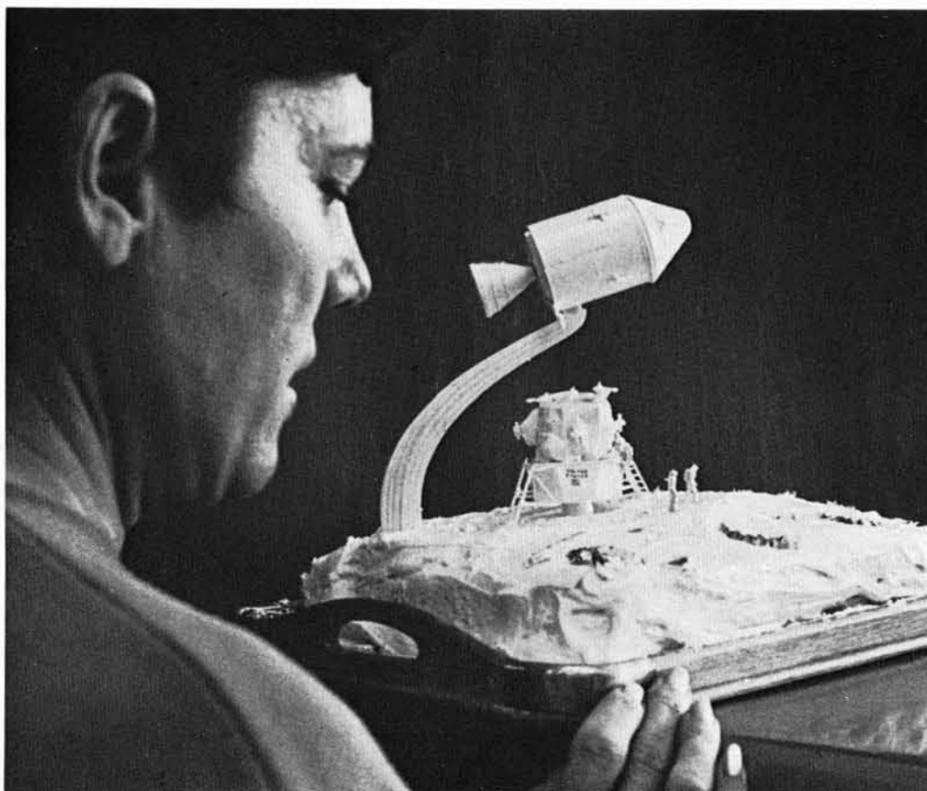
Bond Graph Modeling Subject of Colloquium

The bond graph approach to the modeling of engineering systems is a recent concept based on power flow instead of signal interactions. This concept will be discussed by Professor Ronald C. Rosenberg at the Sandia Laboratories Livermore Colloquium Aug. 12.

Professor Rosenberg received his bachelor's and master's degree as well as his doctorate in mechanical engineering from Massachusetts Institute of Technology. He was assistant professor of mechanical engineering at MIT where he was also involved with introducing people to the art of bond graph modeling.

Before assuming his duties at Michigan State University this fall, Professor Rosenberg will be orienting the SLL staff in the use of the ENPORT computer code. The code's unique advantage is that it produces systems transient calculations from a description of the system thus relieving the analyst from the labor of deriving the equations and programming a solution.

Tickets will be required for admission. R. W. Phillips (8133) is host.



SUBSTITUTING SUGAR for moon dust, Alyce Loveless (8252) whipped up this special cake for Drafting Division at SLL to celebrate the Apollo 11 moon landing by astronauts Armstrong and Aldrin.

Jim Marsh to Be Director In Classification Society



Jim Marsh, supervisor of Classification Division 3414, has been elected to serve a three-year term as a director of the National Classification Management Society. The Society, organized in 1964 by classification specialists at Sandia, now has several hundred members who represent the Army, Navy and Air Force, private industry, and other governmental agencies. Purpose of NCMS is to enhance professional competence of its members and, to this end, a journal is published and annual seminars held.

A local chapter of the Society is headed by Bill Green of DASA and Frank Halasz, also of Classification Division 3414.

Sandia's Son Awarded Distinguished Service Cross

Andres Gutierrez, son of M. R. Gutierrez (5438) was recently awarded the Distinguished Service Cross and Silver Star — the nation's second highest honor for military heroism — for gallantry in action in Vietnam.

Lt. Gutierrez received the medal for his actions while his unit was under rocket and combat assault at the U.S. Army Base at Dau Tieng.

The order accompanying the award says in part: "When the bombardment began shortly after midnight, Lt. Gutierrez organized a reaction force and led it to the perimeter, which had been broken through by the enemy. Spotting three North Vietnamese preparing to fire a rocket-propelled grenade into a bunker, he killed all three with his pistol.

"... while resupplying his men with ammunition, he encountered two infiltrators . . . and shot both of them with his pistol. Lt. Gutierrez made 15 trips to the supply point, repeatedly exposing himself to Communist fire and the danger of ammunition explosion."



THE WILD BUNCH? Sandians who answered a Hollywood call, this crew includes from left: Crawford McCallum (5231), Bill Bishop (7514), Elliot Harris (3454), George Cosden (4332), Henry Fonda, John Shunny (3432), Al Kaping (4332), and Joe Miller (4122). In front: Don Wolfe (3432), Buddy Sanchez (9411), Mike Keegan (9427), and Dick Padilla (9411). The Sandians were

extras in "The Cheyenne Social Club," a film being shot near Cerrillos. The movie is produced and directed by Gene Kelly and stars Fonda and Jimmy Stewart. Not shown are Phil Mead (3412) who had a speaking role, and Bruce Hawkinson (4135). The movie is scheduled for release next April or May.

Weekends Before the Mast

Blue Skies, White Sails Make New Mexicans Sailors

Sailboats in New Mexico? Some people still shake their heads when they see billowing sails moving briskly across Elephant Butte or Conchas Lake. But a number of Sandians, members of the Rio Grande Sailing Club, are convinced that sailboats and the desert country are simpatico.

One of the strongest advocates is John Colp (9372) who was an experienced sailor before moving to New Mexico.

"New Mexico sailing is tricky," he says. "Winds shift suddenly, gusts are common, storms come up quickly, and — you can be sailing with the wind in one direction while another guy a mile or so across the lake is also going with the wind, but in the opposite direction. This never happens while ocean sailing."

John claims that "... motor boating is the simple man's noisy pleasure, but sail boating is the thinking man's pure sport.

"You have to work all the time to sail a boat. Everyone on board has a job to do. The skipper is constantly thinking about changes in wind velocity and direction and how he is going to use these to get his boat where he wants to go." He doesn't say much about being becalmed.

Listed on the roster of the Rio Grande Sailing Club are some 20 Sandians, many of whom will be racing at Elephant Butte on Sunday, Aug. 31. The boats will race around a nine-mile triangular course from the Hot Springs Landing. The Club maintains a headquarters house boat there and invites anyone interested in sailing to drop by.

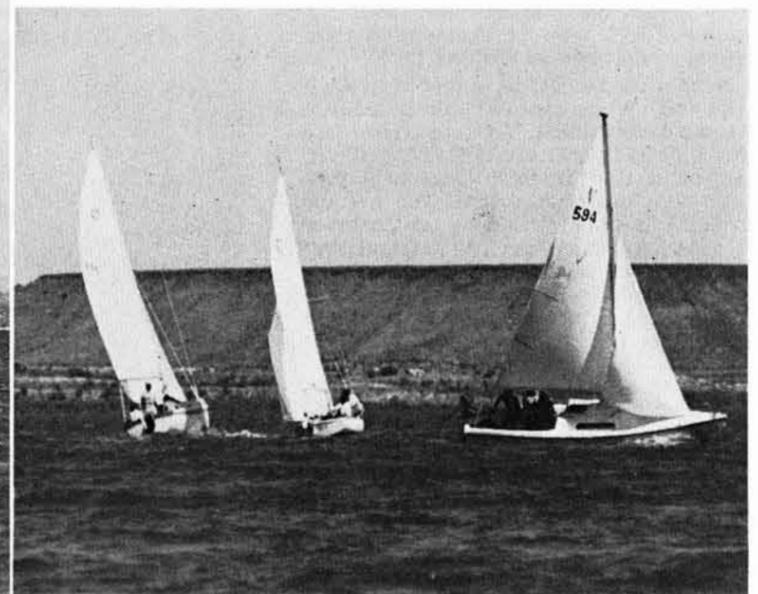


LEFT

BILLOWING SAILS are a common sight these days at Elephant Butte Lake. Carl Schuster and Tom McConnel (both 9235) sail their boat on a fast run before the wind. They built the boat from a kit this summer.

BELOW

HUGH LEWIS (2324) beating hard on the wind in his Venture sailboat (right) pulls out front during recent sailboat races at Elephant Butte. The Rio Grande Sailing Club will hold races there Aug. 31.



Service Awards

20 Years



Louie Armijo
4233



Clyde Babcock
3463



John Cody
7343



Robert Hawk
7623



Merlin McGirk
1525



Julian Perea
4614



Clarence Ray
7635



Henry Saavedra
4211



John Sandelich
7453



C. S. Sandoval
4517



Frank Spinkman
4211



Juan Tafoya
4613

15 Years



Charles Carlson
2632



Lionel Chandler
7423



Cathrin Devarrens
4152



C. O. Erickson
8252



Andrew Fry
4252



Elwood Ingledue
8156



Peter Kamen
2624



Morris MacGibbon
4517



Harry Mason
9232



Robert Neighbors
8129



Walter Nuffer
1545



Irvin Pytlík
8252



Roy Tackett
8153



E. F. Wienczkowski
4252

10 Years

Aug. 1-14

Tommie Bryant 8312, Lyle Wetherholt 9230, Henry Scheller 7651, Jay Jost 8223, Verlan Gabrielson 8321, Robert De Zeeuw 5235, John Ayala 7632, Ronald Cheek 7653, Charles Hoyle 8337, Eugene Koenig 9322, and Secundino Baca 4221.



ARTISTS Judy Elder, Jim Walston (both 3463) and Bob Burgess (2313) display some of the work they will have at the New Mexico Arts and Crafts Fair this weekend. The show, presented at the State Fair Grounds, opens today and runs through Sunday evening.

Arts and Crafts Fair Opens Today; Sandians Have Exhibits

A number of Sandians are exhibiting at the New Mexico Arts and Crafts Fair which opened at the State Fair Grounds today. The event, expected to attract more than 100,000 visitors from across the country, will run through Sunday evening.

Fair exhibits include paintings, graphic drawings, metal sculpture, stoneware, textiles, metals, jewelry, ceramics, wood, leather and glass crafts. All articles exhibited are originals and entirely the design and manufacture of the displaying artists.

Among Sandians displaying their work at the Fair are Jim Walston (3463), realistic pencil drawings; Judy Elder (3463),

miniature paintings for children; Dick Strome (3463), landscapes; Joe Rivard (5222), oil landscapes; Charlie De Moss (4221), glass sculpture; and Bob Burgess (2313), a variety of lamps, furniture, decorative pieces, and jewelry.

This year marks the first time the Arts and Crafts Fair has been staged at the State Fair Grounds. For the past seven years, it was held in Old Town. Overflowing crowds plus more and more exhibits caused the move.

General admission to the Fair is 25 cents. Children under 12 are admitted free with their parents.

Events Calendar

Aug. 1-3—New Mexico Arts and Crafts Fair, State Fair Grounds.

Aug. 1, 6, 9—"Le Rossignol" and "Help! Help! The Globolinks"; Aug. 2, 8, 13—"Salome"; Aug. 14—"The Devils of Loudun." Santa Fe Opera.

Aug. 2—Dances at San Juan and Jemez Pueblos.

Aug. 2—San Juan Mesa in the Jemez Mountains. N.M. Mountain Club, leader Bill Grohe, tel. 243-1501.

Aug. 2-3—Backpack trip to Trampas Lakes. N.M. Mountain Club, leader Marge Lenth, tel. 256-0282.

Aug. 4—Corn dance, Santo Domingo Pueblo.

Aug. 9-10—Indian market, Santa Fe plaza.

Aug. 10—Dances at Picuris, Laguna, and Acomita.

Aug. 14-17—Inter-Tribal Indian Ceremony, Gallup.

Aug. 14-17—"The Empire Builders," by Boris Vian, Old Town Studio, 1208 Rio Grande NW.

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SANDIA LAB NEWS

AUGUST 1, 1969

SHOPPING CENTER

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

- GENERAL ELECTRIC, 40" pushbutton range w/ timer, color white, \$60 or best offer. O'Bryant, 268-9049.
- DISHWASHER, 3-yr.-old Kenmore, \$80; Hi-Fi equipment; Head skis, make offer. Roache, 268-4686.
- BEIGE NYLON FRIEZE sofa & matching chair, \$50; brown platform rocker, \$15. Houghton, 299-3586.
- '68 KAWASAKI 250cc dirt & road motorcycle, \$500. Cropp, 344-4358.
- ALTO SAXAPHONE, American; Keystone 8mm movie camera & light bar. Lewis, 298-4788.
- '64 HONDA 150, \$225; two 14" Falcon wheels, \$5 ea. Martin, 255-8030.
- AKC Miniature Schnauzer puppies, 10 wks. old, 3 males, 1 female. Smailer, 256-7035.

- '57 LAMBRETTA, low mileage. Knapp, 299-4029.
- TWO-YEAR-OLD BURRO, \$25; or burro, saddle, halter & bridle, \$50. Nelson, 264-1674.
- APACHE TX-1 transmitter, \$75, or trade for HT 32-37. McCammon, 255-6125.
- TWO CB transceivers, Knight Safari I 23 channel & Knight KN 2590 8 channel, both \$75. Lincoln, 282-3817.
- AMERICAN-FORD chrome reversed rims, 14". Sandy, 299-0980 after 5.
- 9 CU. FT. refrigerator, 40-50 lb. freezer, \$50. Williams, 299-9150.
- PRACTICE PIANO, \$85; Roberts stereo tape recorder, \$80. Latta, 299-9380.
- '60 6-cyl. Ford truck engine, \$25; '67 Honda 305 scrambler, \$450. O'Connor, 296-2335.
- UNIVERSAL full size electric stove, \$50. Smith, 298-7365.
- LA BURDINA accordion, 120 bass, 7-switch, \$975 instrument, sell for \$600. Bryant, 256-3251.
- VANITY DRESSER w/seat & lg. mirror, limed oak, \$20; 2 small night stands, black, \$5 ea. Miller, 268-5992.
- ANTIQUE FRENCH CLOCK, black marble case, gold Roman numerals, chimes hour & halves, approx. 1' high, \$200. McKinley, 296-7015.
- BASSINET, pad, liner & 4 sheets, \$10; Welsh convertible baby carriage, \$10. Daniel, 268-8335.
- GRAY BUILDING STONES, enough for barbecue pit or face a fireplace; pivot hardware for 2 overhead garage doors. Roberts, 255-9527.
- BATHROOM BASIN, std. size, beige, stopper, faucets included, \$25. Newman, 256-3295.
- CRYSTAL, complete service for 8 plus cocktail shaker, 58 pieces total, bamboo pattern, \$25. Fisher, 298-0526.
- 36" GAS RANGE w/flexible coupling, \$15. Adkins, 296-1284.

- TOW BAR, heavy-duty, attaches to car frame or bumper, \$15. Stevens, 296-6326.
- FIBERGLASS drapes, one to fit 6' sliding door, other for 6'4" windows, \$40 for both; lamp, \$35. Westmark, 298-1945.
- GARAGE SALE: freezer, upright 15'; washing machine; power mower; speakers; table; beds; misc. assortment of stuff. Schowers, 255-9279.
- POLAROID 800 w/exposure meter, wink light & flash in carrying case, \$25. Schmiedeberg, 298-8188.
- BATHROOM FIXTURES: toilets & sinks, working condition. Abrams, 344-8252.
- LUGAR LEEWARD 16' fiberglass sailing sloop w/ trailer, foam floatation, 8' cockpit. Knudsen, 299-6005.
- BICYCLE, boy's 26" Schwinn 2-spd. w/coaster brake, new rear tire, saddle bags, \$30. LeRoy, 296-2953.
- MOTORCYCLES: Honda CB 450 & CB160. Gardner, 299-8455.
- TRAVEL TRAILER, 12' Roadrunner, sc. shwr, 2 gas bottles, spare EZLift hitch, sleeps 4, \$1095. Gaines, 265-0927.
- '67 SUZUKI X6 scrambler, recent major tune, \$400 or trade on larger bike. Schuler, 296-2271.
- EVAPORATIVE COOLER, Magic Aire, deluxe 2-spd., 4700 cfm, \$95; 2 bicycles, 22", one Schwinn 5-spd., \$45; other \$15. Wilkinson, 516 Hillview Ct., 299-8327.
- APPALOOSA GELDING, 7 yrs. old, reg., grey w/ black spots, all around horse, excellent for pleasure & mountains, \$500. Bassett, 898-1840.
- SWING SET w/slide & glider. Brooks, 299-1884.
- TWO girl's bikes w/baskets, \$20 & \$25. Sundberg, 299-2177 or 299-2134.
- MUSKET, Civil War, ideal wall hanger, \$65; belt sander, Sears, 4"x36", \$14; 2-channel Brush Recorder & amplifier, \$60. Reynolds, 299-7367.

REAL ESTATE

- GLENWOOD HILLS, lg. lot, view, best offer over \$7000. Pinkham, 299-9241.
- 3-BDR., 1 1/4 baths, 30 mins. to Base by Freeway, many extras, low down to 5 1/4% loan. Nelson, 855-4424.
- 4-BDR., paneled den, patio, AC, hw floors, near schools & shopping, \$80, T&I included, 60x120. Roybal, 299-0938.
- 2-BDR., paneled den, patio, AC, hw floors, near schools & shopping, \$80, T&I included, 60x120. Roybal, 299-0938.
- 3-BDR. brick, sell or rent, immediate possession. 2708 Alvarado Dr. N.E. Villa, 298-0435.
- CARS & TRUCKS
- '65 FALCON, R&H, AT, 46,000 miles, original owner, new tires & battery, recent tune-up & compression check. Einsmann, 264-2351.
- '62 FORD Galaxie 500 XL, 352 cu. in. engine, AT, PS, AC, bucket seats, \$700 or make offer. Wenz, 929-5488.
- '62 BUICK Special, 2-dr., 190 HP, V8, 4-spd., new paint & battery. Breckenridge, 298-0042.
- SCOUT 800 4x4 1966, 4-cyl., 4-spd. trans., power takeoff winch plus extras, 25,000 miles, cost \$3924, take \$2000. Kindschi, 256-0531.
- '55 MG-TF. Johnson, 298-0296.
- '58 FIAT 600, 2-dr. sedan, new battery, \$125. Asselin, 299-9270.
- '67 FIAT 1500 Roadster, 14,500 miles, color red, R&H. Abrams, 256-0678.
- '64 CORVAIR SPYDER, supercharger, 4-spd. trans., R&H, new tires, 34,800 miles, one owner, \$750. Stark, 8212 Pickard Ct. NE, 299-5953.
- '55 CHEVROLET CARRYALL, 4-wd, 6-cyl., 4-spd., plus transfer, hubs, 30 gal. tank, bunks, 3 seats, \$625. Stephenson, 299-3914.

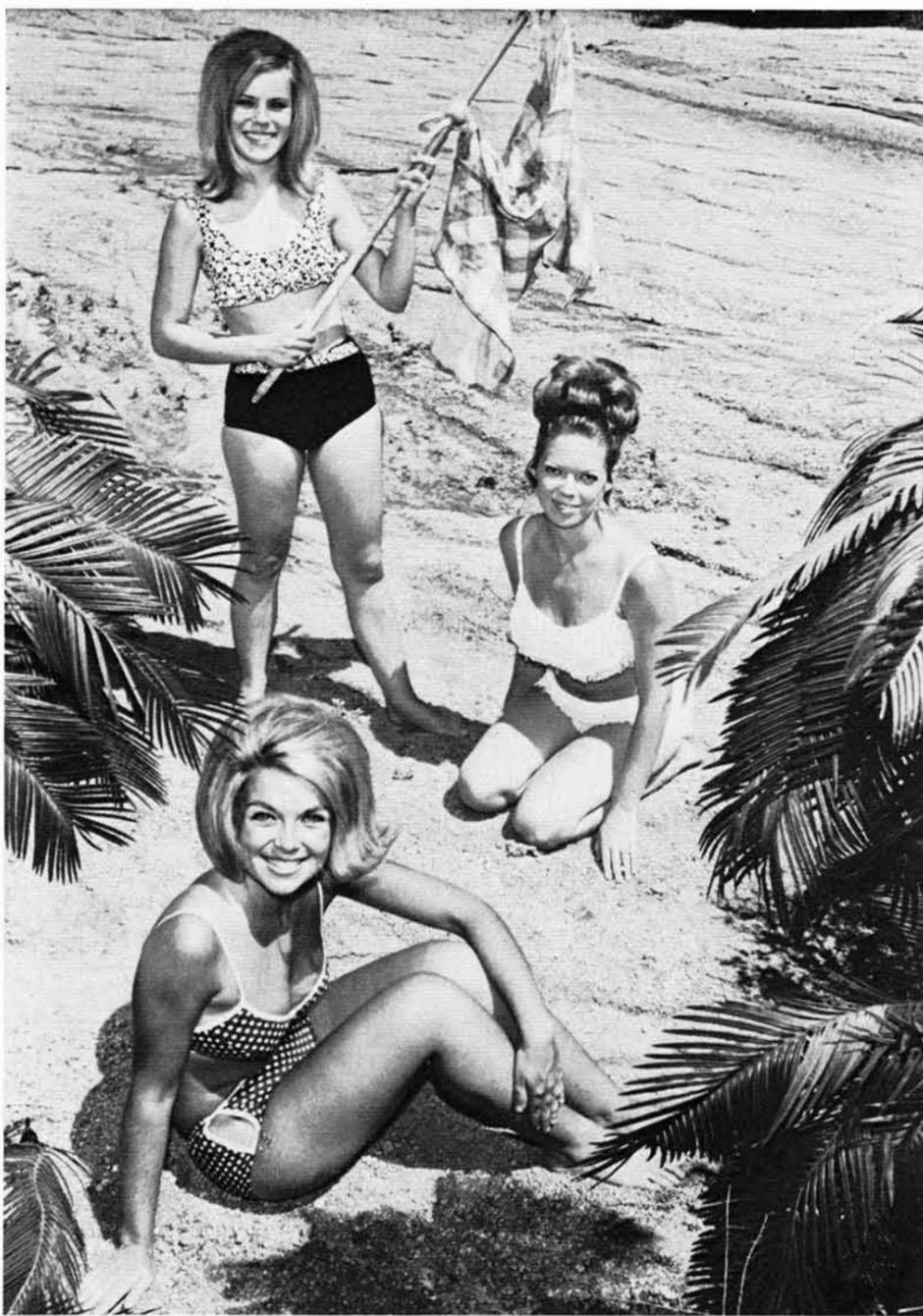
- '60 MGA HT, yellow w/red leather interior, R&H, \$725. Dickson, 298-0969.
- '56 FORD station wagon, 292 V8, AT, \$150; '63 Ford 1/2-ton pickup, 292 V8, AT, wide box, \$900. Shock, 877-3728.
- '67 PONTIAC Firebird w/18,000 miles, 326 V8, 4-on-floor, new Polyglas tires. Harris, 268-6470.
- '62 CHEV. Impala, 2-dr. HT, red, \$675. Baca, 255-8452.
- '64 DKW, \$295. DeVore, 299-1639.
- '59 CHEV. wagon, 4-dr., R&H, V8, lifetime load level shocks, \$300. Dodd, 299-6330.
- '69 CHEVY Impala custom coupe, many extras including air, 10,000 miles. Price, 299-6265.
- '54 STUDEBAKER Commander V8, 4-dr. sedan, R&H. Nesselbaker, 256-1720.

WANTED

- BABYSITTING by reliable teenager. Downs, 299-1537.
- RIDE from Corrales post office area to 892/880 area. Arnold, 898-1467.
- LARGE nylon T-Pee-tent borrowed by Sandian during hunting season — please return; boy w/lawn mower for yard & gen. help, vicinity of Penn.-Menu-Wyoming-Candelaria. Bascom, 299-9044, 299-1662.
- HOUSE to rent, 2 or 3-bdr., unfurnished in NE or SE, Oct. 1 occupancy desired. Bingham, 298-6489 after 6.
- HOME for pup, Collie Terrier mixed, all shots, 3 mos. old. Diumstra, 299-9278.

FOR RENT

- TRAVEL TRAILER, 14', sleeps six, \$35 per week, call for reservations. Bentz, 299-3448.
- 3-BDR. house, AC, drapes, range, refrig., walled yard, Los Altos area, near Sandia \$135/mo., available Aug. 1. Patterson 243-6219.



BEACHCOMBERS Susan Hopkins (1643), center, Vickie Vivian (4335), left, and Jan Babicky (9412), right, remind you to make your reservations now for the Coronado Club's biggest party of the year. The Beachcomber's Ball will be held Saturday, Aug. 9, starting at 7 p.m. with dining, dancing, swimming and special entertainment.

Dress Like a Shipwreck

Beachcomber's Ball Set August 9

Ahoy, beachcombers and other fun-loving types. The Coronado Club is throwing the biggest party of the year and calling it the Beachcomber's Ball. It's set for Saturday, Aug. 9, and the fun starts at 7 p.m. spreading throughout the Club from the main lounge, through the ballroom, to the patio and the twin pools—dining, dancing, swimming and you-name-it. Special entertainment—a professional troupe of hula dancers from the West Coast—will perform about 8:30. Club Manager Jim Noonan promises to wear a grass skirt for the affair.

The dinner menu includes roast pork, sweet and sour pork, salmon, corn on the cob, salads and fruits and other Polynesian goodies.

Plan to attend dressed like a shipwreck. Reservations must be made by Aug. 8. The tab is \$3 for members, \$3.50 for guests.

Annual Meeting

The Club's annual meeting will be held next Monday at 8 p.m. Election of new members of the board is scheduled. Candidates include Bill Weinbecker (4254), Howard Romme (4117), Pete Gallegos (2352), Chet Fornero (4335), Don Graham (3432) and Bill Bickley (AEC). Free refreshments will be served. Only Club members may vote.

Social Hours

Tonight the westerners will be out in force to hear Elton Travis play the sagebrush shuffle. The Mexican food buffet is scheduled at \$1.25 for members, \$1 for kids.

Social hours start right after work and special prices prevail until 8 p.m. The

buffet is spread from 6 to 8 p.m. while the band plays from 6 to 9 p.m. Pat Reich and piano entertain in the main lounge from 9 until midnight.

On Friday, Aug. 8, a group called the Four Keys will occupy the bandstand while seafood is the buffet feature.

Aug. 15 will see Max Madrid return to the bandstand to make the happy music while the Club's famous chuckwagon roast beef is served.

Don't forget the midweek social hour every Tuesday in the main lounge with special prices until 8 p.m.

Bridge

The duplicate bridge group has switched meeting nights from Tuesdays to Mondays at 7 p.m. Ladies bridge meets Thursday, Aug. 7, at 1 p.m.

AEC Team Champions Of SEGA Tourney

Four AEC/ALO men won the recent Sandia Employees Golf Association (SEGA) Northside Open tournament played at Arroyo del Oso July 12. Team members were Dave Klein, Vince Vespe, Zenas Griffith and Roy Crouch.

The team also took the first flight honors while Dave Klein qualified for low gross trophy with a four-under-par 68. Vince Vespe took low net with 63.

Second flight winners were Milt Madsen (2512), George Beller (1500), L. J. Woolrich (7322) and Ben Conklin (9126).

Third flight winners were Dick Reed (4116), Ed Thuman (4116), Goldie Lane (4116) and Bob James (3134).

Tournament co-chairmen were Jim Davis (9251) and John Moyer (9251).

Sanado Women to Hold Membership Party on Aug. 12

Sanado Club women are currently engaged in their annual membership drive. Mrs. S. T. Landrith, president, invites members and prospective members to attend a special party at the Coronado Club Tuesday, Aug. 12, starting at 2 p.m.

Interest group activities, special programs, next year's events and service projects will be discussed during the meeting. Various tables representing Sanado interest groups will be set up with hostesses on hand to answer questions.

Interest group activities include art, gourmet cooking, bowling, bridge, golf, horseback riding, skiing, tennis, fashion and self-improvement and investing. The Club's service project is help to the girls of the welfare home.

General meetings are held the second Tuesday of each month and include programs of great variety. Special Sanado events during the year include the formal Presentation Ball and the Installation Dinner Dance.

Mrs. H. J. Filusch is interest group chairman. Membership chairman is Mrs. R. D. Volk, tel. 299-1702.

Speakers

G. J. Lockwood (5235), "Total Cross Sections for Charge Exchange of Noble Gas Ions in Nitrogen and Oxygen"; F. W. Bingham (5232), "Delayed-Coincidence Study of Inelastic Energy Transfers in $O^+ + Ar$ and $O^+ + Ne$ Collisions at 50-200 keV"; J. M. Peek (5232), "On the Born Theory of Inelastic Electron-Molecule Scattering"; T. A. Green (5232), "Dissociation of H_2 During Collisions with He and Ar," Sixth International Conference on the Physics of Electronic and Atomic Collisions, July 28-Aug. 2, Cambridge, Mass.

A. D. Swain (1642), "A Work Situation

Approach to Improving Job Safety," American Society of Safety Engineers, Aug. 4, University of Maryland.

R. T. Meyer (5224), "High Temperature Thermokinetics of Exploding Metal Droplets," Gordon Research Conference on Inorganic Chemistry, Aug. 4-8, New Hampton, N.H.

C. E. Robertson (7224), "Single Film Photography of Adjacent High-and-Low-Energy Targets," Society of Photo-Optical Instrumentation Engineers 14th Annual Technical Symposium, Aug. 11-14, San Francisco.

H. H. Patterson (9230), "Mexico and the Sea of Cortez," North Valley Optimists, July 15.

R. F. Utter (3132), "Sources of Information on Programs and Programming," Albuquerque Chapter of the National Society for Programmed Instruction, July 16.

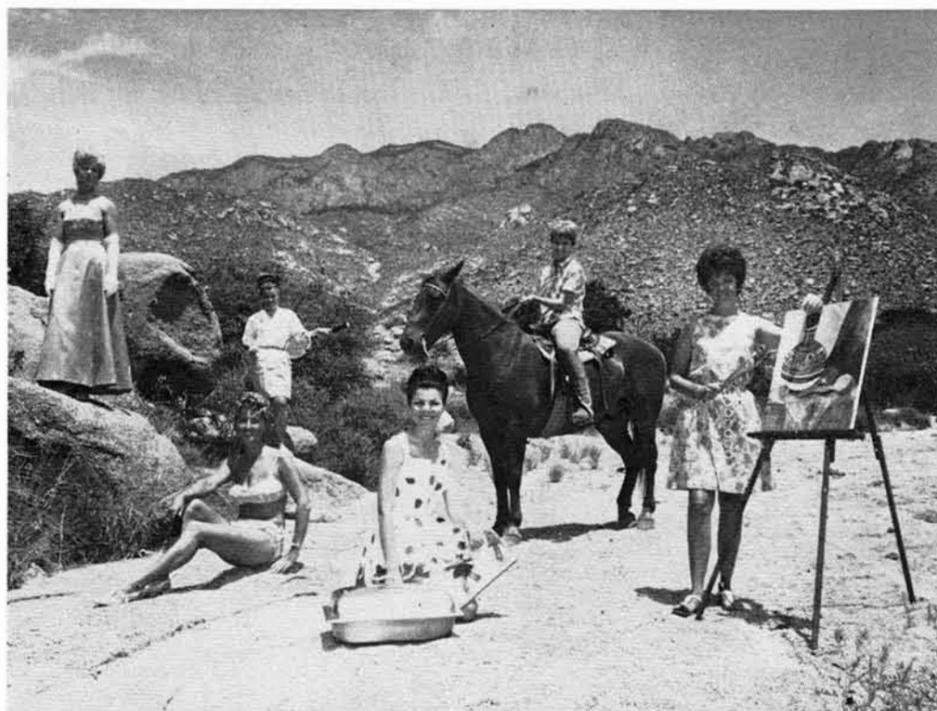
Sandia Safety Signals



You wouldn't. Would he?

He just might. And you just might be in his path when he does. Unless you drive defensively . . . expect the unexpected. Unless you . . .

Watch out for the other guy.



ACTIVITIES of Sanado Woman's Club include a wide variety of special interest groups. Illustrating above are, from left, Mrs. W. J. Meyer, fashion; Mrs. K. J. Deller, swimming; Mrs. R. C. Gauerke, tennis; Mrs. J. A. Reuscher, gourmet cooking; Mrs. F. W. Scheer, horseback riding; and Mrs. R. D. Volk, painting.

Take Note

C.K.N. Patel of Bell Telephone Laboratories will discuss carbon dioxide lasers at a colloquium at Los Alamos Scientific Laboratory on Aug. 11. The session will begin at 8:30 a.m. and, after lunch, will resume at 1:30. Locale is Physics Division Auditorium. Colloquium is unclassified and Phil Mace, LASL ext. 75255, is host.

Sign of fall? The Sandia flag football league is organizing for its coming season of competition. Additional players are always needed. Interested employees who would like to join the league can call O. J. Foster, 264-7775, or Bill Swartz, 264-3271, for more information.

Robert Lefever, supervisor of Materials Research Division 5154, is co-organizer of a session on melt and solution growth for the Conference on Crystal Growth, to be held Aug. 11-13 at the National Bureau of Standards, Gaithersburg, Md.

Approximately half of the 125 papers to be presented at the conference are scheduled for this session.

The conference is sponsored jointly by the National Bureau of Standards and the American Committee for Crystal Growth, of which Mr. Lefever is a member. The committee coordinates activities concerned with crystal growth theory and practice in the U.S.

Mr. Lefever and Richard Baughman (5154) will jointly present a paper on "Effects of Pressure on Melt Vaporization Rates."

A chapter by Clint Purdue (2442) appears in the recently-published book, "Network Computer Analysis," edited by George Zobrist, professor of electrical engineering at the University of Missouri.

Clint's chapter is entitled "A Reliability Program Utilizing Circuit Analysis Computer Programs." He has presented papers based upon the same material at a University of Missouri summer institute, New York University symposium, 11th National Symposium on Reliability and Quality Control, and the recent Western Electric Sixth Interworks Conference.

The book was published by Boston Technical Publishers.