SANDIA LAB NEWS

VOL. 20, NO. 21, OCTOBER 18, 1968

Average Gift Increases Early Results of ECP Drive Show

Early results of the current Employees Contribution Plan campaign show a total of $286,100 pledged with the drive almost complete, according to ECP Chairman Hank Willis (3130). At this time during last year's drive, the total was $268,300.

So far, 5761 cards have been tabulated with 2870 employees designating the Fair Share option. The average gift per contributor is $49.80, compared to last year's average of $45.79.

Mr. Willis expects to announce final results of the drive about Nov. 1.

The ECP Committee has made the percentage allocations for the participating agencies of the ECP. Funds will be distributed as follows:

	Percent
United Community Fund	82.4
American Cancer Society	4.6
Bernalillo County Heart Association	3.4
United Cerebral Palsy Association	1.2
Muscular Dystrophy Association	1.4
Arthritis and Rheumatism Foundation	1.9
Nat'l Multiple Sclerosis Society	1.3
Society for Crippled Children	2.5
Cystic Fibrosis Association	.8
Reserve	.5

Sandia-Developed Ceramic Device Electronically Produces Color Displays

Cecil E. Land of Solid State Electronics Research Division 5153 has described a new device for electronically producing color. He is co-inventor of the device with Donald G. Schueler, Microelectronics Division 2633, now at school under Sandia's Doctoral Study Program.

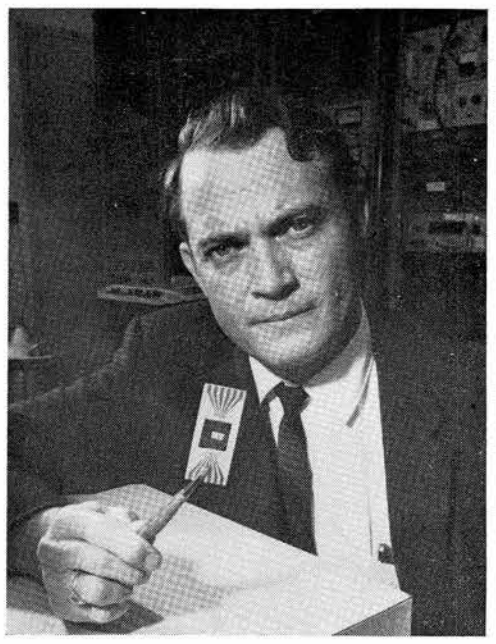
Speaking Oct. 10 in Washington, D.C., at an IEEE Conference on Applications of Ferroelectrics, Mr. Land said the new electro-optical system converts white light into colored light by application of pulses of electrical voltage to precise points on a thin plate of ceramic. Depending on the particular combination of pulses, the voltages on the ceramic cause each of these tiny points or color cells to transmit a desired color of light, thus producing images in somewhat the same manner as colored lights produce images on a sports scoreboard. Essentially a solid-state color filter, the ceramic system provides an all-electronic means of generating an image in color.

The discovery of the color-changing characteristics of the ceramic may eventually lead to a variety of new display devices. In its present state of development, however, the ceramic appears to have two prime areas of application:

1. As a rapidly changeable color display screen for computers and other electronic equipment; and

2. As a means of storing visual information, like an erasable, reusable color slide.

Color display screens based on color television are now available for computer use; however, they require use of the relatively bulky cathode ray tube and a complex electronic system.



CECIL E. LAND displays prototype of ferroelectric ceramic solid-state color filter developed at Sandia Laboratories.

The new development would require little more than the x-y addressing systems used in black-and-white conventional computer displays and graphical recorders. Each type of information would be written on the display with a different voltage code, and different colors would appear accordingly.

The concept has been demonstrated in various laboratory models, but a complete display incorporating the system has not yet been built. A prototype now being fabricated includes 100 color cells in a pattern measuring 130 by 65 mils—about one-eight by one-sixteenth inch. The ceramic is two one-thousandths of an inch thick.

Metallic electrodes are vapor deposited on each side of the ceramic to deliver the electrical pulses to each color cell, an area smaller than a pinhead lying between the two electrodes.

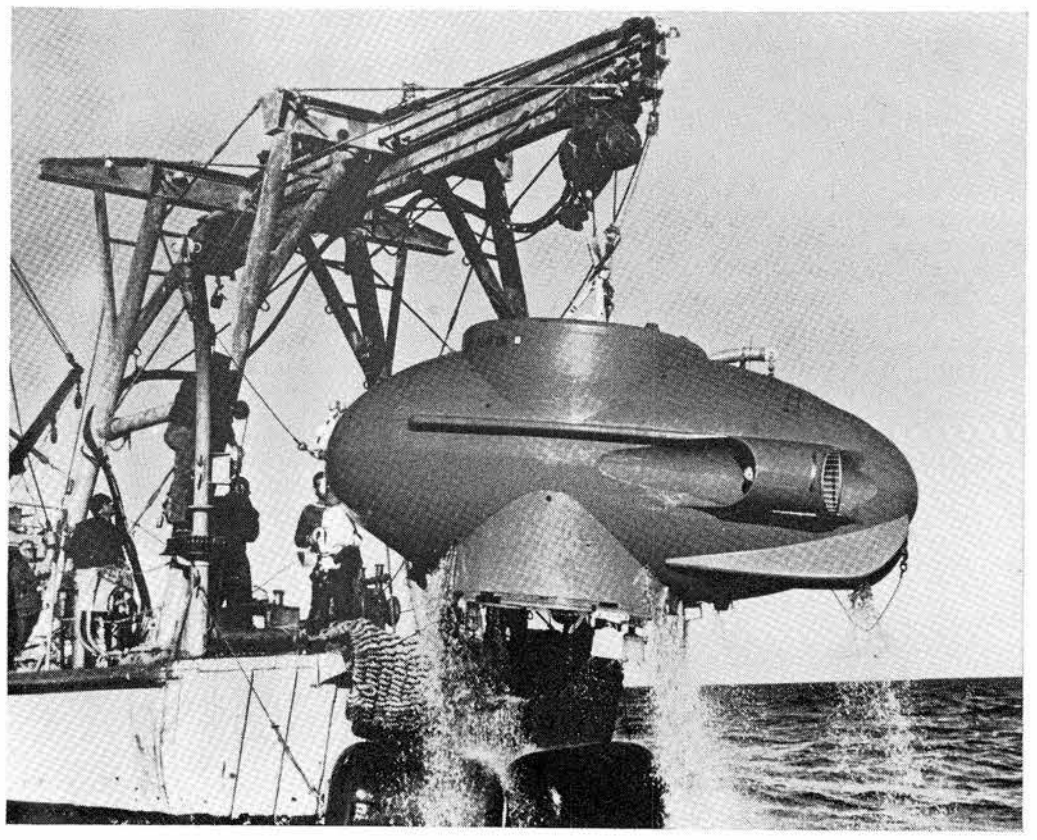
The ceramic, with its pattern of electrodes, is then sandwiched between two thin polarizers which act as light filters. White light shining through this thin sandwich emerges as colored light when pulses are applied to the various color cells.

After being pulsed, each dot of color persists until it is removed by another sequence of pulses.

The new system is an outgrowth of observations that certain ferroelectric ceramics developed at Sandia become doubly refractive (birefringent) when voltage is applied, and that this characteristic can be controlled by increasing or decreasing the voltage. Others involved in development of the color display device include Gene H. Haertling, supervisor of Active Ceramics Materials Division 2317, and Philip D. Thacher of Solid State Electronics Research Division 5153.

Part of Underwater Search and Recovery Development

Sandia Team Locates Missing Nimbus B Satellite



DEEP OCEAN WORK BOAT (DOWB) is shown being hoisted aboard its "mother" ship, the Swan. The DOWB, built by General Motors' AC Electronics-Defense Research Laboratories was used in a recent Sandia-led search effort which located the plutonium 238 SNAP 19 fuel capsules in 310 feet of water off the coast of California near Santa Barbara. The SNAP 19 generators were aboard an aborted Nimbus B satellite launched May 18.

In choppy seas off the California coast near Santa Barbara, a Sandia-led underwater search team located on the ocean floor a Nimbus B weather satellite and its valuable radioactive power supply, missing since May 18.

The search success was a result of a Sandia project to perfect an underwater search and recovery system for inert weapon test shapes. Field activities in the development effort have been centered at Sandia's Santa Cruz Acoustic Range Facility (SCARF) which is near the impact point of the missing satellite.

The wreckage was first located by a three-man team in a deep-water submersible (called the DOWB for Deep Ocean Work Boat) on Sept. 25, during the second day of the search. The submersible is a new 17-foot research craft built and operated by AC Electronics Division of General Motors Corporation. AC Electronics is under contract to Sandia at the SCARF range. Sandia offered to assist with the search for the missing satellite because the operation provided an opportunity to check out the new submersible system being used at the underwater range.

Sandia was also interested in the recovery because the AEC has assigned the Laboratories responsibility for coordinating safety aspects of nuclear generators carried in satellites.

The Nimbus was carrying two SNAP 19 (Systems for Auxiliary Nuclear Power) generators designed to provide auxiliary power with the heat generated by its plutonium 238 fuel supply. The fuel capsules were valued at $700,000.

The missile carrying the satellite was intentionally destroyed by the Pacific Missile Range safety officer at Vandenberg AFB when it veered from its flight path shortly after being launched. Search for the satellite began soon thereafter, but Sandia did not join the effort until Sept. 23. The DOWB was scheduled for experimental trials and the search for the lost satellite provided an opportunity to use it under actual working conditions.

As in the case of the nuclear weapons lost in an aircraft crash on the Spanish coast two years ago, the reconstruction of the vehicle trajectory played a key part in search operations. W. V. (Bill) Hereford, supervisor of Test Data Division 7216, who has been computing trajectories of falling objects since Sandia operated the old Salton Sea Test Base in the 1950's, went to work on data received from a transponder in the Nimbus and from shore-based tracking stations.

Figuring that the signal from the transponder—which continued to operate until impact—would be affected by spurious reflections from the sea below an altitude of 8000 feet, Bill computed the last section of the trajectory, including information on wind velocity and direction, ocean current characteristics, and the time it would take the vehicle to sink 300 feet to the sea bottom. His computation produced a corrected impact point which later proved to be within 200 feet of the wreckage.

On Monday, Sept. 23, the DOWB arrived at the site aboard the motor vessel Swan, a converted minesweeper. Bearings provided by Vandenberg AFB radar, by the Swan's own radar, and by optical

(Continued on Page Four)

Constitutional Convention Question Put to Voters on November 5 Ballot

On Nov. 5, New Mexico voters will act on a referendum to call a constitutional convention to revise the state's 57-year-old constitution.

The convention call is the result of a four-year study by a bi-partisan Constitutional Revision Commission and resolution by the 1967 legislature that the question be placed before the people. The Commission, convened by Democratic Governor Jack Campbell and supported by Republican Governor David Cargo, found the present constitution burdened with stop-gap amendments, antiquated provisions and restraints against necessary governmental change.

A Sandia staff member on leave of absence, Robert E. Esterly (9414), served as vice chairman of the Commission which submitted its report to the legislature in 1967.

Prefacing the report and proposed revised constitution, the Commission noted that the present document has been amended frequently (72 amendments in the past 57 years) and is ". . . among the longest of any of the state constitutions, is replete with archaic provisions, restrictive amendatory and procedural requirements, numerous details of a statutory nature, and contains a multitude of express checks on the exercise of governmental powers." In some cases, the Commission found, the present constitution conflicts with federal law and the federal constitution.

The revised constitution, intended as a working draft for the proposed constitutional convention, would retain some of the features of the present document which are unique and of particular value to the Western area including the 20-mill limitation on property taxes, irrigation and water rights provisions, and the New Mexico Bill of Rights.

A primary aim of the convention, according to the Commission, is to design a constitution that is ". . . short, clear and so designed that it permits flexibility and changes" while preserving those aspects that have proven of value in the past.

If the convention call is approved by the voters on Nov. 5, the 1969 legislature will set up the convention details and will decide if the convention delegates shall be elected or appointed. Following the convention, the proposed constitution would then be placed before the people for approval.

REPRESENTATIVES of the Isleta Pueblo were at Sandia recently where they toured rocket sled track facilities, viewed test sled films, and attended a luncheon meeting at the Coronado Club. Included in the group shown here signing citizenship declarations (!) were, from left: Joe D. Lucero, councilman; Gov. John D. Zuni; Sandia host Juan (Abie) Jojola (4252), a former governor; Judge Luis Lente; Felipe Lucero, councilman; and Juan A. Jaramillo, council chairman.

Indian Land Sought as Safety Zone At Sandia Rocket Sled Track Area

The AEC has entered into negotiations with the Martin-Marietta Corporation and the Isleta Indian Pueblo south of Albuquerque for the use of two land areas as safety buffer zones adjoining Sandia's supersonic rocket sled track.

The land areas involved are near the end of Sandia's 5000-foot north-south sled track. A portion of the land is state-owned and under lease to Martin-Marietta, and the rest is on the northern boundary of Indian land.

The buffer zones are needed to provide an additional margin of safety for Isleta residents in the event that a malfunctioning sled catapults a component into the Indian land. No high explosives or radioactive materials are used in the test sled operation, however.

'The Supreme Court'

New LP Album Available

"The Supreme Court," third LP album in Western Electric Company's public affairs record series called "Dialogues on Democracy," is now available at cost to Sandia Laboratories employees.

The series is designed to entertain, to instruct and to promote discussion and further study. It is part of WE's continuing program to help employees and their families to become better informed and to take effective action in the political life of their community.

"The Supreme Court" album contains three records. The first, "The Supreme Court in American Life," dramatizes the early history of the Court, the evolution of the principal of judicial review and the impact of the Court upon American democracy. Record No. 2, "The Supreme Court at Work," places the listener intimately in touch with the day-to-day functions and procedures of the Court in discussions with former Justice Tom Clark and other experts. Record No. 3 presents a scholar's view of Supreme Court jurisprudence and the Court contribution to the rule of law in our democracy. Dr. Paul A. Freund, professor of law at Harvard University and one of the most respected authorities on the Supreme Court, discusses the subject with Richard D. Heffner.

Mr. Heffner produced "Dialogues on Democracy" for Western Electric. He is a teacher, communications expert and television producer-moderator.

The albums are available at Sandia from Employee and Secretarial Services Division 3126 in Rm. 3 of Bldg. 610. The price for the album is $1.40.

At Livermore, the albums may be obtained from Public Information Division 8242, Bldg. 912, Rm. 138.

HERE COME DE JUDGE? A new album—"The Supreme Court," third in a series of LP albums prepared by Western Electric called "Dialogues in Democracy"—is now available to employees at $1.40. Yvonne Sandoval (3126) displays the album cover and contents.

Events Calendar

Oct. 18-19—University of New Mexico homecoming events including house decorations, parade, football (UNM vs. San Jose State, 1:30 p.m. Saturday), and Sergio Mendes' Brazil '66 (8 p.m. Saturday, University Arena).

Oct. 21—Danseurs Africains du Senegal, 50 singers, dancers and musicians, UNM Popejoy Hall.

Oct. 27—Lava beds southeast of Grants. N.M. Mountain Club, leader Marge Lenth, tel. 256-0282.

Oct. 29-30—Abe Burrows' "Cactus Flower," UNM Popejoy Hall.

Nov. 2—U.S. Marine's 50-piece Symphonic Band, UNM Popejoy Hall, 2 p.m. and 8:15 p.m.

Sympathy

To James A. Leonard (9521) for the death of his father in Port Clinton, Ohio, Sept. 20.

To E. W. Coomes (7322) for the death of his mother in St. Paul, Kans., Sept. 28.

To Herman S. Levine (5271) for the death of his son, David, in Gallup, Oct. 10.

Promotions

G. J. Ferreri (8236) to Staff Assistant Administrative
P. A. Armijo (4574) to Janitor
F. M. Chavez (4574) to Janitor
Antonio J. Pino (4212) to Material Handler
E. J. Zurawski (4254) to Grinder
C. L. Pedroncelli (3415) to Mail Clerk
D. A. Cowboy (3126) to Stenographer Clerk
R. L. Perea (3428) to File Clerk
D. Sanchez (4623) to Record Clerk
J. M. Holcomb (9415) to Messenger
D. S. Lovato (9415) to Messenger
E. E. Baca (3126) to Secretarial Stenographer
R. H. Chinn (3126) to Secretarial Stenographer
V. L. Goen (3126) to Secretarial Stenographer
C. M. Marquez (3126) to Secretarial Stenographer
J. D. Ulibarri (3126) to Secretarial Stenographer
D. B. Milliken (3126) to Secretarial Typist
L. D. Archuleta (7632) to Reproduction Service Clerk
H. T. Lee (7632) to Reproduction Service Clerk
D. E. Cordova (7632) to Reproduction Service Clerk
R. Birdseye (7631) to Record Clerk
Mary K. Lee (8168) to Secretarial Stenographer
H. V. Petersen (8212) to Secretarial Typist
L. L. Mamaros (8314) to Secretarial Typist
G. Martin (8161) to Record Clerk
N. C. McCorkle (8150) to Secretary
E. K. Maynard (8310) to Secretary
T. J. Cody (8322) to Computer Operator
F. E. Cunningham (8243) to Order Analyst
Donald R. Rich (8322) to Computer Operator
P. M. White (2320) to Secretary
H. Connery (9250) to Secretary
M. L. Walla (9340) to Secretary
M. M. Criswell (7611) to Draftsman
G. M. Vetter (7611) to Draftsman

SANDIA LAB NEWS

SANDIA LABORATORIES
ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA

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Staff: Matthew J. Connors, Lorena Schneider

Back Your Ballot Campaign Starts

KAREN LOWRY (3126) at left, urges you to "Back your Ballot With A Bill." The "Back your Ballot" slogan is part of a "Back your Party" Campaign sponsored by Western Electric to encourage employees to contribute to the candidate or party of their choice. Within Sandia, contribution cards (example shown below), which can be used to send money to campaign or party headquarters, will be found on bulletin boards in major buildings. For those wishing to use the coupon below, the address of the Democratic Central Committee is: P.O. Box 1606, Albuquerque, N. M. 87103; of the Republican Finance Committee: Korber Bldg., Rm. 335, Albuquerque, N. M. 87110; and the American Independent Party: 5215 Lomas N.E., Albuquerque, N. M. 87110.

CONTRIBUTION CARD

Date _____

Enclosed is my contribution (cash/check) of $_____

for _____
(candidate or party)

_____
Name

_____
Home Address

_____
City State Zip Code

_____
Home Telephone County

Receipt requested ☐

LIVERMORE NEWS

VOL. 20, NO. 21 SANDIA LAB NEWS OCTOBER 18, 1968

Improved Data Processing System for Telemetry Data

"Got a good signal all the way."

That report after a successful flight test is music to the ears of a test project engineer. It means several things to him. Radio signals were received from the missile without distortion. Telemetry was not interrupted by a system failure. Transducers and other monitoring devices functioned as expected. Receiving stations along the 5000-mile trajectory recorded the signals successfully.

A good flight, however, is not the conclusion of the test. It is a signal for Data Processing Division 8121 to start processing the data.

To speed analysis of this valuable information, Sandia Laboratories Livermore uses a new Signal Processing System.

"The need to update our system for processing telemetry data was foreseen some time ago," related Don Benton, supervisor of Division 8121. "Test criteria then were rather static compared with the highly dynamic conditions we encounter in many tests today. Data-retrieval requirements had to be changed accordingly."

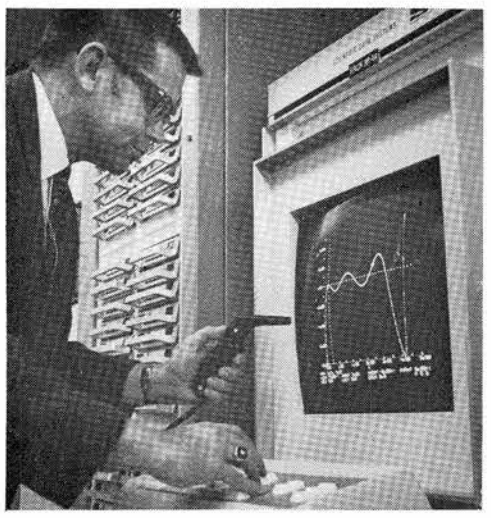
Most noticeable of all the changes is the Signal Processing System itself.

Housed in a temperature and humidity-controlled room which was modified by plant engineer Bill Thompson (8251), the unit can automatically convert raw analog data (transducer signals and warhead functions expressed in electrical voltages) to digital form (computer binary code). It further converts the information to engineering units. From the reels of magnetic tape recorded during the test, graphs and computer-print-outs are derived that show the engineer the behavior of a particular component at any time during the test. Did the component function as intended? Was it affected by conditions in flight that were not present in lab tests? "Answers to these questions may now be found much faster — the new system gives the engineer more accurate data in much less time," continues Don. "With it we will be able to digitize and convert 250 to 500 data channels a day at 100,000 samples per second and to generate finished plots within three days or less. In the past, the process has taken from three to four weeks."

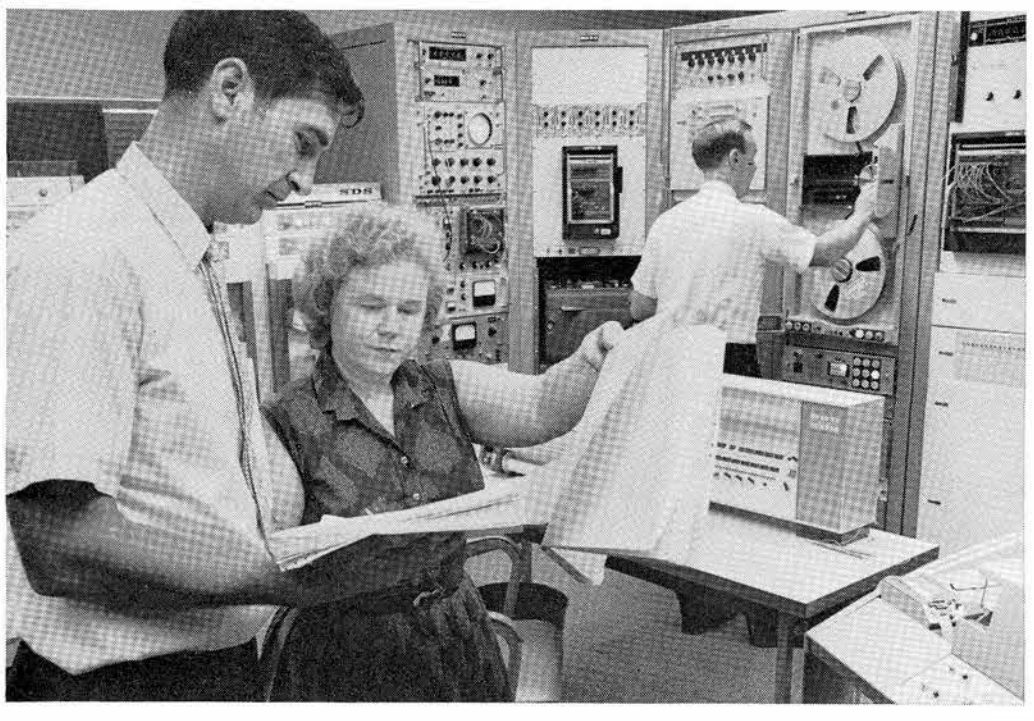
The improved turn-around time for telemetry data is also attributable to better internal communications. Data-base information is a significant factor here. Supplied by the engineer, the data-base information serves as a directory for extracting the desired information from a test. When completed, the form used for data-base information indicates the operating modes of test data-recording equipment, transducer identification and calibration, and describes the tape channels allocated for specific purposes. It further specifies which engineering units are to be used in the data plots. Having the data-base information (in tape form) before the test permits immediate processing of raw data after the test.

"On a typical flight test," says test project engineer Bill Guntrum (8124), "we may want to record 70 to 127 activities. We know in advance that the components are going to experience their greatest environmental changes at specific times during the flight. For instance, the variations in pressure, vibration and temperature will be greater at missile launch, third stage separation, re-entry into the atmosphere and splash-down. The more the data center knows about these test elements ahead of time, the faster the data will be processed. Use of a cathode-ray tube console (CRT) allows us to take a 'quick look' at analog data immediately after it's digitized to determine if further processing of the data is necessary. And, with the new system, we'll have greater confidence in the data because the system will verify its own accuracy."

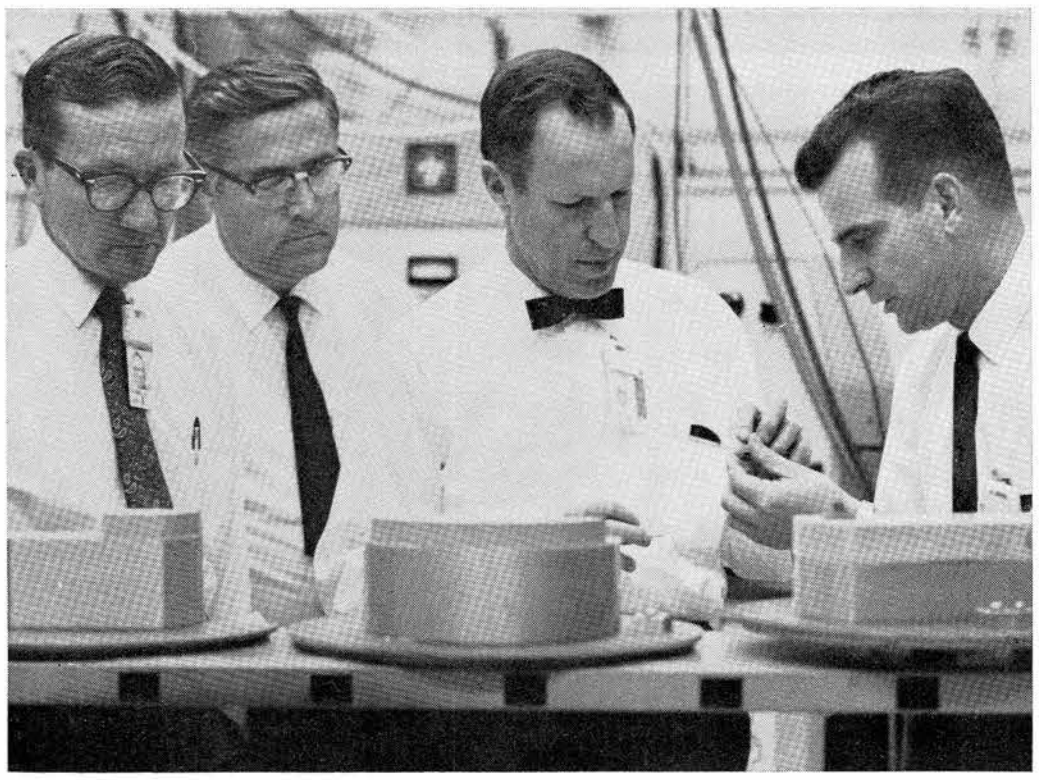
"Some additional capabilities of the systems are not yet operational," Don remarks. "Digitizing photographic data is one example. Processing environmental data in 'real time' (while test is in process) is another. In the future, we expect to do more data refinement as well as data processing. Engineers will then get higher quality and less quantity in their data."



CATHODE-RAY TUBE (CRT) CONSOLE will give engineers a "quick look" at data digitized from analog format before plotting the information. Bert Barger of Numerical Applications Division 8321 uses the CRT system to display a polynomial to determine its characteristics. More detailed portions of data pictured on the CRT can be extracted if desired.

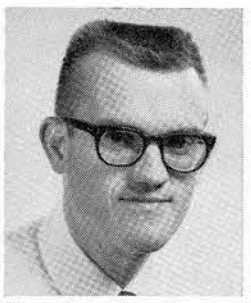


SIGNAL PROCESSING SYSTEM recently installed at Sandia Laboratories Livermore will speed engineering analysis of telemetry data by digitizing 250-500 channels of analog data a day at the rate of 100,000 samples per second. Turn-around time for processing test data will be reduced to three days from three to four weeks time. Discussing an entry on the data-base form are (l to r) Bill Wall and data analyst Louise Converse (both 8121). Jimmie Bauman (also 8121) adjusts the Universal Data Recorder (UDR) 1600 tape machine before processing data received from Nevada Test Site.



VISITING SANDIA LABORATORIES LIVERMORE recently for technical briefings was Brig. Gen. Edward B. Giller, USAF, who heads the Atomic Energy Commission's Division of Military Application. During a tour through the Laboratories, T. B. Cook, Vice President 8000; L. Gutierrez, Director of Systems Development 8100; and General Giller (l to r) listen as S. G. Cain (8125) explains a materials impulse testing technique in the Environmental Test Laboratory.

K. D. Marx Earns PhD In Applied Science



Kenneth D. Marx (8334) received his PhD degree in applied science recently from the University of California at Davis/Livermore. His doctoral dissertation was entitled "Solution of a Spatially Dependent Fokker-Planck Equation for Mirror-Confined Plasmas."

He completed his doctoral studies while on leave of absence from Sandia Laboratories under a fellowship awarded him in July 1965 by the Fannie and John Hertz Foundation. The fellowship was for continued graduate work at UC's Department of Applied Science at Davis/Livermore where he received his MS degree in applied science under the Sandia Technical Development Program. The choice of Mr. Marx as a recipient was based upon his academic record and recommendation from Dr. Edward Teller, then chairman of the Applied Science Department.

Mr. Marx earned his BS degree in electrical engineering from Oregon State University. He joined Sandia Laboratories Livermore in July 1961 and began his graduate study in the fall of 1963 when the Sandia TDP program was established at Livermore.

While at Sandia, Mr. Marx has worked in Livermore's Test Department, primarily in telemetry and environmental testing. Since his return from leave last month, he has been assigned to the Analytical Division in Design Analysis Department 8330.

He is a member of the Institute of Electrical and Electronics Engineers and honorary societies Tau Beta Pi, Phi Kappa Phi, Eta Kappa Nu, and Pi Mu Epsilon.

October Colloquium Emphasizes Sandia's Role

W. J. Howard, vice president 1000, will outline Sandia's long-range planning in weapons technology at the Livermore Laboratory Colloquium on Friday, Oct. 25. Presenting "Sandia's Role in National Defense," Mr. Howard will also discuss Sandia's role in the origination of new weapon systems.

Further information concerning colloquium will be posted on the Laboratory bulletin boards. Tickets are required for admission. A. R. Willis (8313) is host for the colloquium.

SLL Employees Contribute $26,128 to United Crusade

Employees at Sandia Laboratories Livermore contributed a total of $26,128 to the 1968 United Bay Area Crusade (UBAC). The figure represents an 8 percent increase over the $24,053 contributed in 1967.

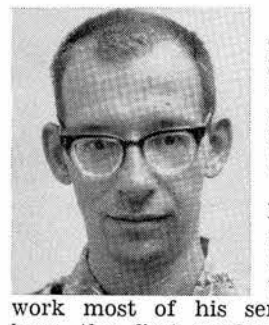
The average gift per contributor was $31.86—an increase of 6.2 percent over the 1967 amount. Seventy-eight percent of the Laboratory employees participated in the Crusade.

The percentage of employees contributing was greatest in Product Engineering Department 8160, followed by employees in Preliminary Design Department 8130. The greatest number of fair share givers was reported for Engineering Services Department 8250.

Bob Johnson (8161), chairman of the 1968 Crusade, was pleased with the results. He noted ". . . that the employees who contributed this year gave more than they did in 1967.

"These contributions as well as the efforts of those employees who worked directly on the Crusade are deeply appreciated; I'm sure my appreciation is at least matched by that of the UBAC-funded agencies receiving our contributions."

Death



John D. Hitchcock, an engineer in Product Division 8171, died in an automobile accident on Sept. 27. He was 43.

He joined Sandia Laboratories Livermore in August 1957 and was involved with specifications work most of his service years, having been the first engineer assigned to the specifications organization when it was established at Livermore in 1958.

Survivors include his widow, a son, a daughter, his parents, a brother and two sisters.

Welcome . . . Newcomers

Sept. 26 - Oct. 8

California

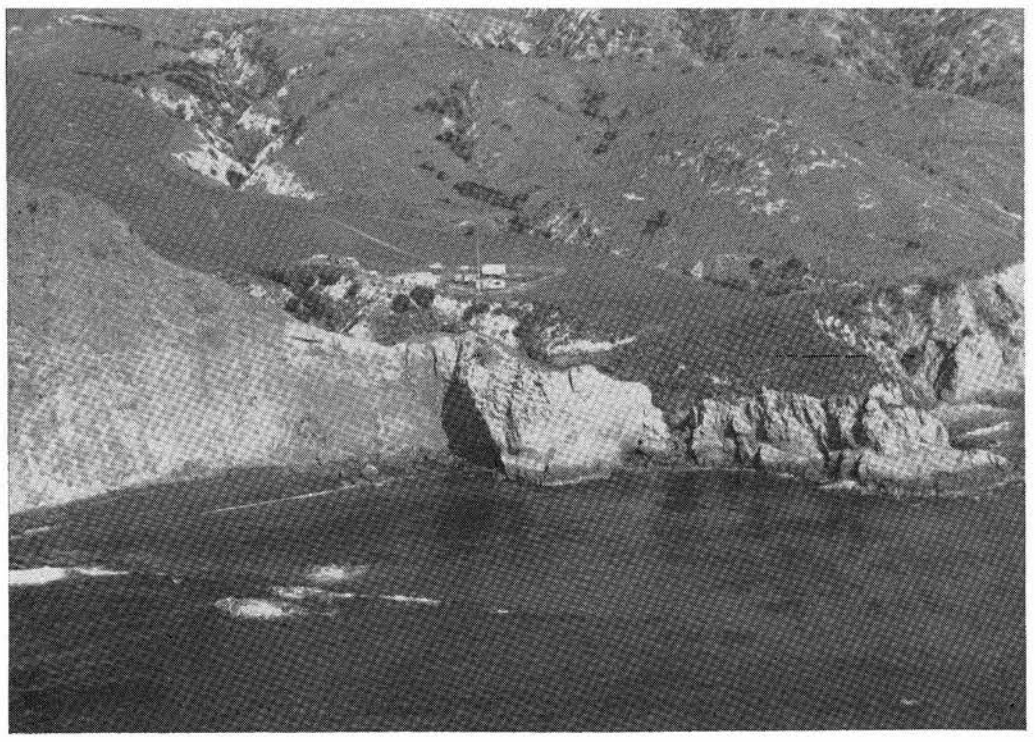
Jeffrey L. Egeberg, Berkeley 8314
Charles B. Robles, Livermore 8245

New York

Richard F. Romanowski, Yonkers 8313

Congratulations

Gary Beeler (8153) and Tamra Koerner married in Conord, Calif., Aug. 10.



SANDIA FACILITY at SCARF range on Santa Cruz Island includes telemetry trailers and tracking cameras on the surface and an underwater hydrophone network to 6000 feet. The island is 25 miles south of Santa Barbara off the coast of California.

Continued from Page One

Sandia Locates Missing Satellite

readings outlined a triangular area about 600 feet on each side. DOWB was lowered the next day at a spot in the center of the triangle and the search began.

Sandians of DOD Range Operations Division 7223 under G. L. (Gordo) Miller were directing activities aboard the Swan. Robert B. Hedberg was project leader.

Bob Hedberg, Tom Earp and Les Harris, working with GM operators of the DOWB, aided the search as observers. Each spent as much as 10 hours at a time underwater.

On the second day, Tom Earp located a section of the missile's fiber glass shroud, and on the fourth day Les Harris discovered what turned out to be the SNAP 19 generator along with other debris from the Nimbus package.

Robert J. Luikens of Isotope Projects Division 9521, who was on board the Swan, made positive identification of the generators from photographs taken of the debris.

Bill Gaines of Health Physics Division 3312, also on board the Swan, performed radiation monitoring during the search operation.

The National Aeronautics and Space Administration assigned actual recovery of the Nimbus package to the U. S. Navy and recovery was made on Oct. 8.

The DOWB was the second submersible evaluated by Sandia for use in an ocean recovery system. Earlier in the summer, the Westinghouse submersible Deepstar was used to recover a test unit at 3600 feet in the Santa Cruz Basin. Bob Hedberg was on board the Deepstar when the recovery was made. Later, G. A. Fowler, vice president 9000, was one of the Sandia observers who made a dive in the Deepstar.

PARTS from the Nimbus B spacecraft payload, identified as the SNAP 19 generators, were found after a four-day search by Sandians using the AC Electronics DOWB. The fuel capsules are valued at $700,000.

Tom Earp has been the Sandia resident supervisor for the SCARF range for the past two years. Function of the SCARF range is similar to that of Tonopah Test Range. The Tonopah Range provides trajectory data on air-dropped test units while SCARF provides three-dimensional tracking data on underwater trajectories. The range is equipped with a complete net of underwater hydrophones for tracking down to a depth of about 6000 feet.

Huff and Puff Brigade

Hunters Urged to Go Easy

The hunting season begins soon, and the New Mexico Heart Association reminds hunters: "Take care of yourself BEFORE you take care of your gun." For the hunter who is out of shape, sudden or unusual exercise may prove dangerous.

Getting into condition for the abnormal demands of the hunt is imperative if the hunter himself doesn't want to wind up in the statistics that report more hunters dying of heart attacks than of gunshot accidents.

The thrill of the hunt need not be linked with heart attacks for a healthy man or even for one who has a heart condition. Both can hunt and enjoy the outdoors if simple precautions are taken, the first of which is to consult the family doctor.

He'll explain why the hunter who has had no physical checkup in years or has followed no regular routine of exercise frequently is in more peril than the animal he stalks.

If the hunter is out of shape, his conditioning must be done gradually and follow a routine. The recovered heart victim should tell his doctor exactly where he plans to go and under what conditions he will hunt.

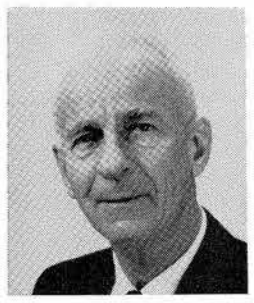
The doctor probably will specify just how far he can go, taking into consideration the terrain, the altitude, duration of the hunt and the patient's attitude. There will be one condition: that the man with a heart condition does not hunt alone.

Any hunter who gets winded should never hesitate to call a time out, even if his companions rib him as a softy. If they insist on going ahead, he should let them go. Taking a load off his feet may take an overload off his heart.

Take warm clothes, but no weighty ones that add to the burden of the rifle, ammunition and pack. Eat moderately and drink sparingly of alcoholic beverages. Pass up alcohol entirely when a rifle is being carried. If the hunting area is at a higher altitude, the hunter should get there a few days early so that his body can adjust before enduring the stress of the hunt. Avoid getting overheated or too cold. If you down an animal, get help in carrying it back to camp. Know what to do if someone has a heart attack, and if you have a heart condition, make certain your companions know where your medication is kept.

A free booklet titled "Hearts and Hunting" is available from the New Mexico Heart Association, 142 Truman, NE, Albuquerque, N.M. 87108 upon request.

Retiring



Harlan P. Kelsey, who is on special assignment reporting to Quality Assurance Department 7410, will retire Oct. 31 after almost 20 years at Sandia. During these years, he has worked in the same general organization—quality control and quality assurance. He was promoted to division supervisor in 1952 and has headed various divisions in the group.

Before coming to Sandia, Harlan was a quality control supervisor for Sylvania Electric in Massachusetts and had been a landscape architect and nurseryman.

Mr. and Mrs. Kelsey live in a 169-year-old adobe house in the Valley. Part of Harlan's time will be spent on the care and maintenance of his home. The Kelseys have three children and 10 grandchildren living in Colorado, California and Oregon. Harlan says he and his wife enjoy camping and traveling and will, of course, visit their children.

Other retirement plans include improving his golf, gardening, reading, sketching and some part-time landscaping work.

* * *

"Taking early retirement is not an easy decision to make. My work has always been a big part of my life. I've worked since I was 14 years old. I've been with Sandia for 22 years." These are some of the thoughts of Henry G. Sweeney of Photometrics Division 7226.

"I did decide to take advantage of the company's early retirement plan," Henry says, "and will leave Sandia the end of this month. After considering all aspects of retirement, my wife and I decided that we are in good health and would enjoy those extra years. I'm looking forward to a life away from the clock and the calendar."

Mr. and Mrs. Sweeney have a married daughter living in California and a son serving with the U.S. Army in Vietnam. They have three granddaughters.

The only definite plans Henry has made are for traveling. They plan to visit Mexico and will make a return trip to Canada and Alaska. They spent a month in Alaska two years ago, but are anticipating a much longer visit this time.

"I've had 22 wonderful years at Sandia," Henry says, "If I had it all to do over again, I wouldn't change a thing. The work has been important and challenging. Being with Sandia enabled me to take part in many interesting field test projects."

Women Golfers Elect, Honor Top Players

Trophies were awarded and new officers were elected when the Sandia Employees Golf Association (Women's Division) annual banquet was held Oct. 8.

Ann Michele (4500) won the Championship Trophy for low gross in regular tournaments and Betty Chappell (AEC/ALO) won the President's Trophy for low net in regular tournament play. Tournaments were held at Socorro, Los Alamos, Arroyo del Oso, and Los Altos golf courses.

Officers for the 1968-69 season will be Wanda Bishop (3341), president; Lillian McCullar (3341), vice president; Gloria Perrine (4152), secretary; and Bea Whittaker (4335), treasurer.

W. A. Nelson Sets New Golf Course Record

Wendell A. Nelson (4137), 1967 Sandia Employees Golf Association champion, added another notch to his putter Sunday, Oct. 6, when he set a new record at the Arroyo del Oso course by shooting a six under par 66 for 18 holes.

Playing in the Bear Canyon Golf Association Club Tournament, Wendell turned in the record low card while winning the Medal Play Tournament. He also holds the 1966 University Golf Association Title.

Josephine Sandusky, secretary for Environmental Testing Department 7320, will retire Oct. 31. She joined Sandia in December 1951 in the Quality Engineering organization. She remained with this group until July 1965 when she transferred to her present position.

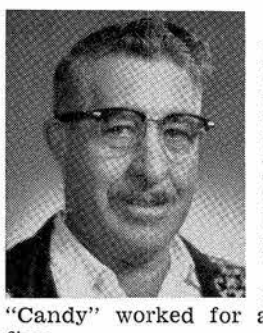
"I've been a department secretary to Mr. G. H. Roth for 13 years," Josephine says. "I have enjoyed working for him all these years—he's a very nice boss."

Before coming to Sandia, Josephine was a secretary at the Monte Vista Christian Church for six years.

Mr. and Mrs. Sandusky have two daughters, both living in Albuquerque, and five grandchildren. Mr. Sandusky works for the railroad and they will continue to reside in Albuquerque.

The first of Josephine's retirement activities will be a vacation in San Diego and San Francisco. Later on, she hopes to do some volunteer work at one of the local hospitals. She enjoys sewing and gardening and also plans to resume church work.

* * *

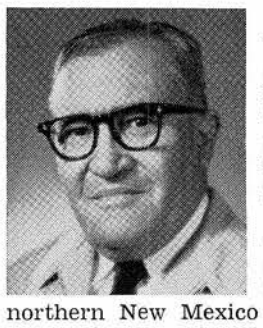


Candido C. Montano, a dismantler in Materiel Declassification & Sales Section 4622-3, is retiring Oct. 31. He has been with Sandia 17 years and has worked in the same organization the entire time. Before joining Sandia, "Candy" worked for a local construction firm.

Mr. and Mrs. Montano own a small farm near Los Lunas. They have five children and 18 grandchildren. One son, Eusibio, works at Sandia in Maintenance Section 4512-2. Mr. and Mrs. Montano are also caring for their four-year-old grandson.

Candy's retirement plans include visiting with his children, a hunting trip this fall and continuing his farming activities.

* * *



Salome Ramos, a water treatment serviceman in Mechanical Systems Section 4511-2, will retire Oct. 31 after more than 19 years years at Sandia.

Mr. Ramos farmed and raised livestock in southern Colorado and northern New Mexico in his early years. "In 1917 I saw for the first time, a post office notice which said 'Uncle Sam Wants You!'. Well, I was too young then, but it stayed with me." In the meantime he worked on various ranches and in the coal mines. He joined the U.S. Army in November 1923. Altogether he served 22 years in the Army, chiefly as a baker and a cook. In January 1945 in Washington, D.C., he was presented a certificate by the Chief of Foods Service, QMC, ". . . in recognition for maintaining high standards of performance in the training of Army mess and bakery personnel." He retired from the Army in March 1946.

"I've always remembered a lecture I attended as a new-hire at Sandia," Mr. Ramos says. "The man that spoke to our organization called us a housekeeping group. With those words in mind, I've proceeded to this day to try to make others comfortable in their work."

Mr. Ramos has no definite plans for retirement except to take care of himself and to remain in Albuquerque.

Take Note

Sandia Gun Club will hold a sighting-in shoot tomorrow, one week before the opening of deer hunting season in New Mexico, for non-members as well as members.

Hunters should bring their guns to the Sandia Base range between 8 a.m. and noon. The range is at the southwest corner of Sandia Base, south of the road leading to Kirtland AFB. Additional information may be obtained from Dick Vivian (1611).

Parachute Recovery Device Papers Read by Four Sandians at El Centro

Parachute and flotation recovery systems were the subjects of papers delivered by four Sandians at the recent 2nd Aerodynamic Acceleration Systems Conference at El Centro, Calif. The international conference was jointly sponsored by American Institute of Aeronautics and Astronautics (AIAA), and DOD Joint Parachute Test Facility. William B. Pepper (9324), general chairman, was responsible for organizing the conference which was attended by some 400 engineers and scientists.

From Sandia, those presenting papers, besides Mr. Pepper, were Donald W. Johnson and William Barton of 9324, and Robert D. Fellerhoff of 9323.

In addition, Aerothermodynamics Director Alan Y. Pope (9300) recounted highlights of his associations with rockets in a luncheon speech entitled "Adventures with a Thousand Rockets." Also attending the three-day meeting at the Department of Defense Joint Parachute Test Facility was Randall C. Maydew (9320).

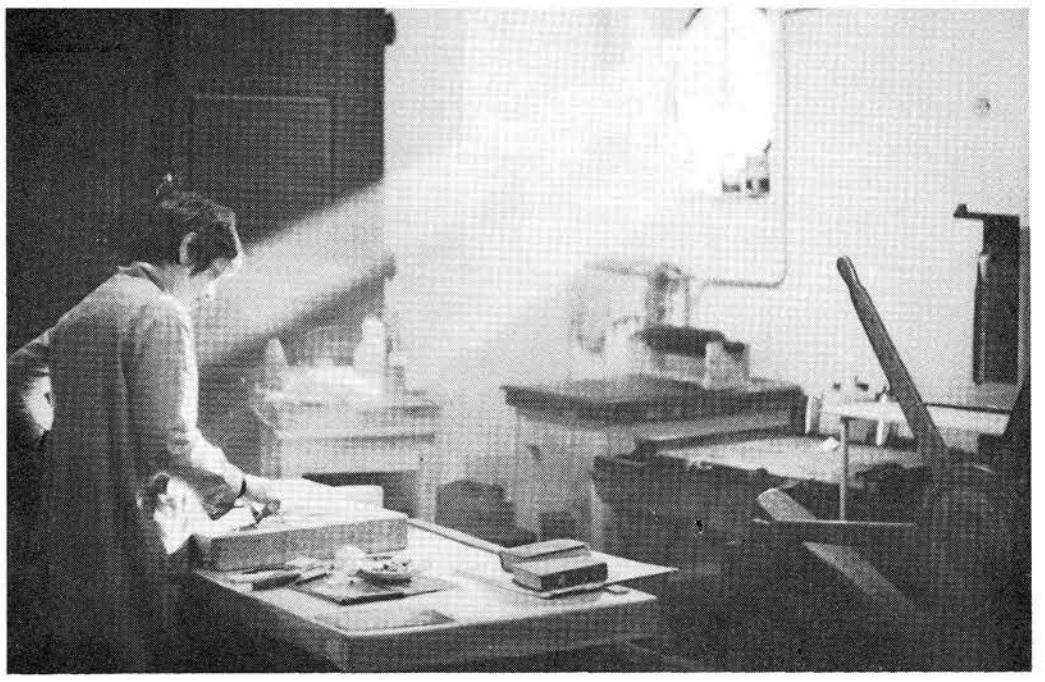
In his paper, Mr. Johnson discussed the design of a system for recovering rocket payloads that fall into the sea. In the new system, which allows recovery of either floating or nonfloating payloads, a new type of flotation device, called a ram air bag, is used as a backup to the primary recovery system (a CO_2 filled bag). The ram air bag consists of an open-end, spherical bag attached to the top of the payload parachute. As the payload drops into the water, air is funneled through a vent in the top of the chute, inflating the bag. The weight of the payload submerges the open end of the bag, sealing the air inside and keeping the entire unit afloat. The locator beacon then broadcasts signals to shore-based receiving equipment. The new system has beeen used in 29 successful recoveries by helicopter or ship out of 30 rocket flights.

William R. Barton, supervisor of Rocket & Recovery Systems Division 9324, delivered a paper describing the design and development of a heavy duty 76-foot ribbon parachute. The new chute, one of the largest of its kind, provides a highly repeatable trajectory on test vehicles ranging in weight from 20,000 to 45,000 pounds and dropped under varying release conditions. The system has been successfully tested more than 30 times, including a successful deployment at a velocity of 780 feet per second at 45,250 feet altitude, where dynamic pressures on the chute reached 280 pounds per square foot.

BILL PEPPER (left) discusses a rocket payload recovery system with two other members of 9324, Bill Barton, supervisor, and Don Johnson. The three, and Robert D. Fellerhoff (9323), presented papers recently at the AIAA Aerodynamic Deceleration Systems Conference in El Centro, Calif.

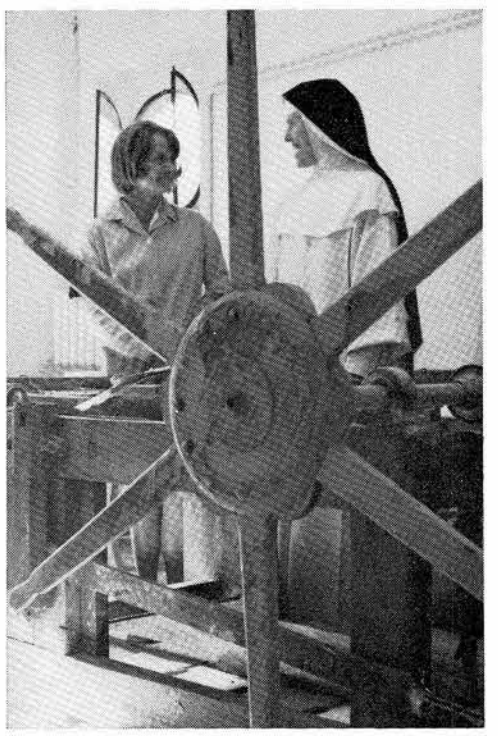
A third parachute system, which makes possible the recovery of a spinning 155mm shell, was described by Robert D. Fellerhoff. The system "soft-lands" the shell after it is fired from a conventional 155mm artillery piece. The shell itself is used as a test vehicle to subject nuclear ordnance components to high g-loads. Inside the fiber glass nose of the shell a six-foot parachute is packed together with an explosive deployment system. A key feature of the new system is that recovery loads occur in the same direction as the original setback loads and at much lower magnitude of force. This helps insure that failures in the components being tested were occasioned by the launch rather than recovery environment.

In his paper, W. B. Pepper, described a hypersonic parachute system having the advantages of economy of materials, light weight, low pack volume, and high heat resistance. The nylon-ribbon chute has a silicone-coated fiber glass heat shield and an ablative coating. Weighing only three and one-half pounds, the small chute may eventually be deployed from space vehicles at Mach 4 to 10 velocities.



CONVERTED GARAGE in Villa Schifanola was used by Janet Jenkins (3463-3) as a studio during her year in Florence, Italy. She helped to set up a graphic arts graduate program.

Early Italian Printmaking Equipment Contrast for Sandia Graphic Designer



100-YEAR-OLD lithographic press, similar to type used by Toulouse-Lautrec, was renovated by Janet Jenkins, shown with Sister Giotto, dean of art school, Villa Schifanola.

A 100-year-old lithographic press in Italy was a sharp contrast to modern art aids used by graphic designer Janet Jenkins (3463-3) in her work at Sandia.

Janet operated the old press during the past year while setting up a graphic arts program at the Villa Schifanola in Florence, Italy, a graduate school of fine arts associated with Rosary College of River Forest, Ill.

The press was formerly owned by the son of the mayor of Florence and had been shown in international antique shows. When sections of Florence were inundated last year, the press was one of many art treasures and items of historic interest damaged by flood waters. The litho press was donated to Villa Schifanola and it was Janet's job to disassemble, clean, and reassemble the device.

"Fortunately the press had been in excellent condition before the flood and since then had been sitting in dried silt," Janet says. "The metal parts were rusted but the hardwood was well preserved. "

The villa itself, located in the hill country between Florence and Fiesole, dates back to the early 16th Century. Janet used a converted garage as a studio. "Every other building on the estate was at least a hundred years old with walls covered with Renaissance paintings," she says.

The school has a small enrollment— about 50 students— and about half of the courses are presented by artists, archeologists, and historians who live in the city. Janet taught print making with emphasis on woodcuts and lithography. The other instructor in the graphic arts department, Swietlan Kraczyna, taught etching and engraving.

The problems of restoration are receiving emphasis now in the art history department. "Fortunately the Florentines have always been exceptional in restoration techniques," Janet says. All museums in Italy are active in the restoration program, and other countries are also helping; for example, a German museum is restoring all of the damaged armor in one of the major Florence museums. The school's art department raised $6000 from U.S. sources to help artisans replace lost equipment.

While Janet was in Florence there were three additional flood scares. "People in town panicked and began moving with their belongings to the upper floors of buildings. During the big flood a year ago, the townspeople were not warned about the rising waters of the Arno River because city officials felt the people would crowd into churches in low lying areas," she says.

During the summer Janet attended a seminar in Christian iconography, which included seeking out religious art in museums and churches of many Italian cities and towns. "Often even the Italians did not know these items were in their village. In one instance we saw an alterpiece which a priest had stored away for 20 years," she recalls.

Before returning to Albuquerque, Janet had a one-man show of lithographs at the Strozzi Palace Gallery.

Projected plans for Villa Schifanola include offering a Master of Fine Arts degree in sacred art. Abstract or nonobjective religious art would be studied and emphasis would be placed on communicating sacred art by means of contemporary media.

Also figuring in the plans of the school are some 40 acres of land in this country, donated to the school some years ago. The donated land would be the site of a sacred art center, for use by artisans and others interested in this art form. Its location? between Cerrillos and Santa Fe, New Mexico—pretty much on our doorstep.

Speakers

R. A. Hill (5243), "A New Plane Grating Monochromator with Off-Axis Paraboloids and Curved Slits," Fall meeting of the Optical Society of America, Oct. 9-12, Pittsburgh, Pa.

M. M. Sluyter (9341), "Technical Obsolescence of Scientific Personnel"; Irving Auerbach (9328), "Decomposition Kinetics of a Phenolic Ablator," Fall meeting of the New Mexico Academy of Sciences, Oct. 11-12, New Mexico Western University.

C. M. Percival (5133) and F. R. Norwood (1721), "A Theoretical and Experimental Investigation of the Dynamic Response of Rolamite"; R. V. Cadman (2322), "Rolamite—Geometry and Force Analysis," 10th American Society of Mechanical Engineers Mechanisms Conference, Oct. 6-9, Atlanta, Ga.

O. E. Jones (5130) and R. A. Graham (5132), "Sheer Strength Effects on Phase Transition Pressures Determined from Shock Compression Experiments"; G. A. Samara and W. L. Chrisman (both 5132), "Study of Phase Transistions in Insulators by the Dielectric Constant Technique," National Bureau of Standards Symposium on the Accurate Characterization of the High Pressure Environment, Oct. 14-18, Washington, D.C.

C. E. Land (5153), "Ferroelectric Ceramic Electro-optic Materials and Devices"; R. E. Nettleton (5151), "Domain Structure and Scattering of Visible Light in a Perovskite Ceramic"; E. P. EerNisse (5112), "Electromorphic Ceramics in Extreme Environment—Parametric Device Applications"; P. D. Thacher and C. E. Land (both 5153), "Electro-optic Ceramics with Reduced Scattering"; J. C. Crawford and F. L. English (both 5153), "Ferroelectric Ceramic Field Effect Devices," Symposium on Applications of Ferroelectrics, Oct. 10-11, Washington, D.C.

R. C. Heckman (5424), "The Electronic Properties of the Rare Earth Hydrides" (invited); L. C. Beavis (2613), "Characteristics of Selected Binary Transition Metal Hydrides" (invited); R. W. Rohde (5133) and R. A. Graham (5132), "Effect of Hydrostatic Pressure on the Reverse Martensitic Transformation in Fe-30%Ni," joint meeting of the American Society of Metallurgists and American Institute of Metallurgical Engineers, Oct. 14-16, Detroit.

T. W. H. Caffey and W. R. Hale (both 7211), "RF Telemetry from a High Speed Subterrain," 1968 International Telemetering Conference, Oct. 6-8, Los Angeles.

L. E. West (9424), "SPIRAL (Sandia's Program for Information Retrieval and Listing)," Association for Computing Machinery, Sept. 27, Los Alamos.

R. L. Park (5273), "Imperfections in Single Crystal Surfaces," Physics Department Colloquium, Brown University, Sept. 30, and Materials Science Colloquium, Cornell University, Oct. 3.

F. K. Truby (5232), "Temperature Dependence of Electron Attachment in I_2 Vapor"; E. J. Shipsey (5232), "Deduction of Crossing Point of the Repulsive I_2 and Ground State I_2 Potential Energy Curves from Measurements of the Electron Dissociative Attachment Coefficient"; F. W. Bingham (5232), "Post-Collision Charge States in $O^+ + Ar$ Scattering at 50-100 keV," 21st annual Gaseous Electronics Conference of the American Physical Society, Oct. 16-18, Boulder, Colo.

S. W. Key and Zelma Beisinger (both 5162), "The Analysis of Thin Shells with Transverse Shear Strains by the Finite Element Method," Air Force Second Conference on Matrix Methods in Structural Mechanics, Oct. 15-17, Dayton, Ohio.

E. L. Burgess (5272), "The Thermionic Emission of Rhenium and Chemically Vapor Deposited Rhenium in Cesium Vapor," Thermionic Conversion Specialist Conference, Oct. 21-23, Boston.

R. E. Nettleton (5151), "Self-Consistent Phonons and Ferroelectricity in Strontium Titanate," Dielectrics and Insulation Division Symposium of the Electrochemical Society, Oct. 6-11, Montreal, Canada.

C. S. Johnson (7271), "The Scientific Quest for ESP," UNM Student Chapter, IEEE, Oct. 1, and Sertoma Service Club, Oct. 17.

R. D. Driver (1722), "A Visit to the Soviet Union," Senior Citizens, Hospitality House, Oct. 2.

R. M. Jefferson (9141), "Uses of Nuclear Energy," Sunport Optimist Club, Oct. 2.

J. W. Reed (9111), "Sonic Booms," Sertoma Service Club, Oct. 3.

A. M. Chodorow (9141), "Sandia Laboratories Reactor Facilities," Naval Reserve Unit, UNM, Oct. 9.

W. C. Garcia (3233), "Retention of Spanish Language," Santa Fe High School Career Guidance, Oct. 9, Santa Fe.

Emma Hollingsworth (3126), "Secretarial Science," Santa Fe High School Career Guidance, Oct. 9, Santa Fe.

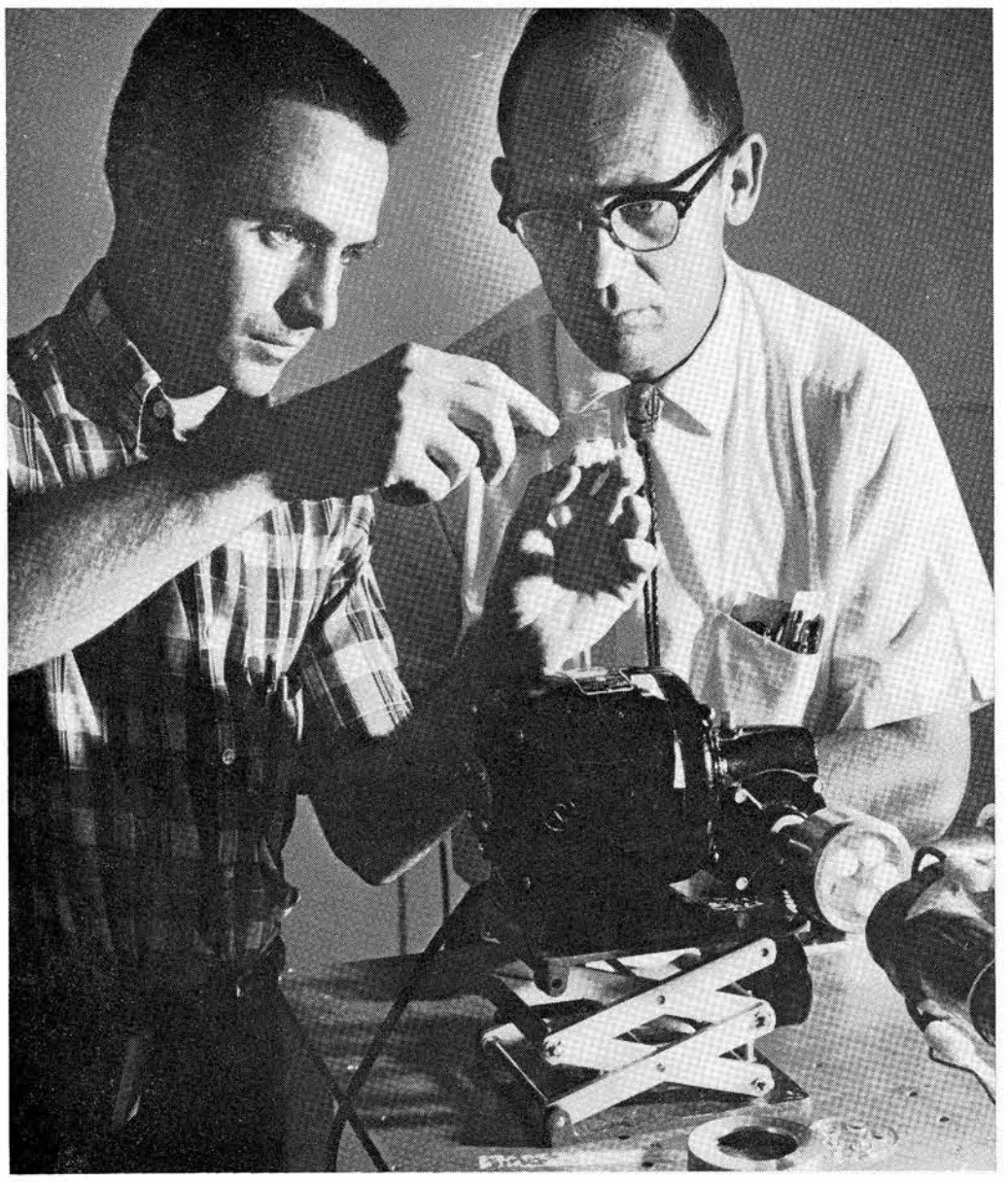
N. C. Anderholm (1224), "Lasers and Quasars (or What's New in Science)," Idaho-Montana Section, ASME, Oct. 17, Idaho Falls, Ida.

Participating on Panels

Walt Dodd (3254) is scheduled to participate in panels during two forthcoming meetings. On Oct. 19 at Gallup, he will be on a panel discussing "Federally Funded Programs and Job Opportunities" during the NAACP State Convention, and on Oct. 23 he will take part in an Equal Employment Opportunity Seminar in Albuquerque.

Congratulations

Mr. and Mrs. A. L. Brazda (7231), a son, Douglas Frank, Sept. 28.



EXACT LENGTH of the polymer sample to be irradiated by a Sandia linear accelerator is crucial to the thesis research being conducted by UNM graduate student Nelson Stalnaker (left). Bernard T. Kenna (5421) is thesis supervisor.

Joint Staff Appointments in 2nd Year

Sandians Find Teaching Stimulating

Teaching and R&D, R&D and teaching — the combination is now in its second year under the Sandia-universities joint staff appointment program. The results, according to program coordinator Howard R. Shelton (3134) and five Sandia participants, have been valuable to Sandia and the universities, while the academic work has been stimulating to the scientist-teachers.

Sandia Laboratories' joint staff programs began in the fall of 1967 in cooperation with the University of New Mexico and New Mexico Institute of Mining and Technology (Socorro). The purpose was to promote the interaction of top-flight people at the Laboratories and the universities — the interaction of knowledge and ideas, projects and facilities, creative staff people and advanced students.

Under the program, participating Sandians become university faculty members with full rights and responsibilities while remaining staff members at the Laboratories. University faculty people have a similar arrangement with Sandia.

Discussing the program to date, Mr. Shelton noted, "Actually, our people really have to be dedicated to teaching to come into the program because they usually end up working much longer hours. Sandia and the universities certainly get more than their money's worth from these people."

Of the five staff members who began the joint appointment program last year, all agree the program has been valuable to both Sandia and to the universities.

Donald R. Morrison (1713), who holds the rank of professor in the UNM mathematics department under the program, said that his work at the university last year gave him the chance "to look at problems in my field in a more general way than I normally can at work." Mr. Morrison, who was a college professor before he came to Sandia, frankly enjoys "the university atmosphere."

Bernard T. Kenna (5421) and James D. Williams (2631), who worked in the UNM chemistry and electrical engineering departments, said their association with university colleagues in and out of their fields definitely broadened their perspectives and was valuable to their work at Sandia.

Mr. Kenna, whose work bridges analytical and nuclear chemistry, said "the interaction with professors in all fields of chemistry was particularly valuable in cutting through the compartmentalization that normally characterizes research work." Talking with graduate students about their research projects also gave him new insights into his own work.

DAVID K. BRICE (5111) commutes from NMIMT at Socorro to Albuquerque twice each week.

Charles Stein (5431) is overseeing the master's thesis research of four full-time Sandians in his role as professor of metallurgy at New Mexico Institute of Mining and Technology. These metallurgy research projects are all related to Sandia work, although this is not a requirement of the program according to Mr. Stein.

All of these NMIMT master's degree candidates also happen to be assigned to the Materials and Processes Directorate: Charles E. Albright and Maurice Karnowsky (5431), Robert H. Altherr (5434), and Norman L. Knudson (5414).

David K. Brice (5111), another Sandian with a faculty appointment at NMIMT, feels that the process of preparing his course in solid state physics gave him new insights into the subject. "And the teaching experience itself has been enjoyable," he said.

The only university-Sandia appointment in the program so far is NMIMT Prof. Alan Miller, a ceramics specialist. Prof. Miller is studying phase relations in thermoelectrics in Materials Research Division 5154.

Under the joint staff program Prof. Miller spends one day a week at Sandia, and Division 5154 supervisor Robert A. Lefever feels that his organization is fortunate to have him. "We benefit particularly from his academic orientation. He has already held two seminars here — on thermodynamics and high temperature phase relations."

As the joint staff appointment program goes into its second year, Mr. Shelton reports overall satisfaction with its progress. "Faculties and students are enthusiastic, and we hope for an increasingly close relationship with universities in New Mexico in the coming years."

Aero-Modeling Enthusiast Wins Place on National Glider Team

When the Academy of Model Aeronautics held its national competition in Burlington, Wis., last month, the team to represent the United States in the 1969 international meet was selected. James P. Taylor (4253-1) will be a member of that team.

Jim won his place by finishing second among 33 finalists in the glider category, having previously competed at the regional and semi-final levels with 500 aero-modeling enthusiasts. He was only three seconds behind the national winner.

The Federation Aeronautique Internationale, the governing group in which the Academy is a division, recognizes three categories of models: gliders, rubber-powered craft, and gasoline-powered craft. A three-man team was selected from the winners in each category. The international meet is held every other year (last time it was Czechoslovakia), but the site for 1969 has not yet been selected.

Like many boys, Jim became interested in model airplanes when he was 10 years old. But after his initial enthusiasm waned, there was a long period before his interest was renewed — when his son started making planes. Jim now designs his own craft and applies a number of techniques learned through many years as a model and instrument maker at Sandia.

He now has three glider models, each of which took about 150 hours to fabricate. The 80-inch wings are of tissue-covered balsa, as is the tail structure. The fuselage is of the same lightweight wood except for the nose section which is of aluminum, trimmed to close tolerances. "The craft must be carefully balanced and adjusted to fly perfectly level because any erratic movement in flight is counted against the general performance rating," Jim says.

Owing to the glider's light weight (about 14½ ounces) and aerodynamic qualities, once it catches a thermal air current, there normally is nothing to prevent it from continuing upward out of sight. After Jim lost several of his models in thermals over the nearby mountains, he added a spring-operated timer which mechanically actuates the stabilizer after a certain period. He adds, "If you lose your glider during a meet, you're out of the competition.

At Burlington, the meet was held at an abandoned Air Force base. The models were towed aloft (like a kite) at the end of 50-meter lines. The trick is to place the glider in rising air. "The Europeans take off their shirts to better sense the differences in air temperature that are characteristic of a thermal. The scientific approach is to use a thermistor device. The most common method is to watch the action of another person's glider. No matter how you do it, finding the thermal is the hard part," Jim says.

PLACE ON U.S. TEAM was recently won by James P. Taylor (4253-1) when he flew his glider in national competition sponsored by the Academy of Model Aeronautics. Model took 150 hours to build.

Points were given for those flights having at least three-minute duration. (If a glider is placed in "dead air" it won't stay aloft even three minutes.) Out of 15 rounds over a three-day period, Jim had 11 perfect scores despite varying weather conditions which included strong winds and some rain.

"My family helped make the win possible," Jim says. "My daughter manned a walkie-talkie to guide my wife to where she could retrieve the model."

There are a number of aero-modelers in Albuquerque as well as a local club. Jim can provide additional information to anyone interested.

DISTINGUISHED ALUMNI, retirees that is, talk with Bob Blount (3120) at annual Coronado Club dinner and get-together Oct. 10. From left, seated, Naomi Bennett ('66), Mrs. Ed Mould and Mr. Mould ('64), who celebrated his 69th birthday on the banquet date. Mr. Bennett, standing, drove with Naomi from Las Vegas, Nev., for the occasion.

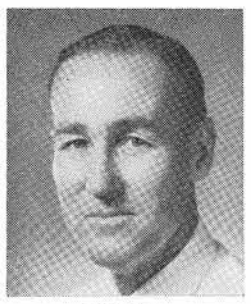
Service Awards

25 Years

D. S. Dreesen
7321

C. E. Runyan
4620

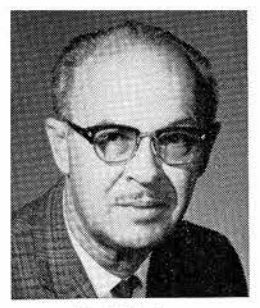
20 Years



E. S. Ames
9122

D. P. Anderson
9211

J. G. Bumgarner
7642



K. R. Fortman
7222

W. J. Haskell
9323

E. R. Lopez
7351

Aneda A. Pittit
1640

H. M. Roberson
4513

Manuel Sanchez
4512

Craig Summers
7641

15 Years

J. DeMontmollin
9238

G. T. Kross
2315

J. H. Stoever
5242

K. G. Schuette
4573

Doreen Westfall
7412

10 Years

Oct. 18-31

James Doerner 2313, A. P. Disch 2344, G. D. Haycraft 4512, J. C. Mashburn 5414, P. G. Dominguez 8161, L. E. Clauson 8331, J. L. Silva 4623, C. E. Jenkins 4231.

Gersedon Martinez 3432, L. K. Renfro 4574, Jane E. Baker 3313, M. B. Moore 4114, Cynthia J. Harris 7611, and B. J. Little 8151.

Tetanus Immunization

Two Types of Shots Explained

By S. P. Bliss, M.D.
Sandia Medical Director 3300

Since there still seems to be confusion in the minds of some people regarding the two forms of tetanus shots, it might be worth taking a brief look at the whole topic.

Tetanus is a severe, acute bacterial infection marked by generally persistent muscle spasms accompanied by convulsive seizures. The characteristic spasm of some of the chewing muscles around the jaw accounts for the disease's familiar name "Lockjaw."

Tetanus is an ancient disease universally dreaded, and for good cause. Even today in the face of all our modern medical knowledge, once a person has actually contracted tetanus the fatality rate is 30 to 50 percent depending on the circumstances. The rate is much higher in the very young, in the aged, and in those who develop pneumonia or other secondary infections.

Even if you're lucky enough to survive a first attack of tetanus, you're not immune to reinfection.

The tragedy of all this is that tetanus is an essentially completely preventable condition — if action is taken even before one is ever exposed to the disease. What action? Immunization with tetanus toxoid. Two to three doses a month apart with a booster in 6 to 12 months will result in basic immunization. Then, whenever one is exposed to a contaminated environment from which tetanus might result, a booster shot of the same toxoid is all that is needed and the likelihood of getting tetanus just disappears.

Tetanus toxoid is a surefire protection with no complications (for the incidence of any complication from tetanus toxoid — even as little as a sore arm — is virtually unknown). What worries some people is tetanus antitoxin, and that's a horse of a different color.

Tetanus antitoxin is really horse antiserum to which 10 to 25 percent of persons can have a reaction — all the way from hives and rashes to shock and death. Tetanus antitoxin is used when a person with a potentially contaminated wound does not have a history of receiving a basic tetanus toxoid immunization.

Since the offending agent with antitoxin is the horse serum, medicine now has human tetanus immune globulin which obviates the use of the offending horse serum. However, since neither of these offers long term protection, they are not the preferred method of tetanus prevention.

Should everyone have tetanus toxoid protection? Yes. And, since 1940, doctors have generally seen to it as far as children are concerned. Some of the standard "shots" of childhood are DPT (Diptheria—Pertussis (whooping cough) — and Tetanus) which offer the required protection.

For those born before the universal use of DPT shots, give it a thought. Having your body immunized against tetanus may very well save your life.

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Deadline: Friday noon prior to week of publication unless changed by holiday.
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CARS & TRUCKS

'55 BUICK Roadmaster 4-dr. sedan, PS, PB, R&H, air, 2-tone green & white, $225, 60,000 miles. Goodwin, 256-2216.

'62 STUDEBAKER Lark station wagon, 4-dr., V8, needs body work, $150 or best offer. Pfarner, 298-3206.

'67 MERCURY station wagon, AC, PS, PB, 4 seats, luggage rack. Gay, 636-2781.

'66 DODGE ¾ ton pickup, 10' Travel Queen camper. Scott, 298-2129.

'60 RENAULT DAUPHINE, new tires, 1 yr.-old-engine. Lee, 898-0779.

'66 ENGLISH Ford Cortina GT, 30,000 miles, one owner, R&H, 4-spd. Stark, 296-4971.

'59 DESOTO, 4-dr., V8, PS, PB, AT, $500. Marney, 299-3676 after 5.

'67 FORD XL, 428 engine, fully equipped, 12,500 miles, deluxe interior, 3-yr. warranty below retail. Winner, 255-3253.

'63 FORD station wagon CTY sedan, V8, AT, transmission needs work, $450. Schuch, 298-9924.

'55 CHEVY, engine completely overhauled, $200. Landavazo, 299-2422.

'63 VW sunroof w/completely overhauled engine, p.b. radio, 4 new tires-clutch-battery-brakes, vinyl seats, Brammer, 265-8194.

'63 FORD pickup w/camper equipped ready to go. $1450. Bodine, 296-3620.

'64 CORVAIR MONZA sport coupe, 4-spd. trans., 27,000 miles, selling below book at $725. Stone, 298-4620.

'66 PLYMOUTH Valiant, std. trans., R&H, AC, less than book price, $1125. Johnson, 299-5105.

'56 VOLKSWAGEN sedan, radio, 57,000 miles, $225. Hull, 298-8506.

'60 FORD FALCON, 4-dr. sedan, Tome, 296-1048 evenings.

'62 GMC suburban, AC, equalizer hitch. Johnson, 255-5427.

JEEP, completely rebuilt, new motor, trans., repainted, seats reupholstered, tow bar, extra parts. Jones, 298-1733.

'67 VOLKSWAGEN Beetle, FM radio, $1399 or best offer. Mayhew, 299-2638.

UNIVERSAL JEEP, WW II, 4-wheel drive, tow bar, hubs, $500. Gonzales, 877-5693.

'63 RAMBLER station wagon Classic, 660 series, 8 pass., 6-cyl., std./OD, R&H. Stake, 255-0610.

CAMPER BUS, VW 4x8 luggage rack makes into tent, gasoline heater, chuck box, dinette seating makes into bed. Stixrud, 298-0478.

'61 JEEP WAGON, 4 wd, Warn lock-o-matic hubs, new clutch, needs tires, $750. Karnes, 299-9033.

MISCELLANEOUS

PAIR of frisky gerbils, $2; record player, 3-spd., $7. Guttmann, 299-7031.

PORTABLE GE tape recorder w/AC adapter, $17.50; Stenorette dictating machine w/transcribing headphone & foot pedal; 2 Dutch rabbits & hutch, $5. Constant, 296-1431.

TRUMPET, LaFayette student model, never used, retail about $140, sell for $75 w/case. Trauth, 299-2176.

CHAIN SAW, David Bradley, 24" $70. Russell, 299-0159 after 5:30.

17' TRAVEL TRAILER, sleeps 6, monomatic toilet, butane, electric ice box, electric brakes, electric water system, E-Z Lift hitch. McGarvie, 296-5561 or 298-3364.

21" TV, RCA console, $25; home study servicing course, $25. Dieter, 255-8056.

4 PANES & 4 panes steel casement window, already glazed, $10. Meikle, 299-4640.

MOBILE HOME, Angelus 1958 8 x 45, 2-bdr., front kitchen, furnished, carpeting, gas furnace. Miller, 255-1324.

MAYTAG wringer washer w/lg. size aluminum tub. Cruze, 256-9338 after 5:30.

JANSSEN spinet piano w/matching bench, modern style in fruitwood, 7 yrs. old, $450. Braziel, 299-7222 after 5.

VIOLIN, $50; ski boots, size 6, $7; girl's 26" bike, $6. Curry, 298-5028.

TOY POODLES, silver, silver beige & white, males & females, 6 wks. old, AKC reg., excellent pedigree. Shipley, 298-2433.

RANGE HOOD w/fluorescent light & blower, mounted on base of Youngstown steel wall cabinet, complete unit, $27. Zachmann, 299-6871.

COLEMAN Catalytic heater, adjustable 3500 to 5000 BTU, used once, $18. Knutson, 299-6183.

OUTBOARD MOTOR, auto bail, 7.5 hp., used 4 times, tank & hoses, $175. Kingsley, 299-1226.

HI-FI, monaural, walnut cabinets, $75 or best offer. Kepler, 298-5652.

TWO 8-week-old puppies, mixture hound, chihuahua, $5 ea. Shock, 877-3728.

23" B&W TV, Admiral console. Iverson, 298-0003 after 5.

AMPLIFIER for electric guitar, solid state, $17. Schreiner, 268-4159.

SEA-FOAM mahogany (white) bedroom set—triple chest, lg. mirror, bookcase headboard dbl. bed, mattress & box springs, $110. Syme, 298-9167.

GIRL'S BICYCLE, 26" wheels, puncture resistant tubes, less than 1 yr. old, $35. Peay, 299-5936.

SLINGER, complete drum set in flamingo blue, one 18" & 20" cymbals. Flores, 299-3848.

7" SKILL SAW, saber saw, plane block, plane brace bits ¼" thru 1", timing light D well meter, motor manual. Eaves, 299-7728.

SMALL TEAR DROP shaped camping trailer, sleep space & covered storage, no cooking facilities, $75. Souder, 282-3121.

17' GULFSTREAM deluxe, convertible top, 125hp Mercury, power trim, stereo tape, full accessories, skis, belts, trailer, '68 equipment, $3275. Fisher, 256-6457.

GE electric range, 36", white, $75. Calloway, 299-3695.

YAMAHA 100 Trailmaster, new larger rear tire, tube, chain sprocket, battery, mirrors, cover, buddy seat, spares, $325. Watkins, 299-0411.

ICE SKATES, size 5, Hockey, black & brown, Canadian Flyer, $5. McDowell, 255-2512 after 7.

WESTERN YOUTH SADDLE, 11" seat, fits full-size horse, ¾ rig, full carved leather, 2 yrs. old, $45. Bassett, 898-1840.

NIKON-NIKKOR auto 85-250mm zoom lens w/close-up lens, lens shade, leather case & Rowi stock. McMaster, 268-8062 after 5:30.

FULL VIOLIN, $75; snare drum, $30; guitar, $20; trumpet, $59; big roll-top desk, $150; snow shoes wanted. Tiefa, 299-2763.

BOGEN stereo amplifier & pre-amp, $65; Starlight Metzner turntable w/tone arm & diamond needle, speed from 16 rpm & strobe for 33 1/3, 45, 78 rpm, $65. Smith, 299-6873.

HALICRAFTERS communications receiver model SX-100 MK II, $100; 100-watt transmitter, VFO or crystal tuning, $50. Laskar, 299-1024.

PUPPIES, mini-toy poodles, AKC reg., $75. Miller, 255-6838.

PIANO, old upright, cabinet grand, $50—you move it. Hudson, 296-3484.

WINCHESTER 1200 12 gauge shotgun, modified choke, $60; Ruger 22 single six w/holster, $60; trade for ham receiver. Reed, 299-1684.

STROLLER, high chair, tote-board, car seat, potty chair; Argus C-3 camera w/case & flash attach.; rotisserie w/shish-kabob. Gauerke, 299-5806.

HAMMARLUND HQ-145C receiver, 055/30mc w/ calibrated ham bands & crystal calibrator, $125; BC-221 AK freq. meter w/AC supply, $40. Mattison, 256-3951.

COFFEE URN, 30-cup, stainless steel, $15; garbage disposal heavy duty w/fittings, $25. Svensson, 344-7700.

WINCHESTER 22 cal. pump rifle, model 61, $65; will trade for old guns or .45 auto. Zaluga, 344-1564.

PICKUP CAMPER, 8' cabover, stove, sink & icebox, homemade, $375. Schnetzer, 298-8255.

KENMORE automatic washer, $40; Sear's 8000 psi grease gun w/10 cartridges, $8; Argus C-3, $15. Reinman, 256-9737.

DRESSMAKER'S FORM, adjustable, used once, $12. Bourgeois, 298-4998.

MOBILE HOME, $1950; ideal for retired couple or single person, Thornton Trailer Park, space No. 45. Ungerman, 268-2136.

PING PONG TABLE, regulation size, w/folding legs, $25. Savitt, 268-0158 after 6.

NECK BRACE COLLAR for whiplash injury treatment. Nelson, 255-2364.

SINGER featherweight portable sewing machine, includes case & all attachments, plus blind hem attachment; used 16 mos., $75. McKnight, 282-3377.

REAL ESTATE

$18,500, 3-bdr., 1¾ bath, dbl. garage, Mankin home, asking $1900 down, take over payments $137, includes everything. Watkins, 298-3667.

2-BDR w/12x18 den, lg. walled corner lot, NE, must qualify FHA or VA, no down payment, $10,050. Hofer, 344-8047.

MOSSMAN, enlarged Sun Valley Deluxe, carpeted, draperies, sunken den, 2 fireplaces, covered patio, screened porch, Fiesta swimming pool, landscaped, 3637 Georgia NE. Schafer, 299-4634 after 5.

3-BDR., dbl. garage, paneled den, custom fireplace, built-ins, carpet, lg. corner lot, house 3 yrs. old, new FHA appraisal, $19,950. Stiver, 256-6457.

3-BDR., BRICK, 1½ baths, full carpets-drapes, fireplace, covered patio, air, walking to all schools. Starkovich, 298-5847.

ROBERSON 3-bdr., den, LR w/fp, 1¾ baths, dbl. garage, dbl. corner lot, 5¼% loan & large down, or refinance. Shaut, 299-8569.

3-BDR. Roberson, 1¾ baths, pitched roof, dbl. garage, fireplace, hw/floors, Eubank-Candelaria area, FHA appraisal $16,400. Tendall, 256-0712 after 6.

$75 payments on 2-bdr. home, separate furnished apt. brings $60, both new inside & out, range & refrig., carpet, etc., $450 down. $13,850. Bascom, 299-9044, 299-1662 or 255-4772.

WANTED

GOOD USED 10" table saw. Kjeldgaard, 296-2212.

BICYCLE, girl's 5 or 10 spd. derailor, 26". Fisher, 299-9235.

SMITH & WESSON 44 Magnum revolver, Souder, 282-3121.

RELIABLE Jr. High school girl desires babysitting, weekends only, NE Heights. Downs, 299-1537.

RIDER for car pool from vicinity of Cooper & Juan Tabo or Foothills Estates to Bldg. 880/860, parking lot, drive one day per week. Bartlett, 299-4861.

LAWN SWEEPER. Smith, 299-6873.

RIDE TO UNM to make 9:30 a.m. class on Mon., Wed., Fri. Kromer, 296-6157.

WHEELBARROW, big, stout. Shunny, 265-1620.

FOR RENT

3-BDR. HOUSE, furnished, to share w/male owner, NE section, $55/mo. Gallo, 298-1089 after 5.

LOST AND FOUND

LOST— Check book, key chain w/single key for Chevy pickup & red medallion; calendar wrist watch w/IAM emblem on face, black leather 3-fold wallet w/ID cards. LOST AND FOUND, tel. 264-2757, Bldg. 610.

FOUND—Bi-focal Rx glasses. LOST AND FOUND, tel. 264-2757, Bldg. 610.

VERY INTERESTING, but stupendous, is the word from (l to r) Sandy Floyd (4372), Bill Weinbecker (4252) and Margaret Piberghian (Coronado Club staff) describing tomorrow night's Octoberfest Hofbrau at the Club. The fun starts at 7 p.m. with a great German food menu and free beer. The MBC trio will play for dancing.

Coronado Club Activities

Annual Octoberfest Hofbrau with German Food Opens Tomorrow

Tomorrow, the Coronado Club's annual Octoberfest Hofbrau opens at 7 p.m. with a spread of German food guaranteed to delight the most demanding connoisseur. The Club's staff goes all out for this one — the dinner buffet will feature the finest sauerbraten, knockwurst and sauerkraut. Pig knuckles, a selection of salads, and deviled eggs and apple strudel will round out the menu. Free beer goes with the food.

Dancing starts to the MBC trio at 9 p.m.

Tickets (members $3, guests $3.50) should be picked up tonight.

* * *

Social Hours

Tonight, Sol Chavez and the mighty Duke City Brass will make the happy music while the seafood buffet is spread. The buffet costs $1.25 for members, $1 for kids.

On Friday, Oct. 25, Tommy Kelly's trio will be on the bandstand while the Club's famous chuckwagon roast beef is wheeled out for the buffet. The price is $1.75 for members, $1.50 for kids.

On Friday, Nov. 1, the southern fried chicken buffet will be the food feature while the music for dancing expands to a special four-hour session. Elton Travis and the Westernaires will play from 6 until 10 p.m.

ROARING TWENTIES party scheduled Nov. 2 at the Coronado Club requires costumes and masks. Getting an early start on the project are (from left) Mrs. R. J. Dye, Mrs. A. H. Koontz, and Mrs. H. L. Crumley of the Sanado Club. Prizes will be awarded for the best costumes.

Football Bus

Tomorrow afternoon, the buses leave the Club at 1 p.m. for football fans who want to beat the parking lot situation while the Lobos tackle San Jose State. The buses return to the Club after the game and social hour prices will be offered in the main lounge.

* * *

Bridge

Duplicate bridge meets Mondays at 7 p.m.

* * *

Ski Equipment Barter

The Coronado Ski Club will hold its annual ski equipment exchange on Oct. 29, 7:30 p.m., at the Club. Members may buy, sell, or exchange ski equipment of all types during the meeting.

Welcome . . . Newcomers

Sept. 30 - Oct. 11

Albuquerque

*Cathleen G. Casper	3252
*Helene L. Chavez	3252
*Evelyn L. Harris	3252
*Mercedes T. Ipiotis	3252
*Linda S. Klattenhoff	3252
Donald E. Lent, Jr.	3415
*Dora T. Montoya	3252
*M. Helen Payne	3252
Barbara H. Reynolds	3126
*Annabelle Sanchez	3252
Margaret I. Smith	4364
Ronnie G. Stone	3415
*Lucille D. Vigil	3252
*Magdalene Vigil	3252
Mary E. Woods	3126

Colorado

Donald D. Wolfe, Boulder	3432

New Jersey

Eugene H. Fornum, Plainsboro	5154

* Temporary

Sandia Safety Signals

Freeway Roulette

Tailgating remains the freeway's most prevalent form of Russian Roulette. The practice of driving close to the car in front at 60 miles per hour is not universally lethal, just sometimes. So the tailgater hangs in there, say Monday through Thursday, always a few feet from the car in front, without incident. But suddenly, on Friday, his number comes up in this deadly game and he is left to contemplate (in the midst of his wreckage) the folly of freeway roulette.

Short-Timers Long on Results

Research Division Makes Effective Use of Employees Awaiting Clearance

Do people "peak" early on a new job? Crystal Lattice Defects Division 5111 has some reason to believe they do in the light of their wide experience with all kinds of employees awaiting clearance. Their division gets big results from the short-timers.

As the only research group located outside of the Laboratories' security area, the division serves as a year 'round site for these people.

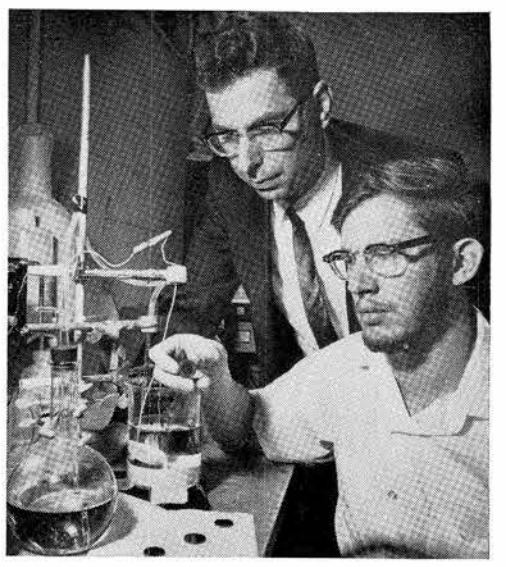
"Last summer every desk in our building (803) was occupied and one man was stashed away in the conference room. We didn't have any Youth Opportunity Campaign (YOC) trainees, which was just as well because we ran out of space," explains Fred L. Vook, division supervisor.

Significantly, the short-timers have made noteworthy contributions to the organization's program. "We've found that graduate students who are here for the summer start slowly the first month, then peak rapidly—they want to have something to show for their summer's work. Visiting professors and technical institute graduates awaiting their clearances tend to start their task immediately. In all cases, a staff member must work closely with them and the newcomer's responsibilities are well-defined," Mr. Vook says.

For six months this year, Professor Don E. Harrison of the Naval Postgraduate School at Monterey, Calif., was assigned to the division. He used a computer simulation technique to see what happens to the lattice structure of semiconductor crystals when ions are implanted and to determine how ions lose energy when they are trapped in channels within the crystals. His work in Division 5111 with D. K. Brice and Mr. Vook has already been reported in two technical papers and a third paper is in the writing stage.

Another visiting professor was Miles V. Klein of the University of Illinois. During his one month's stay, he developed a theorem for resonant phonon scattering. (In a nonmetal, the quantized lattice vibrations, or phonons, are the sole carriers of thermal energy.) Impurities in crystals will scatter phonons at a resonant frequency. The theorem shows that for a wide range of resonances, the peak average phonon scattering rate is practically independent of many properties. This theorem already has been used to determine scattering of the oxygen-hydrogen radical in potassium chloride (KC1), and it can be used in general to predict thermal conductivity changes in crystals.

James C. Tsang, a doctoral candidate at Massachusetts Institute of Technology, was with the Division for three months and worked closely with George Arnold.



SIGNIFICANT RESEARCH contribution was made by Tom Roberts (right) Duke University student, during his summer with Crystal Lattice Defects Division 5111. Discs being shown to Fred Vook (5111) contain thin layers of silicon which can be studied for impurities.

Their interest was in optical luminescence of cadmium sulfide, a crystal with wide commercial applications as a phosphor.

Another PhD candidate this summer was Tom Roberts, who attends Duke University. Using anodic stripping, he developed a method to remove thin layers—about 300 angstroms — from silicon to determine the depth distribution of impurities (there are 10-billion angstroms in a meter). Tom also did mechanical design work on cryostats to implant ions into crystals at low temperatures, and developed computer-codes for equations that describe the focusing properties of ion beams by a quadrupole magnet.

A staff aide temporarily assigned after graduation from DeVry Technical Institute, Mikell Lambird (now 2611), worked with Herman Stein and Fred Vook on a study of infrared absorption properties of carbon- and oxygen-doped silicon and made contributions to the resulting technical paper.

Another DeVry grad, Tony David, Jr., (now 2321) installed electrically-controlled coaxial switches on an electron paramagnetic resonance spectrometer under the supervision of Keith Brower.

As Mr. Vook summarizes, "We've found that new people generate new ideas and different approaches and are productive even in a short time. They in turn get a better insight into Sandia's research efforts."

Authors

R. A. Graham (5132) and W. J. Halpin (1641), "Dielectric Breakdown and Recovery of X-cut Quartz Under Shock-Wave Compression," October issue, JOURNAL OF APPLIED PHYSICS.

R. T. Meyer and J. M. Freese (both 5271), "A Reaction Vessel for Flash Photolysis and Time Resolved Mass Spectrometry," November issue, REVIEW OF SCIENTIFIC INSTRUMENTS.

L. V. Rigby (1642) and D. A. Edelman (1643), "A Predictive Scale of Aircraft Emergencies," October issue, HUMAN FACTORS.

R. L. Schwoebel (5273) and W. P. Ellis (Los Alamos Scientific Laboratory), "Low Energy Electron Diffraction from Surface Steps on UO_2 Single Crystals," Vol. 11, pages 82-98, SURFACE SCIENCE.

R. W. Cohrs (4544), "Fire Protection at Sandia Corporation," September issue, THE FIREMEN.

R. L. Kruse (1713) "Rings in Which All Subrings Are Ideals. I," Vol. 20, No. 4, pages 862-72, CANADIAN JOURNAL OF MATHEMATICS.

M. M. Sluyter (9341), "Similar Solutions for Unsteady Magnetohydrodynamic Couette Flow," August issue, PHYSICS OF FLUIDS.

O. L. George, Jr. (9322) and J. D. Whitfield (Arnold Engineering Development Center), "An Extended Correlation of Hypersonic Conical Normal Force Data to Large Incidence," September issue, AIAA JOURNAL.

M. J. Sagartz (1541) and M. J. Forrestal (1222), "Membrane Response of a Two-Layered Circular Shell Including the Effects of an Interlayer Bond," September issue, AIAA JOURNAL.

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