



SOUND OF HOPE? Eyes speak louder than words in this young visitor at Salvation Army headquarters. Listening to Veloy Johnson (4333-3) play with the Army's band a young man dreams of what? — a full meal? shoes? clean bed? scattered family brought together? ECP dollars given by Sandia Lab employees help make his life tolerable. (See "Your ECP Dollars" on Page Six.)

AEC Seeks Bids for Remodeling Work In Area III Bldg. and 802 in Area I

The Atomic Energy Commission advised contractors last week that bids will be sought soon for two construction projects at Sandia Laboratory.

Bid invitations will be issued about Aug. 24 for modifications to Bldg. 6501 in Tech Area III. The building, which has been used as the area maintenance shop, will be modified for mock-up and assembly work of Environmental Test Operations Department 7320. Bids are scheduled to be opened Sept. 20, with project work to be completed within 100 days after the contractor is told to proceed. Murl B. Moore (4543-3) is the Plant Engineering Department project engineer.

The work includes installation of a six-ton crane, removal of

existing partitioning and doors, and furnishing and installing new overhead doors. Also included are modifications to the building's power, lighting and plumbing systems.

Bids are scheduled to be invited Aug. 30, and will be opened about Sept. 27, for interior modifications to the architectural, electrical and mechanical systems in the south wing basement of Bldg. 802.

Work is to be completed in 90 days. Additional modifications include the disconnecting, moving, and reconnecting of photographic processing equipment used by Still Photography Division 3467. Plant Engineering project engineer is Ken D. Harper (4543-3).

F. L. Vook Will Present Paper at International Conference in Japan

F. L. Vook (5311) will be among scientists from universities and laboratories in 12 countries who will present technical papers at the International Conference on Crystal Lattice Defects at Kyoto, Japan, Sept. 7-12. Prior to this conference, he will attend a symposium in Tokyo on Mechanical Aspects of Lattice Defects.

J. S. Koehler, a consultant to Sandia Corporation, is co-author of two papers which will also be given at the meeting. He is a faculty member of the University of Illinois.

The symposium and conference are being held under the auspices of the International Union of Pure and Applied Physics, organized by the Physical Society of Japan.

Mr. Vook's conference paper, entitled "Lattice Strain of Isolated Defects in Elemental and Compound Semiconductors," reports measurements of the change in length of electron-irradiated semiconductor crystals at very low temperatures. These measurements are directly related to a description on an atomic scale of lattice defects introduced into solids.

Professor Koehler is co-author with F. Seitz, head of the Physics Department at the University of Illinois, of a paper entitled "Non Equilibrium Point Defect Concentrations." G. Liebfried, of the Technische Hochschule, Germany, is co-author of the second paper,



F. L. Vook

"The Interstitial Configurations in Copper, Silver, and Gold."

The study of lattice defects at Sandia Laboratory is a very active program, with work being carried out in production of lattice defects by radiation; nature of lattice defects produced; kinetics of annealing; interaction of lattice defects with electrons and phonons; and interaction between point defects and the formation of multiple defects.

ECP Drive Oct. 1-3

100% Fair Share Pledge Would Be Stroke Against Illness, Want

Two goals are in mind for the Sandia Laboratory Employees' Contribution Fund drive Oct. 1-3, according to J. W. Hook (4110), chairman of the ECP Committee.

The goals: First, 100 per cent participation by employees, and second, a fair-share pledge from each employee.

What's a "fair-share pledge?" It has been described by the com-

mittee as equivalent to one hour's pay each month.

If an employee's pay is \$2 per hour he would need to pledge only 45 cents per week to do his fair share. If his weekly pay is \$130, his fair share is 75 cents per week. An employee earning \$900 per month is doing his fair share with a \$5.25 monthly deduction to ECP.

If all Sandia Laboratory em-

ployees become fair-share members of the ECP the needs of the local health and welfare organizations would be more nearly met.

"The need for those who have, to help those who have not, is greater than ever," Jim Hook reminds us. "Our fair-share request is so small that it takes a particularly insensitive person to turn his back on the needs of his fellow men."



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AUGUST 17, 1962



ASSISTING ENGINEERS in machining problems is an important part of a Branch Shop supervisor's job. J. A. Hay (4252-2) is going over a drawing brought into the Bldg. 892 Branch Shop by John T. Geohegan (2451-1).

Prototype Models for R&D Pose Major Challenge for Development Shops

Sandia Laboratory's Development Shops originally consisted of a truck-mounted machine shop, a welding shop on another truck, and a steel building hauled in from Wendover, Utah. The contrast as seen today is unbelievable. Now, only 17 years later, the shops are housed in a complex of buildings. And the variety of crafts represented is extensive.

Director R. J. Hansen (4200) has more than 600 employees representing 25 crafts reporting to him. Investment in equipment for the Development Shops is approximately \$5,400,000. This includes unusual facilities, such as plastics, scientific glass, and ceramics.

"Our job is to support research and development activities at Sandia," Mr. Hansen explained. "We do this with some of the finest and most capable craftsmen in the United States."

Many of the employees have "grown" with the 4200 organization; more than half have 10 years' service, and 18 have already received their 15 year service pins. This is no production line oper-

ation. The Development Shops work primarily on prototypes and development (or "breadboard") models. Once this phase is passed, the item is turned over to commercial contractors so as not to limit the 4200 capabilities and thereby deny service to organizations needing initial support.

This is a change from the original "machine shop" on abandoned Oxnard Field (which later became Sandia Base). A. E. Hall, supervisor of Specialties Division A, 4221, who was with the original group, recalled that immediately after the Japanese surrender, weapon component assembly performed at Wendover was moved to Albuquerque. Assembly of components for testing purposes was carried out in a steel Butler building, and limited modifications were made in the shop trucks.

Building Added

In January 1946 a wooden lean-to, added to the steel building, gave the operation a more permanent look. Additional personnel arrived from Los Alamos and surplus machine tools were moved in from Kirtland AFB. When the

first phase of Bldg. 840 was completed in early 1950, the mushrooming shops were consolidated under one roof. Production unit work was gradually de-emphasized, and specific facilities were established to back-up changing areas of interest in research and development.

There is a constant effort to keep abreast with ever-present changes in craft techniques. In addition, Sandia engineers often require processes, applications, or use of new materials which are at the frontiers of the state of the art.

Knowledge of advances in technology is obtained from frequent contact with other AEC contractors, Bell Telephone Laboratories, and Western Electric Company. There is an exchange of ideas in professional meetings, information available in technical journals, and specialized courses offered out-of-hours at Sandia and at the University of New Mexico. These courses are taken voluntarily by

(Continued on Page Four)

Editorial Comment

Economics Literacy Via TV

Qualifications are abundant in the man who claims to be a physicist, biologist, agronomist, or psychologist. But, in this free society, any man may claim to be an economist — and this is probably right. The only question is whether he is a good, bad, or indifferent one.

Economics is both the bone and fiber of our existence. As with anything else, the better we understand our economy, the better our skill in keeping it healthy. Yet, most Americans know little about the economics of the country. Discouraged early, perhaps by dull textbooks, many otherwise responsible citizens today have only apathy and inertia for economics.

The Rockefeller Report on Education has this to say, "Among the tasks that have increased most frighteningly in complexity is the task of the ordinary citizen who wishes to discharge his civic responsibility intelligently." As the task grows, so must the abilities of the citizens to cope with it.

This is what the new educational movement, reported elsewhere in this issue of the **Lab News**, is all about. It undertakes a mission to teach the nation's students and adult citizens to think clearly and objectively about economic issues. The mission is taking the form of a nationwide television class, "The American Economy." Not for the slightly interested or the faddists, the course will be offered on most CBS-TV stations at 6:30 a.m. In Albuquerque it will appear on KNME-TV at 10:30 a.m. and again at 5:30 p.m. daily, beginning Sept. 24. It will not be telecast by the CBS-TV outlet in Albuquerque.

In the San Francisco Bay Area the program will appear on KPIX-TV Channel 5 from 6 to 6:30 a.m. weekdays beginning Tuesday, Sept. 25. A special preview series entitled "Money Talks" will be shown during the evening hours Aug. 20-24 on KPIX-TV.

Economics isn't quickly grasped like politics and it is difficult to demonstrate by a swift, striking example such as a national convention demonstrates politics. And because it is such a multifaceted, hard-to-bite-into subject, economics in its variety of interpretations has confounded students and teachers alike.

Dr. R. A. Gordon, chairman of the University of California Department of Economics, says, "Widespread economic literacy is essential if we are to maintain the visibility of an economic and political system based on individual freedom and responsibility. As consumer, worker, saver, and owner of some wealth, the individual in our society is concerned with economic questions during virtually every waking hour."

Each of us might start becoming better acquainted with the roots of free enterprise by taking time to learn the exciting things in store for students of "The American Economy."



P. Creagh



T. S. Edrington



R. G. Elsbrock



C. C. Fornero



R. Martin



J. C. Mick

Coronado Club Members Elect Six Representatives to Board of Directors

Six Coronado Club members were elected to the Club's Board of Directors at the annual meeting on Aug. 6. The new directors are R. G. Elsbrock (3211-

1), C. C. Fornero, Jr. (3153), T. S. Edrington (7147), J. C. Mick (4251), Peter Creagh (AEC-ALOO), and Robert Martin (ACF). The four Sandia directors were elected to two year terms; Martin and Creagh to one year terms.

In addition to the appointed directors, W. G. Funk (3120) and T. B. Miller (AEC/SAO), four directors will serve the second year of a two-year term. They are J. M. Kelly (2632-2), P. H. Arnold (3451-1), J. A. Woodley (2343), and R. E. Berry (7112).

At a meeting of the newly-elected board on Aug. 7, Jim Kelly was elected president, Phil Arnold, vice president; Bob Berry, secretary, and Peter Creagh, treasurer.

Congratulations

Born to:

Mr. and Mrs. Richard Gallegos (7243) a daughter, Gwen Dee, July 21.

Mr. and Mrs. J. R. Ashcraft (7242-1) a daughter, Rachel Marie, on June 29.

Mr. and Mrs. Harry Chaney (1431) a daughter, Michelle Annette, on July 26.

Mr. and Mrs. Charles Westmark (1431) a son, Brian Charles, on Aug. 1.

Mr. and Mrs. David Barham (5151) a son, Gary Scott, on June 14.

Mr. and Mrs. James F. Cope (5413) a daughter, Renee Kathleen, on Aug. 6.

Mr. and Mrs. Richard Gonzales (4212-2) a son, James Mathew, on July 7.

Mr. and Mrs. Charles Lowe (3452) a son, Robert R., on June 6.

Sympathy

To Roscoe G. Brooks (4232-4) for the death of his father in Blackwell, Okla., July 28.

To Bonnie Montano (4573-1) for the death of his father in Los Lunas, N. M., July 24.

To Sarah Long (6021-1) and Claudine Sproul (3444-1) for the recent death of their mother in Wellston, Ohio.



SANDIANS D. H. Habing and H. N. Woodall (extreme right) position component adjacent to the pulsed reactor in one scene for a filmed semi-annual BTL report on the Nike Zeus program. (L to R) Director T. T. Sharsky and cameramen Richard Cunha and Michael Shroyer shot several scenes at Sandia Laboratory July 19.

BTL Filmed Nike Zeus Report to Show Sandia Pulsed Reactor Test

The pulsed reactor, a missile component, H. N. Woodall, and D. H. Habing (both 5321) played leading roles in film footage taken at Sandia Laboratory July 19. The footage will be part of a Bell Telephone Laboratories semi-annual report to the Department of Defense on the Nike Zeus project.

T. T. Sharsky, who has been Nike Zeus project coordinator for BTL for the past three years, directed a crew of three men from MPO Production Company, New York City. Other phases of the anti-missile program at Kwajalein, Vandenberg AFB, and White Sands Missile Range, had already been photographed. Mr. Sharsky will write the narration for the film under the direction of Jack Leuddeke of BTL.

The 16mm color movie will run approximately 30 min. in finished version.

"We try to introduce a new facility in each report," Mr. Sharsky explained. The Sandia

Laboratory scenes showed the two Sandians placing a component adjacent to the pulsed reactor prior to irradiation, the reactor's operating console, and an exterior view of the facility.

"Filmed progress reports have proved extremely successful," Mr. Sharsky said. "Written reports on a complex program such as this are highly technical, very detailed, and require considerable time to read. The movie is a comprehensive report on the entire Nike Zeus project, and is shown to the Pentagon, special Department of Defense committees, and Zeus subcontractors." The last report featured interception of a Nike Hercules by a Nike Zeus. The current report will highlight another mile-post—intercept of an Atlas ICBM - boosted target vehicle launched from 4500 miles away.

Western Electric Patent Official Visits Sandia

C. H. Nanz, Assistant General Patent Counsel, Western Electric Company, visited F. C. Cheston, General Attorney, and R. M. Betz, Manager of Patent Department 6010, on July 31-Aug. 2.

The purpose of his visit was to familiarize himself with some of the Sandia activities out of which patentable inventions may arise. Mr. Nanz works with Department 6010 on patent matters.

Mr. Nanz was also given a tour of the hypersonic wind tunnel facility and much of the equipment in the environmental testing area.

Mr. Nanz and Mr. Betz then visited Livermore Laboratory where Mr. Nanz was briefed on various aspects of the patent functions there.

Sandia Papers to Be Presented at Meeting Of Physical Society

Technical papers written by six Sandians will be presented at the American Physical Society meeting to be held Aug. 27-29 at the University of Washington in Seattle.

They are: "Expansion and Thermal Conductivity of GaAs upon Low Temperature Electron Irradiation" by F. L. Vook (5311); "Nuclear Magnetic Resonance of Cr⁵³ in CrCl₃ and CrI₃" by Albert Narath (5151); "Invariant Imbedding Approach to the Schrodinger Equation" by C. J. MacCallum (5411); "The Molecular Configuration of Trisacetylacetonatomanganese (III)" by J. R. Brathovde (5414) and Bruno Morosin (5152); and "Surface Charge Layers in BaTiO₃ Whiskers" by John C. Crawford (5131) and R. D. Dragsdorf of Kansas State University.

H. G. Page Retired Aug. 16; To Live In San Bernardino

Herrmann G. Page, an employee at Sandia Laboratory for nearly 11 years, retired Aug. 16. He was a mechanical engineer in Climatic, Centrifuges and Nondestructive Test Section 7322-2.

Mr. Page and his wife plan to move to San Bernardino, Calif., to be near their two children and seven grandchildren.

After getting settled in their new home, Mr. Page will resume his interest in music (he plays piano and violin). He also enjoys playing chess, which he admits is a very time-consuming hobby.

Jewette Bowlers Meet

Jewette Bowling League meeting will be held Tuesday, Aug. 28 at 7 p.m. in La Cana Room, Coronado Club.



J. Fern Robinson (4212)

Take a Memo, Please

Run-down heels and haste can combine to create a hazardous situation, almost guaranteed to cause a sprained ankle.

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Television Economics Course to Unravel Mental Tangle Surrounding Confusing American Issues and Problems

Ever pin down the reasons behind steadily creeping cost of clothing and canned food, of gasoline and garden spray, of most consumer goods and services? Ever wonder why America imports so many products from foreign countries, or if American families really can live "on the cuff" and like it? What's behind supply and demand and continued chronic unemployment in certain areas? Is the "Common Market" good or bad for us?

Maybe you'd like to sell your house, buy a new car, or better appreciate the financial page parlance of the newspapers. What happens when they cut taxes, or when they don't? How does the daily status of the gross national product affect you personally? What is the GNP anyway?

Of these and many another everyday economic issues and problems, most Americans are frightfully foggy. But happily, the fog may partially clear through an improvement effort being headed by such widely respected organizations as the American Economic Association, the Joint Council on Economic Education, the National Task Force on Economic Education, and the Learning Resource Institute.

The effort is a nationwide television program called "The American Economy" which will be offered this fall. It is part of CBS-TV "College of the Air." The course will be narrated by Dr. John R. Coleman, head of the Economics Department at Carnegie Institute of Technology.

"The American Economy" will be telecast twice daily in Albu-

querque, Monday through Friday, over KNME-TV, once at 10:30 a.m. and again at 5:30 p.m. University of New Mexico will offer two hours credit per semester for those completing Department of Economics requirements. The University of California will offer three credits in the Department of Correspondence for the Course.

In San Francisco Bay Area it will be shown on KPIX-TV every weekday at 6 a.m. beginning Sept. 25. A week-long preview series entitled "Money Talks" will be shown each evening Aug. 20-24 on KPIX-TV.

The program will be carried by most CBS-TV outlets at 6:30 a.m. It will not be telecast by the CBS-TV outlet in Albuquerque.

If economics has been dull and difficult in the past, "The American Economy" is the brightest effort yet to bring it to life and make it meaningful in the future. Many organizations, the Bell System among them, have contributed financially to the course. Participating on the program will be representatives from various segments of the national economy. Frederick R. Kappel, board chairman of American Telephone and Telegraph Company, will be among those taking part.

The curriculum will cover 15 general subjects. Typical are: America's Resources to Meet America's Needs; Income, Jobs, and Prices; Competition, Monopoly, and Points In Between; Government Taxing and Spending; Understanding a Market Economy; The United States and The Undeveloped Nations.



THE AMERICAN ECONOMY — National teacher of the television course on economics, Dr. John R. Coleman, left, and British Economist Herbert S. Morrison will appear on the fall series. Also appearing will be F. R. Kappel, Chairman of the Board, American Telephone & Telegraph.

Educational Aids Applications Due From Employees Taking Fall Studies

Sandia Lab employees planning to take college credit courses under the Educational Aids Program should file applications as soon as possible, according to Staff Training and Education Division 3131.

Registration at the University of New Mexico is scheduled for Sept. 20, 21, and 22. College of St. Joseph registration will be held Sept. 10.

Payment of 50 per cent of tuition costs and up to seven and a half hours per week for attending class and traveling are provided by the Educational Aids Program.

Employees who wish to avoid the cashier's line during registration may attach a personal check, for half tuition costs, when submitting their application to their supervisor for approval. A receipt will be sent by Section 3131-2 to the employee indicating that half the tuition has been received.

Time-off provisions may be used in any combination for juniors, seniors, and graduate students when classes are not available outside working hours. Juniors and seniors will be granted time off for classes only at the beginning or end of the work day and the hours just before or after the noon hour. Graduate students may take time off at any time

Look Looks at A. T. & T., As 'World's Biggest Business' Enterprise

Look magazine gave mention of Sandia Corporation in its Aug. 28 lead story on A.T.&T., "World's Biggest Business."

A full-page color photograph is entitled "Big-Bomb Makers in New Mexico." The caption explains that AT&T's most secret defense job takes place on the desert near Albuquerque, N. Mex., where Sandia Corp. designs and tests arming and firing mechanisms for nuclear weapons. The magazine points out that the centrifuge, one of the largest in the world, whirled warheads to simulate launch and reentry speeds.

Several pages later in the main text, Sandia is identified as a non-profit subsidiary which develops the "nonexplosive parts of nuclear warheads."

during the work day.

Employees and their supervisors are encouraged to consider projected work loads and required out-of-town travel before enrolling under the Educational Aids Program. Course withdrawals are expensive in both time and money for employees and the company.

Additional information is available from Section 3131-2, Bldg. 300, ext. 45157.

F. K. Truby Article In Technical Journal

"Energy Transfer in Irradiated Alkyl Disulfides" was the title of an article by F. K. Truby (5153), which appeared in the notes section of the Apr. 15 issue of *Journal of Chemical Physics*.

No job is so important and no service is so urgent that we cannot take time to perform our work safely.



ELECTRIC HEATERS, called in last week by Plant Engineering Department 4540, are piled high awaiting complete checking and overhaul by electricians in 4511-2. Frayed cords, such as the one held by Billy D. Thompson above, will be replaced along with other defective parts. All heaters should be turned in to Division 4542, Bldg. 887, ext. 21158.

Two Livermore Lab Men Have Narrow Escape in Accident

W. J. Howard (8100) and R. L. Brin (8160) had a narrow escape Aug. 6 when the plane in which they were passengers skidded and crashed while taxiing toward the terminal at Knoxville, Tenn.

No injuries to any of the passengers were reported, but the plane ripped off a wing when it skidded off the runway during a violent storm.

This was the first near-disaster involving Livermore Laboratory personnel flying in commercial airlines. As many as 300 trips are made by Livermore Lab employees in a single month.

Mr. Howard and Mr. Brin were bound for Y-12 at Oak Ridge when the accident occurred. They continued on without mishap.

Environmental Health To Be Responsible for All Respirators in Lab

Environmental Health Division 3311 is checking on all respirators at Sandia Laboratory.

Hereafter, respirators will be considered "on loan" from 3311 to the using organization. The new system will increase safety and provide a method of control for quarterly check-ups of respirators.

"A respirator is a very individual device," according to R. J. Everett, supervisor of Industrial Hygiene Section 3311-1. "It must be fitted properly to the person using it, and it must be properly fitted with the right filters for the proposed job."

The Environmental Health Division is asking all Sandia Lab organizations to report to that division, in writing, the quantity and manufacturer's stock number or style of all respirators in their possession. If respirators are no longer needed they may be turned in to 3311. In the future, the section will fit, issue, and store all respirators.

Supervisory Appointments

JACK L. BOLEN to supervisor of Section 8151-1, Acceptance Equipment Design Division, Livermore Laboratory.



Jack joined Sandia in September 1956, where he has been employed in project group and preliminary design work. Before 1956, Jack worked for six years as a design engineer at the Puget Sound Naval Shipyard, Bremerton, Wash., designing steam catapult systems for planes on aircraft carriers.

A mechanical engineer, Jack received his BS degree in 1950 from Montana State College in Bozeman.

STEWART A. INGHAM to supervisor of Section 8126-2, Device Support Division I, Livermore Laboratory.



Stu has been with Sandia since 1956. He was hired in Albuquerque as an electrical engineer and assigned to Manufacturing Relations. He

later transferred to full-scale testing, and participated in Operation Plumbbob and Phases 1 and 2 of Operation Hardtack. In July 1959 he transferred to Livermore Laboratory where he has worked in full-scale testing and telemetry development organizations.

A graduate of the University of Wyoming at Laramie, Stu received his BS degree in electrical engineering in 1956.

Stu served four years with the Navy during the Korean conflict as an aviation electronics technician aboard an aircraft carrier.

He is a member of the Institute of Radio Engineers and the American Institute of Electrical Engineers.

JAMES S. GRUVER to supervisor of Electronic Design Drafting Section 8114-3, Drafting Division, Livermore Laboratory.



Jim joined Sandia at Livermore in November 1957 as a Staff Assistant mechanical draftsman. Before coming to Sandia, he worked seven and a half years in the machine shop and the engineering department of Gerlinger Carrier Company, Dallas, Ore. Before that, he had his own dairy farming business.

A graduate of Porterville (Calif.) Junior College, Jim received his Associate of Arts degree in 1942 majoring in mechanical and architectural drafting. He also attended the Oregon College of Education, Monmouth, Ore., for one year, studying math and science, and has taken evening courses in math at Diablo Valley College.

LESLIE E. WEST to supervisor of Programming Section II, 3451-2, Electronic Data Processing Department.

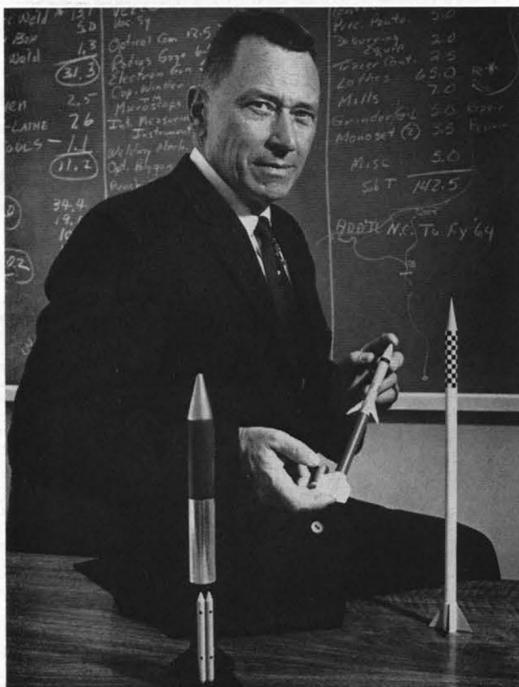


Les has been at Sandia since 1946, working initially in engineering design and development. The past five and a half years he has been assigned to the electronic data processing organization.

He came to Sandia immediately after serving three years in the Navy.

Les received his BS degree in electrical engineering from the University of New Mexico, and is a professional registered engineer in New Mexico.

Prototype Models Made by Skilled Development Shops Craftsmen



DELICATELY-BALANCED wind tunnel models of missiles are displayed by R. J. Hansen, Director of Sandia Laboratory's Development Shops, as representative of work undertaken by 4200 craftsmen. Every skill in the machine trades is called upon to fabricate models such as these.

many of the craftsmen and supervisors in 4200.

Broad experience and technical know-how are needed to maintain rapport with engineer "customers." Engineers on some projects may be able to offer prints or written specifications to denote exactly what they need. In such cases there is only a minimum amount of contact between the engineer and the Development Shops.

Other times, an engineer may have an objective firmly in mind, but have only a nebulous idea as to how it can be achieved. Meetings are set up by 4200 supervisors to discuss the engineer's objective and to work out an approach to the problem that will enable the shops to develop the item.

Work Farmed-Out

All requests are fulfilled on a "first in, first scheduled" basis. Control Department 4210, headed by R. E. Hepplewhite, makes sure that Sandia's facilities are used to the fullest extent through careful scheduling. Routine, unclassified jobs (about 25 per cent of the total work load) are farmed out to some 40 outside firms. Nearly all of these are located in Albuquerque, and range in size from two-man operations to 20-man shops.

Staff Assistants follow through on these jobs from the engineer's initial request to delivery of the requested part. In the interim, these "shop graduates" review the engineer's specifications for completeness, supplement the information through personal contact when incomplete or perhaps suggest a change to improve the manufacturability of the product. The Staff Assistant makes a draft of a purchase requisition, listing Sandia specifications in detail, and suggesting suppliers for components. After the contract is let, these 4210 representatives maintain frequent contact with the supplier to determine if the work is progressing satisfactorily.

Taking quantity jobs to outside sub-contractors leaves Sandia's shops free to handle classified items or prototype models which often require frequent changes.

"Our motto," Mr. Hepplewhite said, "is: 'Give the engineer what he wants when he wants it.'"

This department also lends administrative support to all of 4200. It orders about a million dollars a year in non-stock material, raw stock, and expense items; keeps track of some 7000 tools in all sizes (mainly machine attachments); gathers statistics on shop performance; and maintains budget information on a daily basis.

General Machining

General machining activity is carried out by Mechanical Department 4250, headed by Walter Hall. The word "general" hardly describes the wide range of jobs completed by these journeymen. Parts being machined may be as large as six ft. in diameter or 20 ft. in length or micro-miniaturized, requiring use of a magnifying glass. Materials range from the hardest, most exotic metals, to plastics and ceramics.

The three project shops included in this department are responsible for large programs involving hundreds of man-hours, scheduled and planned well in advance. These shops are located in Bldg. 840 where they have available a wide range of equipment, and assistance from specialty shops when needed.

Approximately one-third of the 175 craftsmen in 4250 are assigned to the eight Branch Shops located throughout Tech Area I to support specific engineering organizations. These Branch Shops can accommodate rush requests, and the journeymen work from minimum specifications—often merely verbal instructions. The jobs are usually completed the same day they are brought in. The shops range in size from two to 10 men, and equipment is limited.

The Branch Shop supervisors are responsible for assisting the engineer in determining if there is a feasible solution to a machining problem, estimating time required to complete the work, ordering the material, assigning the job to a shop man, and controlling the quality of the work. Facilities of Mechanical Measurements Section 4232-1 are available to assist him.

Always Busy

Nature of the work dictates the staffing of the Branch Shops. Despite this difference, the shops do have one thing in common—they are always busy.

The engineer determines applications of new materials; the shops must keep pace in learning how to shape and work these new materials. "We're also getting into the handling of unusual materials," said Department Manager Walter Hall, "but no matter what the material, we don't miss any bets in protecting employees against physical hazards."

Personnel from Bldg. 840 are assigned to work on toxic materials in the Bldg. 868 Branch Shop as the need arises. The two drill presses, milling machine, lathe, and Doall saw are housed in individual metal and plexiglass containers. The machines are operated through portholes with long

rubber gloves attached. An exhaust system sucks out air from the enclosures and passes it through an absolute filter.

No matter where the machinist may be located, top quality is required in his work. Sandia Lab has a reputation for making some of the best small ballistic wind tunnel models in industry and some of the camera work is also outstanding (i.e., mounts, running gears, and controls for telescopes). Commercial parts are used when available.

The most recent changes in the Mechanical Department include obtaining equipment for numerical control of machine tooling. Also, the size of the miniature machine shop has been doubled within two years to meet the increased demand for more minute instrumentation with higher accuracy.

Specialties Department 4220, C. E. Runyan, Manager, is comprised of a group of shops established to provide service in those fields which were not available or where local shops could not meet Sandia requirements.

Included are such specialties as heat-treat, plating, foundry, ceramics, welding, plastics, sheet metal, scientific glass, and pattern shops. Often equipment is not available on the market to incorporate new processes, so the shops must build their own or modify existing equipment. A current example is the hot pressing equipment being added to the ceramics shop. Similarly, skilled personnel and craftsmen are often not available from industry because of scarcity or the unique nature of job requirements. This has necessitated particular emphasis on training employees to fill these vital requirements.

The scientific glass shop is frequently asked to work on advanced designs used as research tools.

Unusual Requests

Even the foundry is faced with unusual requests—such as 1000-lb. sections for a wind tunnel or a cast aluminum parabolic reflector.

Since practically every job must go into more than one shop (freelancers are involved), Shop Clerks, who are experienced in the various fields, serve as "expediteurs" and relieve the supervisors of clerical details. The Shop Clerk keeps track of materials so that the craftsman has his stock lined up for the job at hand. He also makes sure that each item moves smoothly from one shop to another.

Future plans include modernizing the plastic shop and weld-

ing shop. "We are installing additional equipment to keep up with rapid advances in technology and techniques of welding, and investigating new fields such as automatic welding for highly accurate control of processes," said Charles Runyan, department manager. The new techniques include electron beam, plasma jet, and submerged arc welding.

Mr. Runyan's department also includes several assembly shops which do minor machine work and fabrication. They mechanically assemble components for environmental tests or prepare units for experimental or development purposes. These shops also disassemble units for inspection after environmental and operational tests.

Inspection Services

R. S. Lemm is manager of Electronics and Standards Department 4230, which is responsible for a variety of functions. The organization offers four kinds of inspection service: control of 4200 shop effort; control of both mechanical and electric quality from sub-suppliers; inspection, with the very close tolerance requirements of research and development; and instrument calibration and certification service for Sandia Laboratory.

Another division works with both draftsmen and engineers in setting up product tester prototypes, utilizing standard panels, chassis and components. Similar assignments are carried out by other fabrication sections in utilizing information from research and development customers to put together field test "breadboard" models of wide variety. One section modifies or repairs electric meters, cameras of all types, and clock motors for special R&D applications.

The most unusual applications of craft knowledge are made in the printed circuitry, transformer, and physical electronics shops. The printed circuit shop has recently been expanded and has new equipment for printed circuit electronic devices and photoengraving. This shop is currently exploring the fabrication of two-sided printed circuits on curved or spherical surfaces, and miniaturized packaging (both layout and assembly). Photoengraving is employed for special name plates, templates, and to produce prototypes of small metal parts having a complex outline not easily machined.

The transformer section assists R&D personnel in physical configurations of different coils, and special purpose transformers, resistors, and thermocouples. Wire sizes range from 1/10 the diameter of a human hair up to 1/2 in. or more in diameter.

The Physical Electronics Section has been developing vapor deposition techniques to a high degree of sophistication. Usage includes coating filaments with metallic

vapors for "passing" components (such as conductors and resistors) which, combined with transistorized semiconductor, make a complete microcircuit.

Miniaturization

Another recent project was development of a miniaturized nude ionization gauge used to measure extremely low pressures in a vacuum. A commercially manufactured standard gauge, about the size of a 100 watt light bulb, was scaled down physically to the size of a pencil erasure, yet retained the same electrical characteristics as the model. Controlled atmosphere brazing of exotic materials, such as sapphire, ceramics, and many uncommon metals, is performed to produce high vacuum seals.

"Both the printed circuitry and physical electronics shops have discovered some new processes in their advanced work," Robert Lemm explained. "Customarily 1300 and 1400 organizations offer the functional parameters—what the device should do—then 4230 determines the mechanics of how to do it."

As to the future of Sandia's Development Shops, Director R. J. Hansen emphasized that there is always the job of meeting advances in technology. "We anticipate more comprehensive facilities in the line of space and buildings to provide better temperature, humidity, and vibration controls, and nearly dust free conditions. Only by applying close environmental conditions can precise results and required knowledge be achieved. We will also continue to advance the capabilities of our personnel."

Four-year machine and electronic apprentice programs are already in effect, in addition to a 4 1/2-year formal training program for technicians in the plastics shop.



VISITORS AT SANDIA — Officials of American Telephone and Telegraph Company and Mountain States Telephone and Telegraph Company were recently present at Sandia Corporation for meetings with S. P. Schwartz, President. L to R: W. K. McAdams, Vice President Defense Activities and Services, A. T. & T.; E. E. Louthan, New Mexico Vice President and General Manager, Mountain States Telephone and Telegraph Company; Mr. Schwartz; and H. T. Killingsworth, Vice President Defense Activities and Services, A. T. & T.

AEC Reports on Project Gnome Cavity in Test Result Summary

The Atomic Energy Commission has released information on the cavity formed by the Gnome detonation on Dec. 10, 1961, as part of a summary of the results to date of the project's five technical objectives. Project Gnome was the first nuclear detonation in the Commission's Plowshare program to develop peaceful uses for nuclear explosives.

Although the site of the underground detonation 25 miles southeast of Carlsbad, was placed in standby condition by June 30, 1962, many of the analyses of data and samples by the various participating groups remain to be done.

Entry was made May 17, 1962, into the cavity formed in a salt bed 1,200 feet underground. This was a part of post-detonation operations which, in addition to conducting several experiments immediately following the detonation, have included: excavating a new drift parallel to the original tunnel; cross-cutting into the original tunnel at several points both to recover instruments and samples and to survey the physical condition of the tunnel; and obtaining core samples from the cavity region.

The five technical objectives of Gnome were:

1. To determine characteristics and physical effects of underground nuclear detonations in a salt medium.
2. To explore the feasibility of converting the energy from a nuclear explosive into heat for the production of electric power.
3. To make neutron cross-section measurements which will contribute generally to scientific knowledge and to the reactor development program.
4. To provide scientific and technical information on design principles useful in developing nuclear explosive devices specifically for peaceful purposes.
5. To investigate the practicality of recovering useful radioisotopes for scientific and industrial applications.

The lower half of the cavity is filled with solidified melt and rubble, water, and fragments and blocks of rock that have spalled off the cavity walls. The present radius of the cavity at the ground-zero (point of detonation) level varies from 68 to 98 feet, while the top of the dome is about 75 feet

above ground zero. The temperature in the cavity is about 130 degrees Fahrenheit with a relative humidity of 60 to 70 per cent.

The original tunnel is intact to within about 30 feet of ground zero or to within about 45 feet of the present cavity wall. It is possible to walk down the original tunnel that far. The 45-foot section between where the original tunnel turned to form a hook and the present cavity wall is connected by a channel with a minimum height of 2 or 3 feet in the region where the neutron pipe passed through an 80-foot section of rock to ground zero.

A black low density melt, now solidified, containing pieces of what appears to be crystalline white salt, has been found between the rock beds out to 180 feet from ground zero. This melt probably was extruded into cracks and fissures by the initial high pressures in the detonation region. Also in the rock beds out to points about 200 feet from ground zero are strata of irradiated salt, most likely the result of radioactive steam being forced through the beds.

Of the 132 samples which were located 54 to 178 feet from ground zero, 110 have been recovered and are being distributed for analyses by the Bureau of Mines. These samples were placed near the detonation to determine the effects of high pressures (up to 100,000 atmospheres), temperatures, and radiation on several mineral and organic materials.

The surface rose approximately 6 feet at the time of the detonation and fell back to about 1.8 feet above its pre-detonation level. This displacement seems to be the surface expression of a displacement which exists in the rock beds above the cavity.

It has been estimated that about 1,000 tons of salt were melted by the detonation. Later, fragments of rocks fell from the cavity walls filling the lower half of the cavity with about 25,000 tons of cooler salt. On the entry by drilling from the surface on Dec. 22, the temperature in the void was greater than 212 degrees Fahrenheit and the rubble region temperatures ranged from 120 degrees to 1300 degrees Fahrenheit.

Approximately 200,000 gallons of water were injected into the rubble region and a very low grade, low pressure steam was

formed. Some data were obtained on heat transfer problems, salt corrosion, and radioactivity pickup, but the inadequate quality of the steam and the risk of additional venting into the shaft with an increase in pressure led to the termination of the power recovery studies on Jan. 19, 1962.

Although the neutron wheels were rotating at 2,600 revolutions per minute, instead of the planned 3,000 revolutions per minute, at the time of detonation, the neutron physics experiment was successful. Several new significant resonances in the 10 to 60 electronvolt region have been found in the elements studied; gold, uranium, hafnium, and thorium.

Preliminary analysis of data indicates that the yield of the device was 3 plus or minus 1 kiloton as compared with the expected 5 kilotons.

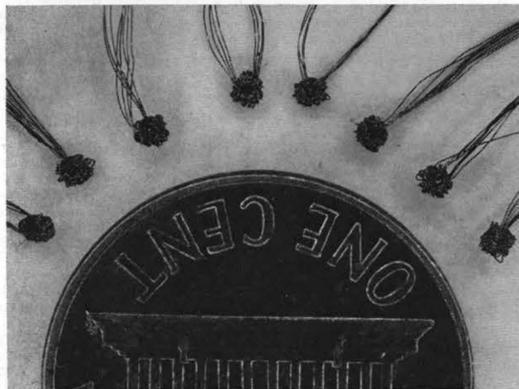
The pipe which was to have brought gaseous samples to the surface immediately following the detonation collapsed ahead of the gases and hence no prompt or immediate samples were obtained. From rather meager data it appears that the steam that escaped through the shaft apparently contained virtually all the gaseous isotopes.

It is significant that the gaseous elements separated from the solids. Thus, the recovery of gaseous elements from the cavity void, providing the cavity remains sealed, would be possible and could lead to a means of producing such elements.

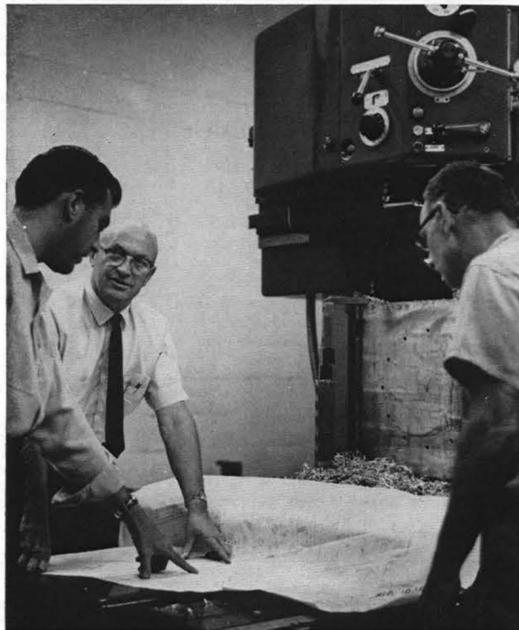
From the analyses of samples taken from the cavity region through a drill hole from the surface during January, separation of the solid radioisotopes is believed to have occurred. Recently, samples have been obtained by drilling into the lower half of the cavity and the region adjacent to the cavity. While the samples are still to be analyzed by Lawrence Radiation Laboratory, the radioactivity profiles of the samples indicate highly radioactive zones along the lower boundary of the cavity.

Need More Back Copies

Copies of more back issues of the Lab News are needed: Vol. 14, No. 2, Jan. 19, 1962, and Vol. 14, No. 8, Apr. 13, 1962. If you have extra copies, please send them to the Lab News office in Bldg. 610.



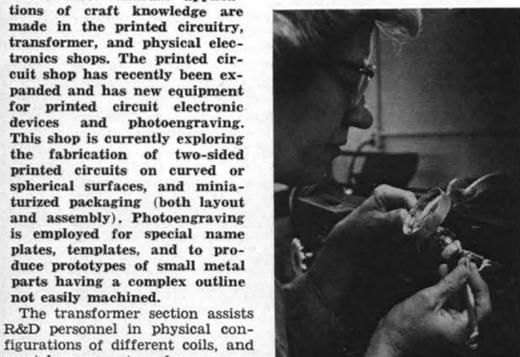
MEMORY COILS, hand wound in Sandia Lab's Transformer Shop, make American one cent piece seem almost pie-size. These are the smallest coils wound in the shop. Each has two bifilar windings of fine wire.



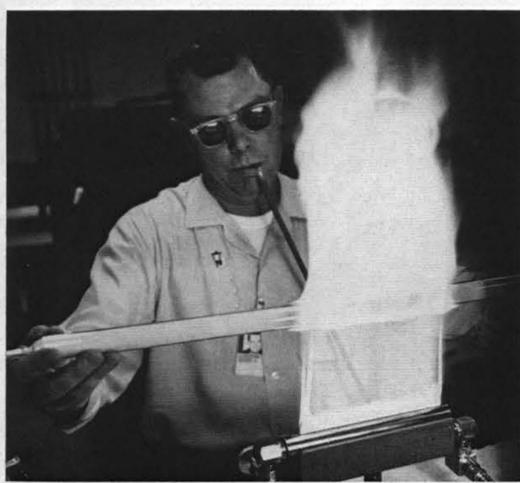
ALBUQUERQUE SUB-SUPPLIERS help keep Sandia's Shops free to work on prototype and development models. (L to R) Russ Stump, vice president and shop supervisor for Benischek Manufacturing, Inc., confers on plans for vibration test fixture with Lloyd E. Lincoln (4211-1) and tool and die maker Dick Deal. The 800-lb. aluminum cube, being worked on a Swiss-made precision jig bore, is carefully inspected.



"STONE SAW" in Metal Stock and Cutting area can accommodate pieces of metal up to 12 ft. in length and four inches thick. Phil Moya (right) is measuring aluminum stock two inches thick, while Pedro S. Ortega (both 4212-2) stands ready to operate controls for making a straight cut. Forklift is used to move metal.



EVEN TRANSFORMERS occasionally require the use of a magnifying glass. Marie K. Carlson is placing three windings of finer-than-hair copper wire around the tiny cores. The Transformer Shop has its own "clean room" for use when dust-free environment is required in working with minute assemblies.



VACUUM JACKET transfer tube, used by 1400 and 5100 organizations to transfer liquid nitrogen, is bent over heat by Warren A. Robertson in the Scientific Glass Shop. Foundry sand poured between the double tubes helps transmit the heat evenly and keeps inside tube centered.

Your ECP Dollars Go A L-o-n-g L-o-n-g L-o-n-g Way

Sandia Laboratory Employees' Contribution Plan dollars continue to fight the good fight. To study the service these dollars give, the Lab News presents more reports on the agencies receiving ECP money.

Following are accounts of visits to the Salvation Army and Albuquerque Boys' Club, both United Community Fund Agencies.

These and the other first-hand reports indicate that the ECP dollar goes a long way in the fight on illness, misery, want and need. But more dollars are needed to go an even greater distance.

ECP Distribution For Year Now Reaches \$88,661

At the end of July, Sandia Laboratory employees had given \$88,661 to the Employees' Contribution Plan since the first of December, 1961. The funds are distributed to the United Community Fund, which includes 25 local charity agencies, and to nine national health and welfare agencies.

As the July checks were mailed, the following distribution had been made:

	July Distribution	Total to date
United Community Fund	\$8,544	\$68,146
Fund		
Society	652	5,200
Bernalillo County Heart Association	505	4,034
Arthritis and Rheumatism Foundation	191	1,424
Albuquerque Association for Mental Health	112	896
N. Mex. Society for Crippled Children and Adults	483	3,855
National Multiple Sclerosis Society	78	626
Albuquerque Association for Retarded Children	179	1,433
Cerebral Palsy Association of Bernalillo County	269	2,151
Muscular Dystrophy Association of America	112	896



BETTER HEALTH, better sports, better men are products of Albuquerque Boys' Club. Larry Witt (5153) saw the program in action last week as he visited the UCF supported agency. See article for his first-hand report.

I saw youth and vigor . . .

As told by Lawrence J. Witt (5153)

The Albuquerque Boys' Club is a bright modern colorful building near the corner of Rio Grande Blvd. and Mountain Rd. Inside I found a feeling that many times over outshines the exterior.

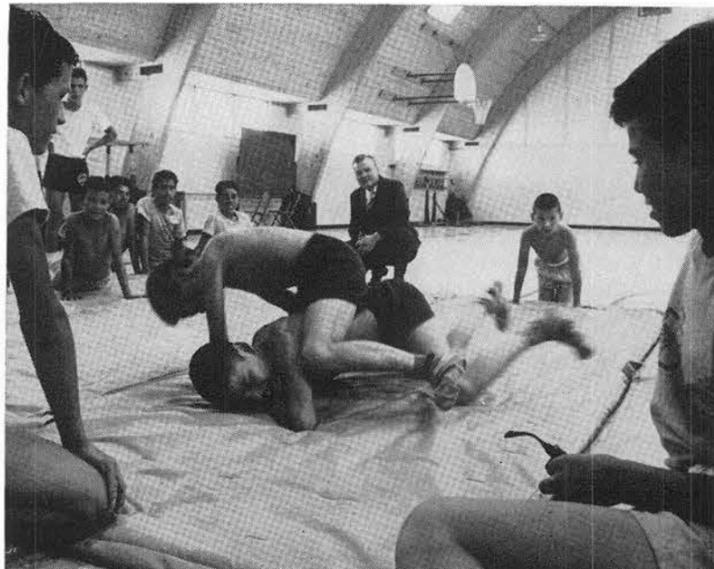
It had been a long time since I'd been in the boys' club. Albuquerque has one of the finest facilities I've seen and has a top-ranking dedicated staff. I talked with the director, Joe Baca, and the program director, Mike Harvia — two young graduates of the University of New Mexico — and watched them guide about 200 boys through touch football, gymnastics, weightlifting, table tennis, and a session on the trampoline.

The boys play hard with the kind of excitement that can only be felt by the young and vigorous. Although the program at the Boys' Club stresses athletics, it's much more than that.

For example, there was a youngster about six who would be starting first grade next fall. Mr. Baca said the boy lived with an older brother and didn't know where his parents were. When we neared the group where this boy was playing, he came over and grabbed Mr. Baca's leg in sort of a half hug, half wrestling hold. "Count to 10," Mr. Baca said. The boy did. "He couldn't do it when he first started coming here a few weeks ago," Mr. Baca said. "He was pretty shy, too."

We watched the boy go back to the group of tumblers and perform a couple of forward flips. He felt right at home.

You can't really describe the kind of need these boys have and the way the Boys' Club staff fills it. Mr. Baca introduced me to another boy. This one was about 12. He had started coming to the Boys'



GIVE AND TAKE program at Albuquerque Boys' Club was approved by Sandian Larry Witt. Boys' Club members like the strenuous life.

Club about two years ago to watch TV. He discovered the library and joined an art class. He also discovered he could paint. Last month the club exhibited the boy's paintings and presented him with an award. At school, the youngster's grades had improved and he had achieved recognition by painting many of the school's posters.

I watched a game of touch football. Bobby Santiago, the UNM varsity player, is a part-time member of the Boys' Club staff, and he was playing in the backfield with one of the teams. It was a fast game.

Bobby was continually urging his team to go. He kept encouraging the players. "Good pass," he said to one of the smaller boys. The boy's grin was so big you hardly noticed the missing teeth.

In the summer the club is open from 9 a.m. to 9 p.m. and activities are scheduled every minute of the day. The Boys' Club directed a baseball league this summer with teams participating from the city

community centers, YMCA, and other recreation programs. More than 400 boys participated every day. This was a tremendous organized activity conducted with as much efficiency as a professional league.

In the winter, a full schedule begins at the club after school.

Competiveness, aggressiveness, sportsmanship, fair play are the human qualities that emerge from these recreation programs. I say any boy who has these qualities will grow into a successful man.

The Boys' Club produces these qualities in its 1030 members. The activities are designed to appeal to all types of boys from those who create in arts and crafts to those who win weightlifting contests. The United Community funds that are spent at the Boys' Club — \$21,282 in 1961 — are well spent dollars but finance only 75 per cent of the program. None is spent for equipment. This comes from other contributions.

The Albuquerque Boys' Club certainly deserves our continued support, and more.

I learned that every dollar counts . . .

As told by Veloy Johnson (4333-3)

I never thought I would play a baritone horn in a Salvation Army band. But I did. It was fun. These dedicated people belong to a religious denomination and an organization steeped in the traditions of service.

In a way, the street corner band and its message of hope is the symbol of the Salvation Army. The organization will go to great lengths to extend its help and no one in need is ever turned away.

The afternoon I visited the Salvation Army Albuquerque headquarters at Broadway and Lead Ave., I saw these principles in action. I saw a family receive clothes and a cash grant for food. There was a room full of others waiting their turn.

Most of us at Sandia never come face to face with people in great need. The Salvation Army does, every hour of the day. The poor, the hungry, and those so degraded to be beyond caring turn to the Salvation Army.

To me, the visit was an eye-opener. I had always given my contribution to ECP with a vague feeling of "doing good." I know now how much my dollars are needed.

The Salvation Army makes every dollar count. Most of the work is performed by volunteers — and what work they do! There is a sewing circle of women who spend one day each week preparing bandages and dressings for the County-Indian hospital. They also repair clothing and help with other chores.

Volunteer leaders work with youth groups of several different ages. These groups come mostly from the neighborhood, a low income area. Activities are aimed at



FAMILY PROBLEMS — frequent in a day's Salvation Army work are solved by Mrs. Beulah McCracken, counselor. Each month clothes, food, money are provided to about 170 families by the UCF agency.

recreation but, here again, service is stressed. Each group has a project which helps others. One group of little girls collected magazines for the patients at the VA hospital, another group folded newspapers into disposable bags for use at the County-Indian hospital.

Capt. Elmer Yardley, the commander of the Albuquerque Salvation Army, is one of the busiest men I've ever seen. He took time out to show us around the new Salvation Army facilities and tell us about the work of the organization. I watched him work with a group of boys and give instructions to play a horn. That's where I sat in with the band.

He deals daily with the problems of race relations. His own attitude sets a fine example. The group was

working well together in an atmosphere of friendliness and respect.

"Yes, I'm busy," Capt. Yardley said, "but I've found that if you keep busy, you don't have time to worry about yourself or your problems. Isn't this the first requirement of happiness?"

Religion is a significant part of the Salvation Army. Capt. Yardley conducts services several times a week for persons of all faiths. He feels that social problems would be eased if people were at peace with themselves.

One little boy who is being helped by the Salvation Army said, "I don't throw rocks and break windows any more." He meant it.

Salvation Army charity, more than just doling out subsistence help, aims to get the needy person



BUSY BOY WITH BASS HORN toots with gusto. Veloy Johnson (4333-3), who plays the baritone horn herself, and Salvation Army Director Capt. Elmer Yardley approve. Music lessons are part of the agency's program.

in a position to help himself, to restore his pride, and to make him productive.

The Salvation Army exists for

this purpose. It was a worthwhile experience to see the organization's work and a privilege to help support it through ECP.



Meet Your Reporter

Diane Martin has been a Lab News reporter for Physical Research Department 5130 for three of her seven years at Sandia. Her stories have covered a wide range of subjects from technical to humorous.

In addition to her work in data reduction and math analysis, Diane also serves as secretary for the Research Colloquium Committee.

Away from work, Diane loves to bowl, play bridge, and ride horses. Last December she and her husband purchased three acres of Bosque farmland and Diane, a Chicagoan, is trying her hand at gardening. So far their livestock consists of one house cat.

Three Ardent Skiers Take Off For Chilean Snows

When Albuquerque temperatures hit the high 90's, enthusiastic skiers dream about snow-covered slopes. The thought was too much for three bachelors—they're going skiing.

Jack Hanna (3424/7300), Tom Edrington (7147-1), and Wayne Cook (7311) leave tomorrow for Chile. The seasons are reversed there and the trio hopes to hit top skiing conditions at Portillo in the Chilean Andes.

They plan stops at Mexico City and several South American countries en route.

They'll be back in three weeks and the Lab News will tell all—about skiing.

Increased Interest Being Shown in TI Class Program

More than 400 Sandia Lab employees are expected to enroll in technical institute level courses of the Out-of-Hours educational program, according to Howard R. Shelton, supervisor of Section 3132-2.

"These courses are designed especially for the staff assistants who do not have technical institute backgrounds," Howard said. "During the past three semesters about 300 employees had been enrolled. Indications are now that another 100 will join the program and work toward the equivalent of a Tech Institute degree. Others, including graded personnel, are encouraged to enroll in the program beginning Monday, Sept. 20."

Four curriculums are offered in the program: Electronics Technology, Mechanical Technology, Drafting and Design Technology, and Industrial Technology. A complete listing of courses and enrollment information is contained in the Out-of-Hours booklet now in the company booklet racks. Additional copies are available from Section 3132-2, Bldg. 815.

Sandia Gun Club To Help Hunters Sight-in Rifles

The first of a series of sighting-in shoots sponsored by the Sandia Gun Club will be held Sunday, Aug. 19, from 1 to 4 p.m. on Sandia Base rifle ranges. The ranges are located about one mile south of Gibson on Pennsylvania.

"The Sandia Gun Club is offering this opportunity as a public service to all hunters in the area as part of a nation-wide program conducted by the National Rifle Association," R. E. Adams (2452) said. "A correctly sighted-in rifle is an important step to safe and accurate shooting."

Other sighting-in shoots are scheduled Sept. 2 from 1 to 4 p.m. and Sept. 29 from 8 a.m. to 12 noon. Hunters are requested to have all firearms unloaded and actions open when entering the range area.

Summer Bowlers End Season; Also Name Winners

The 24 teams of the Sandia Lab Mixed Handicap Bowling League wrapped up summer play recently and announced winners.

In Division A, the team of Neith Pollard (1413), Shirley Pollard, Tony Repetti (1413), and Lucy Repetti came out on top with 31 1/2 points won and 12 1/2 lost. Top Division B team was L. T. McKenzie (3242), Bette McKenzie (3444), Herb MacPherson (3242), and Patte MacPherson (2624) with 28 1/2 points won, 15 1/2 points lost.

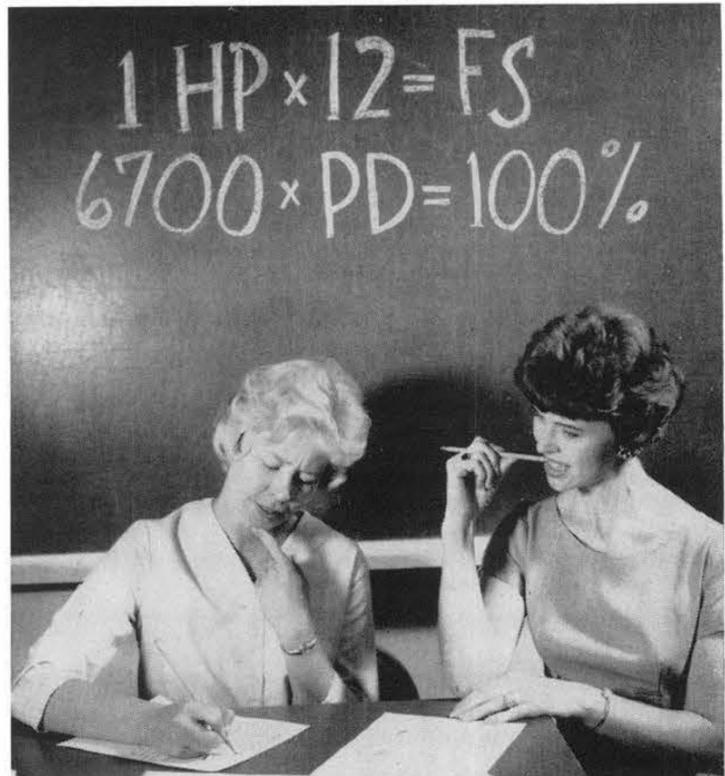
Bill Bray (1414) and his wife Fina both took high game honors in Division A. High game winners in Division B were Carl Blair and Nancy Duhigg (4411).

High series winner in Division A was Paul Spencer (4413) and in Division B it was Jim Rabold (3242). Women high series winners were Sharon Gauerke (3422) and Helen Peacock (wife of Don Peacock, 4511).

Welcome Newcomers

July 30-Aug. 10

Table listing newcomers with names and employee numbers for various states including Albuquerque, Florida, Illinois, Maryland, Minnesota, Missouri, New Jersey, New York, Oklahoma, Texas, and returned from leave.



FORMULAS FOR GIVING THE ECP way. A pledge of an amount equivalent to one hour's pay per month is a fair share. And the goal for Sandia Laboratory is 100 per cent participation in payroll deduction. Peggy Wheeler (3126), left, and Charlotte Cast (3113), help figure it out.

Flag Football Kickoff Will Be August 25; Season Ends Nov. 3

Flag Football begins Saturday morning Aug. 25 for the six teams of the Sandia Lab Football Association, according to R. Norris Rose (3121), newly-elected league president. Joe A. Abbott (2421) is vice president.

All games will be played on Saturdays beginning at 8:15, 9:30 and 10:45 a.m. Play will be divided into two rounds: the first scheduled from Aug. 25 through Sept. 29, the second from Oct. 6 through Nov. 3.

Teams with the best win-loss records from each round will play for the championship.

All games will be played on the Sandia Base Military Field.

Chess Players to Plan Tournament For Sandia Lab

All chess players at Sandia Laboratory, novices through experts, are invited to attend a meeting of the Sandia Laboratory Chess Association in Bldg. 806, Rm. 201, at 12 noon, Tuesday, Aug. 21. A laboratory-wide tournament will be planned with players divided into classes according to ability.

Winners of a recent tournament included Bob Smith (4421), first; Rod Carlson (1424), second; and Dick Jackson (4421), third.

Additional information about the coming tournament and the Association is available from Dave Newcomer (4412), league president, ext. 34169.

SHOPPING CENTER

CLASSIFIED ADVERTISING. Deadline: Friday noon prior to week of publication unless changed by holiday. 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 Corporation and AEC employees only. 6. No commercial ads, please. 7. Include name and organization.

FOR SALE. GUNS, 270 custom, 4x scope, \$165; 30-30 Win. carbine, \$50; 12 and 16 ga. Ithaca Featherlites, \$65 ea.; gun cabinet, \$35. Ives, AX 9-7003. '57 STUDEBAKER V-8 Commander, R&H, OD, \$575. Cummings, AX 9-5907. ARC-2 Transceiver, 2-9.05 Mc, \$150; 1/2-acre lot, all utilities. Shea, Box 136, Cedar Crest. AIRCRAFT, Ryan ST3-KR (PT-22) acrobatic aircraft, just relicensed, 370 hrs. on new engine, make offer. Patterson, AX 9-5152. CAR COOLER, Sears evaporator type, 2-speed. Newton, 298-0785. SELL OR TRADE 5 wheels and tires, 600x16, to fit early Chrysler product; need 710x15 tires and tubes, w/w preferred. Shea, 255-8092. 4-BDR, 1 1/2 bath, carpeting, drapes, a/c, screened 32'x14' patio, \$13,700, 1131 Morris NE. Chacon, AX 9-3306. DINING ROOM; bedroom set; 12x13 nylon rug; child's RCA record player; swing set; other misc. furniture. Villa, 2708 Alvarado Dr., NE, AM 8-0568. BASSINET, folding legs, hood, liner, \$8; stroller, \$2. Coon, 6931 Edwina NE, AX 8-0845. LUGGAGE RACK for Volkswagen sedan, \$8. May, 1417 Mercela NE, AX 9-2624. POODLE PUPS, AKC registered, born July 30. Jack, AM 8-8266 after 5 p.m. GIRL'S 24" bicycle, \$25 or trade for or will buy boy's 20" bicycle. Houghton, AX 9-3386. MODEL AIRPLANE, Douglas Dauntless dive bomber, Wenmac 0.49 engine, wing span 22 1/2", length 20", control line included, \$6. Trujillo, AX 9-2590. '60 BSA Starfire Scrambler motorcycle, model 71; .348 cal. Winchester, \$100. Wilson, AX 8-0049. '62 PONTIAC Catalina Coupe, PS, PB, R&H, \$2500. Hannan, 265-0568 after 5 p.m. '60 GMC CARRYALL, one owner, low mileage. Jones, DI 4-1402.

WHITE AND GOLD French Provincial canopy top full sized bed with mattress and triple dresser, never been used. Harris, AX 9-0571. WESTINGHOUSE STOVE, Flair type with base, \$300. Flanagan, AX 8-2757. '61 CHEVY 4-speed pickup; 8' Dreamer cab-over camper; small aluminum boat; mountain motor scooter. McKay, 1822 Morningside NE, AL 5-5658. SHETLAND PONY, harness and pony cart, \$200. Morehouse, Los Lunas, TO 5-7765 after 5 p.m. '58 TR-3 TRIUMPH, \$1075 or take over payments and \$300 equity, must sell quickly. Baber, 402B Stanford SE, 242-5600. '60 VOLKSWAGEN Deluxe sedan, 4-speed trans., individual bucket seats, windshield washer, travelounger reclining seat, other extras. Kotoski, 298-1732. BOY'S 24" bike; King trumpet; Besson Oxford trombone. Maciolek, AX 9-1696. SNOW HTS #1, 3-bdr, 1 1/2 bath, shop, patio, a/c, landscaped, sprinklers front and back, much concrete, FHA appraisal. Parsons, 1624 Hendola NE, AX 9-0400. GYM SET, 3-piece, teeter-totter, swing, trapeze, \$12. Pollard, AX 9-1318. '61 4-DOOR International pickup w/power-lock rear axle, overload springs, hi-altitude engine, \$2200; Teardrop 8' camper, sleeps 4, \$700, sell together or separately. Pruder, AX 9-2978. GE PORTABLE RADIO w/new battery, not transistor, \$10; 20" window fan, \$5. Zeller, DI 4-9000. PORTABLE air conditioner w/water circulating pump; hand painted oil paintings. Womack, 299-5564. CRAFTSMAN 4" joiner, \$35. Pitti, AL 6-1629. BLOND COCKER SPANIEL 1 1/2 yrs. old, pedigreed, trained watchdog, enjoys adult company but not children. Hudson, AL 6-2646. KITCHEN TABLE, maple w/chrome legs, 4 matching chairs, make offer. Karkalik, AX 9-8769. 2-BDR MOBILE HOME, 50'x10', full screened porch, in Sandia Knolls. Hykes, BU 2-3987. '55 PLYMOUTH, \$300. Bowers, AX 8-2542. BUILDING LOT, NE Heights; trailer hitch, universal type. Dodd, AX 9-6330. SECTIONAL, 2-piece, sage green, w/slip covers, \$35; electric floor fan, \$10. Findlay, AX 9-9328. \$1000 DOWN to 4 1/2% loan, 3-bdr, 1 1/2 bath, 2 blocks to grade and junior high schools. Stixrud, DI 4-7873. '50 GMC 4-speed 1/2-ton pickup, R&H, rebuilt engine, new tires and glass. McMullen, TR 7-1935. GYM SET w/2 swings, slide and glider, green, \$15. Boyd, CH 7-9448.

NEXT DEADLINE FOR SHOPPING CENTER ADS Friday Noon, Aug. 24

FRIGIDAIRE chest freezer. Spray, AX 9-0412. ANTIQUE BANK, human figure, moves arm, tongue and eyes, original condition, sell or trade for old guns. Smitha, 8607 Menaul, AX 9-1096. 2 STEEL SASH windows fully glazed with all hardware, two sides open, first offer takes them. Thompson, AX 9-3416. 2 LOTS 1/2 acre each, adjoining, in Sandia Knolls, numbers 200, 201, lights, water, phone available. Kasparek, 299-0506. SOFABED, chair, \$65; chest, \$7; practice typewriter, \$15; metal cartop carrier, \$10; '60 Valiant, small equity and assume payments. Young, 256-1387. SNOW 3-bdr, separate den, a/c, 1 1/2 baths, walled corner lot, 1600 sq. ft. 2 1/2 yrs. old. Ray, 11017 Phoenix NE, AX 8-0408. DOUBLE BED, dark blond heavy wood w/mattress and box springs, \$40 or best offer. Barham, AX 8-2553. FRIGIDAIRE automatic washer. Kirtley, AL 6-0637 or AL 5-1356 after 6 p.m. BC-312 SPEAKER and AC power supply, \$50; complete 6-volt mobile xmitter, converter and dynamotor, \$30. Nogle, AX 9-3863. CORONADO automatic washer, 2 1/2 yrs. old, needs timer repair, \$25; Maytag Drier, \$75. Fitzgerald, AX 8-2506. '59 MOTORCYCLE, Allstate, model 175 deluxe, completely overhauled, \$195, terms. Whitlow, DI 4-1991. SOUND PROJECTOR, 16 mm Bell & Howell; tape recorder, 2-speed Pentron. Lasker, AX 9-1024. '59 WILLYS station wagon, 2-wheel drive, will trade for Volkswagen. Costales, 335 Alcazar NE. TWIN BED, metal frame, springs, mattress; metal side rails for child's bed. Evans, 205 Morningside NE, 268-8001. 3-BDR, 1 1/2 bath, livingroom, diningroom, kitchen, garage, walled, landscaped, 4 blocks Base, 2 blocks schools, 905 Kentucky SE. Mauldin, 255-8356. 2-WAY RADIO, 11 meter citizens band, Pearce-Simpson CBD-5, 5-channel, 12 VDC/115VAC, w/4 crystals, 2 antennas, 2 car brackets, \$140. Luxford, TR 7-1756. 3-BDR, family room, 1 1/2 bath, a/c, corner lot, sprinklers front and rear, \$13,200, 1628 Muriel NE. Flesner, AX 9-9304. '59 CHEVY Bisc., 2-dr. sedan, 348 engine, 4-speed transmission, special cam, will trade. Holovka, 243-0771.

'53 PLYMOUTH 4-dr., recent engine overhaul. Kane, 299-0382. '54 FORD 2-dr., w/heater, \$200. Miller, DI 4-8253 after 5 p.m. 3-BDR, 1 1/2 bath, fully carpeted, fireplace, garage, a/c, landscaped, \$17,500. Landrum, 4022 Alta Monte NE, DI 4-3940 weekends and after 5 p.m. '55 FORD, 9-passenger station wagon, Fordomatic, Thunderbird engine, R&H. Mayhew, AX 9-7212 after 5 p.m. '60 MOTOR SCOOTER, driven less than 4000 miles, will sacrifice. Moyer, AX 9-0759. STAUFFER COUCH. Sanchez, 268-5321. TRAILER HOUSE, 43', '53 Liberty, full-size bath, awning, new a/c, 2 butane tanks. Sanchez, AX 6-0917. 2-BDR HOME, see at 2837 Morningside, NE, \$300 FHA, no down Gl. Trujillo. '55 PLYMOUTH V-8 2-dr. sedan, R&H, automatic transmission, original owner, \$350. McKinley, AM 8-4779. FORMICA cabinet top, 8'x2'x4", cut for standard double sink, \$30. Barber, 299-4287. 1/4 HP ELECTRIC GRINDER; 1/4" drill w/stand; bench vise; misc. hand tools. Hightower, CH 2-0462. LARGE METAL TRUNK, 21"x24"x36". Corey, AX 9-5168. HEATH 50 watt (25 per channel) stereo integrated preamplifier-amplifier, \$90; Heath AM-FM tuner, \$65. Sasser, AX 8-1439. BLOND step and end tables, formica tops, \$15; 4 gallons yellow interior vinyl paint, \$12. Clark, 298-2340. ACCORDION, Larenti, 120 base 18" keyboard, \$200. Bradshaw, AM 8-8708. 3-BDR BRICK HOME on landscaped corner lot, goes to qualified buyer at FHA appraisal. Southerland, 8903 Claremont NE, AX 8-1647. SIX BEAGLE puppies, thoroughbred, six weeks old. Robinson, AX 9-3930. 3-BDR HOME pitched roof, carpeting, drapes, SE heights, across street from Bandler school. Trolinger, AM 8-3414 after 5 p.m. RCA radio-phonograph combination; 17" table model TV; electric fan. Dyer, CH 2-8830. 3-BDR, custom-built house, 2 w/b fireplaces, corner lot, landscaped, restricted residential area. Beeson, 1721 Ross Pl., SE, 255-3249. 3-BDR, MANKIN, pitched roof, walled, sprinklers front and back, a/c, carpet, drapes, assume existing loan, total \$11,600. Howell, AX 8-4001. ENGLISH perambulator, \$20. Smith, 4615 Palo Alto Ave., SE, AL 5-7389. NEWLY DECORATED 2-bdr. home, new roof, water heater, stucco, sprinklers, a/c, \$10,500, your terms. Norvill, 1617 Anderson Pl., SE, AL 5-2787.

WANTED. RIDE from 5702 Princess Jeanne NE, vicinity of San Pedro and Constitution, to bldg. 880. Melancon, AL 5-0677. MEMBERSHIP in car pool vicinity Washington-Sunningdale NE to vicinity Bldg. 836. Hegge, AM 8-3287. CHILDREN to care for, Hodgkin School area. Hastings, DI 4-6818. CHEVROLET, '58 or '59, 2-door, V-8, stick shift. AX 9-6392 after 5 p.m. RIDE from vicinity Constitution and San Pedro to gate no. 1, 2, 3, or 4. Reich, 268-7968. BUTANE TANK, 200 or 500 gal. Torres, ext. 25173 or 26245. BABY SITTER for a 9 mo. old baby, prefer vicinity of Menaul enroute to Sandia base. Myers, TR 7-9715 after 5:30 p.m. USED OR NEW magnifier lamp. Jamme, 8814 Shoshone Rd., NE, AX 9-5797. RIDE vicinity of 309 Madison NE to bldg. 880. Costick, AL 6-4093. RIDE, 3700 black Headingley NE (Carlisle Plaza) to bldg. 892 or 880 parking lot. Pacheco, DI 4-1445. FREEZER, chest-type, minimum 20 cu. ft.; Trickle-type battery charger; pickup, 4-wheel drive, 8' bed, GMC preferred. Maak, BU 2-3482. '55 or '56 JEEP utility wagon, 4-wheel drive, 6-cyl. engine, must be good condition. Adams, AM 8-5943. RIDE from vicinity of Sanford SW to bldg. 880. Crocker, DI 4-0031.

FOR RENT. HOFFMAN ROYAL 3-bdr, 1 1/2 bath, furnished \$150, or unfurnished \$135. Flanagan, AX 8-2757. 3-BDR, 1 1/2 baths, den, garage, wall, sprinklers, NE, near schools and shopping. Seay, 299-5270. UNFURNISHED APT, new, \$80, a/c, electric kitchen, washer rough-in. Matson, 210 Charleston NE, 268-4814 after 5 p.m. UNFURNISHED 4-bdr. home w/basement apartment, \$100/mo. plus utilities, 318 Oak St. SE. Nogaes, CH 7-1178. STORAGE SPACE for campers, trailers and boats. Ward, AL 6-9286. 4-BDR HOUSE, south valley location. Armijo, AX 9-5836. LOST AND FOUND. LOST—Costume ring w/4 black sets, rhinestones and pearls; Baylor 77 automatic watch; Case pocket knife—bone with 2 small blades. LOST AND FOUND, ext. 29157. FOUND—SC 10-year tie chain, Chevrolet key, Welsh Terrier Club of America #129 pin, cigarette lighter, Chantillon hand spring scales, Kwikset key. LOST AND FOUND, ext. 29157.

What Do You Know About Your Government?

You can have fun with this quiz. Try it on yourself, your family, friends. This is the first of three parts.

Part I

Indicate whether the following statements are TRUE or FALSE.

1. Our form of government is a democracy based solely on the principle of majority rule — that what the majority want they are entitled to have.
2. The "electorate" consists of all those who have the right to vote.
3. Knowledge of the political process is interesting, but of little value to the individual citizen.
4. Economic, political and social changes are so rapid that even the interested citizen can do little about good government and honest politics.
5. The growth of government protects the individual, so personal freedoms are not affected.
6. Political parties are provided for in the Constitution.
7. Lobbyists perform no useful function in Washington.
8. Independent regulatory commissions of the Federal Government answer to the President.
9. About two-thirds of the eligible voters do not vote in primary elections.
10. A President can be removed from office if the House impeaches him and a majority of the Senate finds him guilty.
11. "Judicial Review" is an unconstitutional usurpation of power by the Supreme Court.
12. Election laws are passed by the individual states.
13. The political party official closest to the voter is a Precinct Committeeman.
14. Decisions of the state supreme courts must be reviewed by the United States Supreme Court.
15. The Constitution may be amended by a majority vote of the people in a general referendum.
16. The powers not delegated to the United States by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people.
17. No person may become President of the United States who has not been a resident within the United States for 14 years.
18. The Supreme Court has the right to pick and choose all cases that come before it.
19. A Presidential veto may be overridden by majority vote of the Justices of the Supreme Court.
20. Representatives are elected for three-year terms; Senators for six years.
21. The boundaries of Congressional Districts are set by the House of Representatives.

(Answers at bottom of this page)



EQUIPMENT QUALIFICATION team meets to evaluate a new production tester. Department 2340, as Sandia Corporation acceptance organization, has responsibility for approval of all production test equipment. From left

are Ramon L. Baldonado (2323), Thomas F. Steely (2533), William R. Caldwell (2451), Robert L. Wilde (7124), J. Lloyd Williams (2343), and Bernard I. Burrell (2343). Manual and tester are given step-by-step check.

Touchy Task Qualifying PT's -- They Must Be Better Than Best

The production tester is an indispensable item in the nuclear weapons program. This equipment is used to check performance of weapon components during manufacture. Components have to be the best and the tester has to be even better.

The story of production tester (PT) design and the 2400 organization has been told in past issues of the Lab News. Another Sandia Lab organization plays an important role before the PT is released to the user.

Inspection Control Division 2343 headed by Ken E. Bricker puts the first fabricated model of any PT design through its paces before release. Object is to evaluate technical adequacy, compatibility, and performance of tester, hardware, and procedures.

An EQ (for equipment qualification) group is formed for each completed PT design. Members include Division 2343 representatives, the manual writer who wrote instructions on how to use the PT, the component designer, the PT designer, the Manufacturing Development Engineer, and Quality Assurance.

With the 2343 engineer as chairman, and another 2343 representative assigned to operate the tester, it is calibrated and used to test an actual component. Manual instructions are read step by step and the operations performed. Neither of the 2343 men have seen the tester or the instructions before.

Want to Make Sure

"This is done for a very real purpose," Mr. Bricker says. "We want to make sure that when the tester and the manual arrive in the field they can be used. By going in 'cold,' so to speak, we can see if there are any bugs in the tester or manual. If any questions or discrepancies show up, they are resolved at the time by the representatives of the EQ. Many times the EQ recommends changes that make the tester easier to use with its instructions or perhaps simpler to calibrate."

"So far," Mr. Bricker continues, "some 100 testers have gone through EQ. The feedback shows this equipment can be calibrated

and operated when it arrives in the field."

When the PT is designed or fabricated by a supplier under Sandia contract, the tester may be shipped to Sandia for the EQ to study or a team may go to the supplier's plant to perform the evaluation.

Changes Model

As technology advances, changes are made in weapon components to allow for different capabilities. This requires changes in production testers. After the PT designer makes these changes in the design, Division 2343 has the responsibility to follow through.

After reviewing the drawings, Division 2343 determines the necessary parts and arranges for Military Publications Division II to prepare instructions for the modernization and to change the existing manual.

Kits are assembled with the necessary items to make the change in all PTs affected and these are shipped to the using agencies. If a PT is in use at Sandia, a 2343 representative is assigned to cover the job.

The Division keeps a file on all Sandia-designed PTs. These records show the history of the

individual tester, when and where modifications have been performed, and the drawing issue represented.

The information is used when modernizations are being made. It is also valuable to the technicians of Field Inspection Division 2341 who use and maintain PTs in the field.

If a modernization program requires complex changes in the PTs, they are shipped to Sandia and the work is performed in the Development Shops.

"In some cases," Mr. Bricker says, "we are going to have suppliers do this modernizing and maintenance in their own plants, and if possible, calibraton."

Sandia Speakers

Following is a list of speakers, titles, and places of presentation for talks by members of Sandia Laboratory.

Glenn E. Seay (5133), "Shock Initiation of Granular Explosives Pressed to Low Density," Ninth International Symposium of the Combustion Institute, Cornell University, Ithaca, N. Y., Aug. 27-Sept. 1.

D. D. Glower (5322), "Thermal Measurements on Ferroelectric Barium Titanate Ceramics," Black Hills Summer Conference on Transport Phenomena, Rapid City, S. Dak., Aug. 21-23.

What Do You Know About Your Government?

Quiz Answers Part I

1. False. 2. True. 3. False. 4. False. 5. False. 6. False. 7. False. 8. False. 9. False. 10. False*. 11. False. 12. True. 13. True. 14. False. 15. False. 16. True. 17. True. 18. False**. 19. False. 20. False. 21. False.

*False, because two-thirds of Senate must find impeached President guilty.

**False, because there are some cases the Supreme Court is obliged to hear, such as where a state's highest court has ruled an act of Congress unconstitutional, or where a lower federal court has held a state law invalid.

Service Awards

15 Year Pins



A. R. Eiffert
8230
Aug. 19, 1947



C. H. Johnson
4413
Aug. 25, 1947

10 Year Pins

Aug. 18-31
J. R. Ames 1424, C. A. Corbin 4224, Winifred R. DeWitt 3230, F. G. King 7311, G. W. Krause 2541, E. R. Helz 8161, D. E. Hinman 4362, Dorothy A. Matlack 3423, Velda L. Messersmith 3241.
Ruth E. Gustin 4234, W. L. Morehouse 8166, W. E. Petty 4631, Wilfred Sanchez 4221, Seferino Sanchez 3311, Pedro Gallegos 4613, L. W. Gotchall 7521.
M. G. Martinez 4221, E. K. Montoya 7242, R. D. Pace 7215, R. T. West 2444, J. C. L. Leslie 3433, G. C. Warnick 2321, J. H. Billings 4621.
F. T. Hansen 2532, C. D. Broyles 5413, E. E. Komarek, Jr. 1431, I. B. Ortiz, Jr. 4514, C. J. Uribarri 2643, H. A. Warrick 7322, and R. C. Zaluga 1323.

Golfer's Rabbit Some Sort of First For Jerry Mayes

"Eagles" and "birdies" are commonplace golfing terms, but Jerry Mayes (5311) drew surprised looks from golfing partners when she said she "got a rabbit" during a recent practice session.

It was true. During the lunch hour, Jerry often practices driving golf balls on the mesa alongside Area V, and she really did hit a rabbit.

Safety Record Set Back As Employee Tumbles

Sandia Laboratory's safety record fell recently when an employee slipped and fell on a tile floor.

A secretary rose from her desk to answer another phone in the office. As she stepped into the aisle, she slipped and struck her forehead as she fell.

A nurse was called and the employee was taken to Medical Department 3320 where she was treated and sent home. After two days of convalescing, the employee recovered and returned to work.

At the time of the accident, the Lab's safety record stood at 210,000 employee-hours or six days without a disabling injury. Employees have suffered 13 lost-time accidents since the first of the year.

Sandia's Safety Record

Sandia Laboratory HAS WORKED 210,000 MAN HOURS OR 6 DAYS WITHOUT A DISABLING INJURY

Livermore Laboratory HAS WORKED 282,000 MAN HOURS OR 54 DAYS WITHOUT A DISABLING INJURY