





## New Automatic Telemetered Data

By WILLIAM SPAFFORD  
Technical Editor, AOD

Man can claim superiority over the machine only because he built the machine. After the machine is constructed it surpasses man's ability in speed, precision, and accuracy.

A need for speed, precision, and accuracy in changing telemetered data into readable information was felt by NOTS scientists quite some time ago. Eugene Hill, a physicist, and Everett B. Hill, an electronic engineer, both of AOD Development Division 3, seem to have filled that need.

They eliminated man as a component and gained about eight times the speed.

They built a machine.

Last week the Rocketeer featured an article on the Hummergram. The Hummergram is an instrument which records signals displayed on an oscilloscope. This could be meaningless, except that the signals on the oscilloscope, in this instance, are telemetered from a missile in flight.

### Qualitative Analysis

The Hummergram makes it possible to analyze qualitatively the missile's behavior in about one-tenth of the time required previously. The qualitative analysis gives a picture of the missile's reaction to various external and internal stimuli during flight.

But, for a thorough analysis of the missile's behavior, it is necessary to know exactly at what time or at what stage of the missile's flight the missile did this or that and how much.

This requires a quantitative analysis.

When you get into quantitative analyses, you have to use numbers. In other words, the telemetered data from a missile in flight must be changed from analog data (a series of straight lines of varying length) into decimal numbers or digits. AOD scientists prefer to call the resultant information "digitalized telemetered data."

When a certain missile is in flight, it sends out signals (pulses) at the average rate of 600 per second. The duration of each of these pulses must be measured to make possible a meaningful quantitative analysis of the missile's behavior.

### Time Consuming Process

At first, AOD employees had to measure each pulse by hand. Probability of error was high, and the process consumed a prohibitive amount of time.

The time was cut in half when a different method was used in measuring the pulses. The "Binary-Coded Number System" was adapted to relieve man from a tedious job and improve assessment.

This system used sine waves to measure the duration of each transmitted pulse. The sine waves were automatically counted and the count registered by neon lights, each of which had a numerical value. These



A FULLY AUTOMATIC prototype of an instrument constructed by the Aviation Ordnance Department from test guided missiles is shown (standing) and Everett Hill.

neon-light flashes, along with the telemetered data, were recorded by a 35-mm camera.

Now the AOD scientists had a film which showed the signal pulses from the missile and which also indicated the duration of each of the pulses.

However, the flashes of neon lights were not yet numbers. Here again man entered the picture. It was necessary for someone to interpret the recorded neon flashes and, by the use of a keyboard and a data converter, convert the binary numbers to decimal numbers and record them on IBM cards, and on paper with an electric typewriter.

There was still plenty of room for error and one second of missile flight time required approximately one hour of assessment time.

### New Method Devised

This is where Eugene Hill and Everett B. Hill entered the picture.

With Eugene supplying the theory and Everett designing the switching circuits, a machine was constructed which reads the little neon flashes from the film (more accurately, faster, and with more precision than man) and converts them into decimal numbers on the spot.

The system uses photo-electric cells (electric eyes) which are mounted in a screen upon which the

## RADM J. H. Sides Visits China Lake

Rear Admiral J. H. Sides, assistant director of the Guided Missile Division of the Office of Chief of Naval Operations, and Captain U. S. Brady, BuOrd, were on the Station yesterday in connection with guided missile matters.

Another BuOrd official, Captain William C. Bryson will be here next Wednesday in connection with Station ordnance matters.

## Reports from Technical Departments

### Research Society To Hold Spring Meeting May 13

Plans were announced this week for the annual spring dinner meeting of the China Lake branch of the Scientific Research Society of America.

This year's event will be held on the evening of May 13, and will feature a talk by Prof. Linus Pauling, director of the Gates and Crelling laboratories of chemistry at Caltech. His subject will be "Molecular Abnormalities of Hemoglobin and Their Relation to Disease."

Professor Pauling has had a distinguished career in the fields of chemistry and physics, and is widely known through his many papers and books on the determination of the structure of crystals and molecules, the application of quantum mechanics to chemistry, the rotation of molecules in crystals, and sizes of ions and the nature of the chemical bond.

His work on the structure of crystals and molecules has, in recent years, led to the study of the complex protein molecules and to immunochemistry.

The meeting is open to members of Sigma Xi, as well as the local branch of RESA. Reservations may be made by calling Norman S. Hall at 71702.

### Scientist on Trip To Eastern Labs

Dr. Alvin S. Gordon, head of the combustion branch, Research Department, is presently visiting several eastern laboratories engaged in work related to combustion.

While at the University of Connecticut he will give an invited talk on "Kinetics and Mechanisms of Reactions."

Dr. Gordon received his B.S. degree from the Polytechnic Institute of Brooklyn in 1937, and his Ph.D. from New York University in 1941. He is the author of numerous publications in the field of combustion and free radical reactions.

### Photo-Copy Machines Showing Set at Lab

Two demonstrations of photocopying equipment are scheduled for Monday, Tuesday and Wednesday from 10:30 a.m. to 4:30 p.m. in Room 1013, Michelson Laboratory.

One is manufactured by the Photostat Corporation and the second is a product of the Eastman Kodak Company.

Plans are being made to accommodate some 500 persons at the free farewell picnic to be held tomorrow at Sandquist Spa for employees of the Salt Wells Pilot Plant and their families. Activities will get under way at 3 p.m.

A wide variety of games is on tap for all age groups, from preschool youngsters to adults, and huge amounts of baked beans, potato salad and hot dogs will be served.

Prizes and surprises will be in store for the winners of the various races and contests, according to Bobbie Ruggles, chairman of the picnic committee, and the gala affair will be concluded by dancing to recorded music supplied by Larry Bell and his public address system.

### MISSILE STUDENTS VISIT NOTS

Twenty-five naval reservists of the Pomona guided missile school arrived at China Lake this morning for a day of inspecting missile facilities. They are under the supervision of Lt. Col. J. O. Blackwell, USMC.

## News from Pasadena

### Employe Management Council Election Set April 30 at Annex

A ballot listing 68 candidates for election to the Annex Employe Management Council will be cast next Friday, April 30, CDR R. A. Thompson, election committee chairman, announced.

Nominees for election to the council include: Otto Nass, Allen Blaemire, Bob Simeral, Paul F. Reichert, N. M. Saines, Robert Boggs, Robert Thurman, Francis J. Hill Jr., Marvin Drotman, George E. Norton, Carbon Lytle, E. E. Vanden Eykel, Betty Suydam, Irene Dickson, Norman Oleson, A. B. Graybill, Richard E. McKee, George Strom, of the Underwater Ordnance Department.

James H. Spillane, Al Chester, Vera Morgan, John Busik, Arthur Dougan, Grace Boyer, George Maxwell, Carl Nelson, Edgar F. Wulzen, Ruth Hausman, Joann Gorz, Stella Greig, A. E. Eggleston, and Elsie Rehfield, of the Design and Production Department.

F. Donnelly, Perch A. Tigh, Laurence Perry, Ed Hurst, John R. Roberts, James Leiblic, Clyde McHugh, Leroy Pascoe, Mike Drabik, Ralph Ferguson, Hugh Armstrong, and Audrey Smith, of the public works division, and C. F. Sapper, Central Engineering division.

Frankie Hawkins, Monte Denning, George Huges, Karl Branch, Alexander H. Cox, Vernon W. Hayes, Jack Petroff, and Mildred P. Ball, of the supply and fiscal division.

Lief Larsen, Henry Bellucci, James A. Allardyce, Leon Crandall, Elizabeth Roche, Pat Williams, Madeline M. Nelson, and Ethel L. Nichols, of Command Administration.

Gloria P. Armijo, Ellen O'Brien

and Bob Bennett, of the personnel division.

Charles McCormick, Edward Hughes, and Fred Pierce, of the Staff units.

There will be seven representatives elected to the central council. Each unit within the organizational set-up will have one representative, CDR Thompson said.

Serving on the election committee with CDR Thompson were Ed Jones, personnel division, and John Sandy, UOD.

Election officials include: C. Redmond, Barbara Dimitroff, John Sandy, Amy Yamasaki, Bill Smith, Ed Vanden Eykel, John Sampson, UOD; Agnes Tittermary, James Spillane, Bill Reno, Marshall Klein, Julie Kinard, Mary Yamagata, and Josephine Hickerson, D&P; Joe Galante, Frank Donnelly, Leon Jenkins, LeRoy Pascoe, Hugh Armstrong, and James Storms, Public Works; Ed Carr, explosives division; Thadene Firman, Grace Naylor, Bess Johnson, and Laura Ferguson, Supply and Fiscal; Eleanora Nail, Ross Milham, Lynn Jordan, and Mabel Dressler, Command Administration; Priscilla Estes and Catherine Murphy, Staff units.

### For Security's Sake Spin the Safe Dial

Approximately 40 per cent of the security violations at the Pasadena Annex may be chalked up to the fact that in locking a safe, proper precautions are not always taken to spin the dial and test the drawer on which the dial is installed.

All personnel responsible for safe guarding classified material have been urged to take a little extra time in checking to see that safes and files are properly locked.

### Hough on Honor Roll at Harvard University

CHINA LAKE—Jerry Hough, son of Mr. and Mrs. Ralph Hough, 206-B Mitscher, has been listed for the third consecutive year on the dean's list, scholastic honor roll, at Harvard University.

Hough is attending Harvard on a scholarship he won upon his graduation from Burroughs High School in 1951. He was valedictorian of his graduating class at Burroughs, and is now in his junior year at Harvard.

### NORA LEE GETS SERVICE PIN

Nora Lee, elevator operator at Thompson Laboratory, received his five-year service pin this week from LCDR R. C. Jaquess, head of the public works division.



ADMIRAL F. S. WITHINGTON, USN, Deputy Chief of the Bureau of Ordnance, inspected the Pasadena Annex last week. Shown left to right are Robert Leard of the Design and Production Department; Admiral Withington, Captain Robert F. Sellars, OinC; J. H. Jennison, head, D&P; W. H. Saylor, Associate Technical Director for Pasadena; and Captain D. B. Young, Station Commander.

## Rear Admiral Withington Inspects Pasadena Annex

Rear Admiral F. S. Withington, USN, Deputy Chief of the Bureau of Ordnance, made his first official visit to the Pasadena Annex last week.

"I came to learn—not to comment," the admiral said during a press interview.

However, in response to specific questions Admiral Withington said: "The cutbacks in appropriations will seriously hamper construction of new facilities in the Navy, but

will not hamper the production, research and development of new weapons.

"It is always more difficult to get money from Congress for new construction than for research and development. The United States is almost at its debt ceiling but Congress hasn't seen fit to raise the limit and has made planning for defense very difficult," Admiral Withington said.

In response to the question as to whether the trend will be to make cuts in conventional weapons and stress guided missile development and production, Admiral Withington said: "We will try to proceed with the development of new types of weapons and new ideas and make marginal improvements of the conventional weapons we have."

During his visit here, Admiral Withington was given an indoctrination on the work of the Design and Production Department, the Underwater Ordnance Department, and the various divisions, by Captain D. B. Young, Station Commander; Captain Robert F. Sellars, OinC; Dr. W. B. McLean, Technical Director; W. H. Saylor, Associate Technical Director for Pasadena; Dr. N. A. Renzetti, head, Underwater Ordnance Department; J. H. Jennison, head, Design and Production Department; and CDR R. A. Thompson, assistant OinC.

From Pasadena, Admiral Withington flew to China Lake to continue his inspection and indoctrination tour of NOTS facilities.

AWARDS RULING ANNOUNCED  
Superior Accomplishment Award certificates may be given to employees who are at the top of their grade although there will be no monetary attachment to the award, R. D. Melcher, employe relations officer, announced. Mr. Melcher attended a two day conference of the Navy's Incentive Awards Committee at the Clark Hotel in Los Angeles last week.

GOLF TOURNEY PLANNED

Plans are being made for the annual spring golf tournament for male employes of the Annex, Wendell Alexander, committee chairman, announced. Persons interested in participating in the tournament should contact Mr. Alexander at Thompson Laboratory.

### Women Honored



HEADS of the Federal Credit Union and the Employe Service Organization jumped the gun on the National Secretaries Week by paying tribute last week to Mary Maxham, left, and Ethel Kuever, right, who manage the business of these organizations.

