



National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California

NASA/FAA Safety Agreement

NASA has signed an agreement with the Federal Aviation Administration of the U.S. Department of Transportation to act as a "third party" for the purpose of receiving, processing, and analyzing reports of unsafe conditions or practices filed under FAA's Aviation Safety Reporting Program, Acting FAA Administrator James E. Dow has announced.

The new reporting system will modify the program announced by FAA earlier this year whereby reports were filed directly with FAA. It is being established at Ames under the direction of Dr. Charles E. Billings in the Ames Life Sciences Directorate.

Dow said the "third party arrangement should assure everyone that the FAA's only objective in this program is to provide the safest possible aviation system by identifying and correcting unsafe conditions before they lead to accidents. It should therefore further stimulate the free and unrestricted flow of information." The agreement contains

specific procedures to provide for the protection of the identity of persons involved in reports submitted to NASA, except in those cases involving alleged criminal conduct or accidents.

The new reporting system is scheduled to be in operation by next April, Dow said, with details to be spelled out in a Federal Register Notice and an Advisory Circular that will be issued by FAA in April. In the meantime, reports will continue to be filed directly with FAA.

The agreement calls for NASA to set up an aviation safety reporting working group under its Research and Technology Advisory Council to advise NASA on the system design and operation, to evaluate and review the program once it is underway and to assure that the confidentiality of those submitting reports is maintained. Its membership will include aviation user and consumer groups and others involved in the operational aspects of the national aviation system.



"Deke" Slayton at JSC

Donald K. (Deke) Slayton has been named to fill the newly created position of Deputy Director of Flight Operations for Approach and Landing Test at Johnson Space Center.

The announcement was made by Center Director Dr. Christopher C. Kraft, Jr. In his new position, Slayton will report to Kenneth S. Kleinknecht, Director of Flight Operations for the Space Shuttle Project.

Slayton will be responsible for planning and implementing the Approach and Landing Test Project for the Space Shuttle Program.

His most recent assignment was as a member of the U.S. crew for the Apollo Soyuz Test Project in which he served as the Docking Module Pilot.

Slayton was named as one of the original seven Mercury astronauts in April 1959. He became coordinator of astronaut activities in September 1962 and was named Director of Flight Crew Operations in November 1963. He relinquished the latter position in February 1974 to assume the duties of ASTP crewman.

He has a bachelor of science degree in aeronautical engineering from the University of Minnesota, an honorary doctor of science degree from Carthage College in Illinois and an honorary doctor of engineering degree from Michigan Technological University.



Vertical motion simulator



Newest addition to the skyline at NASA's Ames Research Center is this ten-story high structure which will house a new facility to simulate critical maneuvers of aircraft during take-off and landing. The new facility, called the Vertical Motion Simulator (VMS), will provide large up-and-down motions to simulate similar movement by aircraft such as the new Short Take-Off and Landing (STOL) and Vertical Take-Off and Landing (VTOL) vehicles of the future. Research pilots, riding in a simulator cab which can be configured to simulate various aircraft, will experience vertical excursions of up to 18 meters (60 feet) and 12 meters (40 feet) horizontally. The VMS is more advanced than any system now in existence and will for the first time have the ability to accurately simulate flare and touchdown of aircraft. Completion of the facility is scheduled in late 1976. The Carl N. Swenson Company of San Jose is constructing the building.

Satellites studied for snowmelt prediction

NASA, along with nine other Federal and state agencies, is working to analyze the usefulness of data gathered by space satellites for predicting the amount of water to be expected from melting snow in mountain areas of western United States.

Accurate predictions of snowmelt are important in planning the best use of water for power generation and irrigation and for flood-control planning and estimating future water supplies for major cities.

Federal agencies in the program, besides NASA, are the National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, U.S. Soil Conservation Service and Bonneville Power Administration. State agencies are the Arizona Salt River Project, California Department of Water Resources and Colorado Division of Water Resources.

Overall coordination of the project is the responsibility of Goddard Space Flight Center.

Through the end of this month, Goddard will work with other agencies to

analyze data returned from NASA's two Earth-orbiting LANDSAT spacecraft and NOAA weather satellites showing snow cover in mountain areas of four regions in California, Colorado, Oregon and Arizona. This will provide a data base and develop expertise on how to use satellite observations in an operational snowmelt-forecasting system.

Then, beginning next spring, NASA and NOAA will provide data - primarily pictures - to water resources managers in the four regions on a near real-time basis.

At the end of the study project in 1978, the user agencies will evaluate the usefulness of the satellite data in improving the accuracy and reducing the cost of predicting stream flow from melting snow in western watersheds fed by high mountain ranges.

Up to now, such predictions - useful in deciding whether to hold or release water in reservoirs - have been based on observations from aircraft and limited measurements by observers penetrating remote wilderness areas on foot or land vehicles.

Tech Brief Awards

At the award ceremony held November 25, 1975, Dr. Hans Mark, Ames Center Director presented monetary awards and certificates of recognition to 9 Ames employees for their tech briefs. NASA provides a \$50 award to the innovator(s) of each Ames Tech Brief published through the Technology Utilization Program. To date, Ames employees have authored over 500 tech briefs.

The following employees received awards: Richard H. Fish and John A. Parker received for "Fiber-Modified Polyurethane Foam for Ballistic Protection" (B75-10062); Demetrius Kourtides and John A. Parker for "Low-Density Polybenzimidazole Foams for Thermal Insulation and Fire Protection" (B75-10056); Bill A. Williams for "Liquid-Cooled Liner for Helmets" (B74-10249); Maxwell B. Blanchard for "Remote Estimation of Soil Moisture" (B75-10026); Robert L. Altman for "Method for Evaluating Effectiveness of Dry Fire-Extinguishing Chemicals" (B75-10027); Leslie D. Montgomery for "Analytic Model for Assessing Thermal Performance of Scuba Divers" (B75-10029); and Jaime Miquel and Paul R. Lundgren for "Acceleration of the Aging Process by Oxygen" (B75-10030). Robert W. Rosser also received an award but was unable to attend the presentation.

Tech Brief material is not restricted to technical personnel but is a program all Ames employees can participate in. The only requirements are that the technology is novel and has utility beyond aerospace applications. Assistance is provided by the Ames Technology Utilization Office in reviewing and advising innovators as to utilization of proposed tech brief material.



Recipients of Technology Utilization Awards are: (from left to right—front row) Demetrius Kourtides, Bill Williams, Leslie D. Montgomery, John Parker, Jaime Miquel; (second row—left to right) Charles Kubokawa, Chief of the Technology Utilization Office, Richard Fish, Robert Altman, Maxwell Blanchard, Paul Lundgren, and Hans Mark, Director.

Ames Christmas Carolers

The Christmas Carolers were heard twice at Ames this season, once at the Children's Christmas Party on Saturday, December 13, and once for the traditional around-the-center caroling and noon-time concert in the Cafeteria on Tuesday, December 16.

This year's carolers and musicians were: Frank Atcheson-ASF; Trudy Buck-AFG; Barbara Busch-DI; Frank Cota-RSM; Betty Coulter-AFC; Diane Dexter-STP; Bonnie Doty-AFG; Bob Eglinton-RFS; Mona Estevez-AT (and Mona's sister, Thelma Kalua); Fred Hansen-STG; Jerry Hirata-RFS; Harry Horn-RSM; Bob Jackson-AFC; Carolyn LaFollette-ASF; Lois McCracken-ASG; Hilda Montano-DSS; Jack Osorno-RSM; Richard Pea-RFS; Shirley Sheridan-AFC; Freddy Silva-Moffett Naval Air Station.

Lung cancer test

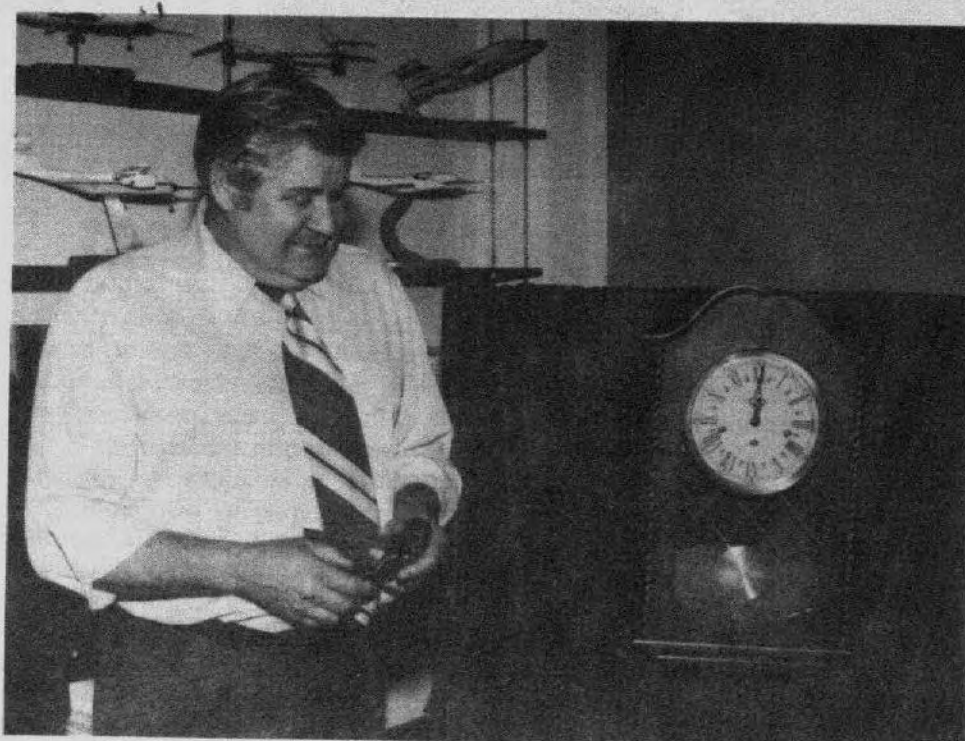
The Health and Safety Office wishes to announce that the Health Unit is initiating a voluntary testing program available to all Ames employees designed for early detection of lung cancer. It is based on sputum study since research has shown that abnormal cells from the bronchial system appear far in advance of clinical or X-ray demonstrated lung cancer, as well as other lung conditions. Further information is available upon a Health Unit appearance.

What is your heart?

It's the muscle that pumps your blood via arteries to bring nourishment and oxygen to your billions of body cells, and to remove wastes from these cells. Blood returns to the heart via veins.

When the heart quits death occurs. Heart and blood vessel ailments are the direct causes of over half of all deaths in the United States.

Woody Cook bids farewell



Woodrow L. (Woody) Cook's recent retirement was celebrated here at Ames on the afternoon of December 5th. Dr. Leonard Roberts, Director of Aeronautics, presented a wall clock to Cook who was Chief of the Research Aircraft Projects Office. Cook is retiring to his home near Lake Almanor after 30 years of civil service NACA/NASA employment.

Engineering review courses

DeAnza College's highly successful "Review of Engineering Fundamentals" course is being offered for the fourth time as a service to the engineering and scientific communities.

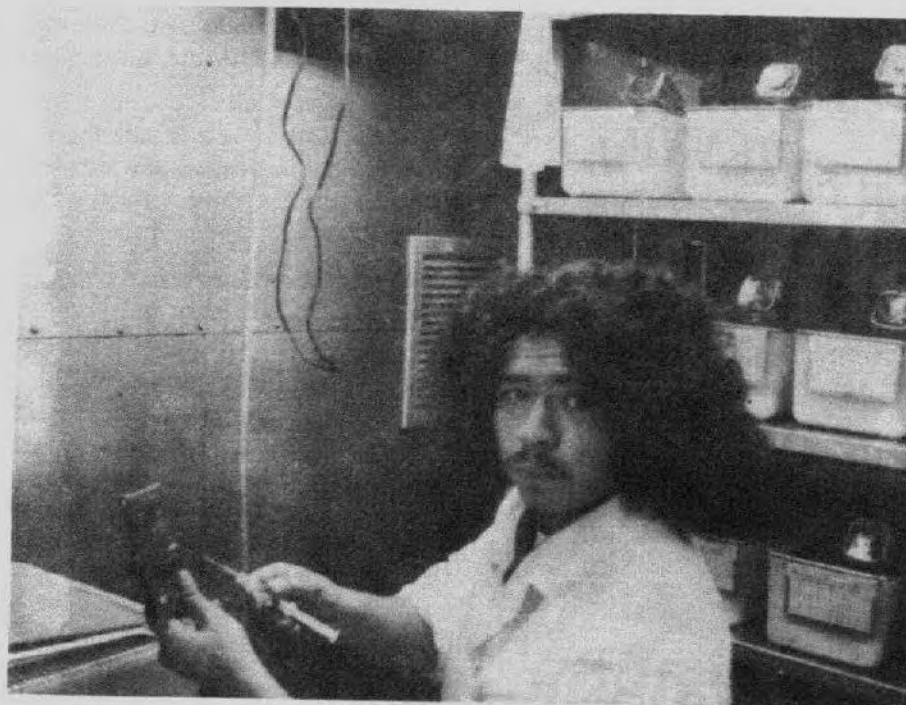
Typical subjects covered in Engineering 365 include Statics, Dynamics, Electricity, Fluids, Thermodynamics, Heat Transfer, Nuclear Theory, and Engineering Economy. In its thorough review of a basic four-year engineering curriculum, the course remains highly individualized, with effort expended by

participants being regulated by their available time.

The course, which is part of DeAnza's Professional Engineering Registration Program, is designed as an Engineer-In-Training (EIT) review, although more than 37% of last quarter's 117 enrollment took the course as a brush-up on rusty fundamentals only. (Past records from the course indicate that 83% of those who complete the course go on to pass the EIT examination.)

(Continued on Page 4)

Student Aide Invention



In the above photo, student aide Gilbert Miranda demonstrates one of his inventions. Miranda, who participates in the President's Stay-in-School program, works with Dr. Henry Leon in the Environmental Physiology Branch. The device demonstrated is a wire mesh restrainer that holds lab mice in place making it easier to give injections and saving the person giving the injection from being bitten.

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Annual Ames Children's Christmas Party



Santa and Mrs. Claus arrived on schedule at the Annual Ames Children's Christmas Party to the delight of 928 youngsters. This annual affair, sponsored by the Ames Exchange Council and conducted by a committee established by the ARA Executive Board, included the talents of many people at Ames. Everyone was entertained by Ed Kelly's marionettes, Paul Sharmen's Sunshine Puppeteers, and Fred Baker's clowns. In addition, the party featured gifts, prizes, goodies, moonwalk, and hobby horses. Mr. and Mrs. Claus were extremely popular. Many wide-eyed youngsters visited with Santa and Mrs. Claus, asking for a wide variety of gifts which will tax even Santa's broad inventory.

The winners of the prizes this year were:

First Prize	\$250	Alexandra Benton	LPB
Second "	\$150	Robert Lavond	SDF
Third "	\$100	Joanne MacArthur	AT
Fourth "	\$ 75	Robert Harper	Contractor
Fifth "	\$ 75	Jim Schmidt	Contractor
Sixth "	\$ 50	JoAnn Williams	LRH
Seventh "	\$ 50	Frank Gibson	RFE
Eighth "	\$ 50	Hjalmar Schacht	SSO

Thank you

The Ames Recreation Association wishes to thank all who contributed to the success of this year's Annual Ames Christmas Party. Special thanks are extended to the Party Committee who took care of the multitude of details which are associated with an undertaking of this magnitude. Your tireless efforts exemplify the real spirit of the Christmas Season. All of you should feel particularly pleased in bringing a little extra happiness to your fellow employees.

Thank you from all of us.

A. E. Lopez
President, ARA

Women's News and Views

by Susie V. Rydquist

What is F.E.W.?

The South Bay Chapter of Federally Employed Women (F.E.W.) is California's newest chapter. It is one of 99 chapters in the United States and overseas. Current members of the South Bay Chapter include NAS Moffett Field, NASA Ames Research Center, U.S. Geological Survey, Defense Contract Audit Agency, Naval Plant Representative Office, Air Force Satellite Test Center, General Accounting Office, Defense Contract Administration Services Office and Veteran's Administration.

F.E.W. is an active organization of Federal employees working in cooperation with and assisting other organizations and individuals concerned with equal employment opportunity in the government without discrimination because of sex, race, color, age, marital status, national origin, political affiliation, religion or physical handicap.

F.E.W. has many programs and projects planned for 1976. For further information on F.E.W. contact Annette Laboy, extension 6510, Ames' Federal Women's Program Coordinator.

Equal rights amendment discussion

Dr. Ellen Boneparth, Professor of Political Science at San Jose State University, has been invited to discuss and explain the provisions of the Equal Rights Amendments, a proposed legislation that will affect both men and women in this country. She will also delve into the myths and realities of ERA and will answer questions pertinent to this significant issue.

Whether we are pro or con on ERA, it behooves all of us, men and women, to know what it is really all about, how it will affect us, our children and society as a whole, now and in the future. Then we, each of us, can take our individual stand on this matter.

This brown-bag discussion is slated for Jan. 12, Monday, 11:30 to 1:00 in Bldg. N-245, Space Science Auditorium.

National Women's Conference

The Senate passed and sent to the President a bill authorizing \$5 million to finance a national women's conference next year to assess the role of women in society.

Equality in ecstasy and ...agony!

Riding the ski lift up in the Sierras last winter, I noticed a busy rescue team below me. The pair of pants and tops of the victim looked familiar. Curiously and hurriedly, I skied down and sure enough, the victim was an expert Austrian skier I used to see all the time happily schussing down the slopes with her husband.

Machine-gun style, I asked, "What happened...where's your husband...?" Calmly, she explained, "He's at home with a sprained ankle. I guess this is what you call equality in ecstasy and agony!"

Ames merit promotion plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76/72	Computer Systems Admin. Specialist	GS-11/12	RKA	Center-wide	1-16-76
76/73	Voucher Examiner	GS-5/6	AFP	Center-wide & Outside	1-9-76

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76/30	Program Resources Specialist	FAA	Judy Bergland
76/38	Instrument Maker	RSM	Thomas Hood
76/38	Instrument Maker	RSM	Dwight Moody
76/54	Budget Analyst (STEP)	AR	Joanne MacArthur

Keep on "carpooling"

Of all the advantages of carpooling, the most alluring may be its money saving potential.

According to the Federal Highway Administration, commuters can save between \$281 and \$427 a year for an average 20-mile daily round trip. There are even greater savings on longer commute runs.

The estimated annual cost of a daily 20-mile commute in a subcompact car is \$646; in a compact \$749; and in a standard size car \$948. Simple arithmetic says that sharing a ride with one person creates a mutual savings of 50%. More riders reduce the amount proportionately.

55 mph speed limit saves lives

Dr. James B. Gregory, head of the National Highway Traffic Safety Administration, stated this month that the 55 mph speed limit was responsible for significant reductions in highway fatalities and injuries during 1974. The following figures were cited:

The 1974 National highway death toll dropped 17% below the 1973 totals. 45,500 fatalities were reported in 1974, which was 9,500 fewer than in 1973. . . an average savings of about 800 lives per month. At the same time, there were 200,000 fewer disabling injuries in 1974 than in 1973.

10 Gallon blood donor

Mr. Perry A. Rowe, former employee of RSS Branch, now retired, was honored at the Palo Alto Area Chapter of American Red Cross Board Meeting on Thursday, December 11, 1975. Mr. Rowe received a plaque for contributing 10 gallons of blood through 80 donations at Ames Research Center.

Engineering courses

(Continued from Page 2)

Classes will be held in room 204 of Ortega Junior High School in Sunnyvale, each Tuesday and Thursday from 6:00 to 8:00, January 6 to March 25. The course, which meets 22 times in the evening, is aimed at preparing engineers and students for the April, 1976 EIT exam.

Four units of continuing-education credit are available for successfully completing the course, which costs only \$8. (Participants are expected to purchase their own texts.) Engr. 365 is a lecture course, with copious examples of application. Derivations and proofs will not be stressed.

Registration will be taken at the first two meetings; however, class size is limited to 100, and advance reservations are recommended. Send your name, address, work/home phones, and a check for \$5 (no cash or stamps) made payable to "Engr. 365, DeAnza College" to:

Michael R. Lindeburg, P.E.
Professional Engineering Coordinator,
OCA
DeAnza College
21250 Stevens Creek Blvd.
Cupertino, CA 95014

WANT ADS

Transportation

1970 HONDA - 350 cc, 14,000 miles. Asking \$350 or best offer (\$1 a cc). Call after 4:00 p.m., 736-5322.

FOR SALE: '68 Buick Skylark Custom, 2-door, P/S, A/T, new front tires & brakes, good condition, with snow chain, best offer. Call 967-4835 after 6 p.m.

1964 Buick AHU Block V8 Engine, \$150. Automatic transmission (will run), \$50. Call 738-2931.

PORSCHE - 1957 Speedster, updated transmission, new tires, new battery, two tops. Very restorable car. Asking \$4,250. Call 267-3661.

Wanted - Used Stereo amplifier and record changer. Call 259-6069.

FOR SALE: Cassette car stereo, automatic reversing, 12v, brand new in box \$83. Call Bob 9 a.m.-1 p.m., 493-8717

CARPPOOL. Vicinity of Colorado & Middlefield, 8-4:30 shift, flexible. Unable to drive, will share expenses. Call Jim Stevenson, X5249 or 328-2112.

Singer Sewing Machine with base, cover and accessories, has zig-zag and embroidery stitches, excellent condition \$70. Call 321-1858.

Drapes, a pair (each panel 100x94) brand new, beige, beautiful fabric, both for \$60. Call 321-1858.

FOR SALE: Motorola 25" color TV \$65. Call 967-4835 after 6 p.m.

FIREWOOD, oak and madrone, \$75 per cord, \$40 per half cord. Will deliver and stack. 493-8710.

FOR SALE: 1973 Apache "Mesa" ten-camper. Excellent condition. Asking \$1700. A great little trailer for a small family. Call 243-5382.

FOR SALE: Capacitive discharge ignition system, Tiger 500, new, \$30. Buckle ski boots and tree, size 6, \$12.50. Call after 5 p.m., 493-8203.

Chess set, beautiful Mexican Jade-type inlays and carving. Velvet lined drawers for carved stone chessmen in original wrappings. Original price \$295, available for only \$195. Call 322-8571.

NRC Associate leaving country, must sell: Excellent tent 9x12, like new, \$60. Also like new Sears aluminum folding lounge chaise, \$8.50, and like new with boxes and warranty cards, two Pioneer CSR-500 hifi speakers, \$145 each. (You may listen if you are not familiar.) Call 964-7060.

LOST: Digital computer (decal 31315) Pacific Data Systems 1966 model desktop installed mobile unit. Size - 5 feet by 2 feet by 2 1/2 feet. Electric typewriter input. Loaned by Systems Analysis Branch to the Aeronautics Division of the Unitary Tunnel several years ago. We don't want it back - just want to get off the records.

Please notify G. Allan Smith at X597 if you have any information. It must be lurking around somewhere in the area. Please check all suspicious coffee tables.

Housing

FOR SALE: Townhouse-Condominium, 2 br., 1 1/2 ba., former model, mirrors and wallpaper throughout. Located in Sunnyvale. \$32,900. Call 249-5190 evenings.

Miscellaneous

FOR SALE: Two stock single bucket seats for a van, \$50. One double back seat, \$35. Call 259-6514.

Scuba Club

The Ames Scuba Club will meet on 14 January 1976 in the Ames Cafeteria dining room. The meeting will begin at 12:45 and be over by 1:30. This schedule will permit attendees to get lunch before the serving line closes and, because of the relatively late hour, to hear the sound track of the movie to be shown. Plan a late lunch and join us.

WG Pay Schedule correction

As indicated in Personnel Bulletin AP/75/19, the new WG pay rates presented may be subject to minor change since the Center had not, as of the date of the Bulletin, received an official schedule from NASA Headquarters. The official schedule shows two minor differences from the ones published in the Personnel Bulletin. These are: WG-12, step 1 is \$7.72/hr, and WS-11, step 5 is \$11.05/hr.

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Ames achievements for 1975

Detailed crystallographic studies, optical property measurement, weight loss studies and chemical analyses of Reusable Carbon Carbon (RCC) materials tested in arc plasma environments have been performed at Ames. These results are being used now to determine both the planned lifetime and thermal performance of the RCC heat shield for the Space Shuttle Leading Edge.

Ames Reaction Cured Glass Coating for Reusable Surface Insulation (RSI) has been selected as the backup coating system for the Space Shuttle Orbiter RSI heat shield. A final selection of a coating for the Orbiter heat shield will be made in CY'76 on the basis of manufacturing studies now being performed at LMSC and thermal tests to be performed by LMSC and NASA/JSC.

Three Test Standard Modules, identical in their functional capability to the three Viking Biology experiments, have been set up at Ames. These units are being used by the Viking principal investigators to evaluate a large variety of soils in order to obtain a wide baseline of information on the range of responses that may be expected from Martian surface samples.

The Russian biological satellite Kosmos 782 was launched on November 25 and recovered on December 15. Three Ames experiments were included, two plant tissue studies and a radiation dosimetry experiment. These are the first American experiments to be carried aboard a Russian biological satellite. In addition, Ames investigators will receive tissues from rats and fruit flies flown by the USSR, and will conduct eleven separate investigations using this material.

An interagency agreement was established with the FAA in which NASA will develop and maintain an Aviation Safety Reporting System over a five year period. The Reporting System will accept and analyze voluntary incident reports from all segments of the Aviation community, including commercial pilots, general aviation pilots and air traffic controllers.

The first totally implantable echocardiographic telemetry assembly was constructed at Ames. This equipment allows the monitoring of heart dimensions by reflected sound waves and the transmission of the information to the outside without wires penetrating the skin.

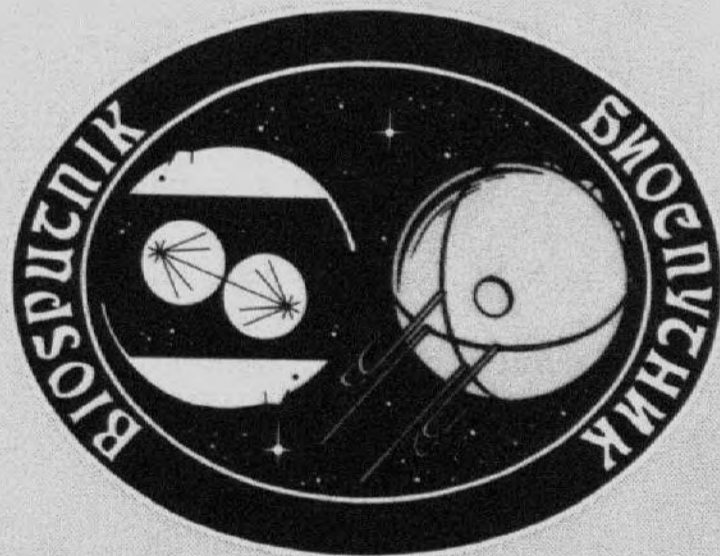
Fixation and sectioning techniques were developed for Kosmos flight #782, which makes it possible to conduct simultaneous light and electron microscopic studies on retinal tissue flown on the Russian spacecraft.

Experimental irradiation of fruit flies showed that single hits by Krypton nuclei are very injurious to nerve cells. These results lend support to the view that exposure to galactic particle radiation during long duration space flights may be detrimental to the brains and eyes of the astronauts.

Analysis of tissue from pocket mice flown aboard Apollo XVII has revealed a six-fold increase in a certain type of cell in the pineal gland. This gland is located deep inside the brain and is thought to be associated with maintaining our biological rhythms.

joint US/USSR biology package launched aboard Kosmos

An entire issue of the journal, *Aviation, Space and Environmental Medicine*, was devoted to a report of the Ames experiment in which pocket mice were flown as part of the Apollo XVII mission.



In August, Ames was host to the sixth meeting of the Joint US/USSR Working Group in Space Medicine and Biology. Eleven scientists from the Soviet Union and delegates from NASA Headquarters, JSC and Ames met for ten days to exchange medical and biological data from spaceflights and to finalize plans for the 1975 Kosmos flight.

Ames laboratory studies of synthetic speech devices have led to collaborative research with American Airlines' Flight Training Academy, Ft. Worth, Texas, to explore the possibility of automating altitude callouts during approach and landing.

It was shown that illusions of linear motion and motion sickness can be produced by visual inputs acting directly on the motion-sensing system of the brain.

Measurements of the stable isotope ratios of carbon-13 to carbon-12 in rocks from Greenland, the oldest rocks on the Earth, suggest that biological processes may have contributed to the geochemical carbon cycle as early as 3.7 billion years ago.

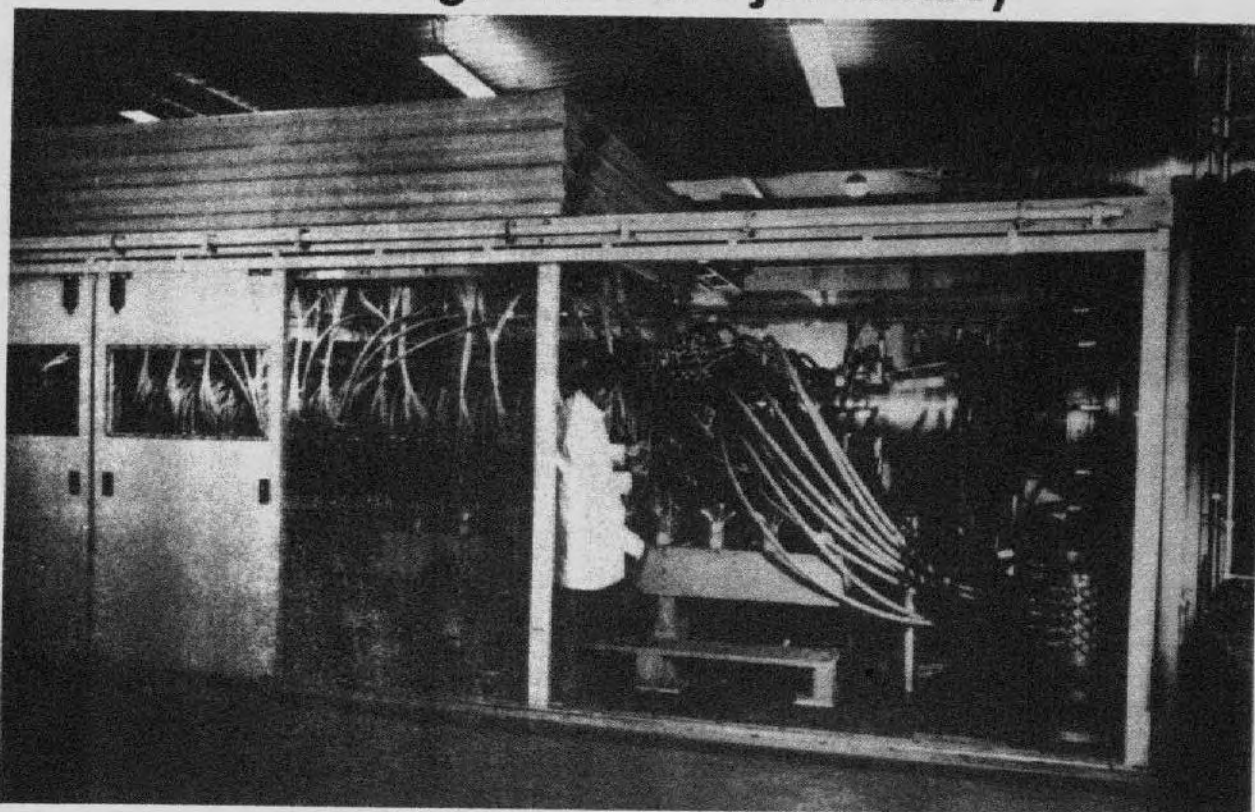
The development of a new model support system for the 40- X 80-Foot Wind Tunnel was completed this year. The system has improved load-carrying capability, speed of response, and positioning accuracy. A significant feature of the system is that it is entirely motorized with provisions for rapid model changes. This system was part of the overall modernization of the 40- X 80-Foot Wind Tunnel which included the construction of several new facilities and the modernization of others.

Hughes Aircraft Company began Phase II of the Pioneer Venus Spacecraft Contract which includes design, development, manufacturing, and testing.

All Pioneer Venus Instrument Conceptual Design Reviews were completed and instrument contracts were awarded during 1975.

Computer codes for predicting the entry heating to the Space Shuttle orbiter have been completed. This work included verification of the codes by comparison with wind tunnel experiments, and the computation of the flow field and heating at four points on the flight trajectory. These computations, which include the effects of finite-rate chemical reactions will be used to improve the simplified design predictions employed by Rockwell International, the Shuttle builder.

60 megawatt arc jet facility



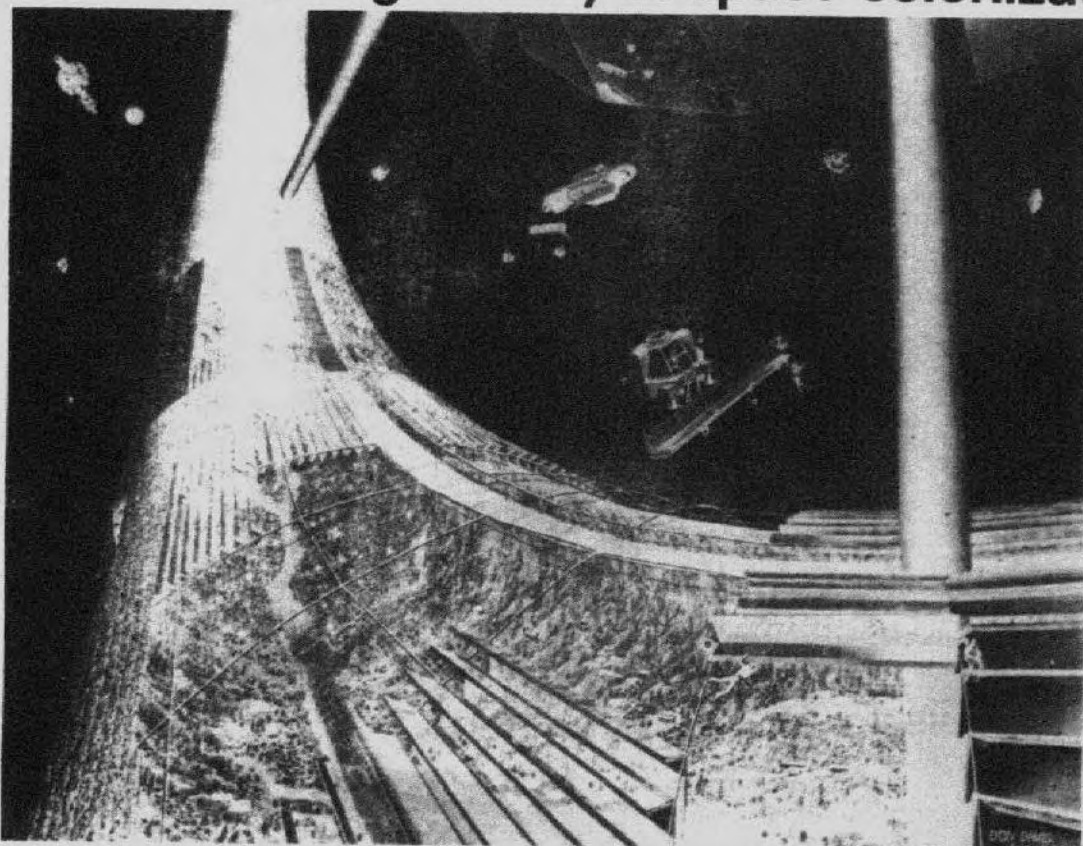
The 60 Megawatt Arc Jet Facility became operational and is a critical facility for developing the Shuttle Heat Shield over the next several years.

Ames' data communications facilities have been significantly expanded in function and capacity to a Centerwide network that provides automatic switching capability in support of interactive terminals and high-speed point-to-point communications for remote batch terminals and graphics display systems. Ames' users can now access both Central Facility and off-site computer resources. This state-of-the-art facility has removed data communications from its previous dependency upon the Ames telephone system, and has thus provided the flexibility for high-speed data communication capacity to be readily located as the research requirements dictate.

A new probe was developed to obtain turbulence measurements at hypersonic Mach numbers in heated wind tunnels. With the use of this probe, valuable turbulence modeling information was obtained for a hypersonic shock-wave turbulent boundary-layer flow.

Based on encouraging laboratory results obtained for a new natural rubber/vinyl polybutadiene tread formulation for heavy duty aircraft tires, a set of Boeing 727 main landing gear tires were retreaded with the Ames-developed elastomer system. These tires, which show promise for markedly improved wear- and blowout-resistance over state-of-the-art tires, will serve as the prototype for tires to be built and subjected to actual airline flight evaluation.

NASA/ASEE design study of space colonization



The NASA/ASEE Summer Design Study of Space Colonization was successfully completed with a design of a "self-sufficient" space habitat for 10,000 people.

The first fully automatic landing for a propulsive lift aircraft was accomplished at Ames using the STOLAND system installed on the Augmenter Wing Aircraft.

The complex flow field of the interaction between a normal shock wave and a turbulent boundary layer at transonic speeds has been experimentally documented and numerically simulated. The measurements include the first transonic turbulent shear stress data ever obtained which is necessary to advance turbulence modeling.

The complete flow field over a thick transonic airfoil has been experimentally investigated in the new Ames High Reynolds Number Channel in support of the development of viscous turbulent computer codes. Numerical simulation of the flow field has also been achieved using the ILLIAC IV computer.

In May 1975 the C-141 infrared observatory was dedicated the Gerard P. Kuiper Airborne Observatory (KAO) at Ceremonies in Tucson, Arizona. The KAO made 70 research flights (for a total of 510 flight hours) in 1975 in support of twelve research groups. In April 1975, a KAO researcher reported the first detection of water in the Jovian atmosphere. In July and August the KAO was deployed to Hickam Field, Hawaii, where the first concerted effort to obtain high spatial resolution IR maps of the Galactic Center was successfully accomplished.

A Stirling engine driving an electric generator has been powered for continuous operation by a CO₂ 10-micron laser. Though efficiencies are presently less than 1 percent, this opens up the potential of an efficient laser energy converter.

In 1975 the Pacific Northwest Land Resources Demonstration Project was established. A cooperative project with the Pacific Northwest Regional Commission and USGS to evaluate the use of remotely-sensed data in the Northwest. The project now involves more than 40 different agencies and 100 people in the states of Washington, Oregon, and Idaho. This project is unique within NASA because of the regional aspect, multi-disciplines, broad spectrum of users, and the political support.

An advanced air traffic control concept developed at Ames was recently tested in the Ames Air Traffic Simulation Facility. FAA controllers participating in the simulation handled 30 percent more traffic with fewer controller-pilot messages than in the current system. The increased traffic flow achieved with this concept would reduce delays, fuel consumption and noise at busy airports. The key to the concept is an airborne navigation and guidance technique developed at Ames, which predicts and controls the landing time of an aircraft to an accuracy of a few seconds.

Low density fire resistant panels have been developed for potential use as secondary structures in aircraft. The panels are made by foaming Polyquinoxaline in a honeycomb core and bonding a bismaleimide and glass cloth face sheet to either side of the core. Fire and smoke tests show that the newly-developed panels are vastly superior to the state-of-the-art material.

Order of magnitude reductions in the solution of Navier-Stokes equations computational times have been achieved by Ames.

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AGARD rotorcraft design symposium planned

The Flight Mechanics Panel of AGARD (Advisory Group for Aerospace R&D to the NATO Military Committee) has recommended that a general symposium on Rotorcraft Design be held at NASA/Ames during May 1977.

The proposal was approved by the Panel at its business meeting on October 24, 1975, in The Hague, Netherlands.

The recommendation will be part of the Panel's overall 1977 program to be submitted for approval by Dr. Irving C. Statler, panel chairman, to the National Delegates Board of AGARD at its next meeting in March, 1976.

Dr. Statler, director of the Ames Directorate, U.S. Army Air Mobility Research and Development Laboratory (AMRDL), noted that such meetings typically attract about 150 engineers and scientists representing all of the NATO nations.

It is planned that the symposium will be jointly sponsored by AMRDL and NASA.

Although the Flight Mechanics Panel will be responsible for the meeting, contributions are also expected from representatives of AGARD's Fluid Dynamics and Structures and Materials Panels.

The major objectives of the meeting will be to review the emerging technology and operational experience base and assess the potential for further technical improvements in future rotorcraft and to identify what must be done to encourage greater coordination of civilian and military programs so that the cost reduction potential for such coordination is maximized.

AGARD was established as a NATO Military Agency in 1952 to provide the scientific and technical support relating to aeronautical research and development. The early reliance on AGARD to pool the aeronautical research among the member nations and to exchange scientific and technical information has steadily grown.

Its contributions to the rapid and effective attainment of the NATO defense objectives has been significant. AGARD draws voluntary support from the NATO nations which provide over 600 scientists and engineers each year to address current problems and issues within the Alliance relating to aerospace research and development.

**Safety Shoemobile
at Ames
Jan. 19 & 20**

Ames supports the United Way



Following the second county-wide United Way report meeting (left to right) Robert Fuhrman (left), loaned executive chairman and executive vice president of Lockheed Missiles and Space Company met with Ben Briggs (middle), loaned executive from Ames Research and Loren Bright, director of Research Support at NASA. They are enjoying a banner honoring the 1975 Loaned Executives.

Machinist trainee earns first certificate



Pictured left to right are Brian Roberts, COPY trainee, Mel Martinez, COPY counselor, and Harry Butler, shop supervisor.

Brian Roberts, nineteen year old Career Opportunity Program for Youth (C.O.P.Y.) trainee, was awarded the first joint COPY/NASA/Mt. View Adult School Certificate of Completion as a machinist trainee. Brian, who has been on the COPY Program since July 1975 successfully completed five demanding projects which included making a set of lathe tool kits (one each) left and right hand turning, 60° thread cutting tool and a parting tool ground on a 5/16" tool bit blank, an adjustable tap handle to specifications, internal and external threading (3/4" - 10 thread and nut class 3 fit), cut one gear to fit center distances of supplied gear train (must make own calculations) and sharpening a 1/2" or larger twist drill.

Efforts are now being made to place Brian on a permanent job where he can use the skills he has acquired over the past 6 months.

IWY at Ames: a recap

With the United Nation's General Assembly Resolution proclaiming 1975 as International Women's Year (IWY), Ames Research Center was one of many NASA Centers endorsing the observance of the Year.

The year started with a kick-off luncheon with guest speaker Shirley Zimmerman. Throughout the year there was an ongoing effort by the F.W.P.C. and the W.A.G. to inform women and men of the Federal Women's Program. There has been a series of special programs with guest speakers, movies and seminars as motivational means of career development.

The grand finale of the IWY was the Federal Women's Week at Ames, "The Bicentennial Woman." The week, in November, consisted of a series of workshops, seminars, movies, a play and ended with a happy hour. Those who attended all or part of the sessions felt it gave ideas for women to help themselves, gave women more confidence, made women more aware, gave supervisors and management a better understanding of the needs of women. Women have become competitive and more are working hard to better themselves. Five times more women were applying for Upward Mobility jobs at the end of the year than did so at the beginning of the year.

International Women's Year at Ames was the start of a new effort to expand the progress of equality, development, and peace, the theme of the year, with women and men continuing to work together to attain true equality.

Ames Merit Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-74	Voucher Examiner	GS-4/5	AFP	Centerwide & Outside	1-23-76
76-75	AST Flight Systems Test (2 positions with duty station in El Segundo, Los Angeles County)	GS-7/9	SA	Centerwide & Outside	1-30-76
	Aerospace Engineering Technician (2 positions with duty station in El Segundo, Los Angeles County)	GS-7/9	SA	Centerwide & Outside	1-30-76
76-76	Accounting Technician	GS-7/8	AFC	Centerwide & Outside	1-23-76

TO APPLY: Call extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-64	Aircraft Pilot (2 positions)	FOF	Charles Mattrau, Stewart Colpitts
76-66	Secretary (Typing)	RFS	JoAnn Innes

WANT ADS

Transportation

1963 Buick Special, V-6 engine, very economical and in good condition, \$425. Call 354-8915.

FOR SALE: 1953 Jaguar MKVII, sedan, partially restored. Call 961-2093 evenings.

1975 4-WD Chev Silverado, air, mag wheels, carpeted bed, 9000 miles. \$2000 under cost at \$6500. 867-4087

1969 Ford Torino GT, 351 cu. in. engine, steel belted radial tires, automatic, p/s, power disc brakes, asking \$850 or offer. Call 796-1473.

1973 Pontiac Grand Am, loaded. Call 258-1675 after 5 p.m.

Housing

FOR RENT: Squaw Valley, Condo, sleeps 4-6, walk to lifts, ice rink, etc. Call Ray Savin, 964-2170 and save 20%.

Home for Sale - Sunnyvale. 3 br, 2 bath, family kitchen, separate utility room, attic with folding stairs, central air conditioning, cathedral ceilings in living room, kitchen, and MBR. Covered patio, 15 fruit trees, large fenced garden. One block from Ponderosa Park. Excellent condition and only 6 years old, \$54,000. Call 246-3356 eves and week-ends.

Miscellaneous

Female or Male roommate needed to share 3 bdrm, 2 bath house in Sunnyvale. Own room, \$75. Call 735-1872.

WANTED: 25 gal. aquarium/fresh water. Need hood and light, any other accessories welcome. Call Marge 378-6449.

For Sale: Antique oak rocker. Spindle back and cane seat. \$75. Call 733-1909.

For Sale: 1975 Honeycomb Irons (Pro-Line) 2 thru pitching wedge. Used about 10 times. Retail new at \$330, asking \$175. D-3 Stiff Shaft. Toe & Heel Balance. Call Bette after 5:00 at 257-8542.

FOR SALE: Washing machine - older model, General Electric, \$30. Call 961-2093 evenings.

Ski Boots, Kastinger, ladies buckle, size 8M, good condition, \$20 or best offer; Cubco bindings, \$25. Call 739-5373.

Guitar, Crown 12-string acoustic, beautiful tone, excellent condition, case included, \$45. Call 341-6736.

FOR SALE: Baumbach Baby Grand Piano and bench, \$800. Call 379-2385.

Ride needed from 20th Ave. and El Camino Real, San Mateo; 8 to 4:30 p.m. shift, share expenses. Call M. Bluth, X5454 or 341-1169.

Ride Needed - 7 to 3:30 shift, live on Via de Adrianna, crossroads are Redmond and Meridian. Call 965-6397.

Thank you

To all my friends at Ames:

I wish to express my heartfelt thanks and gratitude for your prayers, love and sympathy at the loss of my beloved daughter, Nancy. Your support and thoughtfulness during these past tragic days have been such a comfort.

Thank you so much for your generous contributions for Nancy's son, Isaac. A trust fund has been established for him and your contributions will be added to that to help secure his future.

Mary L. Houston

New Astrogram masthead

As you may have noticed, THE ASTROGRAM has a new masthead. The masthead is part of a new graphics system that NASA is developing to improve visual communications with the public, as well as all intra-agency communications. The new system encompasses everything from publications to stationery, from press releases to vehicle identification.

By standardizing all NASA graphics at a high level of design excellence, through the use of a graphics standards manual, NASA expects simultaneously to enhance the appearance of agency graphics and to reduce design costs.

In adopting this new system, NASA is one of the first government agencies to implement the Federal Graphics Improvement Program initiated by the President in May 1972.

One new feature of the system is the design and adoption of a new NASA logotype. The new logotype will be used by NASA Headquarters and all installations on everything from letterheads to building signs.

For the logotype, the letters "N-A-S-A" were reduced to their simplest possible form, with single width strokes. Even the cross strokes in the "A's" were eliminated to achieve simplicity. Though highly stylized, legibility was not sacrificed.

In a statement on the new system, Dr. James C. Fletcher, NASA Administrator, noted:

"We at NASA believe that design excellence is not a luxury but rather a necessity. We believe that it is important to constantly upgrade the quality of our graphics in order to improve communications with the citizens of our country and to develop a closer relationship between graphic design and program operation so that design becomes a tool in achieving the program objectives of NASA."

The graphics system will be implemented at NASA Headquarters and its centers on a step-by-step basis, beginning with stationery and envelopes. The new materials will be put into use as the old ones are used up.

The conceptualization and design of the new NASA graphics improvement system is being done by Danne & Blackburn, Inc. of New York City.

County safety council award

NASA-Ames was honored for operating at an accident rate below the national average this year by the Santa Clara County Safety Council at its twenty-sixth annual meeting Dec. 11 in San Jose.

John G. Habermeyer accepted the award from William L. Nickel, executive vice president of the Safety Council.

Twelve awards were presented to county industries for perfect accident records. Six other company awards were given to industries that operated at a below-average accident rate and three motor fleets were honored for their low accident rates.

Public service awards were presented to a California Highway Patrol officer, four San Jose policemen, an attorney, a post office driver, and a radio station news director.

The Safety Council, headquartered at 1022 Lincoln Ave., San Jose, is a chartered chapter of the National Safety Council.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor Meredith Moore
Associate Editor Marcia Kadota
Reporters NASA Employees

Deadline for contributions: Thursday between publication dates

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Ames Research Center
Moffett Field, California 94035

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By 1971, 2/3 thought a woman would be acceptable. In addition, 81% said they would vote for a

10 years service



Darrell Wilcox (right), Deputy Project Manager of Q.S.R.A., receives a ten-year service award from Jack Boyd, Deputy Director of the Aeronautics and Flight Systems Directorate.

woman for governor, and 88% would vote for a woman senator.

BASIC OPPORTUNITY GRANTS

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ERA - A BREAD AND BUTTER ISSUE

You probably are happy with your life. Most women are. You have a loving husband who supports and cares for you and for your children. You enjoy the satisfactions of homemaking, your chosen career. So why should you bother about an Equal Rights Amendment?

But situations change. Your husband may become sick, lose his job, or still worse, he may die. Did you know that, in this country, one out of every six women is a widow? Widows and single women over 65 have less money than any other group in our society. Their average annual income is only \$1,397, well below the poverty level.

You may be one of these women.

"I think that ratification of the ERA would be helpful not only to the career woman but to the married woman who has to reenter the job market." (Mrs. Gerald Ford)

Your husband's life insurance may well give you a false sense of security. False, because even a \$50,000 policy cannot possibly cover mortgage payments, taxes, education, and everyday living expenses. Be realistic. Add them up.

Nine out of every ten American women will work at some time in their lives.

Women with children account for the largest increase in the number of U.S. working women, a number which has almost tripled since 1948.

Costs of feeding a family continue to rise. When a mother must support her family, should her income be less than that of a single man simply because she is a female?

"The Equal Rights Amendment would ensure equal pay and equal opportunity for the wife, widow, and divorcee who is helping to support a family."

In the interest of common sense, to say nothing of fairness, I believe this should be the law of the land for every one of the 50 states." (Ann Landers)

Recently, President Gerald Ford stated:

"In 1970, on the floor of the House, I said that the Equal Rights Amendment was an idea whose time had come. Today I want to reaffirm my personal commitment to that Amendment. The time for ratification of the Equal Rights Amendment has come just as surely as did the time for the 19th Amendment."

Americans must deal with these inequities that still linger as barriers to the full participation of women in our nation's life. We must strengthen and support laws that prohibit discrimination based on sex."

The text of the Equal Rights Amendment is simple:

Section 1: Equality of rights under the law shall not be denied or abridged by the United States or by any State on account of sex.

Section 2: The Congress shall have the power to enforce by appropriate legislation, the provisions of this article.

Section 3: The amendment shall take effect two years after the date of ratification.

Pioneer 11 on Saturn course

NASA's Pioneer 11, headed for the ringed planet Saturn, has successfully completed what officials consider its riskiest course-change maneuver.

Controllers recently increased spacecraft velocity 108 km/hr (67 mph) to assure that Pioneer has two options at Saturn. The most interesting possibilities are one in which Pioneer would fly between Saturn's rings and the planet, and one in which the spacecraft would come in under the rings and then pass upward outside of them.

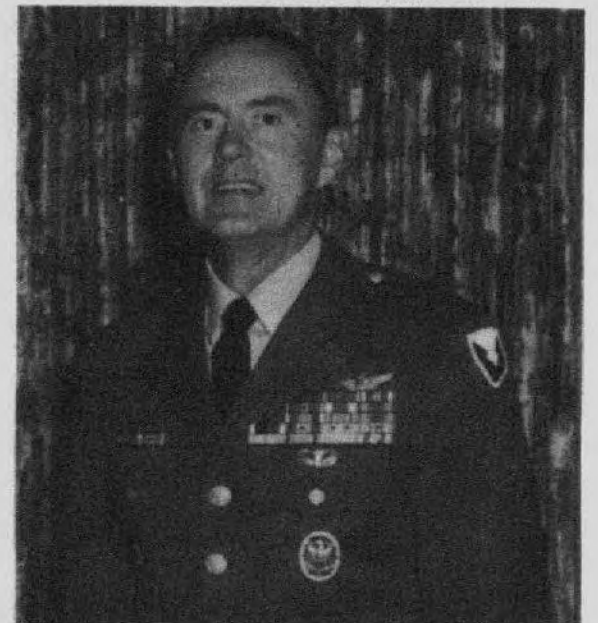
To do this, controllers at Ames had to lose communications with Pioneer, 458 million kilometers (287 million miles) from Earth, for several hours, and allow the spacecraft to command itself to change position, fire its thrusters and then reposition itself to point its antenna back toward Earth in order to resume communications.

Had a problem developed while the spacecraft were turned away from Earth, controllers would have had no radioed information on the conduct of Pioneer 11.

"We are highly pleased with the operation," commented Project Manager Charles F. Hall.

Pioneer 11 will take the first close-up pictures of Saturn and its brightly-lit rings when it reaches the planet in 1979. It flew past Jupiter last December, taking the first pictures of that planet's polar regions. Recent picture-taking has shown that its electronic camera is still working well. Pioneer 11's trip from Jupiter to Saturn spans one and a quarter billion miles across the solar system.

Brigadier Gen. Stevens to address A.H.S.



Brigadier General Story C. Stevens, a leader in the field of Army aviation research and development, will be the featured speaker at the February dinner meeting of the San Francisco Bay Area Chapter of the American Helicopter Society.

BG Stevens, Deputy Commanding General of the U.S. Army Aviation Systems Command, St. Louis, MO, will discuss "recent trends in Army aviation," highlighting Army helicopter developments which provide increased mobility, intelligence and fire power. The presentation will include an overview of the current developments and some examples of application of advanced technology.

The meeting, to be held at the Officers Club, Naval Air Station, Moffett Field, on Tuesday, Feb. 3, is open to all interested persons. No-host cocktails begin at 7 p.m., dinner at 7:30 p.m., with the program getting underway at 8 p.m. Price of the filet mignon dinner (including wine and tip) is \$7.25 per person. There is a \$1 surcharge for non-members.

Contact Jim Biggers, (415) 965-5043 or mail reservations to 4 Oak Court, Sunnyvale, CA 94086.

The Astrogram

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"Star Trek" star tours Ames facility



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You may be one of these women.

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Your husband's life insurance may well give you a false sense of security. False, because even a \$50,000 policy cannot possibly cover mortgage payments, taxes, education, and everyday living expenses. Be realistic. Add them up.

Nine out of every ten American women will work at some time in their lives.

Women with children account for the largest increase in the number of U.S. working women, a number which has almost tripled since 1948.

Costs of feeding a family continue to rise. When a mother must support her family, should her income be less than that of a single man simply because she is a female?

"The Equal Rights Amendment would ensure equal pay and equal opportunity for the wife, widow, and divorcee who is helping to support a family."

In the interest of common sense, to say nothing of fairness, I believe this should be the law of the land for every one of the 50 states." (Ann Landers)

Recently, President Gerald Ford stated:

"In 1970, on the floor of the House, I said that the Equal Rights Amendment was an idea whose time had come. Today I want to reaffirm my personal commitment to that Amendment. The time for ratification of the Equal Rights Amendment has come just as surely as did the time for the 19th Amendment."

Americans must deal with these inequities that still linger as barriers to the full participation of women in our nation's life. We must strengthen and support laws that prohibit discrimination based on sex."

The text of the Equal Rights Amendment is simple:

Section 1: Equality of rights under the law shall not be denied or abridged by the United States or by any State on account of sex.

Section 2: The Congress shall have the power to enforce by appropriate legislation, the provisions of this article.

Section 3: The amendment shall take effect two years after the date of ratification.

Pioneer 11 on Saturn course

NASA's Pioneer 11, headed for the ringed planet Saturn, has successfully completed what officials consider its riskiest course-change maneuver.

Controllers recently increased spacecraft velocity 108 km/hr (67 mph) to assure that Pioneer has two options at Saturn. The most interesting possibilities are one in which Pioneer would fly between Saturn's rings and the planet, and one in which the spacecraft would come in under the rings and then pass upward outside of them.

To do this, controllers at Ames had to lose communications with Pioneer, 458 million kilometers (287 million miles) from Earth, for several hours, and allow the spacecraft to command itself to change position, fire its thrusters and then reposition itself to point its antenna back toward Earth in order to resume communications.

Had a problem developed while the spacecraft were turned away from Earth, controllers would have had no radioed information on the conduct of Pioneer 11.

"We are highly pleased with the operation," commented Project Manager Charles F. Hall.

Pioneer 11 will take the first close-up pictures of Saturn and its brightly-lit rings when it reaches the planet in 1979. It flew past Jupiter last December, taking the first pictures of that planet's polar regions. Recent picture-taking has shown that its electronic camera is still working well. Pioneer 11's trip from Jupiter to Saturn spans one and a quarter billion miles across the solar system.

Brigadier Gen. Stevens to address A.H.S.



Brigadier General Story C. Stevens, a leader in the field of Army aviation research and development, will be the featured speaker at the February dinner meeting of the San Francisco Bay Area Chapter of the American Helicopter Society.

BG Stevens, Deputy Commanding General of the U.S. Army Aviation Systems Command, St. Louis, MO, will discuss "recent trends in Army aviation," highlighting Army helicopter developments which provide increased mobility, intelligence and fire power. The presentation will include an overview of the current developments and some examples of application of advanced technology.

The meeting, to be held at the Officers Club, Naval Air Station, Moffett Field, on Tuesday, Feb. 3, is open to all interested persons. No-host cocktails begin at 7 p.m., dinner at 7:30 p.m., with the program getting underway at 8 p.m. Price of the filet mignon dinner (including wine and tip) is \$7.25 per person. There is a \$1 surcharge for non-members.

Contact Jim Biggers, (415) 965-5043 or mail reservations to 4 Oak Court, Sunnyvale, CA 94086.

10 years service

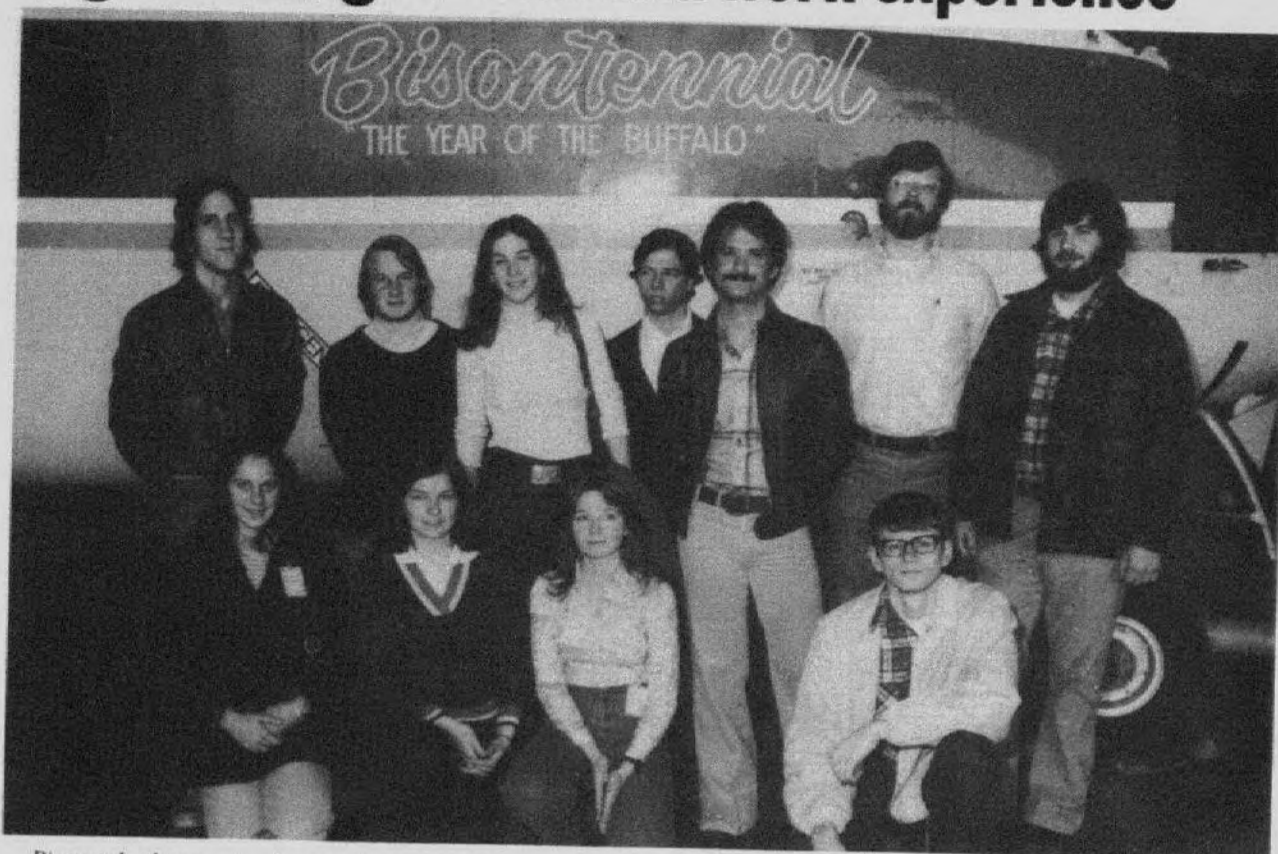


Darrell Wilcox (right), Deputy Project Manager of Q.S.R.A., receives a ten-year service award from Jack Boyd, Deputy Director of the Aeronautics and Flight Systems Directorate.

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FRC renamed (Continued from Page 1)

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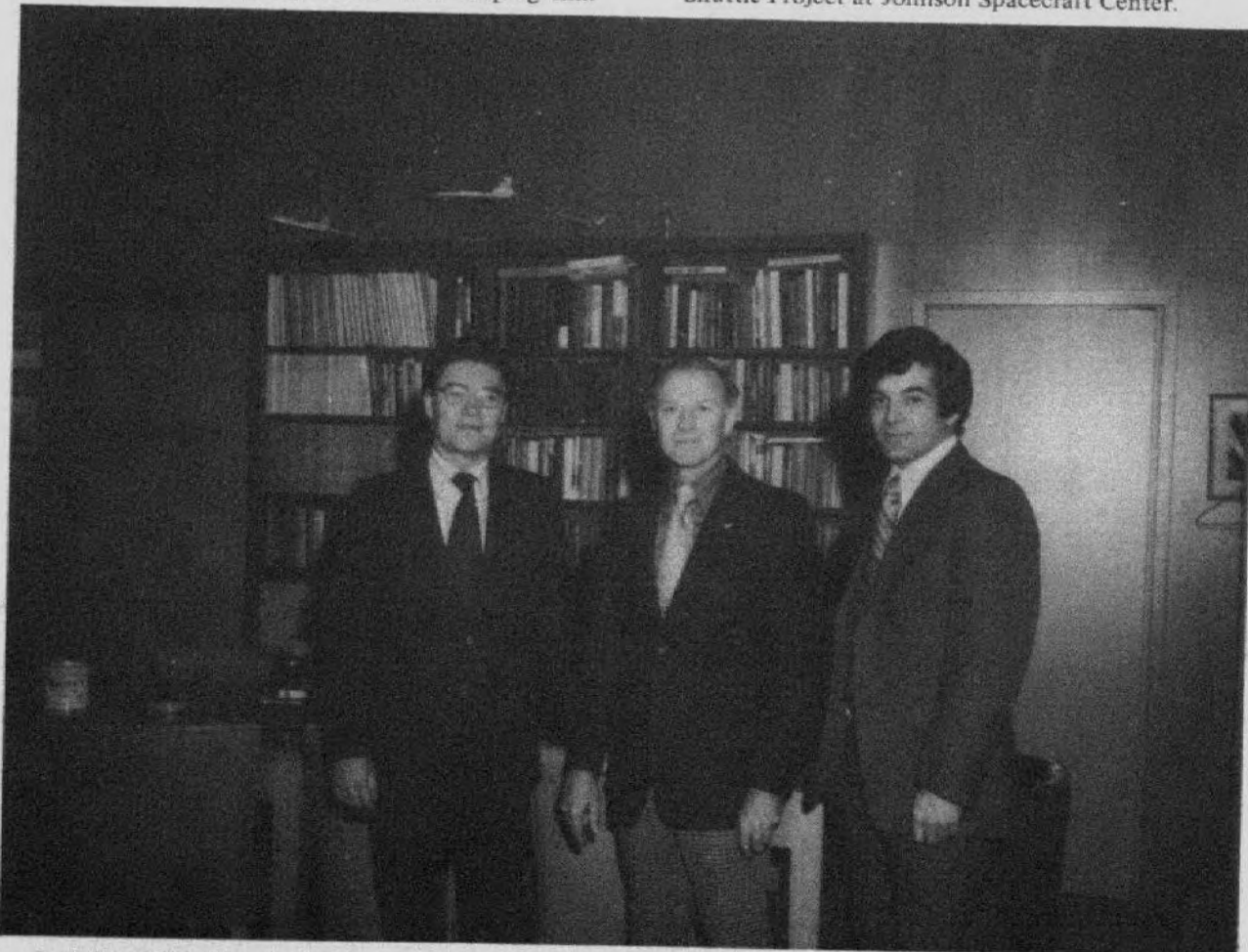
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Jack Boyd (l.), Deputy Director of the Aeronautics Directorate, and Mike Wash (r.), Technical Assistant for Aeronautics, pose with astronaut visitor, Colonel Gerald Carr.

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TO APPLY: Call Extension 5599 or 5600

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76-73	Voucher Examiner	AFP	Robert Ortiz

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OPEL GT-1971: 36,000 miles, new paint, good condition. call 573-8397.

'59 Willys Jeep pickup, 4-wheel drive, \$700. Call 225-5461 after 7:00 p.m., or any time on weekend.

FOR SALE: 1974 Pinto Runabout, automatic transmission, excellent condition. Call 736-8852.

Housing

FOR RENT: Beach house at Pajaro Dunes, completely furnished, 3 bdrms, 2 ba., sleeps 6, view of Monterey Bay, tennis courts, and other recreation facilities. Call John Lundell, 252-7260.

WANTED: Female to share home and expenses. Quiet and quaint location. Must like cats. \$175/mo. Call 328-6944, after 6 p.m.

FOR RENT: 3 bdrm, 2 ba, new carpet throughout, fireplace, 2 car garage, fenced-in backyard. \$285/mo. Near Santa Clara Co. fairgrounds. 252-3937, eves.

Home for Sale - Sunnyvale. 3 br, 2 bath, family kitchen, separate utility room, attic with folding stairs, central air conditioning, cathedral ceilings in living room, kitchen, and MBR. Covered patio, 15 fruit trees, large fenced garden. One block from Ponderosa Park. Excellent condition and only 6 years old. \$52,950. Call 246-3356 eves and weekends.

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LACROSSE PLAYERS: Any interested lacrosse players hiding in the woodwork should contact Herb Finger, 246-3616.

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Weight lifting set (110 lb) with full bar, two one-hand bars and collars. Weights and bars are encased in plastic to prevent rusting. Call 324-2428 after 6:30. \$18.

Half-size violin, case, bow and pad. German made, used 3 years. \$80. R. Wakefield, 739-9124.

Sony reel-to-reel model 560D, auto. reverse, new recording head. Just serviced. Approx. 75 reels tape, \$250. Chris, 494-2794.

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(Tune of JA DA)
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It's on you that we depend.
NASA, NASA,
It's our Nation you defend.
Every day we feel secure
For we understand,
Your research is making sure
Protecting our land.
NASA, NASA,
We support you to the end,
WE REALLY MEAN IT!
We support you to the end.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

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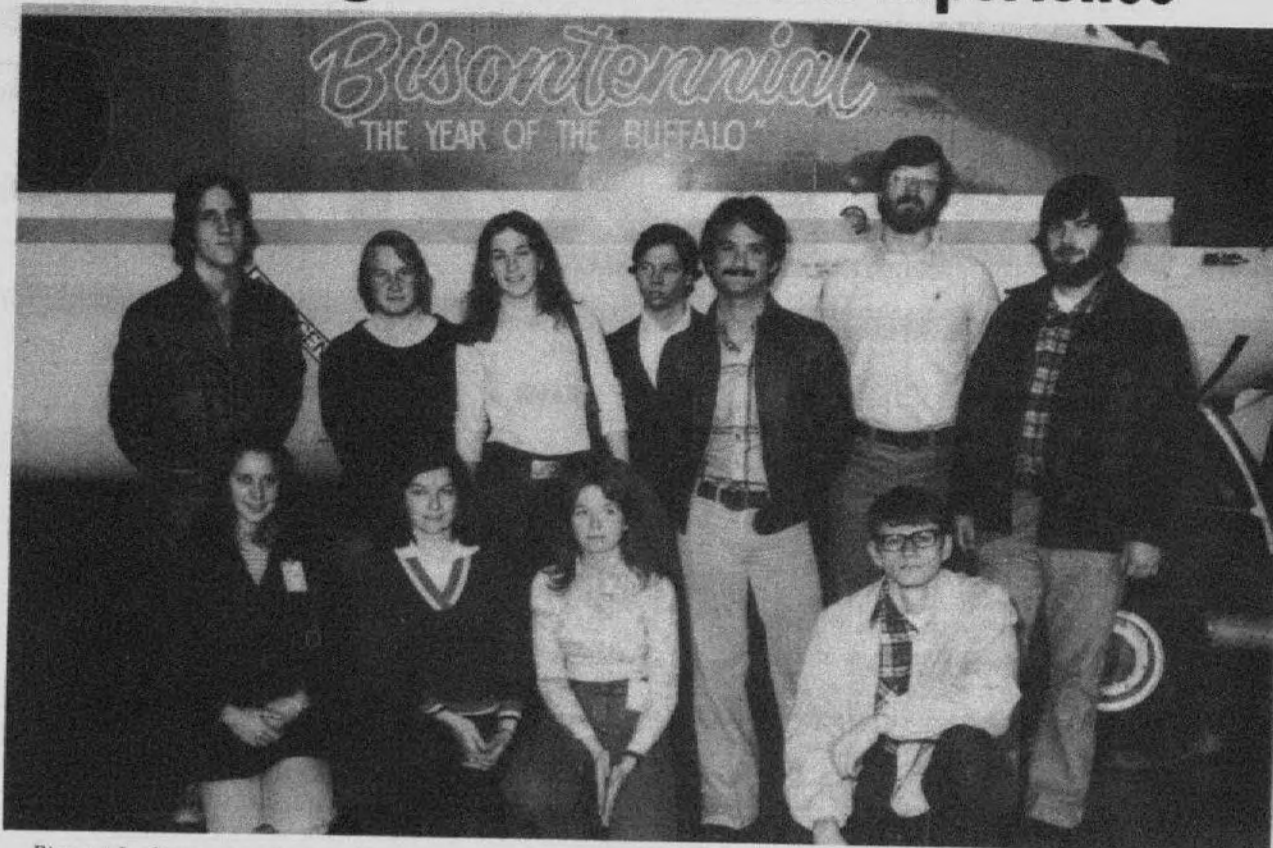
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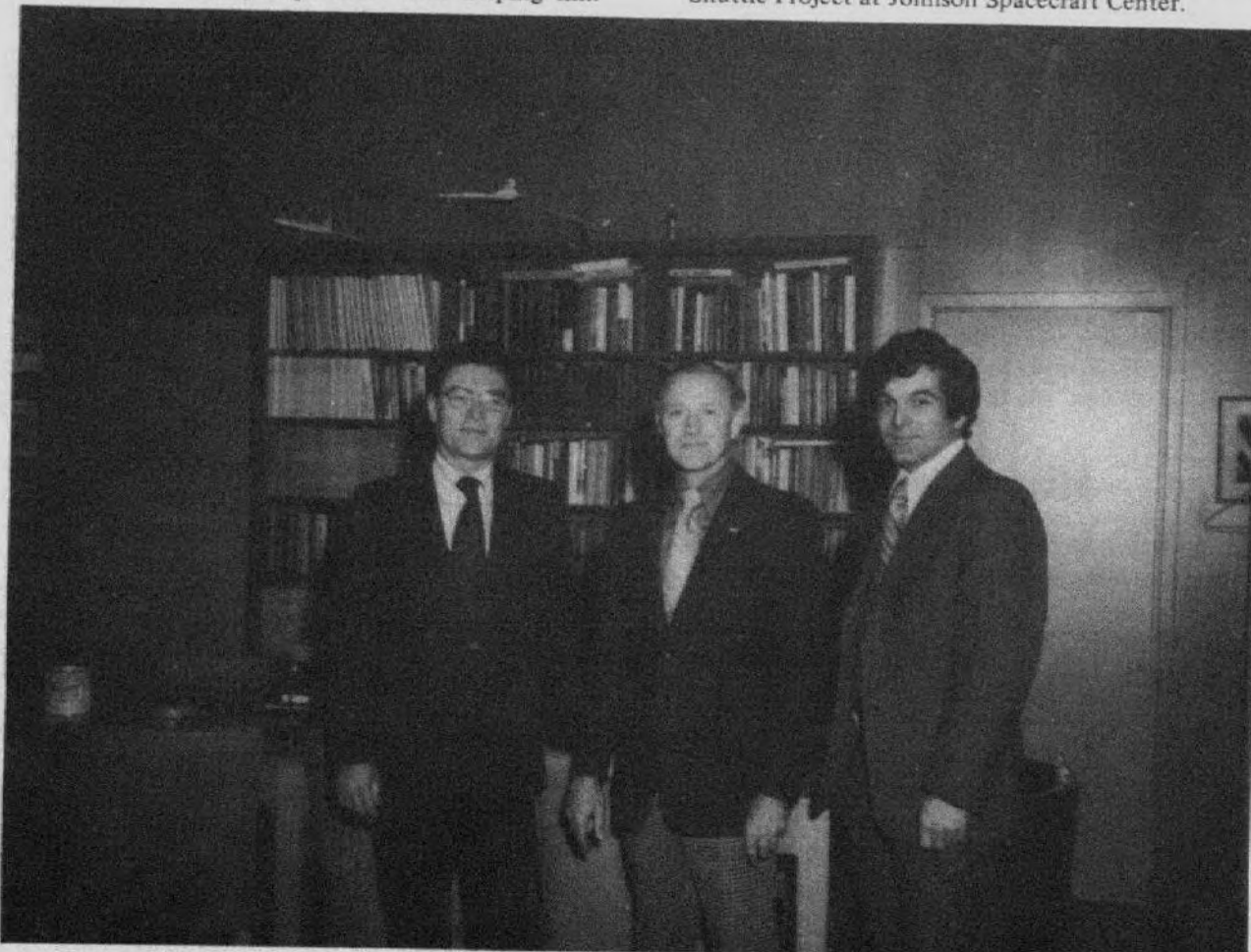
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The Astrogram

VOLUME XVIII NUMBER 10

February 13, 1976

First Ames director celebrates 80th birthday

Dr. Smith J. DeFrance, Director of Ames for its first 25 years, celebrated his 80th birthday on January 19 with the best wishes of 1100 Ames employees.

Dr. Hans Mark and Dr. DeFrance's successor, H. Julian Allen, presented the distinguished developer of the Ames Laboratory with a plaque and a birthday greeting booklet bearing the signatures of more than 1100 current Ames personnel who worked at the Center at the time of Dr. DeFrance's retirement in November of 1965.

Deputy Director C. A. Syvertson and Loren G. Bright, Research Support Director, hosted a tour of

the Center for Dr. DeFrance on his birthday; of particular interest were the modifications and additions to Ames, since Dr. DeFrance was responsible for designing and building the original Center. This work earned him the Presidential Medal of Merit.

In 1964, Dr. DeFrance was presented with the 1964 Career Service Award of the National Civil Service League. This award is given annually to the top ten Civil Service employees in the Government. His fine work has been greatly appreciated, and this past month the employees who had worked with him took pleasure in honoring their former director and wishing him a happy birthday.

Dr. Pollack wins H. Julian Allen award

Dr. James B. Pollack of the Theoretical Studies Branch has been selected the winner of the 1975 H. Julian Allen Award for his paper entitled "Aircraft Observations of Venus' Near-Infrared Reflection Spectrum: Implications for Cloud Composition."

Dr. Pollack is the senior author of the paper and will share the honorarium with the following co-authors: Edwin Erickson, Fred Witteborn, Charles Chackerian, Jr., Audrey Summers, Warren Van Camp, Betty Baldwin, Gordon Augason and Lawrence Karoff.

The H. Julian Allen Award was established in 1969 to recognize outstanding scientific and engineering papers authored by members of the Ames staff. Each year the award is presented along with an honorarium of \$1,000 for the paper judged best by the Award Committee.

The award and the honorarium will be presented to the winner in conjunction with a presentation of his paper to the Center staff. The date and time for the presentation will be announced in the near future.

FPM notice

NASA Supplement for the Federal Personnel Manual Notice 330-7 furnishes the following information: "We have been advised that former NASA employees are subject to the restrictions of the International Traffic in Arms Regulations (ITAR) administered by the Department of State if they are employed in professional positions as aerospace experts working for foreign governments or for private industry abroad. These regulations require an export license for the release of certain unclassified technical information before such information may be disclosed to foreign nationals. Practically all space and advanced aeronautical hardware is covered by one or more of the categories subject to the export license requirements."

In accordance with the above, all NASA employees GS-7 and above separating from the Center will be given a copy of an abbreviated explanation of the Applicability of Export Control Regulations, Form APX-10, and asked to acknowledge that they are aware of the requirement.

FPC Scholarships

The Federal Personnel Council of Northern California has announced the annual college level Scholarship Award Program for 1976. Ten or more \$500 Scholarship Awards for outstanding high school graduates will be paid to the winners upon their enrollment in a recognized junior college or an accredited college or university.

(Continued on Page 3.)



Three Center Directors, Dr. Hans Mark, Dr. Smith J. DeFrance and H. Julian Allen, representing over 35 years of leadership at Ames, pose with a plaque presented to the first director, Dr. DeFrance, on his 80th birthday. The plaque was designed by Darryll Stroud, of the Graphics and Exhibits Branch. The 10" by 14" shadow box plaque shows the interior of the 40' by 80' wind tunnel under construction; the lower left photograph is of the Center when it was dedicated; and the lower right photograph is a recent aerial of the Center.

**"Jet transport fuel
conservation
procedure"
story on page 3**

A "thank you" note

Dear Hans:

It was most thoughtful of you and your staff to remember my 80th birthday.

I want to thank you, and, through you, the staff, for the plaque and the book of signatures. They both will recall many pleasant thoughts.

Sincerely,
Smith

Jet transport fuel conservation procedure tested at Ames

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Pictured in front of the CV990, Galileo II are the engineers for the delayed flap project from the Aircraft Guidance and Navigation Branch. From left to right they are: John Foster, John Bull, Dan Hegarty, and program manager Fred Edwards. Not pictured is pilot Fred Drinkwater.

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Mervin C. Troop
S. Tom Taketa
Ernest L. Winkler

Evelyn E. Forte
Mildred L. Emel
Donzelle J. Norred Jr.
Glenn H. Robinson
Joseph F. Burns
Robert W. Beresford
Chester B. Shapero
Charles U. Ware
Edith W. Watson
Joseph Contro
Margaret E. Toland
Arthur C. Volkman
Maurice D. White

Harry R. Zabower
William R. Johnson
Woodrow L. Cook
Elliott D. Katzen
William A. Melliar
Prajedis M. Munoz
Frank A. Pfyf
Joe R. Querantes
Perry A. Rowe
Russell O. Barton
George R. Holden
Roy C. Nelson
Cary O. Fisk

Olive Fordham
William A. Chivers
Derrill H. Hansen
Robert V. Krause
Donald R. Mulholland
James R. Nelan
Perry P. Polentz
William W. Rodgers
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Gilbert H. Bayer
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The American Institute of Aeronautics and Astronautics (AIAA) annually presents the de Florez Training Award "for an outstanding improvement in aerospace training." This year's (1975) award went to John C. Dusterberry, Special Assistant to Ames Director Dr. Hans Mark.

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Immen chief of AMRDL's Advanced Systems

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Prior to joining AMRDL in 1972, Immen served as a research engineer with the Boeing Vertol Company where he held several positions including Chief of Stress and Chief of R&D Structures during his 20-year career with that company. His aviation career includes experience as a Navy helicopter pilot and commanding officer of a helicopter anti-submarine squadron.

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The Astrogram

VOLUME XVIII NUMBER 10

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First Ames director celebrates 80th birthday

Dr. Smith J. DeFrance, Director of Ames for its first 25 years, celebrated his 80th birthday on January 19 with the best wishes of 1100 Ames employees.

Dr. Hans Mark and Dr. DeFrance's successor, H. Julian Allen, presented the distinguished developer of the Ames Laboratory with a plaque and a birthday greeting booklet bearing the signatures of more than 1100 current Ames personnel who worked at the Center at the time of Dr. DeFrance's retirement in November of 1965.

Deputy Director C. A. Syvertson and Loren G. Bright, Research Support Director, hosted a tour of

the Center for Dr. DeFrance on his birthday; of particular interest were the modifications and additions to Ames, since Dr. DeFrance was responsible for designing and building the original Center. This work earned him the Presidential Medal of Merit.

In 1964, Dr. DeFrance was presented with the 1964 Career Service Award of the National Civil Service League. This award is given annually to the top ten Civil Service employees in the Government. His fine work has been greatly appreciated, and this past month the employees who had worked with him took pleasure in honoring their former director and wishing him a happy birthday.



Three Center Directors, Dr. Hans Mark, Dr. Smith J. DeFrance and H. Julian Allen, representing over 35 years of leadership at Ames, pose with a plaque presented to the first director, Dr. DeFrance, on his 80th birthday. The plaque was designed by Darryll Stroud, of the Graphics and Exhibits Branch. The 10" by 14" shadow box plaque shows the interior of the 40' by 80' wind tunnel under construction; the lower left photograph is of the Center when it was dedicated; and the lower right photograph is a recent aerial of the Center.

**"Jet transport fuel
conservation
procedure"
story on page 3**

A "thank you" note

Dear Hans:

It was most thoughtful of you and your staff to remember my 80th birthday.

I want to thank you, and, through you, the staff, for the plaque and the book of signatures. They both will recall many pleasant thoughts.

Sincerely,
Smith

Dr. Pollack wins H. Julian Allen award

Dr. James B. Pollack of the Theoretical Studies Branch has been selected the winner of the 1975 H. Julian Allen Award for his paper entitled "Aircraft Observations of Venus' Near-Infrared Reflection Spectrum: Implications for Cloud Composition."

Dr. Pollack is the senior author of the paper and will share the honorarium with the following co-authors: Edwin Erickson, Fred Witteborn, Charles Chackerian, Jr., Audrey Summers, Warren Van Camp, Betty Baldwin, Gordon Augason and Lawrence Karoff.

The H. Julian Allen Award was established in 1969 to recognize outstanding scientific and engineering papers authored by members of the Ames staff. Each year the award is presented along with an honorarium of \$1,000 for the paper judged best by the Award Committee.

The award and the honorarium will be presented to the winner in conjunction with a presentation of his paper to the Center staff. The date and time for the presentation will be announced in the near future.

FPM notice

NASA Supplement for the Federal Personnel Manual Notice 330-7 furnishes the following information: "We have been advised that former NASA employees are subject to the restrictions of the International Traffic in Arms Regulations (ITAR) administered by the Department of State if they are employed in professional positions as aerospace experts working for foreign governments or for private industry abroad. These regulations require an export license for the release of certain unclassified technical information before such information may be disclosed to foreign nationals. Practically all space and advanced aeronautical hardware is covered by one or more of the categories subject to the export license requirements."

In accordance with the above, all NASA employees GS-7 and above separating from the Center will be given a copy of an abbreviated explanation of the Applicability of Export Control Regulations, Form APX-10, and asked to acknowledge that they are aware of the requirement.

FPC Scholarships

The Federal Personnel Council of Northern California has announced the annual college level Scholarship Award Program for 1976. Ten or more \$500 Scholarship Awards for outstanding high school graduates will be paid to the winners upon their enrollment in a recognized junior college or an accredited college or university.

(Continued on Page 3.)

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A donation of one dollar per ticket is requested.

Tickets will be available from Boat Club member, Mary-Ellen Casady, Ext. 5481, Ames, and on Derby day at the Redwood City Municipal and Alviso Marinas. ALL tickets will be eligible for a door prize drawing, the first prize of which is \$30.00 dinner for two at Charlie Browns in Sunnyvale. Other door prizes will be awarded. You need not be present to win. The door prize drawing will be held at the Alviso Marina at 4 p.m., the last day (Sun.) of the Derby.

Fish weighing stations will be located at Alviso and Redwood City Marinas. The weigh stations will close at 5 p.m. each day.

Ames Merit Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-80	Accounting Technician	GS-5/6/7	AFC	Centerwide	2/20/76

TO APPLY: Call Extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-76	Accounting Technician	AFC	Nobuko Sasaki
76-74	Voucher Examiner	AFP	Mildred Tamayo
76-25	Chief, Airborne Science Office	SSO	Robert Cameron
76-45	Aerospace Engineer	FPQ	Robert McCracken

Summer bowling

Persons interested in joining the Ames Summer Bowling League, which starts in June, should send their name (or team) to Kathy Cossey, M.S. 243-1, by February 19. Ames contractors are welcome.

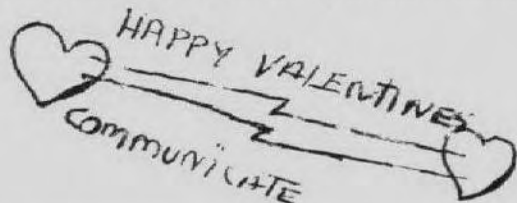
Fastcat books

Books are being made available for use in the Libraries weeks earlier through a novel program called "Fastcat" suggested by the library contractor staff. As new books are received by the contractor, they are given a temporary catalog number that arranges the books in subject groups similar to the Library of Congress catalog number and shelved in a special section in each library. The books are available for use and may be checked out for the same periods of time as other library books.

As "Fastcat" books are returned to the libraries, those in line for processing are sent to the contractor for permanent cataloging, after which they are again available for use and circulation. Since these books are all new titles or new editions to the collections, the "Fastcat" shelves have become the most popular in the libraries.

In addition to making books available earlier, the "Fastcat" program also cuts down on processing costs by eliminating Ames requests that the contractor give special rush handling to the many new books that are in immediate demand.

Ames library users are urged to check the "Fastcat" shelves regularly for the latest available books.



The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor Meredith Moore
 Associate Editor Marcia Kadota
 Reporters NASA Employees

Deadline for contributions: Thursday between publication dates

WANT ADS

Transportation

'73 Silver Fox, 20 m miles, automatic transmission, sun roof, \$3,150. Phone 738-0163 after 5.

WANTED: 1966-1969 full sized station wagon with PS & AC. Must be in very good condition. 941-5535

'68 MGB, low mileage (43,000), excellent condition, \$1500. Call 965-4944.

1974 Buzibodi van, A/C, speedcontrol, Quadrasonic tape, ice box, full seat/bed in rear, captain seats in front, carpeted, paneled, take over payments. For more info. call Shirley/Dick after 6 p.m., 886-1728.

1971 Volvo 164, air cond., PS, PB, AM/FM, 688-8086.

VW Bug, 1971, yellow, good condition. \$1200 or best offer. 253-6673 after 6 p.m. or 494-5337 daytime. Ask for Debbi.

1973 Audi 100LS 4-dr sedan w/sunroof, radials, AM-FM 8-track stereo, vinyl top, immaculate condition, \$3500. Call 493-0217.

Motorcycle, 1971 BSA-750 Rocket 3, saddle bags. Exc. cond., \$1400. 245-8746.

Housing

4 bdrm, 2 bth, cpts, drapes, frpl, range, refrigerator/freezer, disposal, enclosed patio, large fenced yard, walk to schools/shopping, close to 680/17/237, 1 mile from Ford, children welcomed, \$325 per mo., deposit required. Call 263-4807.

SUMMER RENTAL: Furnished luxury condominium at beach overlooking Santa Cruz yacht harbor. Rental by the week, avail. 6/15 to 9/15. Reserve now. Don Frolich, 245-3243.

Cambrian Park: 1/4-acre/3 bdrm/w-w crpt/frpl; co. tax rate by owner, \$39,950/rent to purchase \$295/m, 371-8360, after 5:30 p.m. and Sat/Sun.

Miscellaneous

FOR SALE - Whirlpool portable dishwasher, 4 cycle, 2 speed, wood top. Excellent condition, \$100. 262-6867

Sleeping bags (2 only) Woods, may be zipped together. 4-Star bag (interlining, millium, zips out for backpacking) \$125. 3-Star bag, wool lining, withstand cold to -50° (4-Star bag, -60°). \$100. Dunny bags for both. Call 252-0386 after 5 p.m.

Eico Model 460 oscilloscope, wide band, good cond., \$50. 736-3984.

Spanish-modern couch w/love seat, coffee table and end table, \$450; chest of drawers with 2 night stands, \$200; king-size waterbed with frame, heater, headboard and liner, \$250; 3 lamps, \$25 ea.; Zenith 23" Chromacolor II TV console, \$500; all items in immaculate condition. Owner having to leave the country in a hurry. Call 493-0217.

Sofa (hide-a-bed, double) 1 yr old, black, beige, and rust striped, exc. cond., \$100 or best offer. Motorcycle helmets (medium and small) with face shields (metallic green), \$30 each or best offer. Table lamp (large), \$5 or best offer. Valet (brown leather), exc. cond., \$15 or best offer. Call 258-8072 after 6 p.m.

Firewood, one cord left of choice aged oak-madrone wood, \$80/cord, \$45/half-chord. Will deliver and stack within reasonable distance of Palo Alto. 493-8710.

19-inch color portable TV, Sears Medalist II, 2 1/2 years old, with or without console. \$200. Exc. cond. Call (408)374-1235 after 4 p.m., Vicki.

3 professional stainless steel Nikor tanks. Develops 4-120 rolls or 8-35 mm/run. Call V. Yearwood-Drayton, 651-9540.

Weight lifting set (110 lb) with full bar, two one-hand bars and collars. Weights and bars are encased in plastic to prevent rusting. Call 327-2428 after 6:30. \$18.

10" contractors Delta table saw. 110/220 volts. Stand and wheels. \$190. Jack Addison. 493-7304.

WANTED: Back issues of Sunset Magazine. Jack Addison, 493-7304.

LOST: One Bausch and Lomb Monocular Microscope, Ames number 3984, Serial Number 6975; loaned from Bldg. 213-Instrument Shop. Please notify Robert Gordon, Ext. 5462 of whereabouts.

National Aeronautics and Space Administration
 Ames Research Center
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OFFICIAL BUSINESS
 Penalty for private use \$300

AN EQUAL OPPORTUNITY EMPLOYER

Postage and Fees Paid
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 NASA-451



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A trophy plus an OLYMPIC 2000 Rod & Penn 68 reel will be awarded to the one catching the largest sturgeon. Catcher of the second place fish will be awarded \$50.00 cash. Prizes will be awarded to the catchers of the third largest and also the smallest legal sturgeon.

A donation of one dollar per ticket is requested.

Tickets will be available from Boat Club member, Mary-Ellen Casady, Ext. 5481, Ames, and on Derby day at the Redwood City Municipal and Alviso Marinas. ALL tickets will be eligible for a door prize drawing, the first prize of which is \$30.00 dinner for two at Charlie Browns in Sunnyvale. Other door prizes will be awarded. You need not be present to win. The door prize drawing will be held at the Alviso Marina at 4 p.m., the last day (Sun.) of the Derby.

Fish weighing stations will be located at Alviso and Redwood City Marinas. The weigh stations will close at 5 p.m. each day.

Ames Merit Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-80	Accounting Technician	GS-5/6/7	AFC	Centerwide	2/20/76

TO APPLY: Call Extension 5599 or 5600.

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-76	Accounting Technician	AFC	Nobuko Sasaki
76-74	Voucher Examiner	AFP	Mildred Tamayo
76-25	Chief, Airborne Science Office	SSO	Robert Cameron
76-45	Aerospace Engineer	FPQ	Robert McCracken

Summer bowling

Persons interested in joining the Ames Summer Bowling League, which starts in June, should send their name (or team) to Kathy Cossey, M.S. 243-1, by February 19. Ames contractors are welcome.

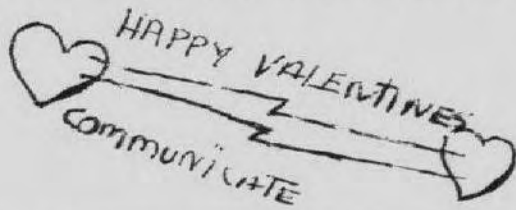
Fastcat books

Books are being made available for use in the Libraries weeks earlier through a novel program called "Fastcat" suggested by the library contractor staff. As new books are received by the contractor, they are given a temporary catalog number that arranges the books in subject groups similar to the Library of Congress catalog number and shelved in a special section in each library. The books are available for use and may be checked out for the same periods of time as other library books.

As "Fastcat" books are returned to the libraries, those in line for processing are sent to the contractor for permanent cataloging, after which they are again available for use and circulation. Since these books are all new titles or new editions to the collections, the "Fastcat" shelves have become the most popular in the libraries.

In addition to making books available earlier, the "Fastcat" program also cuts down on processing costs by eliminating Ames requests that the contractor give special rush handling to the many new books that are in immediate demand.

Ames library users are urged to check the "Fastcat" shelves regularly for the latest available books.



The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor Meredith Moore
Associate Editor Marcia Kadota
Reporters NASA Employees

Deadline for contributions: Thursday between publication dates

WANT ADS

Transportation

'73 Silver Fox, 20 m miles, automatic transmission, sun roof, \$3,150. Phone 738-0163 after 5.

WANTED: 1966-1969 full sized station wagon with PS & AC. Must be in very good condition. 941-5535

'68 MGB, low mileage (43,000), excellent condition, \$1500. Call 965-4944.

1974 Buzibodi van, A/C, speedcontrol, Quadrasonic tape, ice box, full seat/bed in rear, captain seats in front, carpeted, paneled, take over payments. For more info. call Shirley/Dick after 6 p.m., 886-1728.

1971 Volvo 164, air cond., PS, PB, AM/FM, 688-8086.

VW Bug, 1971, yellow, good condition. \$1200 or best offer. 253-6673 after 6 p.m. or 494-5337 daytime. Ask for Debbi.

1973 Audi 100LS 4-dr sedan w/sunroof, radials, AM-FM 8-track stereo, vinyl top, immaculate condition, \$3500. Call 493-0217.

Motorcycle, 1971 BSA-750 Rocket 3, saddle bags. Exc. cond., \$1400. 245-8746.

Housing

4 bdrm, 2 bath, cpts, drapes, frpl, range, refrigerator/freezer, disposal, enclosed patio, large fenced yard, walk to schools/shopping, close to 680/17/237, 1 mile from Ford, children welcomed, \$325 per mo., deposit required. Call 263-4807.

SUMMER RENTAL: Furnished luxury condominium at beach overlooking Santa Cruz yacht harbor. Rental by the week, avail. 6/15 to 9/15. Reserve now. Don Frolich, 245-3243.

Cambrian Park: 1/4-acre/3 bdrm/w-w crpt/frpl; co. tax rate by owner, \$39,950/rent to purchase \$295/m, 371-8360, after 5:30 p.m. and Sat/Sun.

Miscellaneous

FOR SALE - Whirlpool portable dishwasher, 4 cycle, 2 speed, wood top. Excellent condition, \$100. 262-6867

Sleeping bags (2 only) Woods, may be zipped together. 4-Star bag (interlining, millium, zips out for backpacking) \$125. 3-Star bag, wool lining, withstand cold to -50° (4-Star bag, -60°). \$100. Dunnage bags for both. Call 252-0386 after 5 p.m.

Eico Model 460 oscilloscope, wide band, good cond., \$50. 736-3984.

Spanish-modern couch w/love seat, coffee table and end table, \$450; chest of drawers with 2 night stands, \$200; king-size waterbed with frame, heater, headboard and liner, \$250; 3 lamps, \$25 ea.; Zenith 23" Chromacolor II TV console, \$500; all items in immaculate condition. Owner having to leave the country in a hurry. Call 493-0217.

Sofa (hide-a-bed, double) 1 yr old, black, beige, and rust striped, exc. cond., \$100 or best offer. Motorcycle helmets (medium and small) with face shields (metallic green), \$30 each or best offer. Table lamp (large), \$5 or best offer. Valet (brown leather), exc. cond., \$15 or best offer. Call 258-8072 after 6 p.m.

Firewood, one cord left of choice aged oak-madrone wood, \$80/cord, \$45/half-cord. Will deliver and stack within reasonable distance of Palo Alto. 493-8710.

19-inch color portable TV, Sears Medalist II. 2 1/2 years old, with or without console. \$200. Exc. cond. Call (408)374-1235 after 4 p.m., Vicki.

3 professional stainless steel Nikor tanks. Develops 4-120 rolls or 8-35 mm/run. Call V. Yearwood-Drayton, 651-9540.

Weight lifting set (110 lb) with full bar, two one-hand bars and collars. Weights and bars are encased in plastic to prevent rusting. Call 327-2428 after 6:30. \$18.

10" contractors Delta table saw. 110/220 volts. Stand and wheels. \$190. Jack Addison. 493-7304.

WANTED: Back issues of Sunset Magazine. Jack Addison, 493-7304.

LOST: One Baush and Lomb Monocular Microscope, Ames number 3984, Serial Number 6975; loaned from Bldg. 213-Instrument Shop. Please notify Robert Gordon, Ext. 5462 of whereabouts.

National Aeronautics and Space Administration
Ames Research Center
Moffett Field, California 94035

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NASA-451



The Astrogram

VOLUME XVIII NUMBER 11

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The new aircraft will be called the Quiet Short-haul Research Aircraft (QSRA). It will be designed around an existing deHavilland C-8 "Buffalo" fuselage in order to reduce the cost of construction. It will have four AVCO-Lycoming YF-102 turbofan engines mounted on the upper surface of a swept-back wing which mounts to the top of the fuselage.

The QSRA will use a hybrid upper surface blowing propulsive-lift concept. Exhaust flow from the four turbofan engines is directed across the upper surface of the wing and trailing edge flaps to provide lift augmentation. In addition, bleed air flow from the engines is directed through the wing to provide supplementary blowing in selected locations to enhance performance and control during low speed flight and under engine-out conditions.

With the lift being provided directly by the engines, QSRA will be able to operate safely at very low airspeeds. This permits the QSRA to use much shorter airport runways than most aircraft, and to fly steep approach and takeoff climb angles in order to avoid populated areas. The aircraft will be used to investigate new flight procedures that can be used to reduce airport community noise, relieve air traffic congestion, and increase flight safety. Since future aircraft with the performance potential of QSRA would be highly maneuverable, this research will provide significant benefits to military transport technology as well as to the civil sector.

Other research aircraft at Ames which are dedicated to short-haul aircraft systems technology include:

Augmentor Wing Jet STOL Aircraft— This aircraft was built under a joint program of NASA and the Canadian Department of Industry, Trade and Commerce (DITC) to test the Augmentor Wing Powered Lift principle in flight. It has been flying at Ames Research Center since 1972.

Tilt Rotor Research Aircraft— Two of these aircraft are being built under a joint NASA/U.S. Army Air Mobility Research and Development Laboratory (AMRDL) program. When completed in 1977, they will be used for flight investigations of the tilt rotor concept for future military and civilian applications. With rotors in the horizontal position, this aircraft can take off vertically like a helicopter. With rotors tilted forward, the aircraft flies like a conventional aircraft at conventional aircraft speeds.

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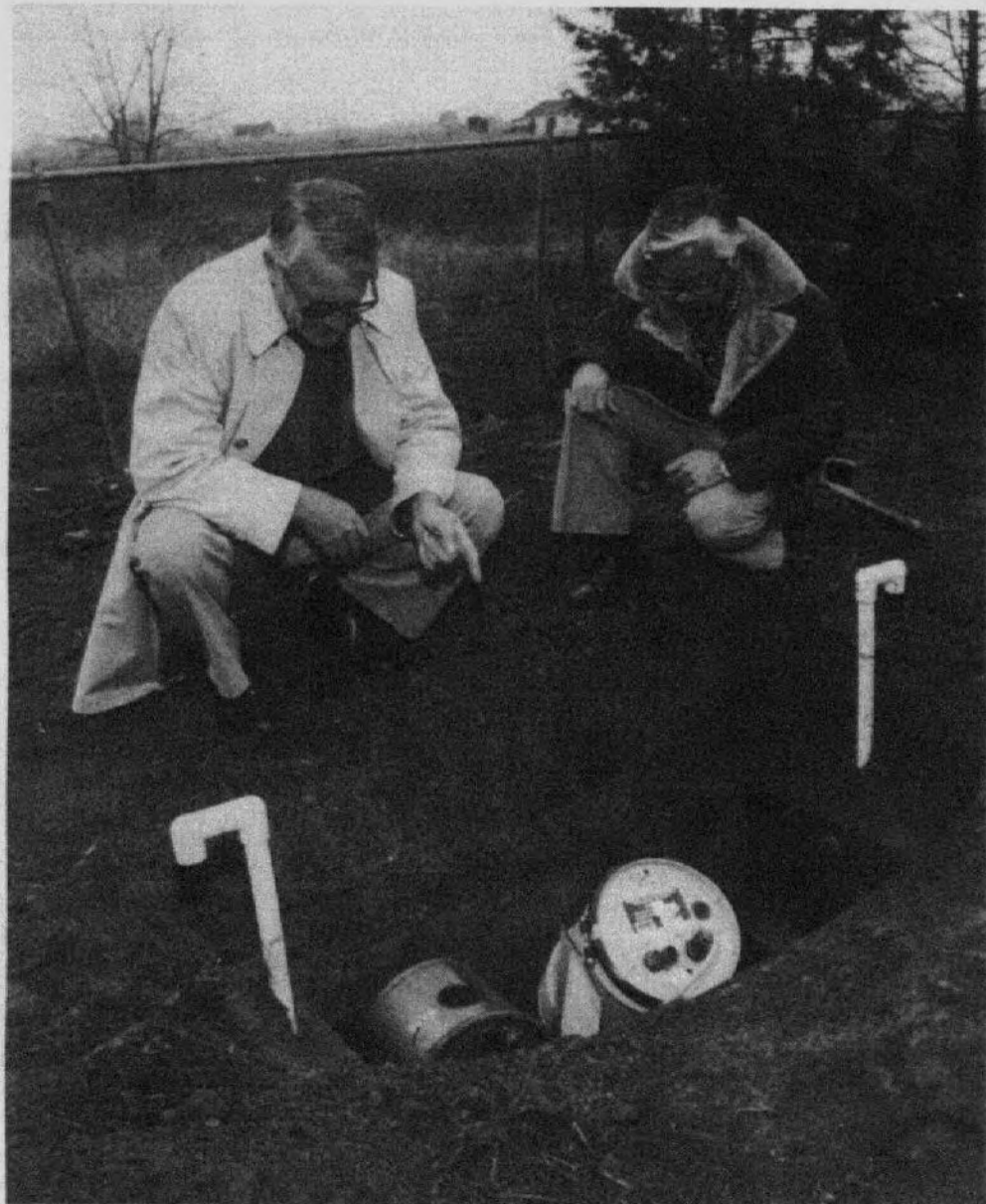
The Region One forest area, which contains most of California's redwood forest and a large part of the state's timber resources, extends from the Oregon border to the San Francisco Bay and from the Pacific Ocean inland to the Coast Range Mountains.

Ames' scientists developed the compact, self-powered stations in cooperation with the State of California's Division of Forestry (CDF). Part of the network will be operating during the 1976 forest fire season; the remainder will be completed in time for the 1977 season.

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Sensors to measure rainfall and air pollution — including particulate matter and ozone concentrations — may also be added to the forest monitors.

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(L to R) William Innes, California Division of Forestry (CDF), Sacramento, and Ken Nishioka, Project Engineer from Ames discuss Morgan Hill forestry installation for satellite watch on forest fire danger.

Donations for 1976 Galileo Scholarships



Galileo Fund Chairperson John S. MacKay (second from left) accepts donations from interested individuals and organizations. They are (l. to r.): Mark Ardema, Ames Aeronautical Systems Office; Dr. Richard Bernawski, Computer Sciences Corporation; and Dick Schaupp, Ames Advanced Missions Office. Not pictured is Robert R. "Skip" Nunamaker who represents a group making a donation from the Project Pioneer office. Garth Hull of the Educational Programs Office and Robert T. Jones, Senior Staff Scientist, also donated honoraria they received from lecture engagements.

Dr. Fletcher discusses Tilt Rotor with AMRDL



Dr. James C. Fletcher (seated, center), NASA Administrator, discusses the joint Army/NASA Tilt Rotor aircraft technology demonstrator project with key NASA/Ames and U.S. Army Air Mobility R&D Laboratory (AMRDL) personnel during a recent visit to AMRDL Headquarters here. Included in the meeting were (L to R): Colonel Norman L. Robinson, AMRDL deputy director; Dr. Irving C. Statler, AMRDL Ames Directorate director; Dr. Fletcher; Dr. Hans Mark, Ames director; Dr. Richard M. Carlson, AMRDL director; and Dr. Leonard Roberts, Ames Aeronautics and Flight Systems director. Rollout of the Tilt Rotor XV-15 is scheduled for fall 1976.

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De Anza courses

The Training and Special Programs Office would like to offer some DeAnza courses this Spring quarter at the Center. If you are interested in a course please check the appropriate box and return to mail stop 241-3 by March 10. A minimum enrollment of 20 persons must be met to offer this off-campus class. These classes would be given either during working hours (if job related) or after working hours.

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- Financial Planning for Retirement
- Effective Presentations Workshop

Name _____ Mail Stop _____ Phone Ext. _____

Astronaut food technology applied to meals of elderly

While three square meals a day are taken for granted by most Americans, getting even one balanced meal each day is a problem for some of the nation's elderly.

Food technology and packaging techniques developed by the NASA Johnson Space Center, Houston, to feed Apollo and Skylab crews during space flight are being applied in a pilot program to help provide balanced meals to elderly who live alone. Physicians, nutritionists, and biomedical engineers at the Center are working together to design and develop a meal system to supplement the existing National Nutrition Programs for the Elderly.

The effort is part of the agency's Technology Utilization program in which space-developed technology is applied in the solution of earth-bound problems.

Project Engineer Gary R. Primeaux reported that surveys have shown that many elderly Americans do not receive adequate nutrition. He cites as contributing factors lack of single-serving products, limited mobility, loss of skills needed to prepare balanced meals, limited finances and often a sense of loneliness or rejection that reduces the incentive to cook and eat nutritious meals alone.

Called Meal Systems for the Elderly, Primeaux says: "Its goal is to develop nutritious, shelf-stable, convenient and easily deliverable meals for the elderly."

While several programs for home-delivered hot lunches for the elderly are being tried in some cities, there is usually no weekend service and spoilage risk is high. The NASA team developing the meal system is striving to come up with a shelf-stable, multi-meal package that can be distributed by several methods — even parcel post — to senior citizens who live beyond the range of hot-meal delivery or to those people in cities where weekend meals are not provided.

The team is working toward a meal system that can be opened, cooked, eaten, and cleaned up by elderly people living alone. A field demonstration, starting early this year, in which selected elderly Texans will prepare and eat developmental meals will give the team an evaluation of meal design and delivery methods.

The basic meal will consist of an entree, two side dishes, dessert and beverage, with a 21-day menu cycle to provide variety from a list of 10 entrees, 20 side dishes, 10 desserts and five beverages. Each meal will provide at least one-third of the daily dietary allowance for elderly persons.

The design, development, field demonstration, and evaluation phases of the program are expected to be completed by late 1976, according to Primeaux.

In addition to the JSC team developing the meal system technology, the University of Texas Lyndon B. Johnson School of Public Affairs, Austin, will assist in demonstrations and distribute meals. The Texas Research Institute of Mental Sciences, Houston, has surveyed attitudes, food preferences and has run taste tests among potential users.

Bloodmobile visit

The American Red Cross Blood Mobile will visit Ames Research Center on March 11, 1976, between the hours of 9:00 a.m. and 11:30 a.m. in Bldg. N-239, Life Sciences Res. Lab, Room 39 (Basement).

Fastpitch softball

Anyone interested in playing on the Ames Fastpitch Softball team please contact either Bruce Ganzler, Ext. 5943 or Jim Myers, Ext. 6294.

Satellite system *(Continued from Page 1)*

The satellite, operated by the National Oceanic and Atmospheric Administration (NOAA), sends the data to a NOAA receiving station at Wallops, Virginia, which automatically relays data to NOAA computers at Suitland, Maryland. The NOAA computers process the data and forward it to the U.S. Geological Survey (USGS) computer facility in Reston, Virginia, which sends it overland to USGS offices in California. Ames Research Center and the California Division of Forestry obtain access to the data from the nearby USGS facilities.

Once the system is in operation, the complex processing and relay of the data will require less than 90 minutes from the time the automatic monitors record information on conditions in remote forest areas until foresters receive the data in Sacramento.

The new system is an experiment that may help reduce annual losses from forest fires in California, and it may also help cut the annual bill to fight fires in the state.

Foresters will use the continuous data on weather conditions to identify areas where the fire hazard is greatest, deploy fire-fighting teams to counteract the threat, and plan strategy to battle any fires that develop.

Experts say that knowing where fires are probable and how they might act is almost as important as having men and equipment to fight them.

Two prototype monitoring stations, designed and developed by Ames on the recommendations of the CDF, have been operating successfully at Sunol and Mount Zion, California, during a two-year test of their reliability and accuracy. The prototype instruments were sponsored by NASA's Technology Utilization program.

The new monitoring stations are low in cost, easy to assemble and require little maintenance. Three people can transport the 200-pound stations to even the most remote forest areas where only an hour is required to set them up. The stations are expected to operate for one year without maintenance, and designers are working on improvements that would permit two years of maintenance-free operation.

Sterile blood transfer technique devised

A promising system for transferring blood without contamination has been devised by a team of scientists and engineers at the Jet Propulsion Laboratory under contract to the National Heart and Lung Institute of the National Institutes of Health, Bethesda, Md.

Extending a concept employed in spacecraft sterilization work for NASA, Dr. Richard M. Berkman, James C. Arnett and Edward L. Cleland produced the Aseptic Fluid Transfer System (AFTS) primarily for use in blood banks.

Two dual-walled tubes, fused and penetrated by heat, are the key to the proposed method of cleanly transferring blood from one container or bag to another.

The JPL-designed system should substantially increase the storage time of blood components, according to Dr. Berkman, a Ph.D. microbiologist and team leader.

"Present transfer systems employed in blood banks do not insure sterility, hence frozen-thawed blood must be used within one day or else be discarded," Berkman says. "Our evaluation of the AFTS shows virtually no contamination — less than 0.001 percent. The heat fusion process kills off any microbes on the connecting tubes."

A biomedical project of JPL's Civil Systems Program Office, the AFTS will be tested clinically in the near future by Dr. Byron Myhre at Harbor General Hospital, Torrance, Calif. The two-year development was sponsored by the Division of Blood Diseases and Resources of the National Heart and Lung Institute.

The JPL method may more than triple the safe storage time. Berkman reported that 99.999 percent of all bacteria and spores were killed in AFTS tests, even when the tube surfaces were purposely contaminated with massive numbers of these microbes.

Phase certificates for De Anza students



Students on the Foothill-DeAnza Machine Tool Technology training program at Ames recently received phase certificates of completion from Deputy Director of the Research Support Directorate Robert Eddy (pictured far right). The students included are (left to right): Andrew Kahler, Thomas Foster, James B. Scott, Dwain Madden, David Everson, and Chris Hawkins.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-81	Secretary (Typing)	GS-4/5	RKP	Centerwide & Outside	3-5-76
76-82	Computer Operator	GS-5/6/7	RKO	Centerwide	3-8-76
76-83	Supv. Engr. Tech.	GS-12/13	RSC	Centerwide	3-12-76
76-84	Voucher Examiner	GS-4/5	AFP	Centerwide & Outside	3-5-76

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-71	Secretary (Typing) Secretary (Stenography)	RK	Clara Johnson
76-56	Aerospace Engineer	FAA	Gerald Malcolm
76-49	Equal Opportunity Specialist (STEP)	DE	Janet Glaab

Safety corner

A new 1976 NASA van was struck head on recently by a Datsun pickup truck which suddenly swerved into the NASA vehicle's lane. The driver of the Datsun was killed. A subsequent investigation revealed that he was being treated for epilepsy with prescription drugs: Dilantin caps and Phenobarbital. In addition there was an odor of alcohol about the deceased's body.

The driver of the NASA vehicle was in no way at fault in the collision. Lessons to be learned accrue from the unfortunate deceased who mixed alcohol with drugs and driving. The combination of these substances ingested probably had an adverse multiplying effect on his ability to properly control a vehicle.

"Thank you"

Dear Friends,

I wish to thank you all for the wonderful retirement party you gave me on my retirement from Ames. The gifts will add many happy hours to my photographic hobby, and the pictures and "Tiger-Moth" model will serve to remind me of the good times at Ames. My thanks to those whose efforts put the luncheon together.

It has been a pleasure to work with you and I will miss you greatly.

Jules Dods

Betty and I would like to express our appreciation to all of our friends who made possible my excellent retirement luncheon. I regret that several, including Betty, because of illness were unable to attend. The affair was overwhelming and the gifts wonderful. I hope that the new set of PGA woods will help me improve my game. I have enjoyed my long association with Ames and expect to keep in touch with my many friends there so my retirement is not goodbye but "auf wiedersehen."

Norm Martin

Want ads Transportation

1967 Ford F-250 P.U., 352 CID, AT, PS, PB, LS axle, Cambria Overloads. 961-8239 evenings.

1972 Honda Coup, excellent condition, \$1500. (408) 438-2629.

Must sacrifice beautiful old 1955 Buick Century in good condition. V-8 engine original, runs smooth and dependable. \$1200 invested in car, will sacrifice for \$750 or best offer. Call Judy at 965-5291.

FOR SALE - 1971 Volvo 164, beautiful bronze, auto transmission, air conditioned, power steering and brakes. Call 688-8086.

1968 Pontiac Tempest, best offer. Call 379-9777.

FOR SALE - Camper Trailer, Apache Ramada II. Sleeps 6, ice box and stove, hard sides and top. \$800 or best offer. Call 274-3714.

WANTED - Dodge Dart (1968-69) or Ford Falcon (1968-69) or an equivalent economy car. Call 733-5128.

Housing

HOME FOR SALE - Leaving area. Super 3 bedroom 1 bath, on corner lot. Many extras. Located in central San Jose. \$45,950 by appt. Call 288-7477 after 4:30 p.m.

24'x64' Golden West Mobile Home, fine Sunnyvale adult park, 2 bdrm., 2 ba., fam. rm., 4 T air, exc. cond. Call 732-2124.

House for Rent in Santa Clara, 4 bdrm, 2 bath, FR, sunken living room, in excellent condition. Near Great America Park. \$425/month. Call 493-6518 or 493-1788.

Miscellaneous

FOR SALE: Tektronix 1A4 Plug-In with manual. Call 733-8778 evenings.

FOR SALE: Realistic lab 12B record changer. Like new, including dust cover, \$39. 408-779-9690.

Stereo Console, Sears Silvertone, contemp. style, good condition, \$200 or best offer. Call 246-5286.

2.4" Refracting Telescope - equatorial mount, setting circles, slow motion control, 3 eye pieces, star diagonal, tripod. 2 months old, excellent condition. Call 266-3250.

Registered poodles, good line, will be available March 12. For info. call 371-8360.

King size mattress & box spring, matched set, excellent condition, Penny's top line. Was Consumer Reports best buy. \$150. 272-0287.

San Francisco Symphony at Flint Center. Two 6th row center orchestra seats available for each of the following: Feb. 28 and Apr. 24, \$8.75/ticket. Call 733-5737.

Cubco ski bindings, \$20/offer, excellent condition; ladies ski boots, 8 med., buckle, Kastingers, \$15. Call 739-5373.

Drill press with vice-table model, \$150; 3/4 H.P. Craftsman electric motor, 5/8" double shaft, \$30; Stanley mitre box & 28" saw, \$65; Honda 90 - step through model, 1500 mi, \$250. Call 578-5472 evenings.

Drapes, pair, 95x70, white, brand new, beautiful material, \$25. Call 321-1858.

Danish chair, very good condition, \$25. Call 321-1858.

Men's 16 lb bowling ball & bag, excellent condition, \$20. Call 296-4996 evenings.

Leaving town and must sell 16 foot office trailer, 8 feet wide, 7-1/2 feet tall. Used only 4 months. I have 8' by 8' water bed in it. See Saratoga Springs Site No. 32. Asking \$1,700. Call Judy at 965-5291 from 8 to 4:30 p.m.

Driver needed for Oakland to Ames carpool. Hrs. 8 to 4:30 p.m. Call Barbara, X5980.

Free: Good outdoor dog. Male beagle-terrier, tri-color, short-haired, lovable, 2 yrs., shots. Call 948-0777.

Need Ride: flexible hours, unable to drive, will share expenses from Colorado & Middlefield, Palo Alto. Call X5249 or 328-2112.

Want to share ride from Evergreen Valley (SE San Jose) to Ames. 7:30 to 4:00 or 8:00 to 4:30 shift. Call Jim Brown at X5020 or 274-3714 (home).

WANTED: To carpool with someone in Morgan Hill area. Call Pamela Baca, X5835.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

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Editor Meredith Moore
Associate Editor Marcia Kadota
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Space Administration
Ames Research Center
Moffett Field, California 94035

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Astronaut food technology applied to meals of elderly

While three square meals a day are taken for granted by most Americans, getting even one balanced meal each day is a problem for some of the nation's elderly.

Food technology and packaging techniques developed by the NASA Johnson Space Center, Houston, to feed Apollo and Skylab crews during space flight are being applied in a pilot program to help provide balanced meals to elderly who live alone. Physicians, nutritionists, and biomedical engineers at the Center are working together to design and develop a meal system to supplement the existing National Nutrition Programs for the Elderly.

The effort is part of the agency's Technology Utilization program in which space-developed technology is applied in the solution of earth-bound problems.

Project Engineer Gary R. Primeaux reported that surveys have shown that many elderly Americans do not receive adequate nutrition. He cites as contributing factors lack of single-serving products, limited mobility, loss of skills needed to prepare balanced meals, limited finances and often a sense of loneliness or rejection that reduces the incentive to cook and eat nutritious meals alone.

Called Meal Systems for the Elderly, Primeaux says: "Its goal is to develop nutritious, shelf-stable, convenient and easily deliverable meals for the elderly."

While several programs for home-delivered hot lunches for the elderly are being tried in some cities, there is usually no weekend service and spoilage risk is high. The NASA team developing the meal system is striving to come up with a shelf-stable, multi-meal package that can be distributed by several methods — even parcel post — to senior citizens who live beyond the range of hot-meal delivery or to those people in cities where weekend meals are not provided.

The team is working toward a meal system that can be opened, cooked, eaten, and cleaned up by elderly people living alone. A field demonstration, starting early this year, in which selected elderly Texans will prepare and eat developmental meals will give the team an evaluation of meal design and delivery methods.

The basic meal will consist of an entree, two side dishes, dessert and beverage, with a 21-day menu cycle to provide variety from a list of 10 entrees, 20 side dishes, 10 desserts and five beverages. Each meal will provide at least one-third of the daily dietary allowance for elderly persons.

The design, development, field demonstration, and evaluation phases of the program are expected to be completed by late 1976, according to Primeaux.

In addition to the JSC team developing the meal system technology, the University of Texas Lyndon B. Johnson School of Public Affairs, Austin, will assist in demonstrations and distribute meals. The Texas Research Institute of Mental Sciences, Houston, has surveyed attitudes, food preferences and has run taste tests among potential users.

Bloodmobile visit

The American Red Cross Blood Mobile will visit Ames Research Center on March 11, 1976, between the hours of 9:00 a.m. and 11:30 a.m. in Bldg. N-239, Life Sciences Res. Lab, Room 39 (Basement).

Fastpitch softball

Anyone interested in playing on the Ames Fastpitch Softball team please contact either Bruce Ganzler, Ext. 5943 or Jim Myers, Ext. 6294.

Satellite system *(Continued from Page 1)*

The satellite, operated by the National Oceanic and Atmospheric Administration (NOAA), sends the data to a NOAA receiving station at Wallops, Virginia, which automatically relays data to NOAA computers at Suitland, Maryland. The NOAA computers process the data and forward it to the U.S. Geological Survey (USGS) computer facility in Reston, Virginia, which sends it overland to USGS offices in California. Ames Research Center and the California Division of Forestry obtain access to the data from the nearby USGS facilities.

Once the system is in operation, the complex processing and relay of the data will require less than 90 minutes from the time the automatic monitors record information on conditions in remote forest areas until foresters receive the data in Sacramento.

The new system is an experiment that may help reduce annual losses from forest fires in California, and it may also help cut the annual bill to fight fires in the state.

Foresters will use the continuous data on weather conditions to identify areas where the fire hazard is greatest, deploy fire-fighting teams to counteract the threat, and plan strategy to battle any fires that develop.

Experts say that knowing where fires are probable and how they might act is almost as important as having men and equipment to fight them.

Two prototype monitoring stations, designed and developed by Ames on the recommendations of the CDF, have been operating successfully at Sunol and Mount Zion, California, during a two-year test of their reliability and accuracy. The prototype instruments were sponsored by NASA's Technology Utilization program.

The new monitoring stations are low in cost, easy to assemble and require little maintenance. Three people can transport the 200-pound stations to even the most remote forest areas where only an hour is required to set them up. The stations are expected to operate for one year without maintenance, and designers are working on improvements that would permit two years of maintenance-free operation.

Sterile blood transfer technique devised

A promising system for transferring blood without contamination has been devised by a team of scientists and engineers at the Jet Propulsion Laboratory under contract to the National Heart and Lung Institute of the National Institutes of Health, Bethesda, Md.

Extending a concept employed in spacecraft sterilization work for NASA, Dr. Richard M. Berkman, James C. Arnett and Edward L. Cleland produced the Aseptic Fluid Transfer System (AFTS) primarily for use in blood banks.

Two dual-walled tubes, fused and penetrated by heat, are the key to the proposed method of cleanly transferring blood from one container or bag to another.

The JPL-designed system should substantially increase the storage time of blood components, according to Dr. Berkman, a Ph.D. microbiologist and team leader.

"Present transfer systems employed in blood banks do not insure sterility, hence frozen-thawed blood must be used within one day or else be discarded," Berkman says. "Our evaluation of the AFTS shows virtually no contamination — less than 0.001 percent. The heat fusion process kills off any microbes on the connecting tubes."

A biomedical project of JPL's Civil Systems Program Office, the AFTS will be tested clinically in the near future by Dr. Byron Myhre at Harbor General Hospital, Torrance, Calif. The two-year development was sponsored by the Division of Blood Diseases and Resources of the National Heart and Lung Institute.

The JPL method may more than triple the safe storage time. Berkman reported that 99.999 percent of all bacteria and spores were killed in AFTS tests, even when the tube surfaces were purposely contaminated with massive numbers of these microbes.

Phase certificates for De Anza students



Students on the Foothill-DeAnza Machine Tool Technology training program at Ames recently received phase certificates of completion from Deputy Director of the Research Support Directorate Robert Eddy (pictured far right). The students included are (left to right): Andrew Kahler, Thomas Foster, James B. Scott, Dwain Madden, David Everson, and Chris Hawkins.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-81	Secretary (Typing)	GS-4/5	RKP	Centerwide & Outside	3-5-76
76-82	Computer Operator	GS-5/6/7	RKO	Centerwide	3-8-76
76-83	Supv. Engr. Tech.	GS-12/13	RSC	Centerwide	3-12-76
76-84	Voucher Examiner	GS-4/5	AFP	Centerwide & Outside	3-5-76

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-71	Secretary (Typing) Secretary (Stenography)	RK	Clara Johnson
76-56	Aerospace Engineer	FAA	Gerald Malcolm
76-49	Equal Opportunity Specialist (STEP)	DE	Janet Glaab

Safety corner

A new 1976 NASA van was struck head on recently by a Datsun pickup truck which suddenly swerved into the NASA vehicle's lane. The driver of the Datsun was killed. A subsequent investigation revealed that he was being treated for epilepsy with prescription drugs: Dilantin caps and Phenobarbital. In addition there was an odor of alcohol about the deceased's body.

The driver of the NASA vehicle was in no way at fault in the collision. Lessons to be learned accrue from the unfortunate deceased who mixed alcohol with drugs and driving. The combination of these substances ingested probably had an adverse multiplying effect on his ability to properly control a vehicle.

"Thank you"

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Associate Editor Marcia Kadota
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The Astrogram

VOLUME XVIII NUMBER 12

March 11, 1976

1976 U.S. Savings Bond drive begins

Sound reasons for bond participation

This year's reasons certainly include all of last year's reasons as summarized briefly in the adjoining column. In addition to the personal financial advantages which are pointed out in the U.S. Treasury Department leaflet (a copy of which will be personally given to each Ames staff member) and in addition to the technical monetary advantages discussed in the Kiplinger article reprinted last year, there are some additional fiscal aspects brought out in an article on the financial page of the Palo Alto Times of Feb. 23, 1976.

The arguments that bond participation is beneficial to the individual and to the county should be persuasive. This year, however, it seems to me that an even more compelling reason is that a high rate of participation particularly 80% or better is a benefit to the Center. I believe it would benefit the Center both externally and internally. As part of the Bicentennial year it is appropriate and just good public relations to have notice taken of a new Minute Man flap flying over the Center to indicate support by a federal agency of a vital government program. Most of my neighbors are amazed to hear that there is any problem in a federal laboratory reaching 80 or even 100% bond participation. They perhaps belong to a generation when institution and company loyalties were taken more seriously.

At a time when the extent of government involvement in many activities is under scrutiny it behooves us to maintain our outward community image as vigorously as we do our inward technical excellence.

Top management supports drive



Leaders of the 1976 U.S. Savings Bond Drive include division and office chiefs such as those pictured above: (front row) Dave Reese, Wally Deckert, Q. Marion Hansen, Vic Peterson, Karroll Reynolds, G. Allan Smith, Tom Dines; (back row) George Lenehan, Murray Gardner, C. Thomas Snyder, Dick Petersen, Paul Bennett, Angelo Giovannetti, Harvey Hartman, Charlie Hall, and Fred DeMuth.

ARC percent participation

CODE	LEADER	START	END	START	END	COMPLEMENT	
		1976	1975	1975	1974		
A	Brennwald	66	76	53	72	223	Administration
D	Mark	78	95	72	79	46	Director
F	Roberts	71	75	53	60	402	Aeronautics
L	Klein	46	54	25	31	139	Life Sciences
R	Bright	65	72	53	62	463	Research Support
S	Chapman	66	69	45	451	411	Astronautics
TOTAL		65	72	51	58.6	1684	

Last year's reasons

The drive for increased Center participation in the payroll deduction savings bond plan was highly successful last year. The statistics, which are presented in detail in this issue of the Astrogram, show that Center participation jumped from 52% at the start of the drive to 73% at the close. This jump was three times as much as usual and more than twice as much as any other NASA Center.

A number of reasons, both logical and whimsical, for bond participation were set forth in the special issue of the Astrogram published last year. In as much as last year's campaign was so successful it would seem that many of last year's reasons would be pertinent to this year's campaign and therefore call your attention to the material in last year's Astrogram. If you have misplaced your personal copy, your branch or division files may be consulted. In addition on Page 3 of the Astrogram, an article from the Kiplinger magazine presented a financial analyst's point of view that made a persuasive case for regular bond investment on the basis of yield, convenience, safety, and tax advantage. That article could hardly be improved upon and you are urged to consult it if you doubt the strictly financial advantages of U.S. savings bonds.

On page one of last year's Astrogram, a discussion of reasons for not buying bonds treated at some length the variety of circumstances that contributed to the low Ames participation rate of barely 50% at the start of last year's drive. Many of these considerations are still valid although some certainly have been resolved as witnessed by the rise to 73% during last year's campaign.

A number of people have gone out of their way to say that the material in last year's Astrogram was very persuasive and, in fact, one letter received from an Ames employee is quoted below:

"I have never read a more interesting or informative issue on U.S. bonds. Read every word and have never previously.

Thanks, from an Employee"

I, therefore, again suggest a quick rereading of last year's Astrogram.

G. Allan Smith
1976 Ames Bond Drive Chairperson

Dr. Fletcher's message

The annual U.S. Savings Bonds Campaign for NASA employees in this our Bicentennial year will be conducted from March 1 through April 2, 1976. This important employee savings program has my full support.

During the campaign, a savings bonds canvasser will meet with you, explain the merits of buying and retaining savings bonds and will ask if you would like to join the bond payroll savings plan or to

(Continued on Page 2)

More Ames leaders pledge support



Pledging their support for the campaign are (front row) Stan Miller, Ray Savin, Leonel Stollar, Ralph Shawlee, Dick Johnson, Don DeVincenzi, Pat Peterson, Dale Compton, Marty Knutson; (back row) Darrell Brekke, C.A. Syvertson, Skip Nunamaker, George Rathert, Lewis Hughes, Bob Hinds, and Harold Sandler.

Bonds get boost

(A Reprint from the Palo Alto Times)

Businessmen should support sales of U.S. savings bonds to keep government borrowers from squeezing industry out of the capital markets, Chairman George A. Stinson of National Steel Corp. said.

Stinson, national chairman of the savings bond campaign, urged fellow businessmen at a luncheon meeting in the St. Francis Hotel Friday to participate in the industrial payroll savings bonds program.

"The U.S. government has sold \$68 billion in savings bonds," Stinson said, "and that comprises 20% of the national debt. Those bonds are held an average of seven years compared to only three years for the market portion of the national debt.

"Bonds provide a very stable base and help the Treasury manage the federal debt.

"If the government is not able to maintain that \$68 billion and expand it, then the Treasury will go

into the marketplace to replace those funds. Industry may find the capital markets glutted with government securities. It would make much more difficult our capital requirements for the next few years."

Stinson said the steel industry alone plans to spend \$9 billion on plant and equipment in the next 6 to 8 years. "Such a sum is way beyond the cash-flow ability of the industry," he said.

Stinson spoke at a meeting chaired by A.W. (Tom) Clausen, president of the Bank of America.

Clausen is Bay Area chairman of the bonds campaign. There are 175,000 employees at 775 companies in the Bay Area participating in the payroll savings plan. Sales last year reached \$120 million.

The national goal this year is sales of \$7.6 billion, a figure picked in part to coincide with the Bicentennial.

Comments on statistics

The three charts of participation statistics are quite interesting.

The NASA Center participation chart shows the participation at the start of the bond drive for the past 3 years as well as the figures for the end of last year's campaign in June, 1975. Most of the centers show only a 3 to 4% change for the start in various years except for Marshall and Headquarters which are down about 8% and Ames which is up by 13%.

There is generally about a 4 to 6% fall off during the year due to retirements and relocations, etc. Ames' jump of 13% during the last year's campaign is by far the best improvement and indicates that we should be able to make the 14% jump above this year's start which is only 8% above last year's finish to reach our 80% goal.

The chart of Ames directorates shows only codes D and F over the 70% mark at the start of this year's campaign but they will easily reach 80% if they recapture their mark at the end of last year in the case of code D and add 5% for code F.

The three codes in the 65% region are crucial to the success of the drive but they need only add 18% to their last year showing.

Finally, code L can make it if they have about the same percentage increase this year as their magnificent jump of 116% last year.

The chart for the divisions shows some very interesting trends and points out the diversity within the directorates. We were up to 72% last year so we only need 130 new bond buyers after we recapture the 6% loss due to attrition during the year for a total of about 235 new sign ups during the campaign.

Message

(Continued from Page 1)

increase your present allotment. When deciding what action to take, remember that the payroll savings plan provides a guaranteed way to save money and as savings grow into substantial reserves, a solid base is formed upon which future financial planning can develop.

There are many reasons why savings bonds are a good investment. They are safe and pay an attractive 6 percent interest when held to maturity of 5 years, and 6 percent annually thereafter. Savings bonds also offer tax advantages. The interest earned is not subject to state and local income taxes and the federal income tax on Series E bond interest may be deferred until the bonds are redeemed.

Rest easy.



Take stock in America.
Buy U.S. Savings Bonds.

NASA Center participation percentage

Center	1976 Start	1975 End	1975 Start	1974 End	Complement
Langley	85.8	89.6	86.1	86.2	3406
Lewis	69.8	73.5	70.9	74.5	3168
Ames	66.2	71.7	53.3	53.0	1684
Dryden	69.9	78.1	73.2	73.9	489
Johnson	80.3	81.5	75.3	75.6	3993
Goddard	57.9	61.3	59.1	61.4	3915
Kennedy	87.8	90.0	86.5	90.6	2317
Marshall	66.8	73.7	74.2	75.3	4377
Headqtrs.	65.3	75.1	69.1	73.5	1632

Division percent participation

CODE	LEADER	START 1976	END 1975	START 1975	COMPLEMENT
AA	Reynolds	62	69	51	35
AF	Shawlee	75	82	59	40
AP	Hartman	58	83	56	36
AS	Walsh	70	90	52	54
AT	Bennett	68	68	50	38
D	Mark	78	95	72	46
FA	Petersen	73	75	49	124
FL	Rathert	77	83	52	45
FO	Reese	45	48	45	62
FP	Deckert	86	94	45	30
FS	Snyder	78	82	64	123
LP	DeVincenzi	45	52	23	40
LR	Sandler	29	41	33	37
LT	Billingham	63	72	23	49
RF	Giovannetti	73	83	55	183
RK	Dines	63	72	53	65
RS	Stollar	57	62	52	194
SA	Hall	75	78	63	58
SD	Hansen	75	76	65	36
SE	Knudsen	52			38
SS	Compton	50	48	29	102
ST	Peterson	76	81	55	140

The Astrogram

VOLUME XVIII NUMBER 13

March 12, 1976

New photosynthesis discovery

A team of scientists at the University of California, San Francisco (UCSF) and at Ames is working on a newly-discovered bacterial system for converting sunlight into chemical energy and food. This is the first time a photochemical mechanism other than chlorophyll-based photosynthesis has been found in a living organism.

Discoverer of the system is Dr. Walther Stoeckenius, UCSF. Various further discoveries about the bacterial system have been made by Drs. Richard Lozier, Roberto Bogomolini (National Research Council fellows at Ames) and Ames employees Janos Lanyi, working in the Biological Adaptation Branch. Project grants came from NASA and the National Heart and Lung Institute.

Because the new-found biological system is relatively simple, the work provides important new understanding of several plant and animal cell functions and may have applications to medicine and agriculture. It also may apply to the generation of solar power, and to possible new "biological" industrial processes, such as desalination of sea water.

The transformation of light into energy forms capable of sustaining life is called photosynthesis. It is the ultimate energy source for plant and animal life on Earth, and is the basis of agriculture. It is also the most efficient large-scale method known of getting energy from the Sun. The new photosynthetic process is based on a purple pigment instead of a green one. The purple pigment is a protein molecule, called bacteriorhodopsin, which is chemically similar to the visual-purple pigment in the eye. The bac-

teriorhodopsin was discovered in the cell membrane of the bacterium, *Halobacterium halobium*, which lives in near-saturated salt solutions.

New insights into basic life processes, resulting from work on the new photosynthetic material, include:

1. The discovery that a single protein molecule, bacteriorhodopsin, functions as a light-driven pump for hydrogen ions (protons). Since protons are electrically charged, this pump converts solar energy into electrical energy.

2. Discovery of a new way of providing the energy to make ATP, the energy-storing molecule in all living cells. Other important ATP-producing processes are chlorophyll-dependent photosynthesis and the oxidation of nutrients within cells.

3. Mapping the three-dimensional structure of this complex protein molecule. This is one of the few protein molecules for which the three dimensional structure is known and the only membrane protein for which it is known at high resolution.

4. A better understanding of how nutrients from dilute solutions outside the cells are concentrated and transported into the cell interior, utilizing electrical and chemical gradients generated across the cell membrane.

5. An improved understanding of the function and structure of cellular membranes.

Dr. Stoeckenius found the purple pigment in the bacterium while at Rockefeller University. On moving to UCSF, he and coworkers identified chem-

(Continued on Page 3)

Where do we go from here?

U.S. Army officials are considering the establishment of an Aviation Development Center which will involve the current Army operations here at Ames Research Center.

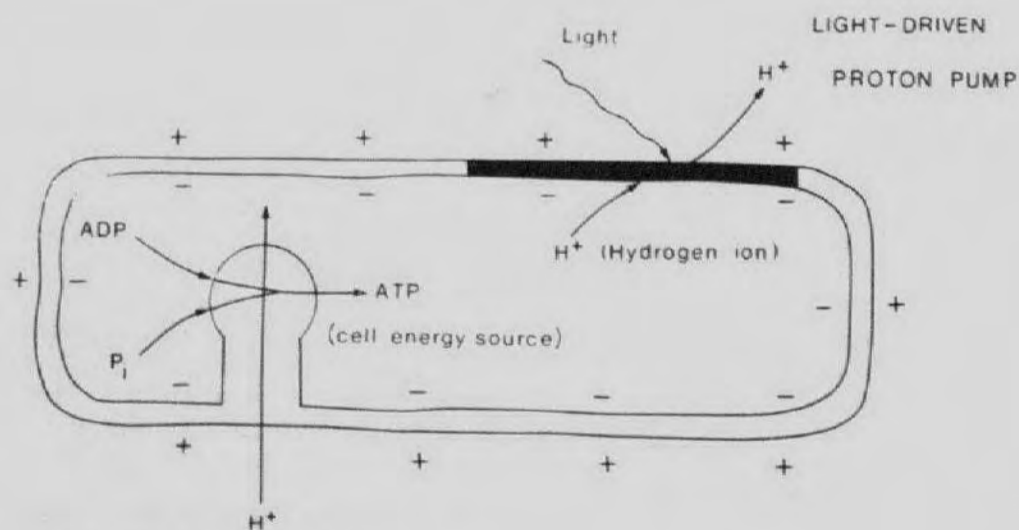
Several years ago, the Army Materiel Command set up a blue-ribbon ad hoc group titled the Army Materiel Acquisition Review Committee (AMARC) to review all aspects of the procedures by which the U.S. Army acquires its material and to recommend changes in those procedures and in the organizations having responsibility for their performance. One of the recommendations resulting from that review was to establish an Aviation Development Center with an objective of evolving to a consolidation at Moffett Field of all those agencies involved in the research, development and acquisition of Army aviation materiel. A large part of this activity is currently conducted within our Laboratory. Another activity, in avionics, is currently conducted at Fort Monmouth, New Jersey.

The Commanding General of AVSCOM established a concept study group to review the AMARC recommended actions and to define implementation means. This study group considered many concepts for reorganizing and consolidating these activities and, after several iterations during a period of well over a year, these possibilities have now been reduced to three concepts. One concept provides for consolidation of all of the activities with the exception of avionics at the Ames Research Center. A second provides for similar consolidation at the Langley Research Center, and the third concept retains the Headquarters of the Aviation Development Center in St. Louis along with certain current other activities in development engineering, and also retains, essentially intact, the three operations collocated with NASA at Ames, Langley and Lewis but disestablishes the organization at Fort Eustis.

The three concepts are under scrutiny at Department of the Army but any decision is still expected to be several months off. The final report presenting the pros and cons of these three concepts is scheduled for submission to Congress this month and due to be returned to the Secretary of the Army with Congressional comments prior to the end of March. Secretary of the Army, Martin R. Hoffmann, is expected to announce the final decision in April.

If the Ames location were selected, it would become the site of a center of the U.S. Army's expertise in air mobility. Currently there are approximately 170 Army personnel located at the Ames Research Center in both the Headquarters and the Ames Directorate of the U.S. Army Air Mobility R&D Laboratory. The selection of the Ames Research Center as the site for the Aviation Development Center could mean an increase in this contingent by about 1600 personnel. It is expected that about 1/3 to 1/2 of these would be transferred from their current locations while the rest would be hired locally.

Light Energy Makes Cell Energy Source (ATP)



Synthesis of ATP energized by the
LIGHT-GENERATED ELECTRICAL POTENTIAL
and the Hydrogen ion (H⁺) gradient across the membrane

■ Purple membrane
— Red membrane

Reflections of Black History week

Ruth B. Harris

By Henry Mack

Mrs. Ruth Bates Harris, Deputy Assistant Administrator of NASA for Community and Human Relations, was the kickoff speaker for the Center's observation of Black History Week. Mrs. Harris began her dynamic presentation by pointing out that it is important for all groups of people to understand the aspirations and problems each group has in order to be responsive to one another and work together on a common mission. She traced the change in Black pride from the time of her youth when her mother used what seemed to be tons of Skin Whitener in an attempt to lighten her color, to today with James Brown and his statement, "I'm Black and I'm proud."

Mrs. Harris gave her audience a number of amazing and little known facts of Black history. She noted that "the oldest drawings and carvings yet discovered were executed by the Negro people over 15,000 years ago in Southern France, Northern Spain, Palestine, South Africa and India."

-A number of churches in France, Spain, Italy and Belgium have an image of a Black Virgin Mary.

-There were three African Popes.

-As for American history, there was a Black pilot on one of Columbus' ships.

-In 1619, before the arrival of the Mayflower, the first slave ship landed.

-Crispus Attucks was killed in the Boston Massacre.

-Peter Salem fought at Bunker Hill.

-General Washington at the beginning of the Revolutionary War would not accept Blacks into the Army but by the time of Valley Forge there were a number of Blacks in the Army. Furthermore, Mrs. Harris pointed out that, "Blacks made significant contributions to the final victory but when the Declaration of Independence was signed, an important paragraph was missing. Southern members of the Continental Congress succeeded in deleting Thomas Jefferson's proclamation against slavery."

Mrs. Harris mentioned a number of Black American scientists. Benjamin Banneker built the first striking clock in the United States and completed the layout of Washington, D.C. Granville Thomas, with his third rail used for electric railroads, made a major contribution to American railroading. Dr. Daniel Hale Williams performed the first open heart surgery in 1893. Dr. Charles Drew developed the modern blood bank and died after an automobile accident in North Carolina when the nearest hospital was for Whites only and wouldn't admit him.

In her closing remarks, Mrs. Harris quoted from President Johnson and Martin Luther King. President Johnson said: "Centuries of oppression and hatred have already taken their painful toll. It can be seen throughout our land in men without skills, in children without fathers, in families that are imprisoned in slums and poverty . . . There is no room for injustice anywhere in the American Mansion." And Martin Luther King said: "No, no, we are not satisfied and we will not be satisfied until justice and righteousness roll down the waters like a mighty stream." Mrs. Harris added, "May the months ahead bring us closer to freedom where all can live and work in a democratic society without such encumbrances as race, sex, nationality, religion, handicap or age. Space, the new frontier may help to provide that impetus."

Dr. J. E. Wilkins

x Dr. J. Ernest Wilkins was the second speaker in a series of these lectures. He noted that there have been and still are too few Blacks in the scientific field. He cited several specific reasons for the discrepancies. The first Black to receive a Ph.D. in Mathematics was Douglas Woodard in Pennsylvania in the late 1920's.

World War II presented a great impact on the Black population. It also brought about an increasing number of Ph.D.'s in Chemistry. Percy Julian was hailed as an extraordinary man and scientist. His perseverance was an asset to his accomplishments.

Militancy did not start in the 1960's. During the time of Roosevelt, it became an American policy not to discriminate.

Blacks have made significant progress in the Science Societies. Some are in key positions, on boards of trustees, presidents and chairmen, etc. The visibility of these positions increases awareness in youth (or in the young generation) and provides models. At the present time there are approximately 15,000 mathematicians with a representation of 200 Blacks.

Dr. Wilkins' concluding statements were geared to the Black Youth. He encouraged parents to be aware of the programs their children are involved in, in their pursuit for education. It is advantageous for your child to be exposed to as many science classes as possible prior to college. If seeking a career in the scientific field the chances for success are heightening.

Prof. Eric Opia

The final lecturer in the series observing Black History Week at Ames was Prof. Eric Opia, a native of Africa who is currently a professor at DeAnza College. Professor Opia titled his lecture "Africa and the USA." He stated that through education people acquire civilization of the past, are provided with an

Call for sculpture ideas

Ames is planning the creation of a theme sculpture for its approach area, in conjunction with the National Endowment for the Arts.

The work is intended to be a dramatic illustration or statement of the Center's role in aeronautics pioneering and research, its work in space exploration and science, and in life sciences research. A grant for the sculpture is expected from the National Endowment for the Arts.

Subject matter for the work will be chosen by a six-member panel from suggestions provided by members of the general public, by Ames employees, or family members. The person submitting the best proposal for the piece will receive a set of large, framed high-altitude color photographs of the Bay Area and Northern California (or other area) taken by Ames Earth Resources Survey Aircraft.

The sculpture will stand in the circle in front of the Administration Building. To fit the site, the sculpture is to occupy a proposed space no larger than five feet by five feet, and ten feet high.

"To recognize the work here over the past 30 years, and expected progress in the almost unlimited fields of space and aeronautics, we hope to get significant subject matter. We would like to have the widest possible participation by the public and NASA employees in its selection," commented Director Hans Mark.

People wishing to suggest themes should send them to:

Graphics 241-14
NASA-Ames Research Center
Moffett Field, CA 94035

Format for suggestions is: not more than 50 words and not more than two illustrations, all on letter size paper.

Deadline for theme suggestions is April 16, 1976. If additional information is required, telephone Michael Przekop at Ames, ext. 5660.

opportunity to take part in civilization of the present and make the civilization of the future. His objective was to show the relationship between the two countries.

Professor Opia began tracing the history of Ghana in 300 AD and developed the relationship between Ghana and North Africa which was the beginning of slavery. He indicated that in this time of slavery, slaves were an important part of the politic. At that time "A slave who knew how to serve his master well succeeded to his master's property." Professor Opia pointed out that prior to acutal slavery there was indentured servitude.

Slavery, legally speaking, did not come into or become a part of the colonies until 1664. In 1619 a Dutch frigate landed twenty Africans at Jamestown, VA. These Africans were not slaves but Christians. According to English law, a slave (indentured servant) who had been converted to Christianity became enfranchised. Thus, the Black Africans were free. He indicated that Africa was the major source of slave supply. At the time of the revolutionary wars in the US, slaves were eventually armed to help win the wars. Even at the time of the civil war the colonial populace feared arming the slaves, but eventually had to arm them to win the war.

Professor Opia continued to trace the historical development of Blacks through the years to the present. He touched on the present problem in Angola from his personal point of view. Following the lecture he opened the way for questions and a most lively discussion followed.

Caillat to retire

A retirement luncheon is being held at the Chez Yvonne restaurant, 1854 El Camino Real, Mountain View, California, on Friday, March 19, 1976, for Kenneth F. Caillat, Chief, Model Development Branch and Nickolas J. Rock, Model Maker, in honor of their retirement in March, 1976. All friends of Mr. Caillat and Mr. Rock are cordially invited to attend. A memorandum giving further details will be distributed. Should there be any questions concerning the luncheon, please call the Model Shop, extension 5413.

DeAnza courses

The Training and Special Programs Office would like to offer some DeAnza courses this Spring quarter at the Center. If you are interested in a course please check the appropriate box and return to mail stop 241-3 by March 10. A minimum enrollment of 20 persons must be met to offer this off-campus class. These classes would be given either during working hours (if job related) or after working hours.

- Elementary Shorthand
- Intermediate Shorthand and Beginning Transcription
- Business Report Writing
- Business Correspondence
- Human Relations in Business
- Financial Planning for Retirement
- Effective Presentationa Workshop

Name _____ Mail Stop _____ Phone Ext. _____

Shuttle crews named

Crews for the Space Shuttle Approach and Landing Test (ALT), the initial flight test of the Shuttle Program have been announced by NASA. The ALT tests are scheduled to begin in mid-1977.

Two two-man crews were named. They are: Fred W. Haise, Jr., commander, and Charles G. Fullerton, Pilot; Joe H. Engle, commander, and Richard H. Truly, pilot. Both crews are scheduled to fly ALT missions, with Haise and Fullerton making the first flight.

The ALT flights will be conducted at Dryden Flight Research Center. The Orbiter will be carried aloft to an altitude of about 7,500 meters (25,000 feet) atop a specially modified 747 aircraft. It will then be released allowing the crew to fly the Orbiter to the ground. Several unmanned and manned non-release flights will precede the initial "free flight" of the Orbiter.

Haise, 42 (civilian), commander of the first crew was selected for the astronaut program in April 1966. He was backup lunar module pilot for Apollos 8 and 11, lunar module pilot on Apollo 13 and backup commander on Apollo 16. He is the only crewman named that has flown in space.

The crews will participate in the various phases of Orbiter test and checkout between now and the first flight. Both crews will train for the flights using the NASA T-38 aircraft with special speed brake; the Shuttle Training Aircraft, a modified twin jet Gulfstream II; Shuttle Procedures Simulator and the Orbital Aeroflight Simulator.

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ACE Spring quarter courses

Course title	Day	Start and end dates	Time
GOLDEN GATE UNIVERSITY MBA PROGRAM GM 262, HR 241, QA 274, EC 298 - in progress			
COLLEGE OF NOTRE DAME MBA FOUNDATION PROGRAM (MANAGEMENT DEVELOPMENT courses denoted by •)			
Management & Organizational Behavior •	M	3/29-6/7	5:00-6:45 pm
Planning & Operations Management •	W	3/31-6/9	5:00-6:45 pm
Principles of Financial Management •	T	3/30-6/8	5:00-6:45 pm
Introduction to Probability & Statistics	T	3/30-6/8	5:00-6:45 pm
SUPERVISORY SKILLS PROGRAM			
Selected Topics in Supervision	Th	4/1-6/10	5:00-6:45 pm
Principles of Effective Business Writing	W	3/31-6/9	5:00-6:45 pm
SPECIAL & GENERAL INTEREST PROGRAM			
Management of Research, Development & Technology * Based Innovation (Section 1) *	M	3/29-5/3	12:00-1:00 pm
Management of Research, Development & Technology * Based Innovation (Section 2) *	T	3/30-5/4	8:00-9:00 am
Corporate Strategic Planning	MW	4/5-6/9	12:00-1:00 pm
Digital Troubleshooting Techniques II	Th	4/1-6/10	5:00-6:45 pm
Digital Signal Processing *	WF	3/31-6/4	12:00-1:00 pm
Introduction to Microprocessors	T	5/4-6/8	4:30-6:30 pm
Microwave Tubes & Solid State Devices	Th	4/1-6/10	5:00-6:45 pm
Introduction to Oil & Gas Exploration *	TTh	5/11-6/10	12:00-1:00 pm
Memory Improvement	TTh	3/30-6/10	12:00-1:00 pm
Effective Reading*	TTh	3/30-4/29	12:00-1:00 pm
Personal Money Management*	MWF	3/29-4/23	12:00-1:00 pm
Financial Planning for Retirement* * Video Tape Program	MWF	4/26-5/21	12:00-1:00 pm

Description:

The effective management of Research and Development and the commercial implementation of technological innovations is described in a 6-session video tape presentation by the Sloan School of Management at the Massachusetts Institute of Technology. Topics include motivating scientists and engi-

Discoveries

Earth's protective ozone layer above the equator has recently come under the eye of NASA's newest Atmosphere Explorer (AE) satellite today.

An ozone detector aboard the spacecraft, called a backscatter ultraviolet (BUV) spectrometer, will provide information on the ozone layer in the equatorial region of the globe between 20 degrees North and South.

Immediately after the instrument was activated at 2:36 a.m. EST Thursday, controllers at Goddard Space Flight Center began receiving data on a check-out basis. The BUV spectrometer is expected to become fully operational next week.

Six other instruments aboard the satellite, which was launched Nov. 19, already have been turned on. Five more are to be activated by the end of next week.

The ozone detector was added to the satellite last spring by NASA as part of the agency's program to measure the atmospheric distribution of ozone on a global scale. The equatorial region is presumably one of the most active regions of ozone production in the atmosphere.

The ozone layer in the stratosphere is a planetary cover which shields Earth from most of the dangerous ultraviolet radiation from the Sun.

Concern has been expressed that manmade pollutants are building up in the atmosphere at such a rapid rate that they will begin depleting the ozone layer before the end of the decade.

Scientists fear that a serious reduction in the ozone cover and subsequent increase in the amount of ultraviolet light striking Earth could lead to an increase in the incidence of skin cancer, as well as changes in the average temperature of Earth's atmosphere.

neers, user needs and industrial innovation, technical venture strategies, communication in science and technology, corporate/R&D interface management, and innovation in industrial organizations.

Prerequisites: For R&D management. Instructor: MIT/Sloan School of Management.

New photosynthesis discovery

(Continued from Page 1)

ically the pigment and found that when illuminated it ejected protons to the surrounding liquid medium. He and UCSF coworkers and Dr. Efraim Racker, Cornell University, made microscopic artificial vesicles containing the purple pigment and demonstrated light-driven proton pumping from the vesicle exterior to the interior. They also found that by adding the ATP-producing enzyme, ATPase, to the vesicles, the electrical proton gradient generated by light across the vesicle membrane could be coupled to make ATP (energy-storage) molecules. This ATP production is thought to proceed in a way similar to that occurring in plant cells, which use proton gradients generated by the chlorophyll-containing photosynthetic system, and in animal cells that use proton gradients generated by oxidation of nutrients.

Dr. Richard Lozier and Dr. Roberto Bogomolni, working at Ames, have learned that the bacteriorhodopsin molecule operates as a proton pump by undergoing a cyclic photochemical process which involves at least five intermediate steps. In one of such steps a proton is ejected by the pigment to one side of the membrane and in a later step a proton is captured from the other side resulting in a net pumping effect. Each molecule can pump 250 protons per second across the membrane. (One bacteriorhodopsin molecule is 25,000 times larger than a proton.) The researchers have studied the function of the proton pump in the living bacterium and measured the efficiency of the process under physiological conditions.

Dr. Janos Lanyi of Ames, and Dr. Russell E. MacDonald, Cornell, have found how the bacterium transports nutrients into itself, showing that this process is similar to that for other types of cells, but is energized by light absorbed by bacteriorhodopsin. This work helps substantiate one of two theories for accumulation and transport of nutrients into cells.

The Ames work is part of studies of earth organisms which live in extreme environments such as those expected on other planets. This study provides clues to the nature of life in such environments.

'76 NASA launches for pay

Most of the launches of spacecraft in calendar 1976 by NASA will be for cash customers.

NASA has plans to launch 19 satellites or space probes during the U.S. Bicentennial Year and will be reimbursed by customers for 15. The customers include NATO, the Republic of Indonesia, the International Telecommunications Organization, Comsat General Corp., RCA, the National Oceanic and Atmospheric Administration, and the Department of Defense.

In 1975 NASA had nine reimbursable launches in which the customers provided the spacecraft and paid NASA for the launch vehicles and the associated launch costs. Total NASA launches last year, including the manned Apollo Soyuz mission, numbered 21. Two failed to achieve orbit.

"The growth of the reimbursable launch activity is a true indication of the maturity of the space program," Joseph B. Mahon, NASA's Director of Expendable Launch Vehicles, said. "When commercial firms and other outside-NASA organizations account for more than two-thirds of NASA launches, and pay for them, the age of space exploitation is really here."

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-85	Aerospace Engineer	GS-12,13	FPQ	Centerwide	3-22-76
76-86	Budget Assistant (Typing)	GS-5/6/7	AR	Centerwide	3-19-76
76-87	Secretary (Typing) or Secretary (Stenography)	GS-4/5	RKS	Centerwide	3-22-76
76-88	Secretary (Typing) or Secretary (Stenography)	GS-4/5	RFD	Centerwide	3-22-76
76-89	Accounting Technician	GS-4/5	AFC	Financial Management Division	3-19-76

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-80	Accounting Technician	AFC	Robert Jackson
76-78	Aerospace Engineer	FS	Victor Stevens
76-70	Chief, Research Equipment Engineering Branch	RFE	David Engelbert
76-67	Contract Specialist	AS	Mary Lee Bodily

Traveling Space show

By the end of 1976, residents of 30 U.S. cities will have had the opportunity to view a large exhibit of objects, tools, photographs and films related to national accomplishments in space. The traveling exhibit, called the Mobile Space Museum, was prepared and is being sent around the country by the High Flight Foundation, a non-profit religious organization founded in 1972 by Col. James B. Irwin, Apollo 15 astronaut, now Chairman of the Foundation's Board. With Col. Irwin on the executive roster are fellow astronauts Col. William R. Pogue (Skylab 3) and Col. Alfred M. Worden of Apollo 15 and past Ames Chief of Systems Studies Division.

"I hope that everyone visiting the Mobile Space Museum will not only be able to relive Apollo 15, but will also feel some of the spiritual inspiration of that flight, remembering that our nation is one under God," Col. Irwin said.

The traveling Museum, which so far has been seen in five cities in Kentucky and Florida, is scheduled to go on display as follows: Feb. 10-15, Paris, TX; Feb. 17-22, Garland, TX; Feb. 24-29, Little Rock, AR; March 2-7, Sand Springs, OK; March 16-21, West Frankfort, IL; April 6-11, Mount Morris, MI; April 13-18, La Crosse, WI; April 20-25, Duluth, MN; May 4-9, Watertown, SD; May 11-16, Omaha, NB; May 18-23, Salina, KS; May 25-June 6, Colorado Springs, CO; June 8-13, Farmington, NM; June 15-20, Chandler, AZ; June 21-25, Eureka, CA; June 26-30, Marysville, CA; July 1-4, Sacramento, CA; July 5-7, San Francisco, CA; July 8-16, San Jose, CA; July 18-23, Bakersfield, CA; July 24-31, Torrance, CA; Aug. 1-7, Newport Beach, CA; Sept. 5-10, Amarillo, TX; Sept. 12-18, Lafayette, LA; Nov. 26-28, Indianapolis, IN.

Inquiries may be directed to High Flight Foundation, 4050 American Drive, Colorado Springs, CO, 80907 (303-598-7070).

Thank you

We wish to take this opportunity to thank all who attended the retirement luncheon. It was heartwarming to see so many friends at one time. We shall always cherish the fond memories of the years spent at Ames. Thank you all again.

Phil "Pappy" and Rae Payne

The Black Advisory Committee wishes to extend their thanks and appreciation to Ames Center for your support during Black History Week, February 9 through 13, which featured the contributions of Black Americans to America's Bicentennial as the theme of the program.

Want ads Transportation

FORD LTD 1969, excellent, will be available end of May, \$850 or offer. Call Avi evenings, 964-7060.

OLDS '71, Delta 88, custom 2-dr hardtop. All power, all extras. \$1725. Call 851-7066 after 6 p.m.

1974 Triumph Spitfire 1500. Teal green, tan interior. Luggage rack, car cover. SCCA-legal roll bar with custom fitted soft top. 32,000 miles. \$3500. Doug Pearson, (415)967-2970.

Housing

FOR RENT: Beach house at Pajaro Dunes, completely furnished, 3 bdrms, 2 ba, sleeps 6, view of Monterey Bay, tennis courts and other recreation facilities. Call John Lundell, 252-7260.

Miscellaneous

1965 - 352-Ford motor and auto. trans. \$50. Needs overhaul. Call evenings, (408) 578-5472.

Mark 10B C.D. transistorized ignition. \$35. Call Clint, 265-7018.

FOR SALE: 1/3 hp swimming pool pump, filter, through-the-wall skimmer, vacuum, water test kit and hoses. All in good condition, \$75. D. Brocker, 377-9345.

Pre-season special - 20 ft wooden sloop with fixed keel. Sleeps 2. Moored in Half Moon Bay. Excellent condition. \$1450. J. Howe, 948-4269.

FOR SALE: Upright freezer (harvest gold) \$185; game table w/4 chairs, \$375; beautiful bookcase (fruitwood finish), \$95; livingroom chair, velvet, \$70; men's valet (like new), \$15; all items in excellent condition. Phone (408)578-5472.

MUST SELL: Pair of Pioneer speakers, showroom condition. List \$340, asking \$240 or offer. Tent, blue, 9'x11', outer frame, list \$120, asking \$60 or offer. Unique and interesting bean bag sofa made of carpets, \$60. Call Avi, evenings, 964-7060.

Appaloosa gelding, black, 15.3 hands, 9 yrs old. Reg., gentle, sound, just shod. Excellent trail or endurance horse. Good conformation. Slow gaits, show prospect. Willing to jump. Trailers well, has been in parades. Must sell, \$575 or best offer, 846-6027.

Purple 10-speed Motobecane bicycle. Custom built. Campi derailleurs, universal center pull brakes, Campi hubs, Fiami red label rims, sew-ups, aluminum cranks, suede unicanter seat. Near new. \$225. Christine, 323-2375.

1/4-size violin with new bow, \$35; Schwinn girls beginners bike, \$25; 2 childrens ski outfits with boots, \$10 ea. 738-2948.

FOR SALE: NRC Assoc. leaving the country soon. Must sell 1 vinyl couch (8' long), 2 end tables, and 1 B/W RCA 19" TV (9 mo. old) in exc. cond. Call Rajan, 965-2466.

Stereo system: Sanyo RCVR/AMP, Garrard changer, cassette deck. 2/4 channel select enhances quad sound from stereo disc. Complete w/4 speakers. \$125. Call 4-7 p.m., 996-7759.

Snow chains, Campell. Lug-reinforced. Used once. 14-inch: 7.00, 7.75, 195, D70, E70, E78, F78. 15-inch: 6.50, 7.35, 195, E70, E78. Will trade for size G78-15, similar style, or \$15. Call 739-1218, evenings.

Washer (Maytag) and dryer (Whirlpool), excellent condition. Must sell. Call 371-8360, after 2:00 p.m.

FOR SALE: Completed Heathkit transistor and diode in-circuit and out-of-circuit tester model IT-18 \$25. Call Earl Menefee, 243-5382.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

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The Astrogram

VOLUME XVIII NUMBER 14

March 26, 1976

Project Porcupine

by Susan Miller



A NASA Lear Jet from Ames Research Center is in flight over Southern Europe to participate in a joint effort with West Germany called Project Porcupine. A German sounding rocket will be fired from a launch pad in Esrange, Sweden, containing a payload of 11 experiments and 12 quill-like booms that extend into space and gather data on the processes that produce the northern lights.

The Lear Jet will be involved in the Barium Ion Experiment in which two canisters of barium powder will be ejected from the rocket and exploded at 450 km. Although the experiment takes place in the early evening during Auroral displays, there will be enough light left at that altitude to activate the barium. Once the barium is ionized it will travel up the Earth's magnetic field lines toward the Southern Hemisphere.

Special cameras on board the Lear Jet will film the barium jets or streaks for the first 1000 seconds after release. During this brief period of time the

streaks will already be visible as far south as the Ionian Sea. At that time the height of the jets will be 18,000 km or three Earth's radii.

The project data will be compared with information gathered by the ATS-6 Satellite — a geostationary satellite which is positioned on the same geomagnetic lines that the barium powder is released upon. Scientists think that the injection of barium may alter conditions in the magnetosphere somewhat. By recording these changes scientists may be able to provide some explanations for the workings of the magnetosphere.

The Lear Jet is based in Athens, Greece. The Ames team and contractor support group is headed by Robert Cameron, chief of the Airborne Science Office, Robert Mason, Lear Jet Facility Manager, and James Martin, chief pilot. The two experimenters on board are Thomas Hallinan and Garry Meltvedt from the Geophysical Institute at the University of Alaska.

National Geographic to feature Ames test

The National Geographical Society is preparing a featured article about flight safety for use in their prestigious magazine. In support of this article, last week they sent one of their staff photographers, Otis Imboden, from Washington, D.C. to Richmond, Calif. to photograph an Ames experiment involving aircraft trailing wake vortices. The experiment was being performed at the University of California's ship-model basin.

In these tests, models of a Boeing 747 and a McDonnell Douglas DC-10 are towed underwater through a 200 foot long, 6- by 8-foot water tank

and the trailing vortices in the wakes of the models are marked with dyes. Ageing and merging characteristics of the wakes are studied as various flap and spoiler combinations are tried in an attempt to cause a rapid diffusion of the wake. An understanding of both the persistence and character of rotational velocities within these wakes is important in assessing safe separation distances between aircraft operating into and around airports.

The tests were being performed under the direction of Don Ciffone of the Large Scale Aerodynamics Branch with photographic support from Chuck Lonzo of the Phototechnology Branch.

AIAA award



Dr. William J. McCroskey, a research scientist with the U.S. Army Mobility R&D Lab here at Ames, has received the "Outstanding Engineer Award" from the San Francisco Section of the AIAA (American Institute of Aeronautics and Astronautics). This award is presented annually to the most outstanding young engineer of the San Francisco Section of AIAA. The award was presented to Dr. McCroskey at the Engineers' Banquet during Engineers' Week.

Dr. McCroskey has been with AMRDL since 1968. He's been engaged with formulating and implementing theoretical and experimental programs of basic research in the fluid mechanics of rotary-wing aircraft.

Dr. McCroskey received his Ph.D. from Princeton University. He belongs to three major societies and has had professional papers published.

747 SCA crew named

The initial crew of the 747 Shuttle Carrier Aircraft that will be used to carry and launch the Space Shuttle Orbiter for its Approach and Landing Tests has been selected by NASA.

Fitzhugh L. Fulton, Jr., and Thomas C. McMurtry, both of Dryden Flight Research Center will be the pilots. Flight test engineers on board the 747 will be Victor W. Horton, also of the Dryden Flight Research Center, and Louis E. Guidry, Jr., of the Johnson Space Center. All of the men are civilians.

The ALT flights will be conducted here in early 1977. The specially modified 747 will carry the Orbiter to an altitude of approximately 7,500 meters (25,000 feet). The Orbiter will then separate from the 747 and the Orbiter crew will pilot the Orbiter to a glide landing. Several unmanned and manned captive flights will precede the initial free flights. (Continued on Page 4)

NASA satellite tracks car

A 1914 Model-T Ford, entered in the American Bicentennial's Around-the-World Auto Race planned for mid-1976, will team up with a NASA satellite in a unique tracking experiment.

The Ford is one of 12 antique cars scheduled to compete in a 60-day point-to-point rally from Paris across Europe, Asia and the United States to New York City as an official event of the National Bicentennial celebration. All of pre-1915 vintage, the cars will travel the approximate route of the Great Race of 1908 in a reversed direction.

Associated with this event, Goddard Space Flight Center will conduct a tracking experiment to help evaluate a research system normally used for the remote collection of environmental data via satellite.

Driven by Robert H. Pickard of Adelphi, Md., the Model-T Ford will be equipped with a 30-pound electronics package for all or part of the race. This rugged, self-powered unit will be used to transmit the ground speed of the moving car to the Random Access Measurement System (RAMS) carried by NASA's Nimbus-6 meteorological research satellite.

Nimbus-6 orbits the globe from pole to pole every 108 minutes. Due to the rotation of the Earth, the satellite covers the entire globe once every 12 hours. All information collected by Nimbus-6 is relayed to Goddard through an Alaskan ground station as the satellite passes over the north pole at the end of each Earth orbit.

"While our RAMS experiments with balloons and free-floating buoys are highly successful, the auto race offers the opportunity to demonstrate the system for ground tracking applications, where transmissions may encounter various kinds of interference," said Goddard's Charles E. Cote.

"Use of the RAMS during the race should also provide us with additional data on system accuracy," Cote added.

Although an employee of the Goddard Space Flight Center, Robert H. Pickard will represent himself as owner of the Model-T Ford. An avid car enthusiast, Pickard is currently rebuilding the antique car for the race.

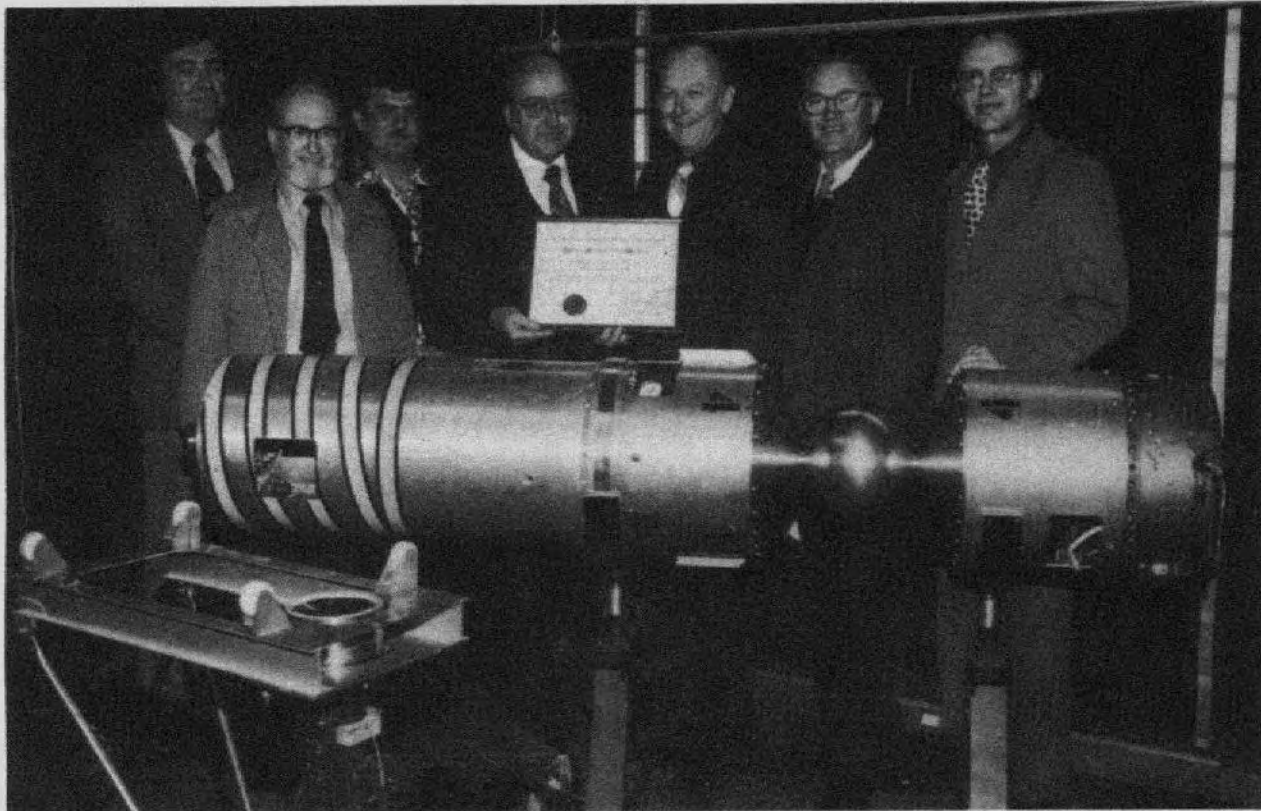
Starting in Paris, France, on about May 31, 1976, the competing cars will travel through Belgium, West Germany, Austria, Hungary, Yugoslavia, Bulgaria, Turkey, India, Japan, and the United States. The race will terminate in New York City on about July 27.

THE WIZARD OF ID

by Brant Parker and Johnny Hart



Ames SPARCS project team



The Ames SPARCS Project Team is shown receiving a NASA Group Achievement Award from Deputy Director, Clarence Syvertson. Pictured left to right are: Norman Yetka, Mort Bradski, Bob Lavond, Mr. Syvertson, Dean Chisel, SPARCS Project Manager, Bill Van Ark and Jim Van Ess. The award citation reads, "For Outstanding Performance by the SPARCS Project Team in the Management and Operation of a Highly Successful Solar Physics Sounding Rocket Program."

The SPARCS Project provides the pointing system instrumentation, integration and launch support for solar physics sounding rocket investigations.

The program originated at Ames in 1966. Since that time the SPARCS Project has flown over 60 sounding rocket flights for 24 different experimenters. Through the years the SPARCS team has refined and modified the SPARCS system to provide more accurate pointing and increased science data return. The SPARCS IV system developed at Ames using fluidic proportional thrusters has consistently provided better than 1 arc second pointing stability. The latest SPARCS systems have used a TV camera and monitor in conjunction with a joystick control which allows the experimenter to visually observe the Sun and point at areas of interest in real time. An improved SPARCS system will be flown in the next few months. This system will provide, in addition to the TV display, automated pre-programmed pointing, real-time data display, and automated signal optimization. The SPARCS program has received enthusiastic support from the scientific community and has exemplified the NASA goal of maximum scientific return at minimum cost. The SPARCS team is a part of the Flight Projects Branch, Astronautics Directorate.

VTOL lift cruise fan research



A 0.7 scale model of a conceptual VTOL (vertical take-off and landing) aircraft being studied as part of a NASA-U.S. Navy lift cruise fan research and technology aircraft program. The model is being readied for testing in the Ames 40 by 80 Foot Wind Tunnel. Such an aircraft would use fans driven by two jet engines for direct lift and forward propulsion.

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Model airplane contest

The San Francisco Section of the AIAA is planning its fourth annual youth-oriented model airplane contest for May 1, 1976 at the San Jose City College, Men's Gymnasium. Prizes will be awarded in three age categories: 11 and under, 12 through 14, and 15 through 19. The oldest group has been added for this year's contest to stimulate interest in aeronautical science among young men and women who are ready to choose a career. Flying will start at 9:00 a.m. and continue until 3:00 p.m.

The types of airplanes flown will be very similar to the last two contests, but additional design challenge has been added for the oldest group. Beginners in the two youngest age groups are encouraged to fly the Delta Dart, which can be built from a kit in one evening. Original design and penny plane events will also be offered, with separate categories for 14 and under and 15-19 age entrants. All models are to be rubber-band powered.

Delta Dart kits at 35c each, detailed contest rules and free penny plane plans are available from AIAA representatives. For information, call Lou Young at 252-2145 or X6546.

The contest is free and open to all youngsters and young men and women.



Bob Merrick, Aircraft Guidance and Navigation Branch, helps one of the contestants of last year's contest with her airplane.

Space medicine: enzyme producing kidney cells

Human kidney cells which produce an enzyme effective in removing blood clots from veins and arteries can be separated from non-producing cells in space.

The same process on the ground has been unsuccessful in separating the cells. About five percent of the kidney cells produce the enzyme, called urokinase, which bears major potential application for future treatment of people with blood clot conditions such as phlebitis.

An experiment on the Apollo Soyuz mission (ASTP) last July was designed to isolate pure samples of the producing cells so that the samples, after return to Earth, could be used as starters for cultures of the cells.

The process is unsuccessful on the ground because the effects of gravity cause thermal convection currents in the solution and the cells sink toward the bottom of the tube because they are denser than the water solutions that can be used for separation. In weightless space flight the process is unaffected by these forces.

In the Apollo Soyuz experiment the separated cells were frozen and returned to the ground for use as starters in the culturing process. The objective of the experiment was successfully achieved and the cultures of the ASTP samples produced six to seven times more urokinase than the original sample.

Special Achievement Award



Bernardo "Dino" Pongeggi receives a Special Achievement Award from A. Giovannetti (L), Chief, Research Facilities and Instrumentation Division. Roland Michaelis (R), Chief, Photographic Technology Branch looks on. (See the attached photo.)

This Award was presented to "Dino" for obtaining several large format aerial camera systems for use

on the Galileo II, CV-990 Aircraft. In addition to obtaining these systems without cost, he was responsible for the adaptation, installation and operation of them during recent flight missions. This represents a major upgrading of Photo Technology Branch support for this Ames research facility.

Unique group effort for gift



This unique baby quilt (pictured above) was recently presented to Jacqueline Kalil by fellow Ames and contractor employees. Jacqueline, an applications engineer with Computer Science Corporation (CSC), is expecting her first baby the end of this month.

The thirty quilt patches are in yellow and brown and each was embroidered by a different person working in the Simulation Investigations Branch. Many of the contributing embroidery designers are men and this was their first attempt at this popular form of art.

CSC employee Tim McCloskey coordinated this effort and noted that everyone was asked to "do their own thing" as far as design, color and subject matter were concerned. Many of the participants spent as many as 15 hours on their individual 7-1/2 inch square. The total project was completed within a six week timeframe. The comforter was filled with polyester koda fill batting for warmth and puffiness. The end product resulted in an extremely attractive 37 inch by 45 inch quilt and a matching Teddy Bear which was sewn up with the scraps of the quilt's yellow calico backing.

An article featuring this particular baby quilt will appear in an issue of "Sunset Magazine" this fall.

A list of dedicated artists follows: James Hedrick, K. McCloskey, James Johns, Richard McFarland, Patricia Jones, George Miller, Stephen Chinn, Cynthia Hutchins, Tim McCloskey, L. Boze, Brian Berg, B. Bertoli, David Astill, P. Delfrate, Dave Boze, Gary Grody, Charles Woodward, Norman Bengford, T. Ritenour, Thomas Alderete, B. Freeman, Joel Rosado, Drew Woloshyn, S. Ray, Benton Parris, Howard Cohen, Warren Birmingham, Marmora Kurkjian, S. Boze, and Clyde Paulk.

Ames Promotion Plan vacancies

Notice No.	Title	Grade	Org.	Area of Consideration	Closing Date
76-97	Research Aircraft Mechanic (2 positions)	WG-13	FOS	Centerwide	4-5-76

TO APPLY: Call Extension 5599 or 5600

MERIT PROMOTION PLAN SELECTIONS

Notice No.	Title	Org.	Name
76-72	Computer Systems Administration Specialist	RKA	Charles Garner

"Thank you"

We wish to thank each and every one of you who donated a pint of blood (through your Bloodmobile, 3/11/76) to our 3-1/2 year old daughter, Gail. You were so kind and generous to do that - no words can fully express our sincerest gratitude.

Most sincerely,
Bob & Gail Shaffer
Fremont, Calif.

Dear Friends,

Thank you so much for the exciting retirement party; it was wonderful to see so many people there, and to see so much of one person (Boy, that was some jack-in-the-box!). I also want you to know how much I appreciate the books on archaeology. I'm anxious to start reading them.

I have many happy memories of my years at Ames and I hope to keep in touch with some of my friends through Toastmasters and Federally Employed Women. So long!!

Love,
Sharon King

SCA crew (Continued from Page 1)

The 747 is currently being used in a wake vortex study and will be returned to Boeing Co. late this month for the modifications required to carry and launch the Orbiter.

Fulton is a veteran multi-engine test pilot and has extensive experience as a launch pilot. He served as launch pilot for the X-15 and manned lifting bodies as well as other experimental aircraft flight test programs. Fulton was an XB-70 project pilot for both NASA and the USAF. He is currently co-project pilot on the triple-sonic YF-12 flight research program.

McMurtry has been flying experimental aircraft for NASA since 1967. As project pilot on the Supercritical Wing, he made the first flight with the new airfoil shape that can lower the operating costs of future jet transports.

At the Johnson Space Center, Guidry has flown as test engineer on the C-135 Zero-G studies and the C-130 Earth Resources aircraft. Horton is flight test engineer on the YF-12 at Dryden Flight Research Center and has flown as launch-panel operator of the B-52 air launch aircraft.

The Astrogram

Room 142, Admin. Mgt. Building, Phone 965-5422

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Editor Meredith Moore
Associate Editor Marcia Kadota
Reporters NASA Employees

Deadline for contributions: Thursday between publication dates

Orient tour

A 16 days-14 nights tour is planned to Hongkong at a cost of only \$699 for the basic tour (optional side trips to Tokyo, Taipei, Bangkok, Pattaya, Kuala Lumpur and Singapore). This includes a gala Welcome Cocktail Party, Welcome Breakfast Briefing, Welcome and Farewell Dinners, gratuities for bellmen, taxes, hotel transfers and 14 nights at the luxurious Hyatt Regency in Kowloon.

October 22nd is selected for weather consideration, and it requires only nine days of annual leave for the trip. Other dates are available for individual travel at the same cost.

Interested travelers at Ames Research Center wishing to take advantage of this Bargain Tour please call Tour Leader Guy Wong at Ext. 6022 (Home: 322-7612) for a detailed color brochure and for reservations. Call at once to insure booking for the same flight/tour.

Want ads Transportation

PORSCHE 911, 1974, 19,000 mi. Immaculate condition. Offers around \$12,000. Bob McCracken, 578-2676.

'73 Courier, 1/2 ton P.U. AM-FM cassette deck, roll bar, fog lamps, new tires - chrome wheels, Baja bumper, gages 38,000 mi, sharp. \$2395. after 5:00 - 984-0855 or 735-9029.

'72 Travel-trailer, Lark 17, sleeps 6, self-contained, air, awning, new TV, and ant., dual-propane, dual-gas-cans, H.D. jacks, deluxe EZ hitch, \$3475. Like-new. 262-8217 after 4 p.m. weekdays.

'74 250 cc Yamaha Enduro, excellent condition. Call Larry, 279-1021.

Housing

FOR RENT: House in South Lake Tahoe area, 6 mi. to skiing, 8 mi. to Stateline. Completely furnished, 2 bdrm plus loft, 2 baths, sleeps 10-12. Call 245-2377.

NEW HOME: 3 bdrm and den; 5 level acres (majority planted in hay); irrigating well pumps 250 gal/min. House equipped with burglar alarm, microwave oven, natural gas; fully insulated; 2 tile baths; quality cabinets; many other features. Convenient to schools and shopping. Located west of South Valley Freeway in San Martin at 13555 Harding Ave. Price: \$105,000. Phone 779-2343.

Miscellaneous

For Sale: Restorable 1952 Ford Pickup less motor and transmission. \$100. Call F. Thompson, 379-2385.

Magnificent redwood burl coffee tables and end tables. Only the highest quality burl used. Call B. Scott, 867-4284.

FLUTE. Gemeinhardt, French model, B-foot, all solid silver, perfect condition. Herb Finger, after 5 p.m. - 246-3616.

FREE - Easter bunnies - to good homes. 268-8430.

Vito tenor saxophone, like new. Make offer. Call Chuck McClinton after 5 p.m. 272-1812.

Queen size Simmons Beautyrest foundation and mattress. Good condition. Steel bed frame included. \$175. 243-5194.

20" Bicycles in excellent condition. One boys and one girls. \$25 each. 446-0740.

MINOLTA SRT 102 body with Rokkor-x 35mm fl. 8. \$280/offer. Call 324-8295.

Summer rental wanted for Princeton professor and wife, approximately two months starting about June 23. Furnished house with pool preferred. Have local references. Mail stop 200-10. (965-5113)

5-piece blond bedroom set w/inner spring mattress and box springs - excellent condition; Samson's belt massager machine; Canister Hoover vacuum cleaner; set of casters for scaffolding. Call 967-2412 any time.

9X12 handwoven wool Moroccan Rug. Braided tassels on each end. White with green-gold scroll design. \$450. Call 238-1623 evenings.

WANTED TO PURCHASE: Late model compact car (Datsun, Pinto, etc.) in good condition. 257-0583.

For Sale: Baby buggy, very sturdy, excellent condition, \$25; Sprindle crib with mattress, bumpers, like new, \$50, 733-5737.

DOG HOUSE: Very nice condition for 20 lb. size dog. Bob McCracken, 578-2676.

FOR SALE: Auto chains. \$6. Will fit 14-inch: 8.55, 8.50, 215R, 15-inch: 8.55, 8.45, 7.60, F70, G70, 215R, 205R. Plus 6.50-16. Call 321-7021 after 6 p.m.

WANTED: G.M. toddler carseat, 733-5737.

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