the astrogram

VOLUME XII
NUMBER 5
January 2, 1970

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

SCIENCE STUDENT . . . Delva Williams, a freshman at Ravenswood High School (left), explains an Apollo space suit to children from Belle Haven School. Pre-schoolers, kindergartners, and first graders from East Palo Alto schools visited the Moon rock exhibit at Ames as part of a special instructional program. Ravenswood High School science students attended an advance briefing and served as instructors.

Students are (from left) Randy Barker, Valerie Jordan, Kimberly Due, Juan Jordan, and Latanya Due. Kathy McGovern, Jordan Junior High School, a Santa's Helper at the Ames children's Christmas party, which the children also attended, looks on far right.

Three Ames Scientists Selected as Investigators for Viking 73 Mission

NASA has selected the areas of investigation and investigators for the Viking 1973 mission to Mars. Included in the list are three research scientists from Ames. Dr. Harold P. Klein, Director of Life Sciences and Vance I. Oyama, Chief of the Life Detection Systems Branch, will be working in the area of active biology. Their investigation will be detection of photosynthesis, respiration, metabolism, and growth of microorganisms. Alvin Seiff, Chief of the Vehicle Environment Division, is on the team working on entry science. His group will investigate the determination of atmospheric composition and structure.

TWO SPACECRAFT

Viking will consist of two instrumented spacecraft which will be placed in orbit around Mars with each spacecraft detaching a landing capsule for descent to the surface and soft landing. Mission objectives include the detection of life on the planet if it exists.

Viking is a follow-on to the 1964-5, 1969 and the 1971 Mariner flights to Mars. The first two Mars missions, in 1965 and 1969, flybys of the planet, sent back pictures and information on the Martian atmosphere. The two 1971 Mariner spacecraft will be placed in orbit around the planet to transmit photos of the entire surface and help locate the best landing spots for Viking.

Langley Research Center is charged with overall project management for Viking and responsibility for the lander portion of the spacecraft. Jet Propulsion Laboratory in Pasadena will manage the orbiter portion of the project and is responsible for tracking and data acquisition.

NASA's Office of Space Science and Applications' Planetary Programs office is in overall charge of the Viking Program.

NASA to Close Electronics Center

NASA announced on December 29 the closing of the Electronics Research Center at Cambridge, Mass.

The decision to suspend operations at the center was made during the space agency's fiscal 1971 budgetary process and in planning the future course of the nation's space program over the next decade.

Administrator Thomas O. Paine told employees at the Center, "We have thoroughly studied within NASA and in working with the President's Space Task Group the new U.S. program for the seventies. We find that we must effect reductions and consolidations across the board if we are to reshape our programs to meet the nations future needs in aeronautics and space.

"As you know, we have already taken steps to reduce our manned space flight program since the successful Apollo Lunar Landing. As we reduce the total program and alter its direction, we must reduce the institutional base of support. We are simply faced with the hard fact that NASA cannot afford to continue to invest broadly in electronics research as we have in the past."

The phasing down of work in the Electronics Research Center will begin at once. Dr. Paine pointed out that final plans are in preparation for placement of the personnel and disposition of real property in Cambridge.

The Electronics Research Center opened on September 1, 1964 and has 850 employees engaged in advanced research in electronics in aeronautics and space. The Center is headed by James C. Elms. About 100 people are presently located in permanent new facilities which have been under construction for the past few years. The remaining personnel are located in temporary rented quarters in the area.

The Center was to have been ultimately located on a 29-acre site in Cambridge. Six buildings representing an investment of some $30 million are in final phases of construction.

THREE TIME WINNER . . . Awards for three inventions were presented to John Dimeff (right), Chief of the Instrumentation Division, by the Director, Dr. Hans Mark, during a recent ceremony. Approved by the NASA Inventions and Contributions Board the total of the three awards was $400. The invention titles were: "Charged Particle Analyzer", "Thermal Detector of Electromagnetic Energy", and "Inertial Reference Apparatus".

Ames Pressure Suit Saves Life of Local Resident

A young woman in Sunnyvale is alive and active this holiday season-all because she spent 10 hours in a pressure suit made for test pilots.

The life of Mrs. Mary Phillips, 25, was saved by the efforts of a team of doctors and researchers from the Stanford University Hospital and NASA's Ames Research Center.

AMES RESEARCHERS

Ames researchers Dr. Alan Chambers and Hubert Vykukal of the Environmental Control Research Branch, and Richard Gallant, Flight Operations Branch, reacted quickly when the hospital's chief resident surgeon explained the critical condition of Mrs. Phillips whose internal bleeding could not be halted by established procedures.

The pressure suit, or G-suit did the trick.

Doctors reported last Friday (Dec. 26) that the pressure suit procedure, used with Mrs. Phillips, Sept. 23, appears to have been a complete success. Examination shows no further bleeding, and the patient has resumed her normal activity.

Prior to application of the suit, Mrs. Phillips had undergone nine operative procedures. All had failed to stop the difficult abdominal hemorrhaging. She had received 46 pints of whole blood and 64 units of plasma in a five-week period.

G-SUIT

A G-suit is worn by pilots to avoid blacking out during high-speed maneuvers. It applies pressure to counter the draining of blood from the brain and upper body. Such a suit was provided by researchers from the Biotechnology Division of Ames. The NASA Center is now studying further medical applications of pressure suits.

STANFORD HOSPITAL

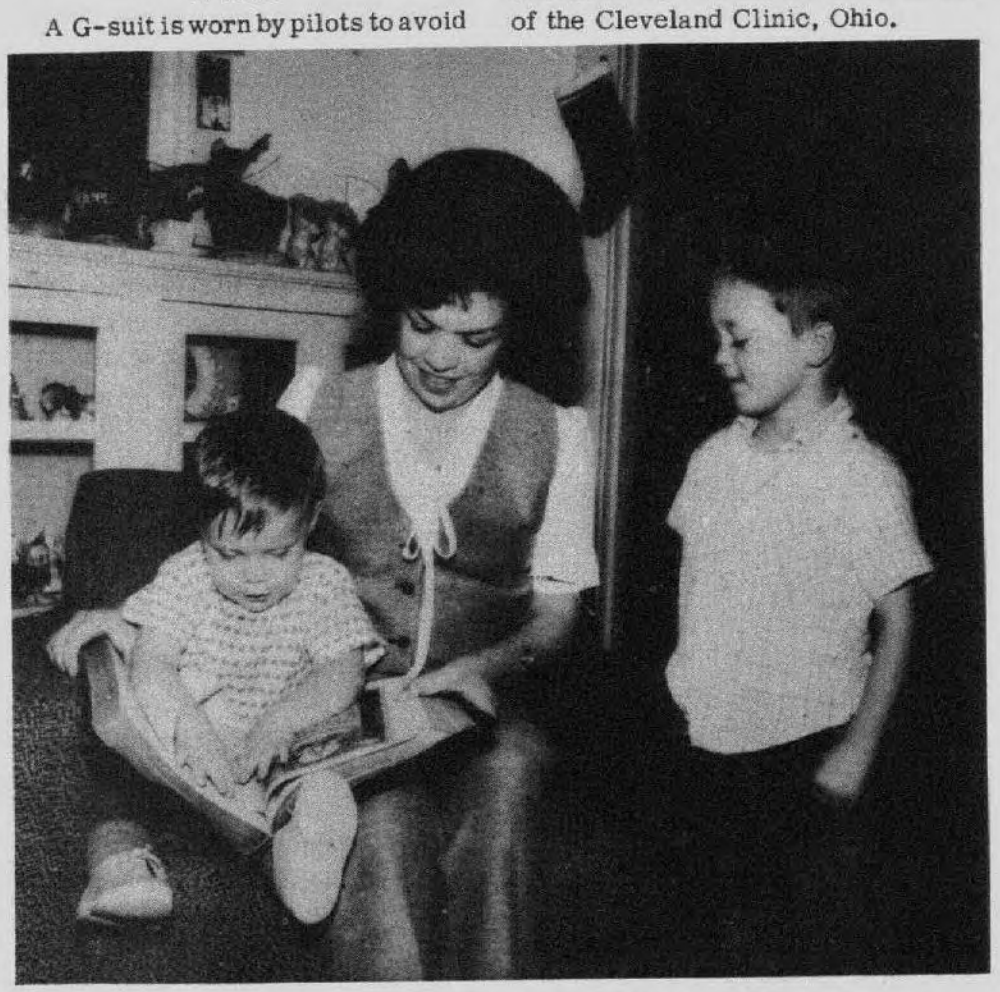
Fitted to Mrs. Phillips at the Stanford University Hospital, the G-suit arrested abdominal bleeding overnight, during the ten hours in which it was applied.

The patient had entered another hospital to undergo a minor operation. Surgical exploration to determine the cause of bleeding following this initial surgery showed an apparent slow oozing of blood within the pelvic area, but with no evidence of active arterial bleeding.

SUBSEQUENT ATTEMPTS

Subsequent attempts to control this diffuse bleeding included pelvic packing, hypogastric artery ligation (tying off arteries supplying blood to the area of bleeding), and other surgery.

Following these measures, the patient was transferred to Stanford Hospital where Dr. Robert Mason recalled a reference in the surgical literature to blood-flow stoppage by a pressure garment. This idea grew out of early brain surgery work and research by Dr. W. James Gardner of the Cleveland Clinic, Ohio.



HER LIFE WAS SAVED. . . Mrs. Mary Phillips, 25, shown here with her sons Charles (in lap) and Jerry (standing) is alive and active in Sunnyvale because she spent 10 hours in a pressure suit made for test pilots. The efforts of a team of doctors and researchers from the Stanford University Hospital and Ames Research Center saved her life.

PRESSURE SUIT... Photo shows Ames pilot Ronald Gerdes with type of over-the-hip G-suit that was used to save the life of Mrs. Mary Phillips.

CHIEF OF SURGEONS

Dr. H. Ward Trueblood. Chief Resident in Surgery at the hospital then telephoned Ames. He outlined the seriousness of the patient's growing hematoma (blood clot) and the failure of all known methods to stop the bleeding.

The Ames group studied the problem and decided a G-suit could provide the kind of pressure required. Within three and a half hours, they had modified the suit and delivered it to the hospital where it was put on Mrs. Phillips immediately.

The Ames team had provided the suit with new hoses, couplers, and two pressure regulators to allow for a range of pressures, and inflation of the suit by the hospital's gas pressure cylinders.

According to Dr. Ralph Pelligra, Chief of the Medical Services Branch at Ames, the suit apparently reduced the difference in pressure between the blood within the arteries and the tissue outside them. This relatively small reduction of pressure difference apparently was sufficient to allow the blood to coagulate in the normal way.

Dr. Pelligra is studying applications of the pressure suit technique to other clinical problems.

The G-suit used is an adjustable nylon garment containing inflatable layers, located around the pelvic, abdominal, and leg areas. The suit was inflated to a pressure of 30 mm. of mercury for ten hours. This is about a quarter of normal blood pressure for most people.

Presidential Recognition

Ames has been given the opportunity to recommend both individuals and organizations for letters of commendation from the President of the United States.

The objective is to provide a basis for Presidential recognition of specific contributions made in the general improvement of life in the United States. Contributions susceptible to documentation made anywhere in the San Francisco Bay Area will be considered. The following represent some of the areas of contribution that should be considered:

a. Educational programs
b. Social welfare - assistance to minority groups, youth work, etc.
c. Culture - theatrical, music, art, etc.
d. Environmental - beautification programs
e. Public health programs
f. People oriented technological achievements

The cooperation of all Center personnel is solicited in bringing to light individual and organizational contributions within their own and surrounding communities. Personal knowledge of the candidate's contribution is desired; however, items appearing in local newspapers or from any source subject to verification are acceptable.

In order to develop a list of candidates it is requested that names of nominees be submitted to the Deputy Director, C.A. Syvertson, Code DD. Include employee's name and organization; or name of candidate organization or individual; and brief synopsis of specific contribution for which commendation is recommended.

Donald Davis Passes California Bar Exam

Donald E. Davis, R&D Contracts, has successfully passed the Fall California State Bar Examination and will be certified to practice law at ceremonies before the Court of Appeals on January 15. Mr. Davis holds a BA degree in Economics from Stanford University and a Doctor of Jurisprudence from Lincoln University. For the past eleven years he has been a Contract Negotiator with the Ames Procurement Division.

The Astrogram

Room 134
Admin. Mgt. Building
Phone 2385

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 ..... Dot Evans
Reporters ..... NASA Employees

Deadline for contributions:
Thursday between publication dates

Personnel Corner

Ames employees in clerical positions such as clerk-typist, stenographer, etc., grades GS-2 through GS-6 are reminded that the procedure used for being considered for promotion under the Merit Promotion Plan or reassignment to other Ames organizations is as follows: Employees should contact Jeanette Remington, ext. 2022, and indicate their interest in future vacancies. At that time Mrs. Remington will ask for an up-date of work experience, if necessary, and the completion of an availability and interest form.

As promotional opportunities occur, only those candidates who have registered for consideration will be rated and ranked under the provisions of the Merit Promotion Plan.

Only on rare occasions will a promotional opportunity for a clerical position be announced through the use of a vacancy announcement.

Special Discounts Offered to Personnel at Ames

Membership cards, mail order discount coupons, and other special offers are available without charge for all Ames employees, tenant organizations at the Center, and retired Ames employees. Contact The Astrogram Office, Room 134, Administration Management Building.

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DISCOUNT CARDS

DISNEYLAND: Magic Kingdom Club cards for special benefits at Disneyland.

FRONTIER VILLAGE: Frontier Wonderland Club Cards for special benefits at Frontier Village.

SANTA CRUZ BEACH and BOARDWALK: Beachcomber Club cards for a 30 percent discount.

ABC MARINE WORLD: Membership cards offering a 10 percent discount at Marine World, Redwood City.

DISCOUNTS

FURNITURE: Cards are available for the House of Karlson, San Francisco.

TIRES: Peninsula General Tire Company, Mt. View and Burlingame, Gerard Tire Service, Inc., for Dunlop, Michelin, and Seiberling, and Keith's Tire and Brake Service, Sunnyvale and Campbell, 35 to 50 percent discount.

JEWELRY: Michael's Jewelry, Moonlite Shopping Center, Santa Clara, and Princeton Plaza, San Jose.

CATALOG: Service Exchange Distributors of San Francisco, offering a variety of merchandise at discount. Catalog in "The Astrogram" office.

AMERICAN FLAG: Price, $5, order forms available.

DINNER CLUB: International Dinner Club coupon books for $5, order forms available.

TRAVEL: You save $350 or more off air fare to Europe and also save on trips cruises and tours to other parts of the world. Join the Universal Social Club for only $10. Offer good through January 15. Coupons available in The Astrogram office.

Fun at the Christmas Party

NEW ITEMS:

NASA-Ames Day at the San Francisco Sports and Boat Show is Thursday, Jan. 15. Reduced rate tickets valued at $1 are now available. There are also a few reduced rate tickets for Tuesday, Jan. 13. The special ticket is to be presented at the Cow Palace Box Office. Show hours are 2 p.m. to 11 p.m. on weekdays.

* * * * * * * * *

DISNEYLAND: The 1970 Magic Kingdom Club cards for special benefits at Disneyland have arrived and are ready for distribution.

CHILDREN. . . from Belle Haven School inspect a sample of Moon rocks at Ames. Kindergarteners and first graders from Belle Haven participated in an educational tour of the exhibit and then were guests at the Ames children's Christmas Party. Science students from Ravenswood High School attended an advance briefing and served as instructors for the tour.

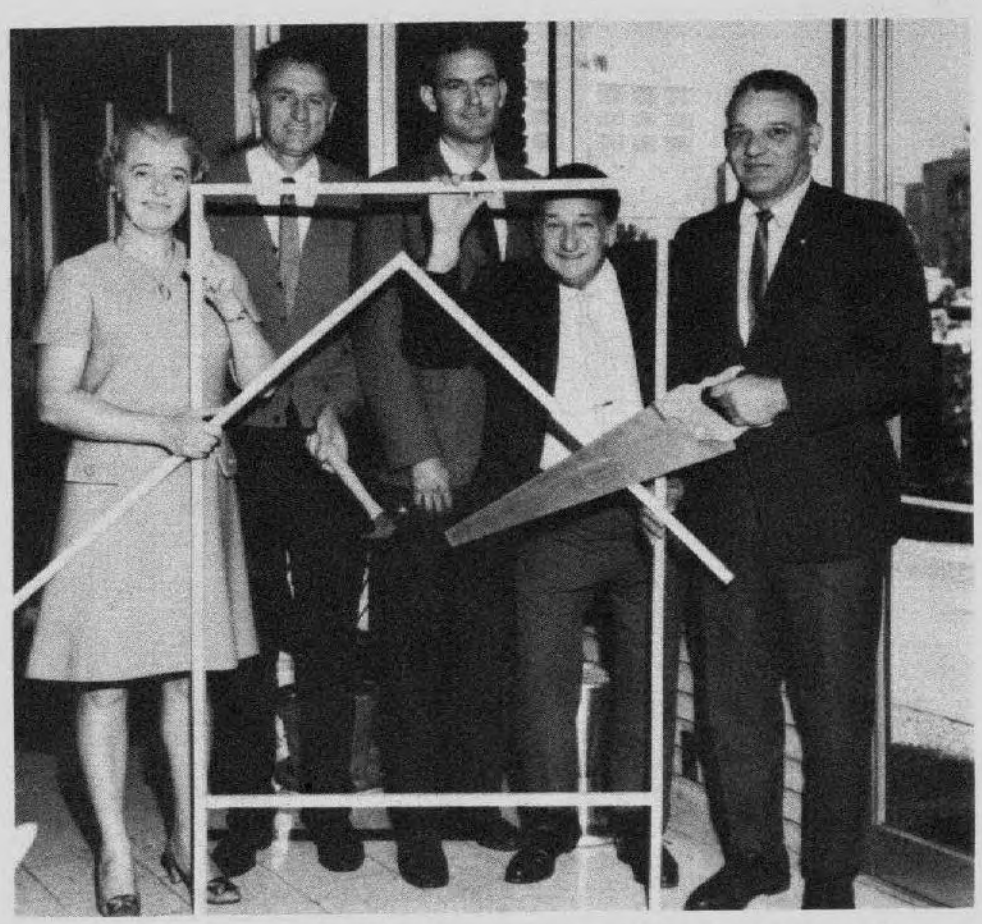
From left are Ravenswood science student Jacqueline Young, and from Belle Haven, Cassandra Barker and Luz Vargos.

THE DNA MOLECULE... prime building block of life, is explained by science student Margie Ardis, freshman at Ravenswood High School (far right), to children from Belle Haven School kindergarten during their visit to the Moon rock exhibit at Ames. Children are (from left) Angela Alexander, Deneen Johnson, and Cheryl Gill. Mrs. Laura Hicks, Belle Haven kindergarten teacher, looks on.

Ames Airings

. . . by Jane Kohler

Many division and branches had a variety of luncheons and parties in celebration of the holiday season. Some of the following have been reported. The Simulations Sciences party was held at the home of GEORGE and Ina RATHERT (Simulation Sciences). Beef burgandy and cracked crab were served in potluck style with a generous portion of good cheer. This affair was followed on the 19th by a Portugese luncheon featuring Vihadolos and beans with Chef JOE SMITH (Simulation Experiments) officiating. . .The Personnel Division had a buffet luncheon on the 19th. Records Management had a dinner at the Red Coach on Dec. 20 and a luncheon on the 23rd. Technical Information had a small party on 19th and so it went, all during the pre-Christmas season. There were many social events that were not reported but the holiday spirit was high throughout the Center. . . BARB HASTINGS (Fiscal)took some time off this Yuletide to be with her family in Philadelphia for the holidays, and and then she plans to go down to her old haunting ground at Cape Kennedy. Barb was very excited about her trip and left in a great flurry. Barb thought a great flurry would be more exciting than a regular airplane. . . BARBARA PERRYMAN (Public Affairs and former "Ames Airings" correspondent) took a week off and flew back to Minnesota to spend Christmas with her father. . . RHONDA HEINZE (Security was also home over the holidays. Rhonda went to Port Orchard, Washington, to visit her family. While there she was able to ride her horse and spend a lot of time with her family. She said it didn't snow, just rained, but going home was well worth it anyway. . . JANET KONRATH (Data Management Analysis) recently flew to Grand Island, Nebraska, where her sister met her in a four-passenger Cessna airplane. They flew to their hometown of Atkinson, Nebraska, where they visited their parents, brother Bernie, and sister and family, Dr. and Mrs. Servousek. After spending a pleasant time of visiting relatives and relaxing Jan flew to Gernsey, Wyoming, to visit her other siter, Mrs. Wallace Hulseman. There she saw quite a bit of snow and did some hill climbing in a four-wheel-drive jeep and enjoyed other "outdoorsy" activities. We know there were many other Center employees visiting and celebrating and hope that all had an enjoyable Christmas. Best wishes for a Happy New Year!



1970 AMES GOLF CLUB OFFICERS. . . already hard at work on the new trophy case to be built. From the left, Kay Bruck, Secretary; Mitch Radovich, Treasurer; Don Dust, Vice-President; Frank Prior, President, and Frank Lazzeroni, Handicap Chairman.

GOLF

. . . by Kay Bruck

The annual Ames Golf Club Award Dinner was held on Saturday evening, November 22, at the Cafeteria to present awards to the winners of the various trophy tournaments held during the year. The affair was a huge success and pictures of the trophy winners are being published in this issue and subsequent issues of the Astrogram.

The movies of the last regular tournament taken at Sunol (Cypress) Course were shown by photographer Joe March, and movies of previous years were reshown. One scene recaptured that mirthful performance of Joe Quartuccio teeing up his ball in the rough when he thought no one was looking.

Announcement was regretfully made that in 1970 we would not be attending the Morrow Bay outing usually held over George Washington's birthday. Local residents of the area who had to be interspersed with the Ames Golf Club last year voiced their objection to outsiders, so the Morrow Bay Golf Course Pro decided against renewing our annual contract. A committee has looked into the possibility of lining up another course. Announcement will be made later.

The officers of the Ames Golf Club elected for 1970 are: Frank Prior, President; Don Dust, Vice-President; Frank Lazzeroni, Handicap Chairman; Mitch Radovich, Treasurer; and Kay Bruck, Secretary.

Ames Joggers to Hold Organizational Meeting

Ames joggers (tentative name: Joggernauts) will meet Friday, Jan. 9 at 12 noon in the conference room of the Instrument Research Laboratory (Building 213). Dr. John Greenleaf of the Biomedical Research Branch will give a short talk on running and health.

If you run or might run for therapy, or competition, or just for the fun of getting out there and running, this club is for you. Open to anyone who works at Ames. For information call Jim Woodruff, ext. 2066.

Jetstream Toastmasters

Men who want to speak more effectively are invited to Jetstream Toastmasters which meets every Wednesday 11:45 a.m. - 12:45 p.m., at the Kosy Grotto in Mountain View. For information Call Guy Ferry, ext.2884.

Sequoia Toastmasters

For those who prefer an evening session, Sequoia Toastmasters meet every Monday from 6:30 to 8:30 p.m. at Foothill College. For information, call Bill Hurley, ext. 2892.

THE ROAD TO SAFETY

US MISSION SAFETY 70

WANT ADS

For Sale-'67 Triumph Spitfire MK II, Red w/new black top, 38,000 mi., black interior. $1250 or best offer. Call Karen, 961-5331, after 5.

For Sale-Chevy, original mileage, clean inside and out, automatic trans., good tires, $475. Call 296-7615.

For Sale-1965 Mustang Convertible, automatic trans., 8 cylinders, excellent condition, $1100. Call 854-3140.

For Sale-1967 Kawasaki 250, low mileage, very good condition, $300 or best offer. Call 967-5924 after 5:30 p.m.

For Sale-Hardwood writing desk, recently refinished, call 327-3867 after 5 p.m.

For Sale-Unfinished Heathkit IM-18 voltmeter, and radio shack pocket voltmeter. Call Pearson, 257-0483 after 5 p.m.

For Sale-Stereo receiver Monacor model STA-150X, excellent condition, $ 85. Call 948-5598.

For Sale-Eichler townhouse, 4 bdrm, 2 1/2 bath, sep. fam. rm., dining rm., pool, nice Santa Clara nbhd., walk to all schools, price $25,000, $5200 down, no closing cost, 51/4% FAA loan. Call 248-4690.

For Rent-Cabin in Lake Tahoe South Shore, near state line, two story, all electrical appliances, fireplace. Will rent by week or by wkend. Call E. A. Harris, 948-6200.

For Sale-Aquarium, 45 gal. display, cover and stand, clean, not wired, $75. Call 732-5569.

For Sale-Dining table and chairs, $50; built-in Frigidaire dishwasher, $50; Frigidaire range top, $30; 3 tricycles, $3 to $14. Call 252-7369.

For Sale-Bunk bed set, $45 with 1 mattress set, $75. Solid hardwood, maple finish, convertible to twin beds. Call 323-7070.

Found-MONEY, identify amount and approximate location where lost. Call Lost and Found, ext. 2337.

BOWLING

. . . by Clark White

The standings of the All-Ames Bowling League with only one week remaining in the first half are:

DIVISION I	WON	LOST
Road Runners	38	18
Keggers	34	22
Comets	30 1/2	25 1/2
4NI	30	26
Glitches	30	26
Machine Shop	28	28
The Splitters	27	29
Owls and Pussycats	25	31
DIVISION II		
Timber Topplers	34	22
Wal-Nut-O's	30 1/2	25 1/2
Sterling Engineers	30	26
MAD	25	31
Double Trouble	23	33
Woodchoppers	23	33
The Hit and Mrs.	20 1/2	35 1/2
The Killers	19 1/2	36 1/2

Bowled Dec. 17:

Men's high series: Dean Jaynes, 562; Roger Hedlund, 561; Dennis Riddle, 559; Howard Garrison, 554; and Francis Genovia, 540.

Women's high series: Jeanne Clemson, 585; Ina Rathert, 498; Winnie Malloy, 490; Judy Long, 484; and Jan Konrath, 480.

Men's high games: Howard Garrison, 223; George Rathert, 223; Joe Marvin, 220; Mike Green, 211; Dean Jaynes, 211; Dennis Riddle, 211; and Carl Roach, 210.

Women's high games: Jeanne Clemson, 223; Judy Long, 208; Ina Rathert, 198.

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Aurora Flights Uncover New Data

Airborne scientists have discovered new and significant information on daytime aurorae in flights from Norway to Greenland.

Flying in the NASA-Ames flying laboratory, "Galileo", scientists from several countries recently conducted a 25-day probe into the mysteries of the aurora. The Expedition was managed by Louis C. Haughney of the Ames Airborne Science Office.

For the first time they have discovered very high ratios of red oxygen emissions to blue nitrogen emissions in the Earth's upper atmosphere.

The higher measured ratios indicate many of the electrons from the Sun that bombard the atmosphere may have very low energy. There may be more oxygen in the polar atmosphere than at other latitudes or there may be high temperatues in the upper polar atmosphere. This could have far-reaching implications to our understanding of the Earth's atmosphere.

Airborne observations of daytime, or mid-day, aurorae are made possible by flying in northerly latitudes where the Sun is well below the horizon at noontime. Little is known about daytime aurorae as ground-based observations are difficult because of the aurora oval's (see accompanying sketch) being farther north in the daytime.

Bombardment of the Earth's atmosphere by protons was also detected. Comparison of the light emission caused by the protons and electrons will help to explain the origin of these particles.

A final explanation of the newly discovered phenomena will be the result of measurement from six photometers and three spectrometers which are sensitive light measuring devices.

Aurorae are caused by electrons and protons from the Sun, bombarding atoms and molecules in the Earth's upper atmosphere that emit light. The Earth's magnetic line of force guides the particles into the polar regions where the auroral oval is formed.

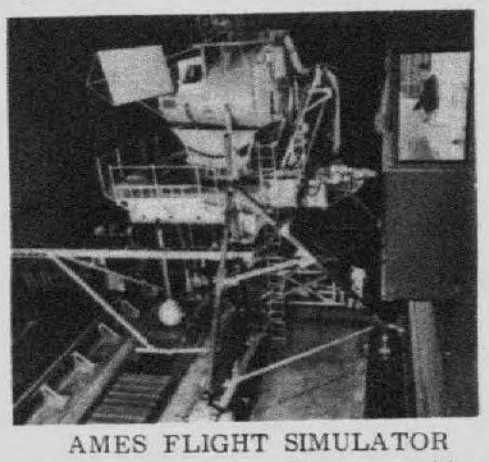
Guest scientists from Norway and Sweden joined the expedition's 25 scientists from universities, industry and government agencies

(Continued on Page 2)

1969 Significant Accomplishments at Ames

The year 1969 was an eventful one at Ames with many significant accomplishments added to the ever-growing list. A few of the highlights are reviewed here.

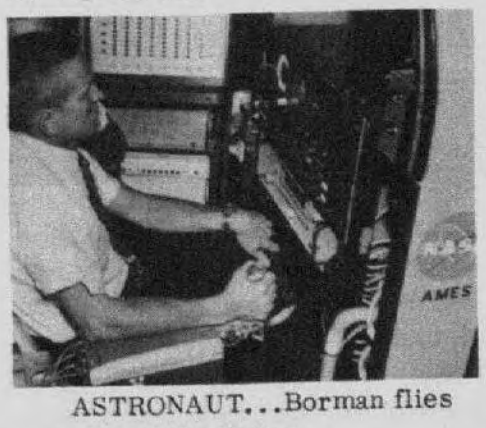
•During the year the Flight Simulator for Advanced Aircraft was brought into full operation on research problems. This simulator, designed principally for research simulation of large transport aircraft, provides a degree of fidelity of motion cues of flight to the pilot exceeding that of any other simulator operating in the world.



AMES FLIGHT SIMULATOR

•Large Lift-Fan Transport Aircraft: To contribute towards solutions of the nationwide aircraft transportation problems, a program has been established with the objective of providing a firm technological base for the design of large lift-fan V/STOL short-haul transport aircraft.

•Computer program for the analysis and optimization of simple airplane configurations at subsonic and supersonic speeds. This is the only program known which calculates wing-body interference for wings of arbitrary planform. By use of this program, a designer may asses the aerodynamic effects of modifications to a vehicle configuration and, in addition, determine the shape and loading of the wing with least drag for a given lift.



ASTRONAUT...Borman flies an Ames simulator.

•Visual Accomodation Studies: The servo operated automatic recording optometer developed by Stanford Research Institute for Ames is now instrumented and operable as a research tool. One of the first studies to be made using the device is the measurement of ocular fatigue in flight crew members from the Moffett Field Naval Air Station.

•Instrumentation Requirements for Pilot Management of Automatic Landings: Simulation studies are being carried out on potential problem areas of landing operations dealing primarily with the pilots' role during low visibility approaches.

•Cardiovascular Research Program: The principal objective of the overall program for cardiovascular research is to determine the effects of the aerospace environment on the human cardiovascular system in order to be able to predict circumstances under which failure will occur. One major goal of this approach is the qualification of man for extended space flight.

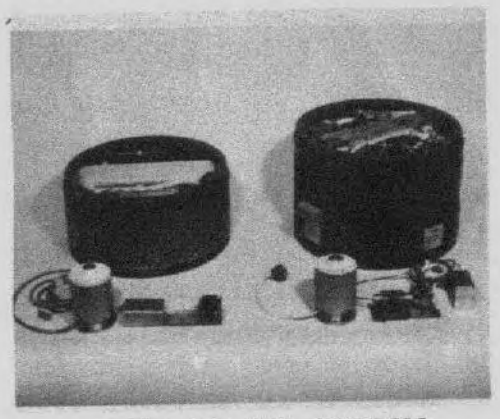
•Advanced Space Suit Life Support Technology: Technical assistance has been given to the National Academy of Engineering Committee on Mine Rescue and Survival Techniques. Dr. Alan Chambers of the Environmental Control Research Branch has been serving as a member of this Committee and has been endeavoring to apply aerospace life support technology to portable life support systems for mine rescues.

SIMULATION STUDY

•Investigation of a Digital Automatic Aircraft Landing System: An analytical and simulation study of a digital computer-controlled automatic landing system for transport aircraft has been carried out. The simulation included an investigation of the effects of gusts and wind shears near the ground.

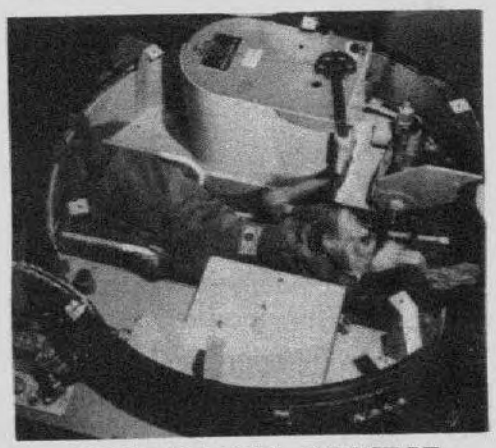
•An Improved Estimate of Position and Velocity for an Aircraft Landing Display: Ames is conducting research on a bad weather landing system which uses an airborne digital computer to process data available from distance measuring equipment and attitude angle instrumentation.

•Thermally-Induced Oscillations of Booms with Open Cross Sections: Analytical research conducted by Vernon Merrick and Bruce Tinling, Theoretical Guidance and Control Branch, has shown that the thermo-elastic instability of open-section booms is due to their low torsional rigidity and thermal bending both of which have been minimized in the newer zippered and perforated booms flown successfully on the RAE Satellite.



THE SPARCS SYSTEM

•The Ames-developed SPARCS (Solar Pointing Aerobee Rocket Control System) continued to achieve extremely precise arc-second pointing for experimenters. The unique features of SPARCS and the outstandingly successful flight record have resulted in a high demand for the system.



BIOSATELLITE PROJECT

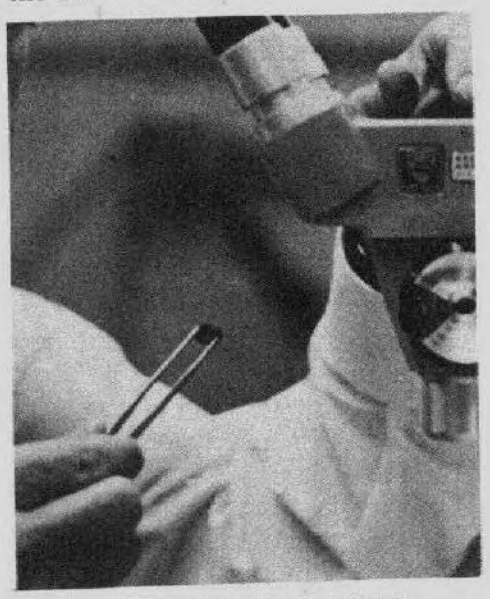
•The third biological research spacecraft, the Biosatellite III, carrying a highly instrumented 14-pound Pigtail monkey, was launched successfully from Cape Kennedy. Despite the curtailed length of the flight, experimenters have said that mission produced significant results.

•Apollo 11 successfully completed its historic lunar landing mission in July. Many research engineers and scientists at Ames have contributed to the success of the Apollo program, and their work extends from the command module design concept to the ground controlled guidance system.

(Continued on Page 2)

'69 ACCOMPLISHMENTS
(Continued from Page 1)

• A research-oriented program for twenty-five gifted high school student scientists from the local area was conducted at Ames during the 1968-69 academic year. As a result of this successful program five students were chosen to continue their research at the Center during the summer months.



THE LUNAR SAMPLE

• With the arrival at the Center of the lunar samples collected by Astronauts Armstrong and Aldrin during the Apollo 11 lunar landing mission Ames scientists began their intensive scientific investigations. Dr. William Quaide, a geologist in the Planetology Branch, has two experiments. He is measuring the quantities of radioactive nuclides produced by the cosmic ray bombardment of the lunar surface; and is studying the rocks to determine changes brought about by impact. Dr. Cyril Ponnamperuma, Chief of the Chemical Evolution Branch, is heading a consortuim of scientists who are looking for the building blocks of life in the lunar samples. And Vance I. Oyama, Chief of the Life Detection Branch, is principal investigator for biological studies of the lunar material. He and his team, working in ultra-clean facilities at the Center, are analyzing the lunar sample and have cultured it for living organisms.

• The 1969 NASA Aurora Expedition managed by the Airborne Sciences Office conducted an airborne assault on the secrets of the Aurora Borealis, or Northern Lights, flying in the NASA-Ames Convair 990 jet aircraft. Scientists have acquired many hours of successful data and thousands of scientific photographs, and made several coordinations with satellites.

• Three research scientists from Ames have been selected as investigators for the Viking 1973 mission to Mars. Dr. Harold Klein, Director of Life Sciences, and Vance Oyama, Chief of the Life Detection Systems Branch, will work in the area of active biology; and Alvin Seiff, Chief of the Vehicle Environment Division, is on the team working on entry science.

THE MAGNETOMETER

• The Ames-Apollo Magnetometer prepared by Principal Investigator, Dr. Charles Sonett, Chief of the Space Sciences Division, and co-investigator, Dr. Palmer Dyal, left on the Moon by the Apollo 12 astronauts, radioed back to Earth the first magnetic field information ever obtained from the surface of another celestrial body. The Ames magnetometer was one of five geophysical instruments deployed on the lunar surface by Apollo 12 astronauts.

AURORA (Continued from Page 1)
from the United States, Canada and France.

Other flights by the "Galileo" in the 1969 NASA Aurora Expedition were made from Ft. Churchill, Manitoba, Canada and Fairbanks, Alaska.

Goodwin and Vorreiter Receive NimbusIII Award

Glen Goodwin, Director of Astronautics and John Vorreiter, aerospace engineer for the Magnetoplasmadynamics Branch, as members of the 16-man SNAP-19 (Systems for Nuclear Auxiliary Power) Team have been presented a Group Achievement Award for their work on the Nimbus III weather observatory.

The award was presented to "the Project Team, the SNAP-19 Team and the IRLS Experiment Team for the outstanding success of the Nimbus III mission, the first meteorological observatory to achieve global soundings of the atmosphere, thereby making possible more precise long-range weather forecasts." The certificate was signed by Dr. Thomas Paine, NASA Administrator.

HOME AGAIN. . . Lou Haughney, Aurora Expedition Manager greets members of his family, Peter, 2, and Laura, 1. See story on Page 1.

AURORA BOREALIS . . . as seen from the cockpit of the NASA-Ames 990 aircraft, "Galileo", during the recent airborne assault on the secrets of this phenomena. Flying from the base of operations at Fort Churchill on Hudson Bay in Canada, NASA's 1969 Aurora Expedition was making three to four flights a week across and parallel to the doughnut-shape auroral oval in the northern polar regions of the world. (Photograph by Joe March, Ames Photographer).

Have You Checked Your Badge Lately?

The current NASA badge identification cards carry an expiration date of December 31, 1969. However, NASA Headquarters has extended their validity to December 31, 1972. The present badge eventually will be replaced by a series "B" card which differs only from the current badge in that it has a black star in each lower corner, the number is prefixed with the letter "B" and does not carry an expiration date.

Series "B" badges are now being issued to new employees, for replacement of old badges on change of security clearance level, and when old badges have become excessively worn, damaged or photo faded beyond recognition.

Because a substantial number of December 31, 1969 expiration badges are in need of replacement due to the deterioration of the plastic or photograph, replacement of all old series badges is tentatively planned for next May. Unless a badge has reached the point where replacement now is absolutely essential, employees are asked to hold off until May rather than flood the badge office with replacement requests.

CHECK YOUR DECAL!

Ames employees with vehicles registered with a NAS Moffett Field identification sticker are reminded that it is their responsibility to ensure that the decal does not expire. Since the date tab is issued for a three year period, decal holders are asked to keep track of the expiration date and renew the tab at the Ames Security Office, Room 119, Administration Management Building, 241.

Jetstream Toastmasters

Men who want to speak more effectively are invited to Jetstream Toastmasters which meets every Wednesday 11:45 a.m. - 12:45 p.m., at the Kosy Grotto in Mountain View. For information Call Guy Ferry, ext.2884.

Sequoia Toastmasters

For those who prefer an evening session, Sequoia Toastmasters meet every Monday from 6:30 to 8:30 p.m. at Foothill College. For information, call Bill Hurley, ext. 2892.

The Astrogram

Room 134
Admin. Mgt. Building
Phone 2385

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 . . . . . Dot Evans
Reporters . . . . . NASA Employees

Deadline for contributions:
Thursday between publication dates

Personnel Corner

Ames is cooperating with the Santa Clara County Registrar of Voters in his efforts to simplify the reregistration of Santa Clara voters.

Formerly, when registered voters moved within Santa Clara County, they had to reregister at some central location to maintain their voting eligibility. However, an amendment to the law now permits reregistration using a more convenient special post card form.

The Records and Reports Section of the Personnel Division at Ames will stock and distribute these addressed and postage-free cards -- which must be postmarked not less than 45 days before the election in which the employee wishes to vote.

Please call ext. 2411 and request a card for each Santa Clara County registered voter in your household when address is changed.

U. S. Savings Bonds Pay 5 Percent Interest

The interest rate on Series E. U. S. Savings Bonds has been increased from 4.25 percent to 5 percent in accordance with Public Law 91-130, approved December 1, 1969. The new 5 percent interest rate applies both to E Bonds issued on and after June 1, 1969, and to all outstanding E Bonds previously issued, beginning with the first semi-annual interest period commencing on or after June 1, 1969, for the remaining period to maturity or extended maturity. For E Bonds issued on or after June 1, 1969, the maturity period is now 5 years and 10 months instead of the previous 7 years.

The U. S. Treasury Department will not allow the acceptance of any new authorizations for Freedom Share Notes previously issued in combination with E Bonds. The Freedom Shares paid 5 percent.

Employees currently purchasing the combination Freedom Share Notes and E Bonds must now terminate the combination plan and substitute payroll deductions for E Bonds only. Forms to accomplish the change may be obtained from the Ames Payroll office.

All Freedom Share Notes heretofore or hereafter issued, which remain outstanding, will continue to earn interest at their orginal rates to the point of initial maturity which is four and one-half years from the issue date.

Take stock in America
Buy U.S. Savings Bonds & Freedom Shares

Is Your Address Correctly Listed?

In case of illness or injury it is often necessary for Ames medical or other staff members to reach someone at an employee's home so that they may be notified of the problem. Also in certain emergencies a member of the Safety Office, security guards, or swing-shift personnel may wish to notify an employee of some problem and obtain advice.

It was discovered recently when trying to reach a number of employees that the telephone numbers were incorrectly listed.

Any change in telephone number or address should be reported. Please obtain an ARC Form 208 and submit the corrected information to the Records and Reports Section, 241-5.

Witholding Tax Reduced

The Tax Reform Act of 1969, Public Law 91-172, has been signed by President Nixon. One of the provisions of the new law reduces the income tax surcharge from 10 percent to 5 percent. Consequently, income tax withheld from wages will be reduced effective with the pay period ending January 10, 1970. The reduced withholding will be reflected in the pay checks scheduled to be mailed by the U. S. Treasury on January 16.

SECOND NOTICE

Annual Ames Ski Trip Scheduled for Feb. 20-23

A three day ski trip to Squaw Valley for the Washington's Birthday Holiday is set for Ames families and friends.

The legal holiday is Sunday, February 22, but will be celebrated on Monday, Febraury 23. Two buses have been chartered and departure is scheduled for 6 p.m., Friday the 20th from the parking lot of the Data Reduction Building, N-233, and return about 9 p.m., Monday the 23rd.

PRICE AND RESERVATIONS

The price is $42.50 each person at three-to-a-room and $45.50 each at two-to-a-room. (Deduct $10 from price for children under 12 if sharing room with parents.) Deposits of $10 per person are required to secure reservations. Deposits are refundable when cancellation occurs before Wed. January 21. Deposits are subject to forfeiture if cancellation occurs after January 21, 1970. Full payment due date is February 4.

Checks should be made payable to NASA Ames Exchange Council and sent to Ralph Maines, 241-2.

AN AWARD . . . of $150 was presented recently to Mike Kodani (right), Army Aeronautical Research Laboratory for his suggestion to standardize the data digital board for wind tunnel data analysis. With his suggestion a standard format was adopted whereby engineers can make small variations on the digital board without having to rewire the board completely for each new wind tunnel test. Savings of approximately three days of engineering and programming time per project resulted from this idea. Mr. Kodani is shown being congratulated by AARL's Director, Paul Yaggy.

Special Discounts Offered to Personnel at Ames

Membership cards, mail order discount coupons, and other special offers are available without charge for all Ames employees, tenant organizations at the Center, and retired Ames employees. Contact The Astrogram Office, Room 134, Administration Management Building.

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DISCOUNT CARDS

DISNEYLAND: Magic Kingdom Club cards for special benefits at Disneyland.

FRONTIER VILLAGE: Frontier Wonderland Club Cards for special benefits at Frontier Village.

SANTA CRUZ BEACH and BOARDWALK: Beachcomber Club cards for a 30 percent discount.

ABC MARINE WORLD: Membership cards offering a 10 percent discount at Marine World, Redwood City.

DISCOUNTS

FURNITURE: Cards are available for the House of Karlson, San Francisco.

TIRES: Peninsula General Tire Company, Mt. View and Burlingame, Gerard Tire Service, Inc., for Dunlop, Michelin, and Seiberling, and Keith's Tire and Brake Service, Sunnyvale and Campbell, 35 to 50 percent discount.

JEWELRY: Michael's Jewelry, Moonlite Shopping Center, Santa Clara, and Princeton Plaza, San Jose.

CATALOG: Service Exchange Distributors of San Francisco, offering a variety of merchandise at discount. Catalog in "The Astrogram" office.

AMERICAN FLAG: Price, $5, order forms available.

DINNER CLUB: International Dinner Club coupon books for $5, order forms available.

NEW ITEMS:

NASA-Ames Day at the San Francisco Sports and Boat Show is Thursday, Jan. 15. Reduced rate tickets valued at $1 are now available.

* * * * * * * * *

DISNEYLAND: The 1970 Magic Kingdom Club cards for special benefits at Disneyland have arrived and are ready for distribution.

NEW ITEM:

The San Jose Symphony Orchestra is offering a 50¢ discount on $3.50 seats for their performance Friday, Jan. 23, 8:30 p.m. at the San Jose Civic Auditorium. For tickets and more information contact The Astrogram Office, x2385, m.s. 241-4.

John Gooch To Be Exchange Student

Johnny Lee Gooch, 17, son of Mr. and Mrs. James Gooch (Mechanical Services), a student at Sunnyvale High School, was chosen recently by Youth for Understanding Foreign Exchange to receive a $400 scholarship which will send him to Sweden for two months this summer. The award was based on scholastic ability and personal interviews.

John will be living with a family in Sweden that has a boy about his age. The following quotes are from a letter written by John:

"It will give me the experience of living in a foreign country. I will be learning to adapt to a new environment based on new standards of living, economics and social understanding. I will display my best qualities at all times as I am an ambassador for the U. S. My biggest hope is to make friends and let them know that the U.S. is a great place to live.

Ames Airings

. . . by Jane Kohler

TUT GERDES (Employment), his wife, Millie, and their daughter, Elizabeth Ann recently flew to Hawaii for 11 days where they stayed at Maui El Dorado Condominium Apartments overlooking the ninth fairway of the Royal Kaanapali Golf Course where Tut and his wife spent most of their time relaxing in sand traps or diving for golf balls. Tut says that anyone who is interested in golf should play this course at some time in their life. While her parents were on the golf course, Ann spent her time snorkling and surfing. The entire vacation was wonderful for all concerned. . . DARLYNE MOEN (Theoretical Studies) flew to Vancouver, British Columbia, where she toured the city for a day and then went by train to Winnipeg, Manitoba, which took her through the snow covered Canadian Rockies and along the Columbia River. Darlyne said the ride was beautiful. From Winnipeg, Darlyne took another train to her home town of Reynolds, North Dakota, where she spent two weeks over the Christmas season with her family. While there she spent a lot of time driving snow mobiles, or "Ski-doos" through the countryside. Dar said that at first she thought it looked too dangerous but soon she was caught up in the fun. . . The Rattlers, a 35-man football team with members ranging from 10 to 12 years of age, are the undefeated champions of the Bay Area Police Atheletic League for the '69' season after 11 straight games reports DON CIFFONE (Wind Tunnel Installation), one of the teams eight coaches. The team, who was sponsored by the Norhtwest Youth Athletic League was treated to a day in Disneyland for their splendid effort. Pacific Southwest Airlines gave them free roundtrip airfare so Don and the seven other coaches got up early on December 15 to escort the 35 boys on their trip. Congratulations to the Rattlers. . .Rolf and DIANE HANSEN (former secretary for Simulation Experiments) are happy to announce the birth of their first child, Steven Paul, born on December 28 at 2:25 a.m., just in time to be a tax deduction. He weighed in at 6 pounds, 8 ounces. Congratulations to the proud parents.

GOLF

. . . by Kay Bruck

The 1970 schedule has been completed and is printed on the back of membership cards. Ames personnel interested in joining the golf club are requested to do so by paying $2 for new members and $4 yearly payable to Mitch Radovich, Treasurer, ext. 2904, m.s. 220-1.

The 6th Annual George Washington Weekend Outing will take place in the Monterey Area and flyers will be sent out concering this event. Watch for them.

BOWLING

. . . by Clark White

Final standings of the All-Ames Bowling League for the first half of the season are:

DIVISION I	WON	LOST
Road Runners	40	20
Keggers	36	24
Comets	33 1/2	26 1/2
4NI	33 1/2	26 1/2
Glitches	32	28
Splitters	30	30
Machine Shop	28 1/2	31 1/2
Owls & Pussycats	25	35
DIVISION II		
Timber Topplers	36	24
Sterling Engineers	34	26
Wal-Nut-O's	32 1/2	27 1/2
MAD	26	34
Double Trouble	25	35
Woodchoppers	25	35
The Hit and Mrs.	21 1/2	38 1/2
Killers	21 1/2	38 1/2

Congratulations to the first half winners, The Road Runners in Division I and the Timber Topplers in Division II.

BASKETBALL

. . . by Phil Wilcox

The All-Ames Basketball League has finished the first half of the season. The results of the last games were:

ARO	35	Beer Barrels	29
Pumas	46	Jets	35
BCA	49	Madmen	34

The standings at the end of the first half are:

TEAM	WON	LOST
Jets	4	1
BCA	4	1
Madmen	3	2
Fighting Pumas	3	2
ARO	1	4
Beer Barrels	0	5

WANT ADS

For Sale-1966 Pontiac Tempest convertible, red with white top, radio, heater, automatic transmission, power brakes & steering, 42000 mi., original owner. Call 257-7681.

For Sale-1962 Buick Special Station wagon V8, automatic transmission, power steering, radio, heater, 48000 mi. Call 257-7681.

For Sale-Hoover upright vacuum cleaner, Singer sewing machine, Sunbeam electric frypan, new steam iron, bed frame, mattress, freezer, desk, table and 2 chairs. Call 257-7681.

For Sale-1931 Hupmobile, $2,500; 1933 Buick 4 dr. conv., $1,350; 1935 Dodge conv. coupe, $450; 1934 Plym 4 dr. sedan, $750; 1937 Buick 4 dr. sedan, $300. All cars need restoration. Call Jack Osorno, 5 p.m. and 6 p.m., 962 1915.

For Sale-1967 Suzuki 250 X6 Scrambler, $425. Call Don Lefforge, 296-4019.

For Sale-1951 Chev. 2 dr. hardtop, good condition, dependable. $150. Call George Mateer. 266-2256.

For Sale-'67 Triumph Spitfire MK II, Red w/new black top, 38,000 mi., black interior. $1350 or best offer. Call Karen, 961-5331, after 5.

For Sale-'69 Ply. Valiant, 2 dr., stick shift, excellent condition, very real bargain at $1250. Call Helen Kelton, 592-2388.

For Sale-Boat, 10 ft. Melody, glass over wood, completely equipped, new Sears tilt trailer, $395. Call Videll, 243-7408.

For Sale-Kencraft trailer, 1968 model, 26 ft. self-contained, air conditioner, large refrigerator, many other extras, excellent condition, very clean, original owner, $3545. Call J. Anderson, 379-6616.

For Sale-Eichler townhouse, 4 bdrm, 2 1/2 bath, sep. fam. rm., dining rm., pool, nice Santa Clara schools, walk to all schools, price $35,500, $6200 down, no closing costs, 6¼% FAA loan. Call 246-4690

For Sale-Pups, all male, half poodle, $5 each. Ready to go to homes after January 16. Call 736-2621.

For Sale-Television, Sylvania, color, 19 in. portable, late model, rectangular tube with stand. Cost $450, take $225. Call Don Goodsell, 968-1200.

For Sale-Spinet Piano, $295. Call Herb Pankratz, 243-2813.

For Sale-Mandolin, new condition, $25. Call Frank Thompson, 379-9426.

For Sale-Waring blender, 2 speed, fine condition, $7.50. Call 948-3602.

For Sale-Window, 27" x 61", adjustable with louvered window frame, 17 glass louvers included and window screen, $5. Call 739-8973 anytime.

For Sale-Mattress and box spring set, twin size, firm, $30. Call 323-7079.

For Sale-2 dressers, $10 ea.; 1 24x12 rug and pad, $50; 1 GE electric stove, $45. Call 325-1747.

For Rent-Ski cabin, West Tahoe. Chamberlands, 3 br. 2 ba., sleeps 8, washer-dryer, frplc., $60/weend, $150 per week. Call 258-1882.

For Rent-3 bdrm., furnished cabin, fireplace, sleeps 6, 2 miles south of Tahoe City, 5 miles to Squaw. $90 per week or $40 per weekend. Call 328-4642.

Lost-Borrowed from Joanna Phifer's office, rm. 124, bldg. 233 on Jan. 2, the library book, "Automatic Data Processing System, 360 edition by F.T. Brooks, no. QA 76 B74. Please return to L. Coelias, ext. 3051 mail stop 210-5.

Wanted-Female, 20-26 to share apt. Have some furniture, willing to move. Call Carolyn after 5 p.m. at 241-7280.

Wanted-Anyone interested in forming a car pool from Newark for 8-4:30 shift. Call Alice Tice at 2325 or 793-0722 after 5 p.m.

Wanted-Basketball coach for exciting team with veteran ballplayers, 79 years of experience, free post-game cigars and beer for every win. Infamous Beer-Barrel team, ext. 3531, perfect record (0-5) not an error.

For Sale-Pilot monoral amplifier, $20; FM tuner, $10; intercom system, $30. Call 323-2080.

For Sale-Girl's painted desk, $20. Call 323-2080.

Wanted-Joggers to meet with Joggersaute Friday, Jan. 23, at 12 noon in the Conference Room of the Instrumentation Building.

Wanted-Skiers. See story on Page 1.

1969 AMES GOLF CLUB CHAMPIONS . . . proudly display their awards. Owen Koontz (right) was Club Champion for the fifth year, with Roger Hedlund (center) as runner-up. John Rakich (left) was runner-up to Consolation Winner, Dick Peterson (not pictured).

the astrogram

VOLUME XII
NUMBER 7
January 29, 1970

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

Ames Hosts Conference on Holography

The Ames Instrumentation Division was host organization for a Conference on Holographic Instrumentation Applications held January 13 and 14.

The purpose of the conference was to bring together NASA and NASA-contracted researchers in holographic instrumentation to review in-house and contract work in this field, and to provide an opportunity to discuss current trends and future possibilities.

Dr. Boris Ragent, Chief of the Measurement Sciences Branch, was chairman and Richard M. Brown of the same branch was coordinator of the highly successful, two-day meeting.

A total of 54 attendees, including 41 NASA researchers and 10 contract researchers, listened to 24 presentations.

Papers presented included reviews of in-house NASA activities in holographic applications at Ames, Goddard, Jet Propulsion Laboratory, Marshall, Wallops and Langley, and reviews of contracted work at TRW Systems, Inc., Radiation, Inc., G. C. Optronics, Inc. and the University of Arkansas.

The Instrumentation Division was very fortunate in having Professor Emmett N. Leith, of the University of Michigan, come and give a keynote address, "The Outlook for Holography". Professor Leith is considered one of the inventors of modern holography and he has made some outstanding contributions in this field. There were also several specialized papers concerned with holographic applications to such fields as flow visualization, vibration and deformation measurements, non-destructive testing, and sizing of high speed particles.

The Conference concluded with a panel discussion among NASA personnel who are actively engaged in research and development in the fields of holographic instrumentation, or who are monitoring contracts involving this field. The discussion, led by Dr. W. A. Menzel of NASA Headquarters, was concerned with recommendations for consolidation and non-duplication of work in holography among NASA Centers, evaluation of contract research, and suggestions for future activity.

Proceedings of the Conference will be published for distribution.

Ames Apollo 11 Experimenters Explain Formation of Lunar Soil

One hundred and forty-two U.S. and foreign scientists met early in January to present results of their detailed analysis of Apollo 11 Moon samples at the Lunar Science Conference in Houston.

Ames Apollo 11 experimenters participated in the Conference and a summary of their findings will be reported in two parts beginning with this issue of "The Astrogram".

PART I

Lunar soil at the landing site of Apollo 11 appears to have been formed by the grinding up of the bedrock lavas during 3.65 billion years of meteorite bombardment.

Ames scientists found no life in the Apollo 11 samples, but still feel dormant life and building blocks of life could exist on the moon.

Mineralogical studies show that the Moon has been very dry, probably for billions of years. The lunar rocks have differentiated into components ranging from native iron to high-silicon-content minerals. Less oxygen was present during formation of the volcanic rocks at the Sea of Tranquility site than during the formation of most Earth rocks.

These were the main conclusions of Ames scientists as a result of their five Apollo 11 moon rock experiments. The scientists also discovered two new extraterrestrial minerals.

By experimenter, the Ames results were as follows:

Lunar Soil Formed by Meteorite Impact-Dr. William Quaide, Ames Geologist.

Virtually all geologic activity following the lava flows, believed to have formed the Sea of Tranquility 3.65 billion years ago, can be explained by meteorite impact.

The soil shows the complete range of shock damage that would be expected from numerous meteorite hits over a very long time. These hits appear eventually to have ground up a fresh surface of volcanic rock into the present lunar soil.

"Now we have to find out what produced the lava flows that apparently formed the Mare," says Dr. Quaide.

The mineral grains in the lunar soil turned out to be identical to those in the basaltic bedrock lavas beneath the soil layer. Composition of these bedrock lavas has been found from study of the large volcanic rocks returned by the astronauts. These rocks are similar to one another and have probably not moved very far from their site of formation.

The smallest grains in the sample are mostly glass, the largest mainly rock fragments. Most of the glass appears to have been produced by meteorite impact melting. Chemical analysis of the glass shows it has the wide range of compositions typical of impact-formed glass.

Much of the material appears to have been repeatedly shocked. The smallest particles showed the greatest impact damage, and this is consistent with laboratory impact studies.

Half of the crystalline grains of less than 125 microns size have shock features from pressures greater than 670,000 pounds per square inch (psi), and a quarter of these grains show pressures of over 1,320,000 psi. These forces caused internal fragmentation, complete disruption of crystal structures and melting.

Measurements of the isotope Aluminum 26 suggest that time for the lunar soil to be mixed by meteorite impact to a depth of one meter is in the tens of millions of years. Aluminum 26 is produced by the bombardment of the lunar surface by cosmic ray particles.

Life on Moon Still Possible-Vance Oyama, Chief, Life Detection Systems Branch.

Preliminary results indicate no life in the sample of Apollo 11 lunar surface material.

However, life may yet be found on the Moon, says Mr. Oyama, the only scientist chosen to look for it.

His group so far has cultured seven of the 40 grams of lunar dust provided them. They have sought to grow organisms in 3000 petri dishes in 100 different environments. They plan a similar search for life in the Apollo 12 moon material.

Mr. Oyama is anxious to examine samples taken from well below the lunar surface, where they would have been protected from solar radiation and continuous meteoroid impacts.

If life is on the Moon, he believes it arrived there aboard a meteorite or other wandering cosmic object.

"It is unlikely that life originated on the Moon," he says.

The Moon has too little mass to hold an atmosphere and too little water, or even water-bearing minerals, to produce the chemical evolution of life believed to have occurred on Earth.

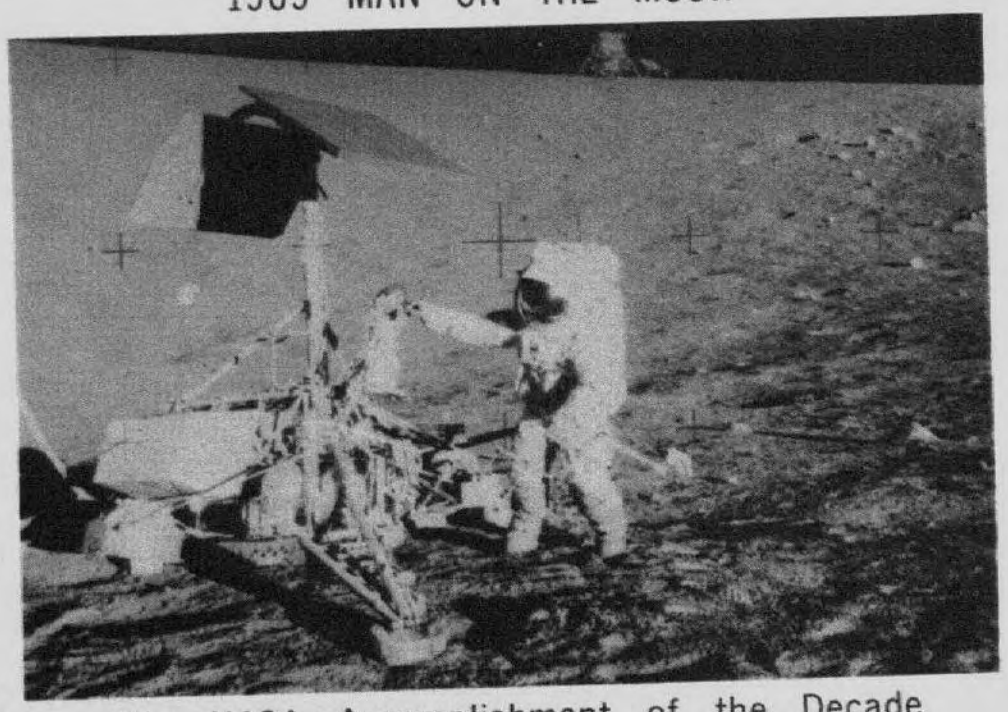
However, the Moon has undergone 4.5 billion years of cosmic bombardment. A portion of these meteorites have been carbonaceous chondrites, which also fall on Earth and contain much organic matter.

These cosmic travelers may have buried themselves in the Moon, below the reach of solar radiation. They could contain dormant life forms, says Mr. Oyama.

He speculates that the lunar dust may actually be hostile to life since no organisms appeared, not even expected Earth contaminants. (The astronauts' life support systems, for example, spray out some 30,000 Earth organisms a minute.)

(PART II continued next issue)

1969—MAN ON THE MOON



The NASA Accomplishment of the Decade

Ames Scientists Attend AIAA Aerospace Meeting

A number of scientists from Ames discussed their research work at the Eighth Aerospace Sciences Meeting of the American Institute of Aeronautics and Astronautics (AIAA) held last week, Jan. 19-21, at the Statler Hilton Hotel in New York City.

Technical committees of the AIAA provided forty-two sessions covering a broad spectrum of the latest results in aerospace research and development, ranging from air pollution, propulsion, and fluid dynamics to astrodynamic analyses of the Apollo flights.

Dallas G. Denery, Manned Systems Research Branch, presented a paper at the session on Guidance and Control 1 - Theory. The paper, titled "A Parameter Estimation Procedure that is Insensitive to Initial Parameter Estimates", is concerned with the estimation of parameters in a constant coefficient, linear system using measurements of the system input and output. The method is applied to simulated and flight data.

At the first session on Plasmadynamics -1, a paper coauthored by Stuart W. Bowen, now an assistant professor at the University of Michigan, and Chul Park of the Ames Magnetoplasmadynamics Branch was presented. The work was performed while Bowen was a visiting assistant professor at the University of Santa Clara. The paper, entitled "Computer Study of Nonequilibrium Excitation in Recombining Plasma Nozzle Flows", discusses the nonequilibrium neutral atom excited state densities, electron and heavy particle temperatures which are computed for a fully dissociated, partially ionized nitrogen plasma expanding in a nozzle, starting from equilibrium in the settling chamber.

William J. McCroskey of the U.S. Army Aeronautical Research Laboratory at Ames, and H. A. Dwyer, Assistant Professor at U.C. Davis, have coauthored a paper entitled "Crossflow and Unsteady Boundary Layer Effects on Rotating Blades". This paper was given at the session on Fluid Dynamics 2 - Numerical Methods, Three Dimensional and Unsteady Boundary Layers.

During the session on Guidance and Control 2 - Applications, a paper by Larry A. Manning, Space Missions, OART Mission Analysis Division, and Donald C. Fraser, Assistant Director, MIT Instrumentation Laboratory, on "Guidance and Navigation Requirements for Missions to Outer Planets" was presented. The paper concerns an evaluation of the balance between ground-based and onboard navigation systems for three outer planet flyby missions. These missions encompass the direct, Jupiter swingby and Grand Tour classes of trajectories.

Leroy L. Presley, Physics Branch, and Masayuki Omura, Measurement Sciences Branch, have coauthored a paper entitled "Microwave Measurement of Precursor Electron Densisties Ahead of Shock Waves in Air at Velocities Greater than 10 Km/sec." This work was presented at the session on Plasmadynamics 2.

INVENTION AWARDS . . . continue in the news at Ames and three cases were recently approved by the NASA Inventions and Contributions Board. The award recipients, pictured here with the Ames Director, Dr. Hans Mark (second from left), are (l to r) Chalres P. Steinmetz, Simulation Experiments Branch; John Dimeff, Chief of the Instrumentation Division; Dr. John A. Parker, Chief of the Chemical Research Projects Office; and Dr. George M. Fohlen, Applied Space Products, Inc. The invention by Mr. Steinmetz relates to energy limiters for hydraulic actuators and serves to reduce personnel hazards in a simulator created by a rapidly returning control column by limiting the return speed without sacrificing training features. Mr. Dimeff has invented a very sensitive gas pressure transducer employing a vibrating member. And Drs. Parker and Fohlen have co-invented an intumescent paint which when heated expands greatly in volume and forms a char which is thermally stable and acts as an insulation to hinder transmission of heat through the surface to which it adheres.

Pay Checks Will Be Less

Employees are reminded that pay checks issued on January 30, will be less due to an increase in the retirement deduction from 6 1/2 to 7 percent and an increase in health benefit premiums. Any health plan changes made during the open season will also be reflected in this check.

Myers New NASA Manned Flight Head

Dale D. Myers, vice president and general manager of the Space Shuttle Program at North American Rockwell Corp., has been appointed NASA Associate Administrator for Manned Space Flight.

He succeeds Dr. George E. Mueller who left NASA Dec. 10.

Mr. Myers will be responsible for the planning, direction, execution and evaluation of NASA's overall manned space flight program. These functions include management authority over the George C. Marshall Space Flight Center, Huntsville, Ala., Manned Spacecraft Center, Houston; and the John F. Kennedy Space Center, Fla.

Myers has been in charge of North American Rockwell's space shuttle program since June 1969. Prior to that he had been vice president and general manager of the Apollo Command and Service Module work since February 1968 and vice president and Apollo Program Manager since April 1964.

OAO 2 Discovers Hydrogen Cloud Surrounding Comet

A great hydrogen cloud has been discovered surrounding the comet Tago-Sato-Kosaka by NASA's Orbiting Astronomical Observatory 2 (OAO 2), launched from Cape Kennedy Dec. 7, 1968. Astronomers, observing a bright cometary Coma for the first time in the ultraviolet, will be able to study the role of hydrogen in comets.

The comet, Tago-Sato-Kosaka, is named for three Japanese amateur astronomers who discovered it last October. It is being observed by University of Wisconsin instruments aboard OAO 2.

The instruments first locked onto the comet on Jan. 14 as it moved away from the Sun and will continue to observe it through the rest of January and follow changes in the density of the hydrogen cloud.

Data gathered thus far show that the glowing cloud of hydrogen surrounding the head of the comet is as large as the Sun itself.

For about ten minutes during each 100-minute OAO orbit, the Wisconsin instrument on OAO measures Tago-Sato-Kosaka's ultraviolet radiation that does not penetrate the Earth's atmosphere.

OAO, above the obscuring density of the Earth's atmosphere, has given man his first look at a comet in the light of hydrogen Lyman alpha and found an extensive envelope.

Ultraviolet radiation from other molecules is also being found with OAO.

From these data, coupled with ground-based observations, it should be possible to determine more accurately the amount of mass ejected from the comet and learn more about its composition.

Comets were probably formed at the time of the formation of the solar system, and knowledge about comets is important to an understanding of how the Earth was born.

Comet Tago-Sato-Kosaka is moving rapidly northward across the constellations Cetus, Pices, Aires, and is visible low in the southwest from the United States after sundown.

On Feb. 2, the comet will be about fifth magnitude and located near the bright star Alpha Arietis (Hamal) in the constellation Aries.

The Astrogram

Room 134
Admin. Mgt. Building
Phone 2385

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 . . . . . Dot Evans
Reporters . . . . . NASA Employees

Deadline for contributions:
Thursday between publication dates

Personnel Corner

Civil Service Commission Chairman Robert E. Hampton has announced additional action to strengthen equal employment opportunity efforts of CSC's 10 Regional Directors. He has approved the establishment in each Region of a full-time regional Equal Employment Opportunity Representative position, reporting directly to the Regional Director.

CSC Regional Directors were recently designated as coordinators for the equal employment opportunity program in their respective areas. The Regional EEO Representative will assist the Regional Director in coordinating EEO activities in all program areas.

"Regional EEO Representatives will be able to guide and assist Federal field managers in applying policies prescribed by President Nixon under the Executive Order 11478," Chairman Hampton said. "The success of the Federal program for equal employment opportunity will hinge largely on what is done at the job site and in communities where Government offices, shops, and laboratories are located. By being close at hand, the Regional EEO Representative will be instrumental in moving the program forward at the agency field installation level. He will give leadership and assistance to agency EEO officers, Federal Women's Program Coordinators, personnel officers, and other officials."

"The Regional EEO Representative, under the general supervision of the Regional Director, will serve as the principal Regional Office resource person in providing Commission leadership and guidance to the Government's internal equal opportunity program," Chairman Hampton said.

In addition to its leadership responsibility, the Commission is charged with reviewing and evaluating agency program operations and reporting to the President on progress and problems. Designation of Regional Directors as program coordinators and establishment of the new full-time Regional EEO Representative positions will serve to assure high-level attention by Federal managers throughout the country to the employment problems of minorities and women. Individuals selected for the new positions will be persons with high levels of ability to relate to minority groups.

Commission Regional Offices are located in Boston, New York City, Philadelphia, Atlanta, Chicago, St. Louis, Dallas, Denver, Seattle, and San Francisco.

Volunteers Needed for New Vision Test

In order to evaluate a newly developed automated vision tester, Dr. Richard Haines, Human Performance Branch, has asked for Ames personnel to volunteer to take two brief vision tests. These tests are enjoyable to take and do not require any special capabilities. The essential requirement for all volunteers is that you must have some kind of vision defect such as a scarred cornea, small-localized blind spot (called a scotoma), glaucoma, cataract, or other dysfunction. He is not interested in testing those who wear glasses or contact lenses for near- or far-sightedness or astigmatism. If you are interested in helping evaluate a device which could someday be used in optometric clinics across the country please call Dr. Haines (ext. 2958) for further details.

Candidates selected for testing must arrange for absence from work with their immediate supervisor.

Jetstream Toastmasters

Men who want to speak more effectively are invited to Jetstream Toastmasters which meets every Wednesday 11:45 a.m. - 12:45 p.m., at the Kosy Grotto in Mountain View. For information Call Guy Ferry, ext.2884.

Sequoia Toastmasters

For those who prefer an evening session, Sequoia Toastmasters meet every Monday from 6:30 to 8:30 p.m. at Foothill College. For information, call Bill Hurley, ext. 2892.

Summer Job Applications

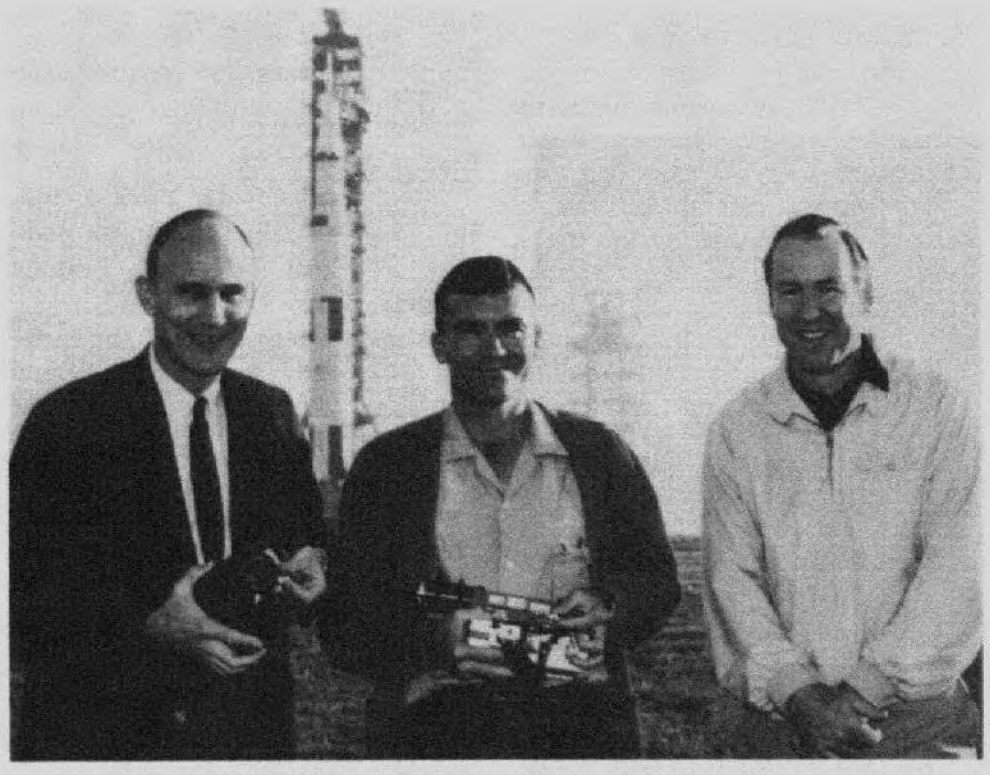
The closing date for filing in the Summer Jobs in Federal Agencies Announcement No. 414 is Feb. 4.

Ames employees with a son or daughter interested in being considered for Federal employment during the coming summer are reminded that the application for employment must be filed with the U.S. Civil Service Commission before the closing date.

If there are any questions please call Mrs. Menges, Personnel Division, ext. 2021.

REMINDER

Deadline for purchasing tickets at a discount for the Oakland Seals vs New York Rangers hockey game on Friday, Feb. 13, is Monday, Feb. 9. Discount coupons valued at $1 are available in "The Astrogram" Office.



THE APOLLO 13 ASTRONAUTS . . . were on hand at Cape Kennedy recently when the Apollo 13 space vehicle was moved to the Launch Complex where preparations were begun for the nation's third lunar landing mission now scheduled for April 11. From left are Thomas K. Mattingly II, command module pilot; Fred W. Haise Jr., lunar module pilot, and James A. Lovell, Jr., commander. The Apollo 13 landing site is the Moon's Fra Mauro region.

Scientific Products Announces Instrument and Product Show

The sixth annual instrument and product show sponsored by Scientific Products, a division of American Hospital Supply Corps, will be held at Goodman's Hall, Jack London Square in Oakland, Feb. 5 and 6, from 10 a.m. to 6:30 p.m.

Representatives from 56 manufacturers will display the latest in laboratory equipment and products.

An additional feature of the two-day affair will be a series of seminars which will begin at 9 a.m. on the 5th.

Topics to be discussed are many and varied and range from "Radiation Treatment of Water and Wastewater" to "Microbiology of Air Sampling". Of special interest will be a seminar and panel discussion entitled "Infection Control for Medical Institutions". The moderator will be Gerald McGlothlen, Director of Bacteriology at the Good Samaritan Hospital in San Jose. The seminar will convene at 9 a.m., Feb. 5.

Ames employees and tenant organizations are invited to attend the show and may register for the seminars by contacting Tony Cook of Scientific Products, Menlo Park, 323-7741.

Special Discounts Offered to Personnel at Ames

Membership cards, mail order discount coupons, and other special offers are available without charge for all Ames employees, tenant organizations at the Center, and retired Ames employees. Contact The Astrogram Office, Room 134, Administration Management Building.

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DISCOUNT CARDS

DISNEYLAND: Magic Kingdom Club cards for special benefits at Disneyland.

FRONTIER VILLAGE: Frontier Wonderland Club Cards for special benefits at Frontier Village.

SANTA CRUZ BEACH and BOARDWALK: Beachcomber Club cards for a 30 percent discount.

ABC MARINE WORLD: Membership cards offering a 10 percent discount at Marine World, Redwood City.

DISCOUNTS

FURNITURE: Cards are available for the House of Karlson, San Francisco.

TIRES: Peninsula General Tire Company, Mt. View and Burlingame, Gerard Tire Service, Inc., for Dunlop, Michelin, and Seiberling, and Keith's Tire and Brake Service, Sunnyvale and Campbell, 35 to 50 percent discount.

JEWELRY: Michael's Jewelry, Moonlite Shopping Center, Santa Clara, and Princeton Plaza, San Jose.

CATALOG: Service Exchange Distributors of San Francisco, offering a variety of merchandise at discount. Catalog in "The Astrogram" office.

AMERICAN FLAG: Price, $5, order forms available.

DINNER CLUB: International Dinner Club coupon books for $5, order forms available.

Ames Airings

. . . by Jane Kohler

KATHY SILVA (Security) was honored Wednesday evening, January 7 at a baby shower attended by Center employees at the home of BEA AIKMAN (Security). Co-hostesses were LINDA VOLLENWEIDER and RHONDA HEINZE also in Security. On Tuesday, January 20, several members of the Branch took Kathy to lunch at the Chez Yvonne, and then Friday, her last day at Ames, several of the girls took her to Qui Hing Low's as a farewell gesture. Kathy is leaving to stay home and wait for her baby which is due the middle of March. . . RUBEN RAMOS (Spacecraft Data Systems Branch) and Gloria Meili exchanged wedding vows on December 29 in the bride's hometown of El Paso, Texas. The newlyweds honeymooned in Acapulco and are now making their home in the Bay Area. . . LARRY RUSSELL (Measurement Sciences) and his wife, YVONNE, (formerly of Research Instrument) are proud to announce the birth of their first child, Mark Lauriston, born Saturday, January 24, at El Camino Hospital. Mark weighed 9 pounds, 8 ounces and was 19 inches long. Congratulations to the proud parents. . . There seems to be a definite cutdown in vacations this time of year but if there are vacations or other items of interest throughout the year please send the information to "The Astrogram" Office, 241-4 or call Jane Kohler, ext. 2385.

GOLF

. . . by Kay Bruck

The return stubs on the announcement for the Annual George Washington Golf Outing indicate that there are not enough people interested in this tournament, so it has been cancelled.

The first regular tournament of the 1970 schedule will be on February 7 at San Jose Municipal Course.

All Ames personnel who are interested in joining the golf club for the 1970 season are requested to do so as soon as possible, so that match tournament schedules may be set up to begin with the March 14 game at Oak Ridge. Initiation fee is $2 for new members and dues are $4 a year payable to Mitch Radovich, Treasurer (x2904, m.s. N-220-1).

THE 1970 AMES GOLF CLUB SCHEDULE

Date	Golf Course	Starting Time
Feb 7	San Jose Muni	11:00 AM
Mar 14	Oak Ridge	10:15 AM
Apr 4	Santa Teresa	11:00 AM
May 9	Sunol (Cypress)	9:00 AM
June 6	Pajaro	10:00 AM
July 25	Aptos Beach	9:30 AM
Aug 8	Sunol (Palm)	9:00 AM
Sept 12	Pasatiempo	8:30 AM
Oct 3	Riverside	10:30 AM
Nov 7	Calero Hills	8:30 AM

TROPHY WINNER. . . Ed Stepnoski admires the Varden Cup trophy which he won for lowest net average in six Ames-sponsored golf tournaments.

MATCH PLAY CHAMPIONS . . . of the Ames Golf Club polish up their trophies. Winners of the three flights are: (l to r) first flight, Jim Nelan and runner-up Joe Quartuccio; second flight, Clark White and runner-up Earl Menefee; and third flight, Russ Cravens; runner-up, Edie Watson (not pictured).

BOWLING

. . . by Clark White

The All Ames Bowling League has completed the first week of play in the second half. Current standings are:

DIVISION I	WON	LOST
Keggers	4	0
Comets	4	0
Glitches	4	0
4NI	3	1
Splitters	1	3
Road Runners	0	4
Machine Shop	0	4
Owls & Pussycats	0	4
DIVISION II		
Double Trouble	4	0
Woodchoppers	3	1
Engineers	3	1
Hit & Mrs.	1	3
MAD	1	3
Wal-Nut-O's	1	3
Killers	1	3
Timber Topplers	0	4

Bowled January 21:

Men's high series: Dean Jaynes, 597; Tony Astalfa, 594; Roger Hedlund, 580; Bill Ross, 566; Francis Genovia, 561.

Women's high series: Ina Rathert, 502; Judy Long, 493; Arlene Robinson, 492; Betty Rupp, 479; Dot Olson, 459.

Men's high games: Roger Hedlund, 226; Francis Genovia, 225; Dean Jaynes, 224; Cal Eddleman, 208; Hank Cole, 206.

Women's high games: Ina Rathert, 188; Yetta Paquette, 185; Judy Long, 180; Arlene Robinson, 180; Betty Rupp, 175.

Civil Defense Alert

Ames employees are advised by the Santa Clara County Office of Civil Defense that the next regular testing of the Civil Defense alert and warning system ocurs at 11 a.m. on Friday, January 30.

WANT ADS

For Sale-1965 Mustang Convertible, automatic trans., 8 cylinders, excellent condition, $1100. Call 854-3140.

For Sale-1965 VW, good condition, $850. Call 967-9479 after 6 p.m.

For Sale-61 Falcon 6 cyl. sta. wag., radio/heater, top rack, good condition, $300. Call 356-2368.

For Sale-1960 Triumph T 120 Bonneville, engine just overhauled, new tires, and paint, $600. Call T. Medeiros, 257-3771.

For Sale-68 Corvette Coupe, four speed trans., p. steer., p. windows, p. brakes, fact. air cond., positraction, tinted windshl, excellent condition. Call 245-6972 after 5 p.m.

For Sale-67 Blue 2 plus 2 Mustang, V/8, GTA, R/H, P/S, disc brakes, tinted windows, Michelin X tires and many extras, excellent condition, new tune-up, must sell, purchased Volvo in Europe, $2500. Call Jean Lee, 967-4216.

For Sale-63 Austin Healey Sprite Mark II, trans. repaired, new valve job, $700/offer. Call Jean Lee, 967-4216.

For Sale-Ricker ski boots, 5 buckle, men's size 9, excellent condition, used 3 times, origionally $75, will sell for $50. Call Jean Lee, 967-4216.

Free Puppies-to good homes. Terrior combination, when full grown should weigh about 15 lbs. and be approximately 15" high. Six to choose from if you call early. Call 732-2688.

For Sale-Dachshund puppy, black and tan, AKC, male, miniature, beautifully marked, lovable disposition, paper trained, $45. Call Irene Tharpe (Morgan Hill) A.C. 408-779-3022.

Free Puppies-Good homes for four two-month old puppies, Poodle-Pekinese-Pomeranian strain. Call Jackie Spore, 259-3125 or see at 2859 Betsy Way, San Jose.

For Sale-2 piece living room set. Medium brown 3 walnut tables, all in excellent condition. Call 297-3843.

For Sale-Shadowbox and two upholstered chairs and sofa. Call 967-0344 evenings.

For Sale-Mandolin, new condition, $25. Call Frank Thompson, 379-9426.

Wanted- Blue chip stamp books. Will trade S&H green. Call 248-6009.

For Sale-Eichler townhouse, 4 bdrm., 21/2 bath, sep. fam. rm., dining rm., pool, nice Santa Clara nbhd., walk to all schools, price $25,000, $5200 down, no closing costs, 5 1/4% FAA loan. Call 248-4690.

For Sale-Antique wall clock, $65; French mantel clock, $75; and American mantel clock, $40. Call 253-2462.

Wanted-Jeep (military type) in good condition. Some repairs o.k. Call Don Moody, 736-5393.

Wanted-Second car to drive to work, standard or compact, 2 or 4 door. Must be clean and in good mechanical condition. Will pay to $450. Call R. W. Lewis, 257-1921 after 5:30.

Credit Union Annual Meeting

The Annual Meeting of the Moffett Field Employees' Credit Union will be held on Friday, January 30, at the Bold Knight Restaurant in Sunnyvale. The dinner meeting will start at 7 p.m. with the regular business portion to follow. A no-host social hour will start at 6 p.m. followed by a roast beef dinner at 7 p.m. Tickets are $3.50 each and may be purchased from board members, committeemen or at the Credit Union office. Plan to attend and learn how the credit union is doing. There will be brief reports and election of officers for the new year.

The Board of Directors is pleased to announce a dividend of 5% per annum plus a 1/4 of 1% bonus per annum for the period 1 July, 1969 and ending 31 December, 1969.