



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

A review of Ames' 1973 major accomplishments

wake vortex studied

*A joint FAA/NASA (ARC and FRC) investigation of the wake vortex generated by a Boeing 727 commercial transport was conducted. The wake characteristics were successfully examined by the probe aircraft (a Lear jet and a Piper Comanche) using hot-wire anemometer instrumentation. In addition, the probe aircraft was instrumented to measure the aircraft response to the wake disturbance.

*As part of a national (multi-agency) program, Ames Research Center is responsible for determining the applicability of the Microwave Landing System (MLS) for STOL operations. An assessment of the accuracy and coverage requirements for MLS was completed.

*Project Breakthrough is the Center's prime vehicle for full utilization and upward mobility for employees in grades below GS-9 or WG-9. This year, 11 employees have been selected for specific positions. The most recent was the selection of a minority female for Stores Receiving and Shipping Attendant, WG-5 position. Five others reached their target positions this year under the program. These positions included two Librarians, two Automotive Mechanics, and one Pipe-fitter.

*A contract was awarded to Bell Helicopter Company for final design and fabrication of two tilt rotor research aircraft under the Joint NASA/Army program. The first aircraft is scheduled to be delivered to Ames in July, 1976.

"Galileo II" arrives

*December 10: Galileo II arrived at Ames to be greeted by the staff and modifications to the aircraft began immediately to prepare it for a possible mission to obtain data on Comet Kohoutek.

*Ames sponsored summer lecture series entitled "Next Billion Years" begins with overflow crowds with Margaret Mead as the lead off guest speaker.

*The largest Summer Aid program ever sponsored by Ames ended in September, 1973 with 120 students participating from school districts in San Mateo and Santa Clara Counties. 90% of the participants in this program were minorities. 50 students remained in the President's Stay-in-School Program. These two programs provide recruiting sources for worker-trainee and worker trainee opportunities programs. January through October, 1973 the Center has hired approximately 90 employees with 55 being minority and women.

*Computer calculations of the transonic flow about a complete wing were used to shorten scheduled wind tunnel tests of a light, highly-maneuverable airplane by avoiding camber settings that were not predicted to be attractive.

*For the first time, a three-dimensional inviscid flow field computer code has been successfully coupled with boundary-layer codes to predict quasi-three-dimensional heat-transfer distributions along the calculated inviscid streamlines over a space shuttle vehicle.

joint US-USSR project

*The NASA CV-990 participated with a USSR IL 18 aircraft and two surface ships in Project BESEX during February and March for meteorological studies in the Bering Sea area west of Alaska. This was the first direct joint endeavor with the USSR emanating from the Nixon-Breshnev agreement for cooperative efforts in several technological fields. These flights acquired information on the capabilities of microwave radiometers mounted aboard satellites for operational use in meteorology.

*Laser-Doppler velocimeters for two-velocity component measurement in fluid flows have been developed and used in experiments in Ames wind tunnels. The ARC developed unit uses two of the colors emitted from an argon-ion laser for the simultaneous local measurement of orthogonal velocities.

*The lunar magnetics group has successfully measured the remanent and global induced magnetic fields of the moon as well as the interaction of lunar magnetic fields with the solar wind; analyses of the data have yielded values for electrical conductivity, temperature, permeability, and iron abundance of the lunar interior.

*An advanced digital flight control system (STOLAND) was installed and acceptance tests were completed on both the CV-340 and the augmentor wing aircraft. Both the aircraft and the STOLAND system are being used in a flight test program in support of the joint DOT/NASA STOL Operating Experiments Program.

*Ames scientists have discovered small fatty acids in meteorites. These are believed to be of extraterrestrial origin. This discovery supports their earlier discovery of amino acids in meteorites, and provides additional evidence in support of the theory that chemical evolution is the basis for life.

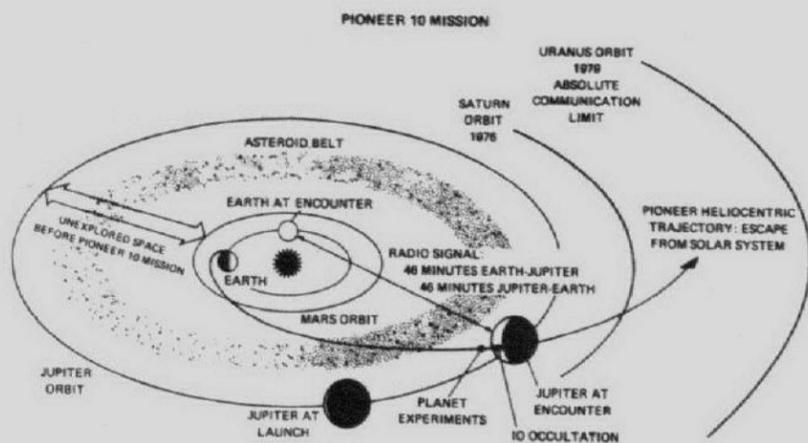
Pioneer-Jupiter early results

Pioneer 10, now safely past Jupiter, has found that Io, the closest of the planet's large moons, is "peculiar"; that Jupiter's dark orange-brown belts are "hot"; that the spacecraft may be able to pass through Jupiter's intense radiation belts at certain points close in to the planet; plus a number of other surprising things.

Experimenters have reached these tentative conclusions after quick looks at data returned by the spacecraft. More results will be forthcoming in the next few months.

Pioneer now is beginning its five-year extended mission — to reach the orbit of Saturn in 1976, and the orbit of Uranus, the limit of spacecraft communications with Earth, in 1979. It will then head out of the solar system.

Scientists currently are using Pioneer 10 radiation belt data to find whether Pioneer 11 — due to reach Jupiter a year from now — can be safely retargeted closer to Jupiter in the next few weeks, so that it can travel to Saturn. Pioneer 11 would reach the ringed planet by late 1979, following its encounter with Jupiter in the late 1974.



Scientists so far have received a number of pictures better than those from Earth telescopes of Jupiter. Rectified or enhanced pictures of the planet will be available in coming months.

Spacecraft experimenters have found that Jupiter's radiation belts are very intense (10,000 to one million times Earth's belts in intensity), with high energy electrons 100 times as frequent as protons (a complete surprise, experimenters said).

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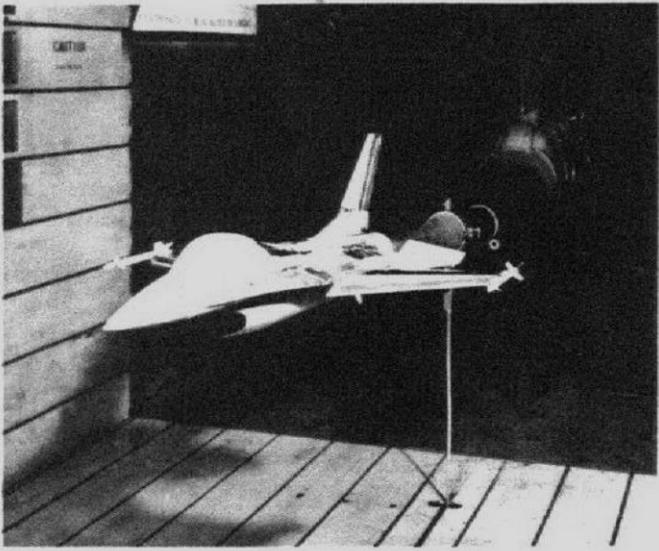
Arizona mapped

*The Airborne Science Office Earth Resources Survey Aircraft completed a total mapping of the state of Arizona. This is a joint NASA, State of Arizona, Department of Interior project to develop the first accurate land use maps of the entire state.

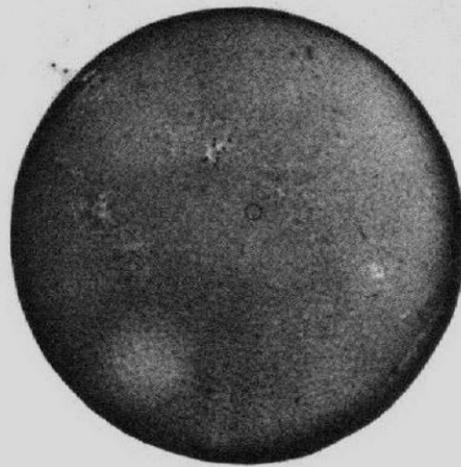
*Discovery of nonrandom distribution of craters on Mars in the form of crater pairs followed by laboratory tests to determine the origin of this phenomenon has revealed an unexpected aspect of planetary impact cratering: near-simultaneous impact of meteoroids.

*Application of fiber-loaded foam to the A-10 aircraft. Fiber loaded urethane foam developed by the Chemical Research Projects Office as a ballistic fire control mechanism was adopted by the Fairchild Aircraft Co., as a means of ballistically hardening their prototype AX aircraft, the A-10.

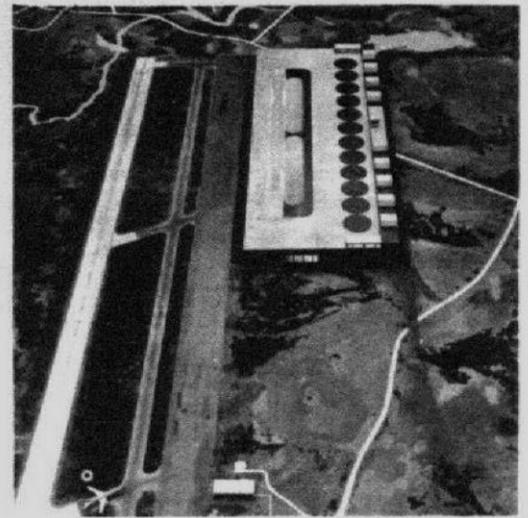
*On the basis of the organic molecules known to exist in interstellar space, Ames scientists predicted the presence of an additional organic molecule — methanimine. This prediction was confirmed by radio astronomical observations using the 210 ft. radio telescope of CSIRO, Australia. This molecule was found in the dense and massive interstellar cloud Sagittarius B 2 near the center of our galaxy.



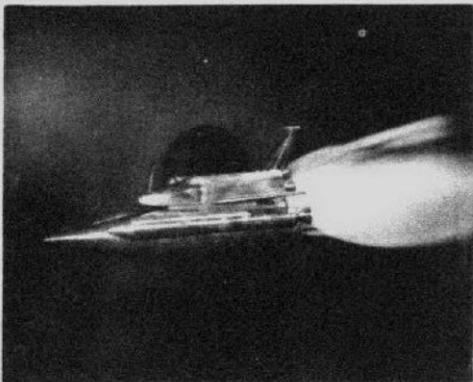
Light Weight Fighter tests were conducted in 11x11 ft. wind tunnel.



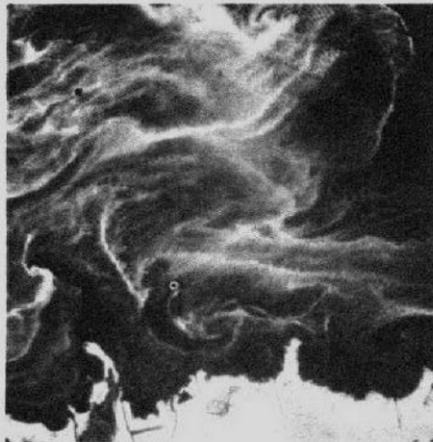
Solar image showing sounding rocket instrument sighting points, all selected during flight by use of Ames developed SPARCS ground command system.



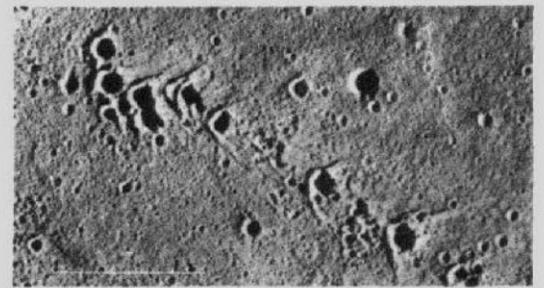
Elevated STOL-port model used in simulator studies of approach and landing by STOL aircraft.



Space shuttle plume tests were conducted in 9x7 ft. wind tunnel.



IR photograph of a portion of Clear Lake showed complex patterns of floating blue-green algae.



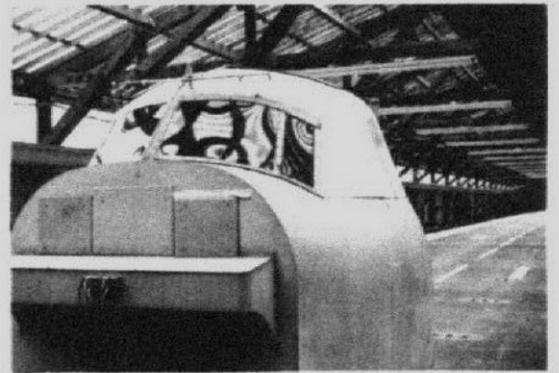
Impact origin of lunar craters demonstrated by simulation of small crater Herringbone pattern.



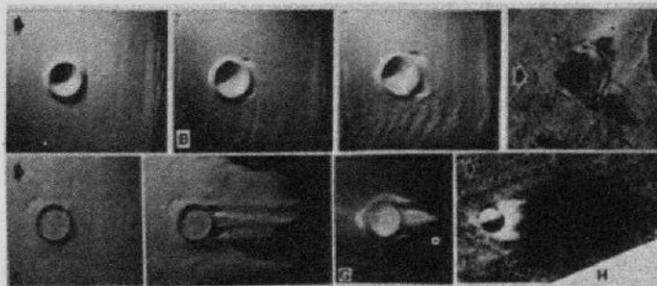
Ames studies demonstrated that a two segment landing approach (top) reduced aircraft noise compared with normal approach (bottom).



Bacteria were discovered which survive and grow in alkaline conditions similar to those which may be found in the atmosphere of Jupiter.



Interior view of the fog chamber showing the cab from which pilots make visual observations.



Wind Modification of laboratory craters (A-B-C&E-F-G) identified erosion patterns on Martians craters (D&H).

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astrogram

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Editor Meredith Moore
Reporters NASA Employees

Deadline for contributions:
Thursday between publication dates

A review of Ames' 1973 major accomplishments

40'x80' refurbished

*The 40 X80-foot wind tunnel refurbishment is almost complete. The items already completed include a model assembly building, a data acquisition system, a refurbished drive system, a crane system, a purge system and an office building.

*Twelve Air Force flight nurses participated in a five-week experiment, including a period of total bed rest; to find out how weightlessness and reentry G's may affect the female body.

*Improved coatings were developed for application to the thermal protection systems on the space shuttle. The lower solar absorptance of these coatings could help alleviate the thermal control problem of the orbiting shuttle. The coatings also have optical and morphological properties that are superior to those of previously available coatings.

*The real time use of the SPARCS ground command system has enabled solar experimenters to point experiments to the regions of the sun of greatest interest, during the brief observation time of sounding rocket flights.

*An initial five-month airborne sampling program defining the concentration of major air pollutants and related meteorology in the nine county Bay Area Pollution Control District has been completed as part of a two-year study funded by the National Science Foundation.

*Ames scientists predicted, on the basis of an analysis of meteoritic rare gases, that the primitive deuterium to hydrogen ratio in the solar system was ten times lower than the previously accepted value. This prediction has been supported by recent observations of the D/H ratio in the atmosphere of Jupiter.

*Ames scientists obtained near infrared observations of the planet Venus from the Ames Lear jet. Comparison of the results with computer generated spectra indicated that the clouds of Venus are made up of concentrated sulfuric acid droplets (at least 75% sulfuric acid).

noise abatement

*Evaluation of the two-segment noise abatement flight procedure by United Airlines using a 727 in scheduled service showed the procedure and equipment to be safe, to be compatible with the air traffic control system and to be acceptable to the pilots.

*Biotechnology and Simulation Sciences personnel have developed a unique simulation capability to study potential operational problems associated with night or daytime landings on elevated STOLPORTS.

*A Joint ARC-Stanford Institute for Aeroacoustics was established to pursue the study of the generation and propagation of aerodynamic noise.

*Joint NASA/Ames-USAF/School of Aerospace Medicine tests confirmed the use of an Ames developed ultrasonic flowmeter for objectively predicting phenomena of blackout under +G_z acceleration. The flowmeter measured temporal artery blood flow and permitted objective evaluation of human acceleration tolerance and effectiveness of anti-G protection methods.

*On December 3, Pioneer 10 successfully negotiated its passage around Jupiter and began its inevitable journey through the solar system and into interstellar space. The spacecraft survived Jupiter's radiation belts and flawlessly returned hoped-for data on Jupiter and its environment.

Project Pioneer is managed by Ames and the Pioneer 10 spacecraft's journey introduced a number of firsts for Man in Space:

- First spacecraft to investigate the solar system beyond Mars.
- First spacecraft to enter and traverse the Asteroid Belt. Results indicated that this was not a particularly hazardous journey as previously theorized.
- First man-made object to be placed on a trajectory to escape the Solar System.
- The Pioneer Mission Operations Center (PMOC), building 244, was used for the first time as the prime mission control center for all encounter activities.

*A Pioneer 11 was launched April 5, 1973 on a trajectory to parallel Pioneer 10's investigations and to carry it to an eventual encounter with Jupiter, December 5, 1973.

fog chamber

*Management of the FAA Fog Chamber located at the University of California's Richmond Facility was taken over by Ames in mid-1972. This facility provides a realistic low visibility (fog) environment which is used to develop specifications for airport lighting and runway marking systems required for safe,

reliable landings in foggy weather.

*Force and pressure tests of the Space Shuttle Vehicle in the launch configuration were completed utilizing high pressure air to simulate the rocket exhaust plume.

*It was demonstrated that a loss of bone mineral can result from a combination of increased CO₂ levels in conjunction with daily aspirin usage, a medicant commonly used by the astronauts.

*A non-injurious technique was developed to test bone strength in living animals which can be related to the mineral content of the bone. This is of interest since the mineral content of bone may be decreased due to the weightless conditions of space flight.

*The FLEXSTAB system of computer programs for predicting the static and dynamic characteristics of flexible aircraft was delivered to Ames Research Center.

*The C-141 Airborne Infrared Telescope (AIRU) was delivered to NASA Ames during 1973. The installation of computers and other electronic instrumentation has been essentially completed and development test flights were started in late December. It is planned to use the AIRO to observe the Comet Kohoutek during January and February 1974.

special forms of life found

*Ames scientists have found bacteria in an ammonia-containing spring which are models for a type of life that might be able to live in the ammonia-rich atmosphere of Jupiter. In the laboratory these bacteria are able to live in more alkaline solutions than any previously known organism.

oblique-wing transport

*A preliminary design of an oblique-wing transport aircraft suggests improved benefits for the air transportation community. These benefits include reduced noise levels during take-off, reduced wake vortex intensity, and reduced trip times with no sonic boom.

*A combined analytic and experimental study led to the surprising conclusion that Teflon was superior to other state-of-the-art heat shield materials proposed for the Pioneer Venus Entry Mission. Teflon achieves its high efficiency by reflecting gas-cap radiation.

*Electrical eddy current heating of the moon has been shown to be an effective mechanism for the extensive melting in the surface layers during the early stages of lunar history. The driving field for this process is the enhanced solar magnetic field in the early stage of solar system evolution.

*A computer program was developed for calculating unsteady transonic flows with imbedded shock waves about oscillating airfoils, and it can be used to determine the aerodynamic coefficients necessary to predict aero-elastic instabilities (flutter).

*Studies have identified for the first time the mechanism of premature failure of titanium alloys exposed to hydrogen environments.

*A new theory for origin of a major lunar surface formation, the Cayley Formation, has been developed that for the first time considers the true effects of ejection of material from large craters and basins: such material will impact at great distances in the highlands with velocities sufficient to crater and produce landslides that collectively produce large pooled deposits of mass wasted debris in the depression of the highlands.

*A far infrared spectrum of the Orion Nebula measured from the Lear

Jet by a Space Science Division team at altitudes in excess of 45,000 feet showed a slow long wavelength decrease consistent with a model consisting of dust shells at different temperatures ranging from 30°K to 100°K.

honors and awards

Glen Goodwin, NASA Medal for Exceptional Service; Norman S. Johnson, NASA Medal for Exceptional Service; Phillip D. Quattrone, NASA Medal for Exceptional Service; Dr. Michel Bader, NASA Medal for Exceptional Service; Harvard Lomax, NASA Medal for Exceptional Scientific Achievement; Dr. William R. Mehler, NASA Medal for Exceptional Scientific Achievement; Dr. Joan Vernikos-Danellis, NASA Medal for Exceptional Scientific Achievement; and Distinguished Women on the Mid-Peninsula; Ames Group Achievement Awards: Lunar Surface Magnetometer Experiment Team and the Lunar Portable Magnetometer Experiment Team; David E. Reese, Jr., the Federal Executive Board's Service to the Community Committee award; Dr. Robert T. Jones, elected member of the National Academy of Engineering; Mmes. Phyllis J. Stawbridge, Marcelline C. Smith, and Sarah Dueker, Distinguished Women on the Mid-Peninsula award.

Speakers Bureau

Betty Baldwin (Theoretical Studies) addressed the Business and Professional Women's Association, Pacifica Chapter, at their meeting on December 20. She talked on the general spinoff benefits of the space program.

Lt. Col. Al Worden (Chief, Systems Studies Division) participated in a panel discussion for a High School Education Symposium sponsored by the Detroit, Michigan, Public Schools, on December 14.

Victor "Tory" Stevens (Flight and Systems Research) talked to the Palo Alto Jaycees on December 12 at their evening meeting. He discussed the overall aeronautics work which NASA-Ames is doing.

Joe Zuccaro (Simulation Experiments Branch) addressed the San Jose Engineers Club on December 11. His topic: "Dial an Airplane through the Use of Flight Simulators and Computers."

Chuck Kubokawa told the San Francisco Kiwanis about his underwater experiences on Tektite II, at the organization's meeting on December 11.

John Foster (Director of Development) gave a Pioneer 10 summary to the employees of Management Systems Associates, contractors at Ames, on December 18.

Annual Ames Children's Xmas Party



Clowns, balloon girls, refreshments, gifts, Mr. & Mrs. Santa Claus, and lots of entertainment greeted over 1100 children at the Ames Children's Christmas party on Saturday, Dec. 15. The new Model Preparation building proved to be a perfect area for "Santaland."

Santa and Mrs. Claus (Mike Donahoe, Public Affairs, and Judy Long, Experimental Investigation) arrived in Ralph Iglar's fantastic 1909 2-cylinder Buick to the excitement of everyone present. Nancy Gowan was a special attraction dressed as a Christmas package.

Dr. and Mrs. Mark greeted everyone at the door with wishes for a happy holiday season and Mr. Syvertson was actively taking in the festivities.

Entertainment provided by Paul and Sharon Scharmen's Muppets; Ed Kelley's Marionettes; The Christmas Martian by Joane Marie, Andy and Debby Paquette; The Mystics by Keith Tice, James Wolley, and Gilbert Prado; the Santa Clara Valley Junior Tamberitzan Dancers of St. Sava Serbian Church in Cupertino; and Christmas carols sung by the Ames Christmas choir put everyone in a holiday mood.

The eleven lucky prize winners for this year's drawing are: first prize—Joe Blas, Wm. Elton contractor, who chose the \$200 cash in lieu of the weekend to Las Vegas; 10 speed bicycle—Eugene Rizzuti, Machine Shop (just what his daughter wanted for Christmas); binoculars—Larry Erickson, Aeronautical Structures; AM-FM digital radio—Mike Przekop, Graphics; cassette recorder—Jean Jope, 40x80; back pack—Edgar Lupton, Mercury Engineers contractor; Kodak Instamatic camera—Joe Anderson, Aero Systems; golf cart—Ron Greeley, University of Santa Clara; blender—Sonia Bernard, Institute for Advanced Computation; styling dryer—Jack Connolly, Electro-Systems Engineering; can opener/ice crusher—Pete Rowe, Metal Fab.

It is absolutely impossible to name who contributed to the success of this year's party so on behalf of all the Ames

employees and their families who attended the party, the ARA Executive Board would like to thank everyone collectively from the ticket sellers to the take down crew for a job well done. It was great to see so many contract personnel and retirees contributing their time. Special thanks to all who volunteered but were not called upon.

This year the leftover refreshments were donated to the Santa Clara County Children's Shelter in San Jose and the leftover toys were donated to the "Toys for Tots" Christmas program. Both organizations extend a personal thank you to Ames for the special thought given to others less fortunate at this holiday time of year.

Attention Skiers

The Ames Ski Club has 15 trips scheduled, ranging from 1 day to 3 weeks. To get the Ames Ski Club Newsletter send \$1 to Linda Cox, M/S 241-2. Any members not getting the newsletter call Don Reynolds, x5477.

Books surplus

The Life Sciences Library, building 239 (basement) is preparing to surplus books no longer needed in the library or branch library collections.

Before instituting formal surplus procedures, the staff wants to be certain that all local needs are being met; therefore, the items being surplus will be available for examination by Ames employees. They may select any titles pertinent to their work for retention in offices or laboratories.

Stop by the library during the week of Jan. 7-11, any time during the day, and the staff will be happy to show employees where the material is on display.

Persons selecting materials are reminded that the material remains government property and may not be appropriated for addition to private libraries or collections.

Missing property reports increase

According to the Security Branch, many high value portable items have been reported missing. Some items are borrowed without letting it be known and this latter proves embarrassing when the FBI is told that someone at Ames had borrowed it without authority or even notifying the Responsible Property Officer.

Theft of Government property and other crimes on a Government reservation are criminal matters, under the primary investigative jurisdiction of the FBI. The unaccountable disappearance of Government property from Ames is presumed to be theft and the results of preliminary inquiries are forwarded to the FBI. The FBI's investigative results are presented to the U. S. Attorney for prosecutive action as warranted.

Want ads

Transportation

FOR SALE:

69 Ford Torino 2 dr hardtop, PS, new brakes, new tires, new battery, new muffler, very clean. \$1090. Call 356-5676 or 249-3906 after 4:30 p.m.

'65 Chev. Impala, 283 engine, AT. Bad body, interior; good mechanically. \$125. Bakke, 246-3356.

(Continued from Page 1)

The radiation belts are so strong that if Pioneer had come another 65,000 miles closer to Jupiter, radiation might well have increased 50 times, almost certainly wiping out the spacecraft. Fortunately the belts seem to have almost the shape of a very flat disc, like a pancake. The belts appear to be contained in a magnetic field about four million miles in diameter and shaped something like a squashed doughnut with the planet in the doughnut's hole.

Both radiation belts and magnetic disc seem to be tilted, so that the magnetic pole is at an angle of around 15 degrees to the planet's axis of rotation. This causes both the magnetic envelope and the thin disc of intense radiation inside it to wobble up and down about 30 degrees with every ten-hour Jupiter rotation.

The most intense and damaging radiation appears to be concentrated directly in the "pancake" or center plane of the doughnut-like magnetic envelope and to fall off rapidly on either side of this plane.

Both Jupiter's magnetic field and radiation belts seem to be displaced above the equatorial plane of the planet.

Jupiter's inner magnetic field seems to be about two million miles in diameter, and particles apparently are trapped there permanently.

The outer part of Jupiter's field is "jelly-like". Masses of "stagnant" particles in this outer field appear to dominate the relatively weak magnetic forces — producing constant changes and distortions as the particles move about. Energetic particles appear to be constantly escaping this outer field.

As the high energy particles strike Jupiter's moons, some of them appear to be soaked up by the moons' surfaces. This may reduce the total amount of radiation in the belts and its hazard to spacecraft.

Jupiter's magnetic field also has been found to have a direction the reverse of Earth's. A compass on Jupiter would point to the south pole instead of north.

Pioneer's ultraviolet instrument has identified helium on Jupiter for the first time. It may be able to determine the hydrogen to helium ratio on the planet. Pioneer's infrared and planet occultation experiments also are likely to determine this important ratio when data is reduced.

This hydrogen/helium ratio will shed light on origins of Jupiter and of the solar system. Scientists now think Jupiter has less helium than previously thought.

The Pioneer spacecraft survived Jupiter's radiation belts essentially undamaged. Analysis of data in coming weeks will tell whether the spacecraft became somewhat radioactive in the belts.

Some scientific instruments were damaged. Glass in the sensor of the Asteroid-Meteoroid Detector was severely darkened, greatly cutting down its "seeing" ability.

Housing FOR SALE:

2 Br, 1 Ba house on 1/5 acre in Los Gatos \$32,000. Call 356-2503

TAHOE KEYS TOWNHOUSE. 2 bedroom, 2 bath. Furnished. Available immediately. Weekly or monthly until June 1. \$125 per week or \$300 per month. 969-1494 or x5639.

FOR RENT—Unfurnished, 2 bedroom detached apartment — private yard — enclosed garage — car port — Los Altos — \$250/mo. plus utilities. Call eve. 964-7289.

Miscellaneous

FOR SALE:

10 Speed racing bike in excellent condition, overhauled and painted. \$60. Call 253-6294.

Hardwood bed frame with bookcase headboard, \$30. 379-2385.

RCA 21" Color TV, beautiful condition, solid walnut cabinet. \$70. Call 245-3188 after 5 p.m.

2 Girl's bikes. Best offer. 378-1055

SHELTIE PUPS, male, sable, AKC, 493-9391

DALMATIAN PUPPIES — Pedigree — no papers \$25. 243-6068.



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

Recent Airborne Science Office activity at Ames

The atmosphere of the Airborne Science Office is one of much excitement these days. There are nightly flights of three Ames aircraft---the Lear Jet, the Convair 990 "Galileo II" and the C-141---and experimenters from several nations and agencies are operating their scientific instruments from the airborne laboratories to perform work on various projects.

Comet Kohoutek

The Lear and the CV-990 have had instruments on board observing Comet Kohoutek since the end of December. Scientists, according to Bob Cameron of the Airborne Science Office, have learned that the comet is composed primarily of gas-as opposed to gas and dust-and the spectacular sight earlier predicted will not occur. For the layman, Comet Kohoutek has fizzled out; for the scientist, the entire Kohoutek adventure has definitely not been a dud since scientists have been able to further their study of comets and what makes them "tick" from this example. Many theories as to why and how the comet "boiled out" have been aired.

Experimenters, such as Ames' Dr. Ed Erickson (Astrophysics Branch) who has been flying aboard the Lear Jet using a circular filter wheel radiometer and wave length range of one to five microns to view Comet Kohoutek, have had to either modify their equipment and adjust it for a weaker object or view different phenomena like the planets Jupiter and Venus. Dr. James Houck of Cornell University is another scientist working aboard the Lear with instruments set to see Comet Kohoutek. He wishes to view the comet in the near infrared with a spectrometer. If the comet is too weak to detect in that manner, Dr. Houck will continue Jupiter studies with the Lear.

CV-990

The first working flight of Ames' new "Galileo II" which arrived at Ames on December 10 was on December 30. Louis C. Haughney of the Airborne Science Office is presently the project manager for the CV-990 along with Earl V. Petersen. Haughney says that the aircraft is currently involved in the

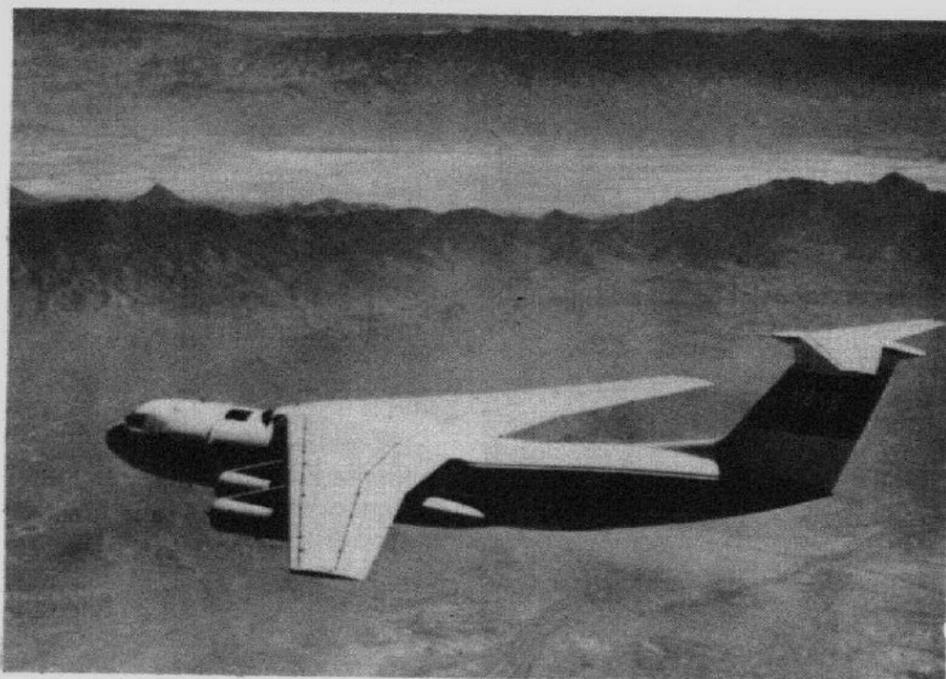
"CV-990 Comet Kohoutek/ASSESS Airborne Mission" (ASSESS stands for Airborne Science Shuttle Experiment Systems Simulation).

Since its arrival Galileo II has experienced some changes. Optical windows have been installed to replace some of the passenger windows and electrical power outlets have been put aboard throughout the cabin for the experimenters.

The January flight plan began with looking at Comet Kohoutek, studying the atmosphere and looking at the ocean. In a recent interview

airborne observations of methane in Comet Kohoutek; Univ. of Alaska (Near UV spectroscopic observations of OH emissions in comet, IR photography); CNRS/France (study of OH by photometry); NASA Ames (Documentary photography of

Comet Kohoutek); NOAA/APCL (infrared observations of the atmospheric water vapor burden); NASA Lewis (Global Air Sampling Program); and JPL (Ocean surface typography).



CLOSE-UP VIEW . . . of partially-opened port in the fuselage of the C-141 Airborne Infrared Observatory, an aircraft which carries a 91.5 cm (36 inch) infrared telescope. The aircraft was officially transferred to operational status for research development out of the Airborne Science Office at Ames on January 10.

Haughney stated, "All the results gathered from the flight observations of Comet Kohoutek have naturally been effected by the behavior of the comet. Many experiments have been set up to look at a much brighter comet; investigators must carefully study their data because there is no outstanding data as such. We are maintaining a flexible schedule subject to change. It will not run through January 25 as originally planned most likely; it is a day to day decision."

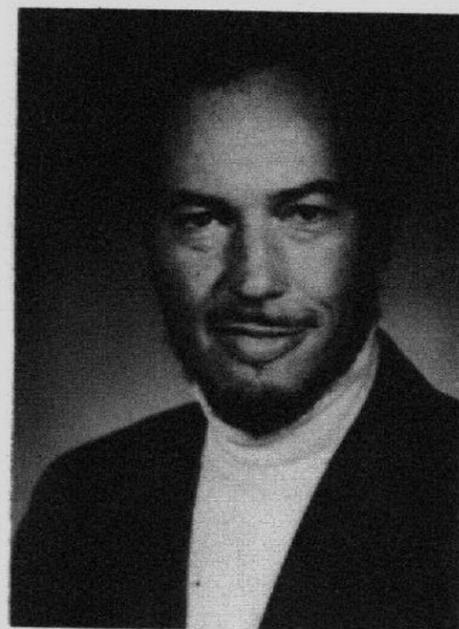
Experimenters operating aboard Galileo II in the Comet Kohoutek/ASSESS Mission include GCA Corp. (experiment-Airborne narrow-band filter photography of Comet Kohoutek); Lockheed Palo Alto, Max Planck Institute, University of Lecce (IR tilting filter photometer for

C-141 AIRO

On Thursday, January 10, at 9 a.m. the C-141 AIRO (Airborne Infrared Observatory) was officially transferred to operational status for research development. The aircraft is now within the Airbrone Science Office under the direction of Bob Cameron who is the Astronomy Mission Manager and now project manager for the C-141 AIRO. It was transferred from a project team for the development of the observatory; project manager for the development stage was Bob Mobley of Research Facilities Management. Cameron was a member of that project team. Carl Gillespie, Jr. is the C-141 facility manager and is responsible for daily operation of the
(Continued on Page 4)

AIAA honors Ames research scientist

The American Institute of Aeronautics and Astronautics annually presents the AIAA Space Science Award "to an investigator who has distinguished himself through his achievements in studies of the physics of atmospheres or celestial bodies; or of the matter, fields and dynamic and energy transfer processes occurring in space, or experienced by space vehicles." This year Dr. John H. Wolfe, Chief of Ames Space Physics Branch, has been selected to receive the Award for 1974.



DR. JOHN H. WOLFE

The Space Science Award is being presented to Dr. Wolfe for his "fundamental contributions to man's understanding of the interplanetary medium and for his leading role in the success of the Pioneer interplanetary and Jupiter missions." The award consists of a certificate of appreciation and an honorarium of \$500.

The Award will be presented at the Honors Banquet to be held on January 30, 1974 during the AIAA 10th Annual Meeting and Technical Display at the Sheraton Park Hotel, Washington, D. C. by AIAA President Holt Ashley.

You're invited

The Navy's Annual Presidential Prayer Breakfast will be held on January 31 at 7 a.m. in the Enlisted Men's Club at Moffett Field. All interested Ames employees are invited to join. Breakfast will be 50¢ and the Master of Ceremonies will be Captain Tegfeldt. There will also be guest speakers.

An RSVP is requested by January 28 to Chaplain Lindsey at 966-5721.

A new staff office has been established

The new year always brings new and exciting things into being and 1974 is no exception. A new staff office consisting of 5 fulltime and 2 parttime employees has been formed and is the Equal Opportunity Programs Office.

Willie L. White, Jr. is the Chief of the Equal Opportunity Program Office and is also the EEO Officer; Hermilio Gloria is the Contract Compliance Officer; Calvin Fenrick is an EEO Specialist (Contract Compliance); Ava Johnson is an EEO Specialist and the new Federal Women's Coordinator and June Freiburger is an EEO Assistant. Parttime people include Barbara Busch (Co-Coordinator of the Federal Women's Program) and Ruben Ramos (16 Point Program Coordinator for the Spanish Surname group).

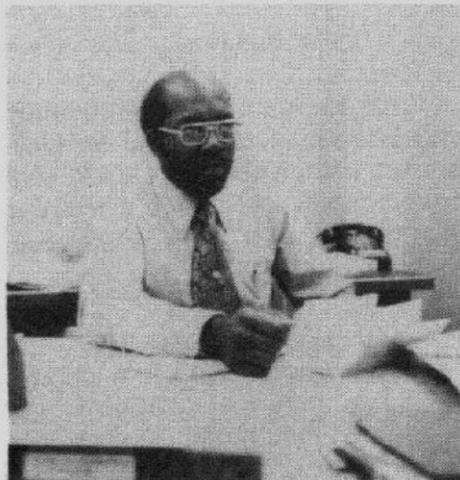
There are a number of reasons for the existence of the staff office which is now directly responsible to the Center



WILLIE L. WHITE, JR.

Director. White feels, however, that the main reason is "to place the proper importance on the Center's EEO Program." White hopes "to make Ames one of the front runners in NASA's Equal Opportunity program, i.e., in NASA's attempt to provide equal employment opportunities for all employees and applicants for employment."

All the staff members are anxious to air their enthusiastic opinions of both



CALVIN J. FENRICK

the program and the part they will individually play in successfully carrying out the program's objectives.

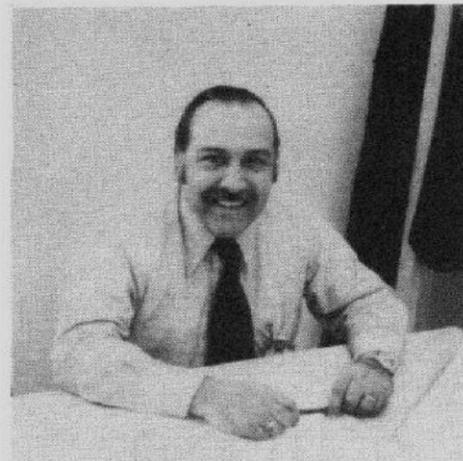
Fenrick states, "Equal Opportunity can be approached from the manner of writing a good new story. Those

elements are why, where, when and how. We know "why" there is a reason for EEO. If the readers do not know, I will be glad to meet with them and discuss the why's of EEO. This program is addressed to the whole nation. Our EEO office is responsible for ARC and FRC (Flight Research Center). The time is now. The who is not just minorities and females but everyone. Our critics do not like the how.

"I believe that the United States can achieve its fullest economic and social potential as a nation only if every individual has the opportunity to contribute to the full extent of his capabilities and to participate actively in the workings of our society."

He went on to say, "I emphasize the fact that in order to bring the full participation of every individual in this society, this program is necessary. Everyone must have the opportunity to express his capability. If the door is closed to those knocking who have the desire, the education and the motivation to succeed, then more Watts will be formed. Once again, I stress that this program addresses itself to everyone. We're here to see whether EEO regulations are complied to by the contractors and we remain neutral and objective in performing our job."

Herm Gloria confirmed Fenrick's feelings and added his personal thoughts. He said, "I am happy to be officially involved with the Ames team on Equal



HERMILIO GLORIA

Opportunity. Although this is a new area I feel that my previous experience in equal opportunity will be beneficial. I strongly feel that the contract compliance activity is the best avenue for Ames to help the surrounding communities achieve equal employment for all."

Ava Johnson is not new to EEO but she is the newly appointed Federal Women's Program Coordinator (FWPC). Ms. Johnson has some strong ideas and she states, "I was appointed Federal Women's Program Coordinator on December 1, 1973. I am now in the process of assessing where women are at the Center, where they are not and why not, and what can be done to assure equal opportunity for all persons at the Center.



BARBARA BUSCH and AVA JOHNSON

"In order to strengthen the Women's Program, some of my goals and desires are: to generate greater awareness and unity of women employees; to implement an extended program for training professional and para-professionals; to obtain additional target positions for women under the "Upward Mobility Program;" to increase the representation of women in the decision making process; to eliminate the barrier that women face in transition roles (their acceptance is rather difficult - they are looked upon as secretaries and given secretarial assignments). I could go on and on stating what I hope to accomplish and what the obstacles are. With the help of all employees, both male and female, we will be able to improve the status of women.

"I was selected under the Project Breakthrough Program to my present position as EEO Specialist. This entails assisting the Chief, EO Program Office in implementation of the Center's Equal Opportunity Program; administration of special programs for the disadvantaged. Such programs include: The President's Stay-in-School Program, College Work Study and Summer Aid Programs, counseling employees regarding EEO matters, training and job growth.

"What am I trying to reach? and what will the atmosphere be like when I reach my goal? Loaded question! Hopefully all discriminatory practices will be eliminated. All people will be treated equal. When that is accomplished there will be no need for an EEO Office. I guess basically that is my ultimate goal ... to work toward the elimination for the need for an EEO Office ... why not?!"

FWPC Co-Coordinator Barbara Busch compares her goals in the EO Programs Office with that of educational goals. She states, "It's similar to the old educational goals in that you take every person as far as he or she is and take them as far as they can go. FWPC can help take every woman at Ames as far as she can go.

"FWPC will help women at Ames overcome the vestiges of discrimination which still exists at Ames. I hope that soon we can disband the Women's

Advisory Board and close down the Federal Women's Program because we won't need them any more.

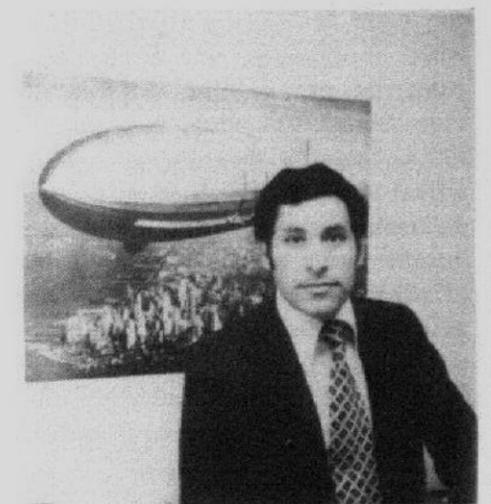
"I'm personally appreciating the experience of working with Ava Johnson and Nancie Bell; I think they are very capable and dedicated women."

June Freiburger says, "I have been wanting to work with this program for a long time and have taken many sociology courses in college related to the problems which must be tackled and overcome. I am thrilled to have the opportunity to put the theories into action. I expect that being a part of this office will prove to be an exciting experience."



JUNE FREIBURGER

To quote Ruben Ramos, Coordinator of the 16-Point Program "If it were up to me, the first "E" of the acronym 'EEO' would be doubly emphasized to stress the fact that the EEO Office strives to achieve equal treatment of all employees, including those who are not members of a minority group. Too many people view EEO as an activity catering



RUBEN RAMOS

(Continued on Page 3)

Room 142
Admin. Mgt. Building
Phone 965-3422

astrogram

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Editor Mersilth Moore
Reporters NASA Employees

Deadline for contributions:
Thursday between publication dates

(Continued from Page 2)

to, and providing preferential treatment, to minority employees. Although it is true that percentage-wise more minority employees benefit from the activities of the office, this is simply due to the nature of the problems being solved."

Ramos went on to say, "The 16-Point Program is a special emphasis program created by the President in



Grace Subega, a student aid from Mountain View High School.

November of 1970 to assist the Spanish-Speaking (or Spanish-Surnamed) American citizens achieve equal employment opportunities within the Federal

government. The program consists of 16 steps which the government is to undertake to achieve this goal. The job of the program coordinator is to ensure that as many of these steps as possible, within resource constraints, are implemented at the local level.



Debbie Crowe, a student aid from Shoreline High School.

"I am looking forward to assuming the responsibilities of coordinator and thus assist in achieving the goals of EEO, and at the same time broaden my personal experience as I have as EEO counselor."

(Next issue: EEO Advisory Groups)

Good wishes to December retirees

The month of December was a month full of holiday parties and good cheer. Some Ames employees decided to take the big step and indulge in an extended holiday by retiring from Ames.

Good wishes are extended to the following December retirees who now have time for hobbies and travel:

- Glen Baker, RSE; Benjamin H. Beam, RF; Abraham Brass, RSP; John C. Delaney, AS; Helen T. Faber, AAS;

- Glen Goodwin, S; Ellis J. Gustafson, SC; Glen T. Haney, FLO; Charles W. Harper, D; C. Dewey Havill, MA; Richard J. Johns, RSM; Betty L. Kay, D; Cecil S. Malmin, FLC; Emma B. Root, ASO; Edward E. Rosselli, RSM; John E. Savage, RSM; Ernest C. Shields, PDF; Charles P. Sonnet, S; Denver L. Stapleton, SSA; James L. Summers, FAA.

Patent Award ceremony



Patent Award Winners were honored at a ceremony on December 21, 1973 by Center Director Dr. Hans Mark (far left) at 3 p.m.

The award winning recipients and their inventions are (front row, l. to r.) Salvatore R. Riccitiello and John A. Parker, "Modified Polyisocyanurate Polymer Foam" and "Intumescent Composition, Foamed Product Prepared Therewith, and Process for Making Same;" James O. McClenahan, "High Speed Shutter;" John Gerds, "Concentric Differential Gearing Arrangement;" (back row, l. to r.) Theodore Wydeven Jr. and John R. Hollahan, "Water Purification Membranes and Method of Preparation;" Robert Munoz, "Continuous Fourier Transform Method and Apparatus;" and Robert J. Zeiger, "Concentric Differential Gearing Arrangement."

AIAA-ARC Galileo Memorial Scholarship Programs

Ames Research Center and the San Francisco Section of the American Institute of Aeronautics and Astronautics are sponsoring a scholarship program as a memorial to the men who perished in the April 12, 1973, accident of "Galileo I." At least one \$500 scholarship will be awarded annually to a high school senior seeking a career in engineering, mathematics, or the physical or natural sciences.

The AIAA San Francisco Section is currently conducting a drive to raise a \$10,000 trust fund to help support the scholarship program. Tax deductible contributions may be mailed to Mr. John MacKay at Mail Stop 233-10.

The scholarship is open to high school seniors who are either residents of

San Francisco, San Mateo, Santa Clara, or Santa Cruz County or children of Ames Research Center career employees, retirees, on-site support service contract employees, or Galileo crew members. The Selection Committee will determine the winner of the Scholarship on the basis of a 1200 word essay describing the career that the applicant intends to pursue and the proposed course of study in engineering, mathematics, or the physical or natural sciences; scholastic standing; a letter of recommendation; and an interview of finalists by the Selection Committee.

Application forms may be obtained from Mr. Lado Muhlstein at Mail Stop 227-9. The deadline for submitting applications and essays is February 15, 1974.

"Jaws of Life"



PAUL WAGNER . . . Chief of Ames Emergency Crew, demonstrates the "Jaws of Life" tool.

On Tuesday, December 18, the Ames emergency crew demonstrated a newly acquired lifesaving tool called the "Jaws of Life." The tool, developed by the Hurst company, is a high-powered, self-contained, maintenance-free hydraulic spreading and pulling device developed to free trapped victims. The versatile too has lifesaving applications in aircraft personnel rescue work which is the main reason Ames purchased the set.

An old car was donated by Ken McAlister, Ames Directorate Army Air Mobility R&D Laboratory, to assist in showing the many uses of the Jaws of Life. A variety of tips can be used on the tool; there is the chain tip, the cutting tip and the lifting tip.

The tool itself is made up of Titanium metal and can weigh as much as 10,000 lb. at the tips with just a simple adjustment. Opening and closing time for arms is 11 sec. without load.

Ames Safety Officer John Habermeyer said, "The Ames Emergency crew has been practicing with this new rescue tool and has developed a lot of proficiency with it. We hope of course we will never need to use it, but it's a comforting thought to know that if the need arises we have competent volunteers for rescue services."

Speakers Bureau

Dr. Lawrence Evans (Space Exploration Branch) talked on Pioneer to a group of 4th, 5th, and 6th grade students of the Cupertino School District on January 10. These students are MGM (mentally-gifted minors) students selected for special kinds of educational programs, from the 35 grade schools in the district. Larry also talked about Pioneer to the third grade of Saratoga Elementary School on January 11th.

On January 15, Arthur "Doug" Alexander (Aeronautical Systems) met with a San Jose State "History of Science" graduate class to talk to them on "Future Technology in the Energy Field."

Fred Wirth (Flight Operations, Pioneer) will describe the Pioneer program to the California Cooperative Snow Surveys Program members, at their meeting in Oakland on January 17.

Barbara Busch (Educational Specialist) talked to three groups about "NASA's Interest in Education": Sons in Retirement, Chapter #32, on January 16 in Santa Clara; Phi Epsilon Phi, a women's service sorority, on January 23 in San Jose; and the Santa Cruz Rotary on January 11.

Steven Belsley (Deputy Director of Development) traveled to UC Davis on January 9 to address the residents of Hammarskjold House on "Unmanned Space Flight."

John "Jack" Dyer (Chief, Mission Analysis, Pioneer) gave a presentation on the ever-popular Pioneer-Jupiter program to the Palo Alto Lions Club, on January 8.

John Cowley (Systems Development Branch) will also discuss the Pioneer program to the Civic Center Kiwanis Club of San Jose, on January 29.

William "Bill" Hurley (Regional Inspector, NASA Hq Inspections Office) will give retiring Chief Petty Officers of the Alameda Naval Air Station a general overview of the space program at their retirement luncheon scheduled for January 30.

Horace Emerson (Technology Utilization Officer) will address the Northern California Directors of Vocational Education at their meeting on January 18 in San Leandro. His presentation is entitled "Space Technology Comes Down to Earth."

Ernest Iufer (Systems Development Branch) combined business and vacation over the holidays. On December 27, Ernie gave a presentation, open to the public, on Pioneer. The program was arranged by the Salem YMCA, Salem, Oregon.

Programs updated

In cooperation with Ames, the De Anza College Minolta Planetarium presents the latest results from the Jupiter Pioneer project which accomplished its Jupiter fly-by objective December 3rd. The program, lasting about one hour, is supplemented with lobby exhibits; it will run through January and the first part of February.

"ENCOUNTER WITH THE GIANT"

Schedule: Thursday through Sunday at 8 p.m.; Saturday and Sunday at 3 p.m.

Admission: Adults, \$1; Students and Senior Adults, 75¢; Children, 50¢. Tickets at the door.

For Comet Kohoutek enthusiasts information on the Comet is being provided by the University of California, Berkeley; 415-642-1638 and Dr. David Cudaback, Associate Research Astronomer (3 p.m.-4 p.m.; 415-642-7207). Also there is a Goddard recorded message on Comet Kohoutek: dial 8-301-982-2383.

GOLF

The last tournament for 1973 at San Ramon was rained out and had been rescheduled for February 9.

The Ames Golf Club schedule for 1974 has been completed and reads as follows: February 23, Spring Valley; March 16, San Jose; April 13, Del Monte; May 11, Pajaro Valley; June 8, DeLaveaga; June 22, Ridgemark; July 27, Santa Teresa; August 17, Aptos; September 7, Laguna Seca; October, Pasatiempo; November 2, Riverside; December 7, Las Positas.

All Ames retired and active personnel, their spouses and children, and contractor personnel assigned to Ames who are interested in becoming members of the Ames Golf Club may do so by contacting Clark White, ext. 5438, mail stop 210-9. Initiation fee is \$2 and the annual dues are \$4.

Booklet available

Copies of the leaflet "Kohoutek" are available, in multiple copies if desired, by written request to Audio-Visual Facility, c/o 204-12. Telephoned requests cannot be honored.

Hands off, please!

Whoever is helping himself to the Public Affairs Office's "Chronicle" newspaper (front Building 204) each morning is asked to "Please stop!" The Public Affairs Office subscribes strictly for business reasons and not for pleasure reading; clippings are taken daily from the local paper concerning NASA/Ames related articles, etc. The missing newspapers only delay the work day.

Thank you for your cooperation... please?!?!?

Want ads

Transportation

FOR SALE

68 El Camino, good condition, 396 engine, 4 speed, best offer. Don Wrightnour, 738-1892.

66 Ford Cortina. Best offer over \$525. Call "Bud" before 8:00 p.m. at 736-7984.

69 Mustang Mach I, 428 CJ, 4 spd, PB, PS, new parts, 49K miles, exc. cond. \$1450 or offer. 964-9808.

SHELBY GT500, 67 body plus new Ford 427 racing engine, headers, extras, \$1500 or best offer. 694-9808 after 6 p.m.

66 Chevrolet S.S. 327 engine, A/T, P/S, new tires, low mileage. Best offer. Call 328-7946.

66 CHEV. 1/2 Ton Pickup, new engine, trans. tires & battery. \$500. Call 353-1879.

Housing

New 3 Bedroom, 2 Bath Chalet, AEK, Fireplace & Wood. Weekend - \$85; Week - \$160. Call 257-3186. SOUTH TAHOE

FOR RENT:

Cabin, So. Lake Tahoe, near casinos & beaches, sleeps 10, for reservations call 274-4285.

CABIN RENTAL - SOUTH TAHOE, 10 min. from Heavenly Valley; 2 bedroom & dorm, 2 bath; w/w carpet, central heating & fireplace. Sinnott 225-8043.

Townhouse at Aptos Seascapes. Vacation only a few gallons away. 3 bedrooms, 2 1/2 baths, bar, fireplace. Short walk to secluded beach. Golf and tennis nearby. Available by week or weekend. Winter rates until May 15. 323-2375

Airborne Science

(Continued from Page 1) observatory.

The C-141 AIRO is now ready for research with its 36" infrared telescope aboard.

In discussing the operation of the aircraft Cameron stated, "Twenty-six separate research programs have been approved for participation aboard the C-141 AIRO. Eighteen are from universities; five are from NASA or other government agencies and three are from foreign countries. This group is referred to as the "Initial User Group."

The project people plan to fly experimenters aboard the C-141 for at least the next 15 years. The entire program is under the auspices of the Office of Physics and Astronomy from NASA Headquarters (Code SG) under the Office of Space Science.

Miscellaneous

FOR SALE:

SHELTIE PUPS, male, sable, AKC, 493-9391.

Bicycles-3-speed 20" girls, 1-speed 20" girls, and 3-speed 26" boys. Phone 296-8594.

Two hamsters with deluxe cages. Reasonable. 739-4443.

DINETTE SET, formica table top with one expansion piece, 6 chairs with naugahyde seats, \$25, telephone 259-6069.

(4) Oak Hill Memorial grave sites, with perpetual care, call 225-4065.

6 rolls of 80 lb. roofing paper at wholesale cost, \$6.30/roll. Also free advice and plug of tar with the lot. Call 252-8609.

SAILORS! 26-foot Thunderbird sailboat, new motor, good shape, \$4,000. Call Larry King, 738-4166.

SAILBOAT - Racing FJ, fully rigged with trailer, \$1500 value for \$995. 268-6910.

RIDE NEEDED:

Car pool, vicinity of Roeder and Monterey Road, San Jose; call Pam Gaines 578-0337 or ext. 6440.

WANTED: Car pool to Ames from Bernardo-Remington (Sunnyvale) area. Call 739-4443, ext. 5537.

Want Ride In Car Pool:

Vicinity of Cottle and Monterey Rds. (near IBM). 7:30 shift (work 965-5473, home 227-8517).

Crew for Int. 470 racing sailboat. Sailing experience preferred but not necessary. Must weigh between 135 and 160 lb. height optional. 732-7628 eves.

"Hello" from Texas

Hello to all our old friends at Ames! We are presently tied up in Port Arthur, Texas, which is near Orange, Texas and the Louisiana line. We're taking care of some long neglected maintenance.

We'll move on to Florida later but don't know just when.

Jack and Charlotte Clementson

Thank you

"We would like to thank our many friends for their prayers and good wishes for our son Paul during his recent illness. The concern shown by so many of you has helped give us strength at a time when we need it."

Gene and May Rosen