the astrogram

VOLUME XIV
NUMBER 6
January 6, 1972

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

CHRISTMAS CAME EARLY . . . for these Ames employees who received invention award checks at a ceremony in mid-December from the Director, Dr. Hans Mark (left), shown congratulating Elliott M. Katzen, Technical Assistant to the Director of Astronautics. Other recipients are (from r to l) Richard M. Westbrook and Thomas B. Fryer, Electronic Instrument Development Branch; and Robert D. Lee, Avionics Research Branch. Not pictured is John Dimeff, Assistant Director for Advanced Instrumentation, Research Support Directorate.

Invention Awards To Ames Employees

The creative efforts of several Ames employees were recognized recently by the NASA Inventions and Contributions Board with monetary awards totalling $700.

John Dimeff, Assistant Director for Advanced Instrumentation, Research Support Directorate, received a $400 award for an invention entitled "Nondispersive Gas Analyzing Method and Apparatus." The instrument provides a highly accurate and sensitive instrument which analyzes a complex gas sample to determine whether or not it contains a particular gas, and further, it determines the percentage of that gas in the sample.

A telemetry-actuated switch which may be used in environments where long life and inaccessibility are critical factors, earned a $100 award for the inventor, Robert D. Lee of the Avionics Research Branch. The primary novelty of the invention lies in the fact that the switching network is wholly passive when turned "Off", that is, non-conducting, thus no standby power is required. Since no power drain is imposed on the battery power supply, the switch may be used in remote installations such as space vehicles to initiate transmission by telemetry of various values or functions being monitored.

Another switch device, invented by Thomas B. Fryer, Assistant Chief of the Electronic Instrument Development Branch, was also awarded $100. This invention is particularly related to solid state electronic switching circuits which may be activiated from a remote point. It has primary applicability, because of small size and zero or low standby power characteristics, in biotelemetry systems which may be totally implanted in animals for instance, to effect monitoring of selected animal functions, or in hidden burglar alarms, and the like.

An award of $150 was shared by Elliott D. Katzen, Technical Assistant to the Ames Director of Astronautics, with Raymond K. Burns and Lloyd I. Shure of Lewis Research Center, for their invention of "A Protected Isotope Heat Source". The inventors were concerned with designing a protective container which would protect a radioactive isotope capsule from destruction during atmospheric reentry, yet would allow the capsule to transmit heat to a utilization source in a space vehicle. This is accom-

(Continued on Page 2)

DR. CHARLES SONETT PROPOSES THEORY

Early Solar System History

Ames research scientists have traced the history of the early solar system and found evidence for a series of cataclysmic occurances which may have shaped today's Sun and planets.

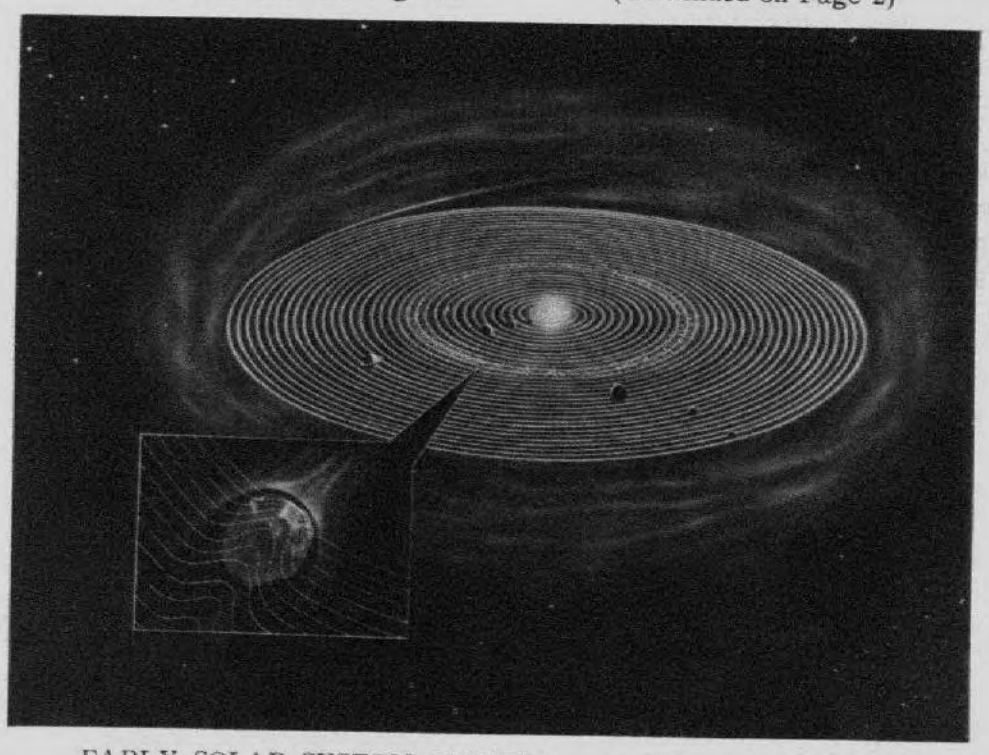
The researchers propose that during a period some 4.6 billion years ago, the Sun may have been spinning 200 times faster than it is today. This spin rate would have been one solar rotation every three hours, instead of the present one rotation every 27 days.

Dr. Charles P. Sonett, Ames Deputy Director of Astronautics heads the Ames group working on the early solar system events. Other researchers in the group were Dr. David S. Colburn of the Center's Space Physics Branch, and Dr. Kenneth Schwartz of American Nucleonics Corporation in Woodland Hills, Calif.

It is believed that the high rotation rate and other mechanisms typical of newly-formed suns have forced a huge flow of electrified gases out from the Sun - causing it to lose an estimated one third of its original mass in only a few million years. This outflow of gases would have stripped away the primordial atmospheres of the inner planets: Mercury, the Earth, and Mars. The flow of electrified gases could have completely melted Mercury and portions of the Moon. Complete melting almost certainly could have occurred in small bodies with diameters of about 100 miles or less, such as most of the asteroids.

The melting would have resulted from heating by electrical induction on an enormous scale. The flow of electrified gases would have carried the solar magnetic field along with it out from the Sun. The field would have rotated rapidly with the Sun,

(Continued on Page 2)



EARLY SOLAR SYSTEM EVENTS . . . as researched by Ames scientists indicate that the Sun had a high spin rate, 200 times that of today's Sun, during its early development stages about 4.6 billion years ago.

This spin would have wound up the solar magnetic field as shown by the white spiral lines in this artist's concept. As the field lines moved through the Asteroids (shown in inset) and even through the Moon and Mercury, electric currents would have been induced something like a huge electric generator. This current flow would have caused melting due to heating much like that in an electric stove element. Mineralogical studies of meteorites have shown that these rocks from the Asteroid Belt were melted at about the right time, 4.6 billion years ago, to support the theory.

Solar System History

(CONTINUED from Page 1)

and passed continuously through the planets and asteroids.

GENERATOR

This would have been like a gigantic electric generator running for a million years. As currents flowed through the planets, electrical resistance would have produced continuous heating by the same process that causes an electric stove element to heat.

Evidence for these early solar system events comes from melting histories of meteorites recovered on Earth, and from a class of very young stars, known as T-Tauri stars, according to Dr. Sonett.

Many scientists agree that the interstellar gas cloud which produced the solar system probably formed about five billion years ago. By about 4.6 billion years ago, gravity is believed to have compressed the cloud tightly enough to form the primordial earth, the early Sun, and the other planets - as well as the asteroids, the belt of rock fragments circling the Sun between the orbits of Mars and Jupiter.

The first indications of an early high-spin Sun came from meteorites. Tracking of incoming meteor trajectories has established that most meteorites probably originate in the Asteroid Belt.

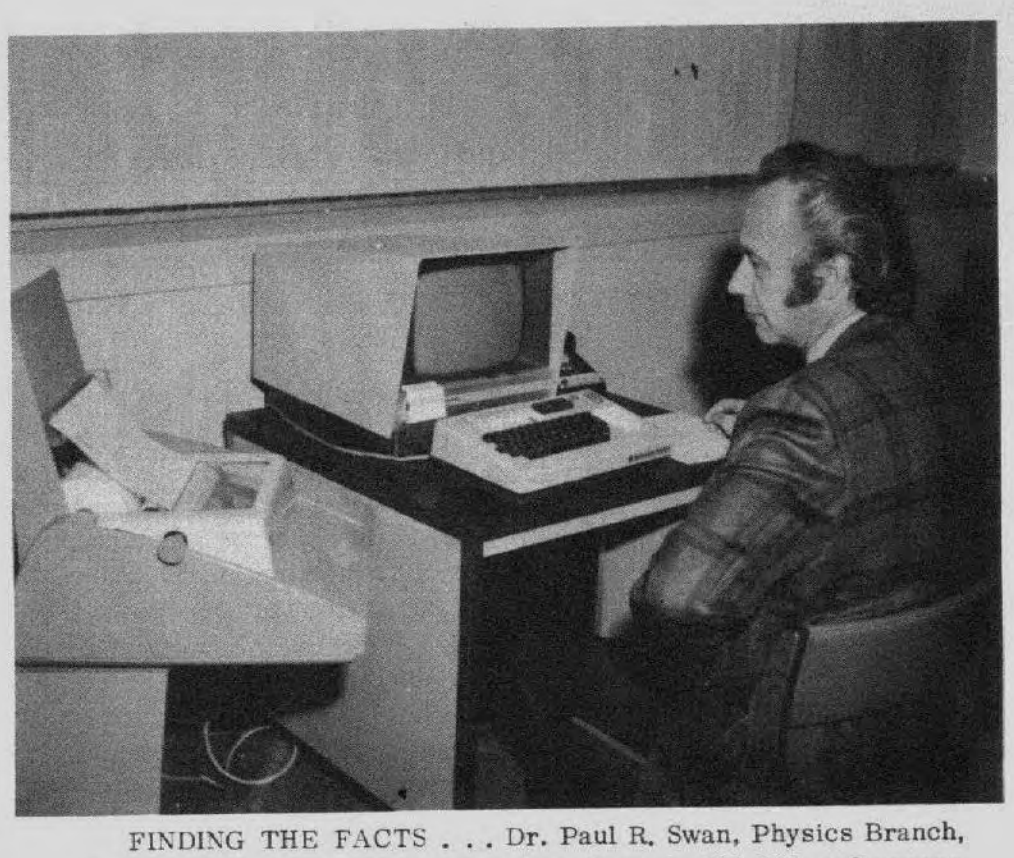
A key point is that other meteorites have no melting history at all and appear to be made of rock produced by gravitational collapse of the original solar system gas and dust cloud. However, difficulties with this concept are raised by distribution of isotopes in today's solar system, and by other factors.

These difficulties led the Ames team to examine the T-Tauri stars. These stars are rapidly losing mass, are shrouded in clouds of gas and dust, and are thought by some scientists to be examples of the early development of stars.

The Ames scientists suggest that the Sun was a T-Tauri star 4.6 billion years ago before it began following the main sequence of development usual for stars.

If the Sun rotated every three hours, 4.6 billion years ago, why isn't it doing the same thing today?

The Ames researchers believe it has gradually slowed due to magnetic braking. The gas molecules thrown out by the Sun are tied to the Sun by the solar magnetic field. The inertia of this material together with the interplanetary magnetic field would have slowed the Sun over 4.6 billion years.



FINDING THE FACTS . . . Dr. Paul R. Swan, Physics Branch, is pictured above as he searches through 780,000 references within a few seconds using the NASA/RECON. The NASA/RECON stores information from six technical sources in an IBM 360-50 computer in College Park, Maryland. This information is made available to Ames employees via the RECON, located in the Ames library.

RECON-A New Source of Knowledge

It looks like a small television set and typewriter, and is almost as easy to use. Next to it is a teletype machine. And, it can find the proverbial needle in the hay stack.

Within a few seconds the NASA/RECON can select a requested bit of information from its 800,000 references.

RECON's name is formed from the first two syllables of two words that describe its chief distinguishing feature: Remote Console. The console is remote from the store of information, a computer at the NASA Scientific and Technical Information Facility at College Park, Maryland, and yet in direct touch with it by leased phone lines.

AVAILABILITY

Each NASA installation now has a RECON linked on a time-sharing basis with the IBM 360-50 computer in Maryland. It is available to Ames employees in the library between 8 a.m. and 4:30 p.m. on a reservation basis.

Information contained in the RECON computer data bank consists of approximately 800,000 references, with 97,000 references added annually. Sources of these references are: STAR (NASA Scientific and Technical Aerospace Reports) "N" series Unclassified; STAR, Confidential "X" series, IAA (International Aerospace Abstracts prepared by AIAA). These three titles account for 70% of the entries in RECON. The balance of the references are NASA Technology Briefs, Reliability Abstracts, RTOP's Aerospace Medicine, and numerous other sources.

RECON is most frequently used at Ames for searches in the areas of aeronautics, aerodynamics, physics, and guidance and control.

APPOINTMENT

When an employee wants to use RECON for the first time he calls the library on extension 3312 and schedules an appointment for a training session. There is usually a group of two or three employees being trained each week.

Training sessions consist of a demonstration of the machines and an actual information search. According to George R. Evans, Library Branch, it takes the average person about one to two hours to learn how to operate RECON.

The first search made by an employee is usually a retrospective search. This means that the information stored on a given subject over the last ten years is requested. Subsequent searches on that same subject would thoroughly cover information stored within the last two years or call for a complete change of direction, which results in another retrospective search.

After an employee has learned to operate RECON he is allowed to use it alone. A trained specialist in the workings of RECON is always on hand to assist if there is a problem.

Ames Technical Paper Recognized

A technical paper by Ames researchers Ronald M. Gerdes, Flight Operation Branch, and Charles S. Hynes, Flight and Systems Research Branch, has been selected as the winning paper presented during the Handling Qualities Technical Session of the 27th Annual National Forum of the American Helicopter Society held last year in Wash., D.C.

The paper, entitled "Factors Affecting Handling Qualities of a Lift-Fan Aircraft During Steep Terminal Area Approaches", was presented at the Forum by Mr. Gerdes. It was recently submitted for publication in the "Journal of the American Helicopter Society."

Invention Awards

(CONTINUED from Page 1)

plished by the use of an insulating layer between the isotope capsule and the front face of its container. The capsule center of gravity is positioned toward the front of the container and the container itself is aerodynamically shaped so that it has a single trim altitude during reentry and the heat transfer from the front face of the container to the capsule is minimized.

An invention which relates generally to electronic oscillator circuitry and more particularly to a novel voltage-controlled RC oscillator which may be used in micropower telemetry amplications, was awarded $50. Richard M. Westbrook, Electronic Instrument Development Branch, and former Ames employee, William J. Kerwin, were co-inventors of this work entitled "A Constant Amplitude vs. Frequency Two Phase Sinusoidal RC Oscillator."

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

Apollo 16 Lift-Off Set for March 17

Apollo 16 Astronauts John W. Young, Thomas K. Mattingly II, and Charles M. Duke, are set for liftoff from Kennedy Space Center at 10:03 PST March 17, 1972, with the area just northwest of Crater Descartes as the lunar landing site.

It is expected that with the Apollo 16 exploration of the central lunar highlands northwest of Descartes more new clues will be uncovered to help close the gaps in man's knowledge and understanding of the creation and evolution of life and our solar system.

The astronauts are tentatively scheduled to begin the first of three scientific expeditions on the Moon at about 6:18 p.m. PST, March 21, four hours after lunar touchdown.

The planned splashdown point is about 9 degrees South Latitude and 169.5 degrees West Longitude in the Pacific Ocean at 3:14 p.m. CST, March 29. Total mission duration is 291 hours and 11 minutes.

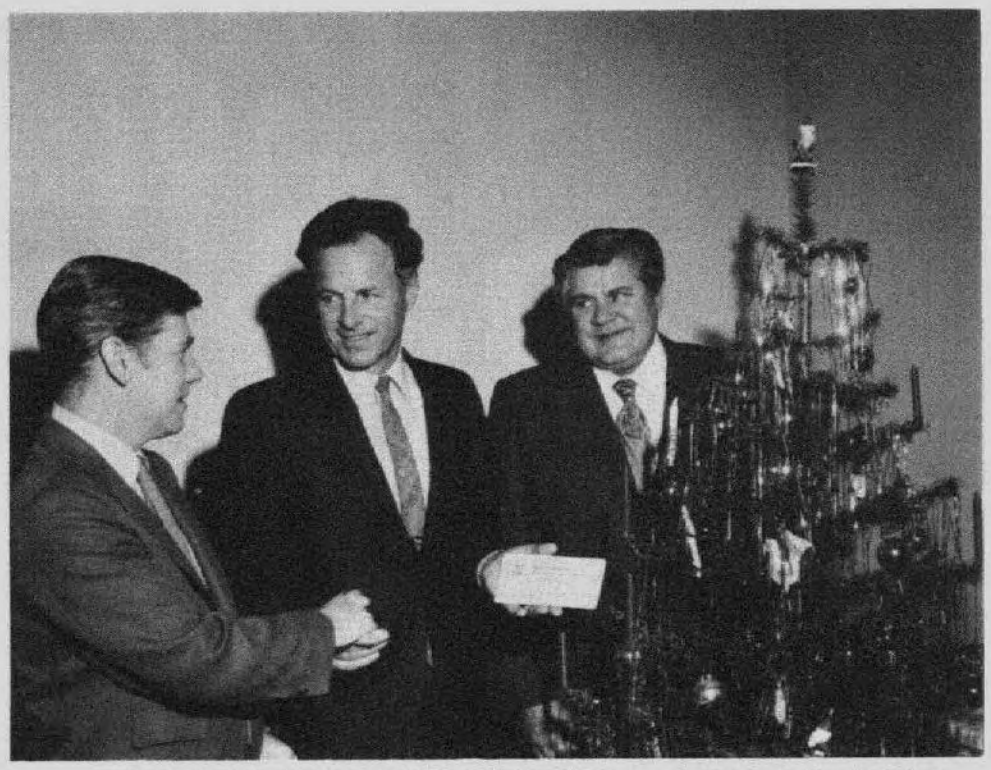
Ames on TV "Bold Ones" Jan. 23

Check the "TV Guide" published the week of January 23 for a feature on the Bold Ones' episode "Short Flight to a Distant Star." The TV Show depicting Ames personnel and the Five-Degree-of Freedom Motion Simulator is an actual case study which will be aired Sunday night, January 23, at 10 p.m., KRON TV, Channel 4.

EXHIBIT

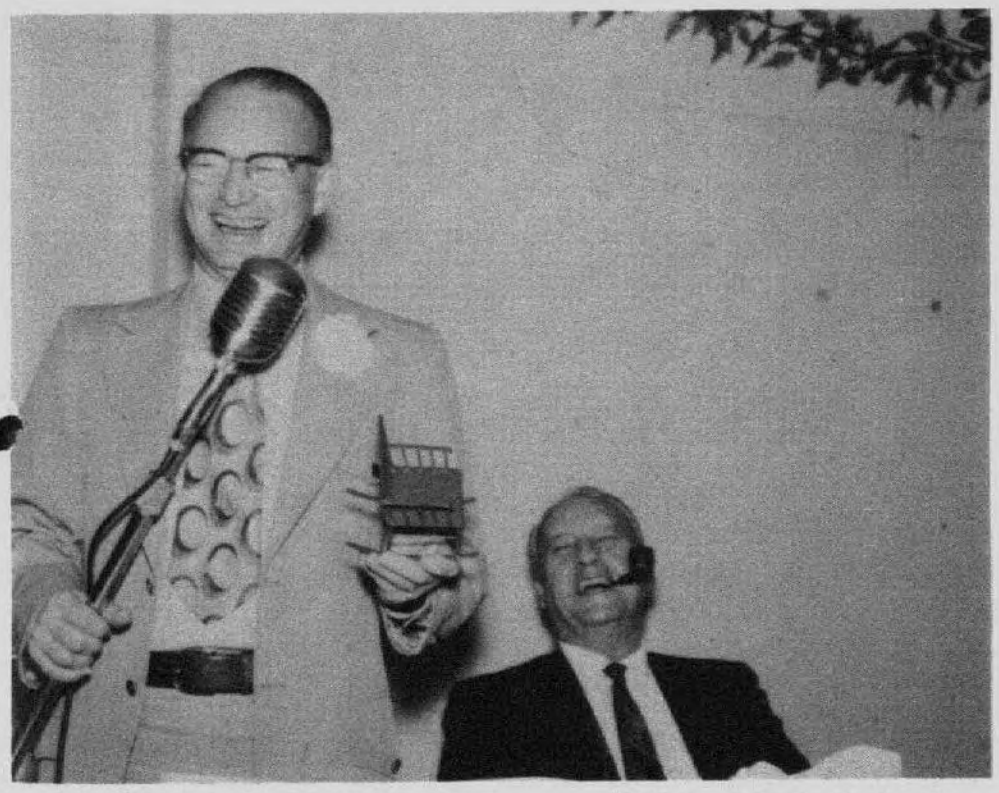
The week prior to the telecast an exhibit on the subject of the script will be loacted in the Ames Cafeteria. The situation involves a robbery victim with a bullet in his brain who was brought to the Center by his doctors for treatment in the simulator as a "last hope" measure to save the man's life. The story has a happy ending and the victim is still alive and well today.

Remember the date: January 23!



MONEY DOESN'T GROW ON TREES . . . but when the holiday spirit prevails there is no telling what might be found under the Christmas tree. For a surprised Curt A. Holzhauser (center) of the Advanced VTOL Project Office, it was a NASA Special Achievement Award check and letter of commendation signed by the Ames Director, Dr. Hans Mark, in recognition of his superior work performance during the past year. In addition to his normal VTOL Project Office duties, Mr. Holzhauser prepared and presented three formal papers at NASA and International Conferences, prepared a NASA TN on a VTOL aircraft, and is presently managing the Lift Fan V/STOL Aircraft Program for Wallace Deckert who received a Dryden Fellowship for a year of study at MIT.

The NASA award was actually presented to Mr. Holzhauser by Dr. Leonard Roberts (left), Director of Aeronautics and Flight Systems, at a ceremony attended by Woodrow L. Cook, (right), Chief of the V/STOL Projects Office.



THAT OL' ROCKING CHAIR . . . held by Dale K. Bonham, former chief of the Metals Fabrication Branch, was cause for much merriment during the recent retirement dinner party in his honor. However, he assured his many friends who came to wish him well that it did not portend his future activity. Among his interests are boating and fishing and a gift of a Lawrence fish locator should spell success for any fisherman -- Dale doesn't plan to be the exception. During his more than 30 years at Ames Dale worked in the structural fabrication field. His duties and responsibilities were supervisory for more than twenty years and included project leader, group leader, foreman, assistant branch chief, and in 1966 he was named to the position of branch chief, from which he retired early last month. Pictured enjoying the rocking chair joke with the guest of honor is Frank Lawrence (right), Technical Assistant to the Director of Research Support, who declared it to be a "great" retirement party. According to Dale, one of the highlights for him was a chance to visit with the many Ames retirees who were on hand to extend their good wishes.

SPACE BENEFITS? HERE'S ANOTHER ONE

NASA Develops New Eye Surgery Device

A new instrument for eye surgery that may greatly simplify the removal of cataracts--an operation which many people face--has been developed by NASA researchers working with Dr. William J. McGannon, a prominent ophthalmologist in Cleveland, Ohio.

The small hand-held instrument uses a combination of high frequency vibrations with a small pumping mechanism to liquify and remove the cataract and lens material. It has been successfully tested on the eyes of animals.

Dr. John C. Evvard, Donald J. Vargo, John Pavlik, and Frank Kuchta of Lewis Research Center developed the instrument in a cooperative program with Dr. McGannon. Patent procedures by NASA are underway.

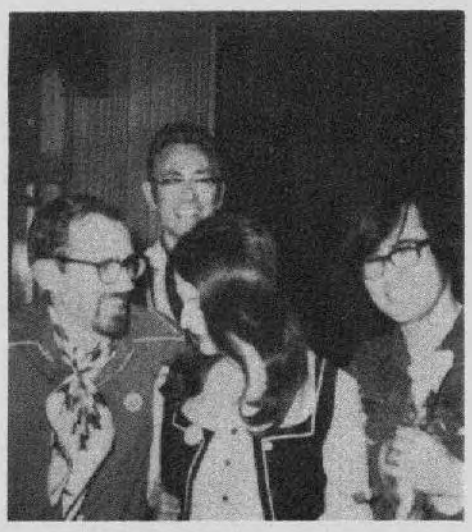
The new instrument, about the size of an electric toothbrush, makes only a small puncture in the eye and would minimize the problem of stitching in most cases. "The purpose of the new instrument is to reduce the operating time and the convalescent period of the patient," Dr. McGannon said.

He sees a world-wide application of the technique once it has been perfected for humans. He explained that practically everyone over age 65 has some opacification of the lens, and the problem is particularly severe in countries where medical treatment is not accessible.

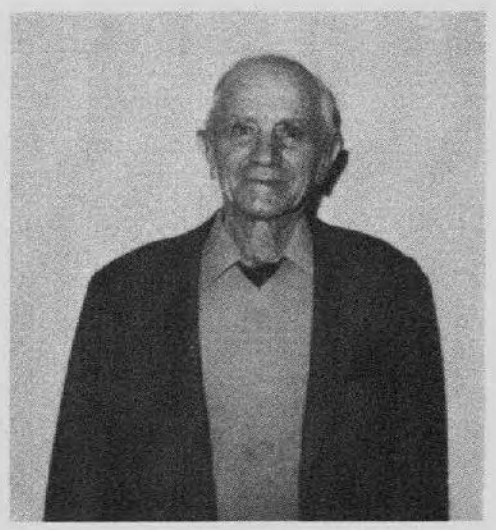
Chinese Dinner

A gourmet Chinese banquet will be served at the Golden Pavilion in Los Altos on Friday, January 28. No host cocktails at 6:45 p.m. with dinner at 7:45; $5.50 per person includes tax and tip. Call Guy Wong, ext. 2471, for reservations. Cut-off for payment or refund is January 26.

Ames Airings . . . by Jeanne Richardson



COMPLETELY MOD . . . . WAYNE HATHAWAY (right), Computer Systems, and his wife, Brenda (center), were chosen the most mod couple at the Computation Division Christmas party. JIM JESKE (left) Programming, was chosen second modest. BILL CRAWFORD (background), also of Programming, coordinated all the party arrangements.



AMES' OCTOGENARIAN . . . ATTILIO MONTEROSTELLI (above) was a special guest at the Model and Instrument Machining Branch Christmas Luncheon. Attilio, now 82, retired from Ames in 1959. He was one of 25 retirees invited to the branch's Christmas celebration.

Two division Christmas parties stood out as stars of the holiday season. The Computation Division threw an elegant bash at the Villa Felice and the Model and Instrument Machining Branch put on a great luncheon party in building 220.

The Computation Division's party featured a contest to determine the most and least mod couple there, funny pins, a dance band, great food and lots to drink. WAYNE and BRENDA HATHAWAY won a bottle of Cold Duck as the modest couple. JIM and BETTY JESKE were second modest.

Chosen least mod at the party were GRACE and RICHARD PFEIFFER. Second to least were JOHN and SALLY HUMBERT.

BILL and PAULINE CRAWFORD organized the party and chose the pins which were distributed at the door.

The Model and Instrument Machining Branch asked 25 retirees to come back for a day and help them celebrate Christmas. From all reports the luncheon, which was prepared and served by shop personnel was delicious.

Below is a list of the retirees who came back for the party;

HANK ATTI, ROY MINNICK, CHARLES NEAVES, STAN MAJESKI, TOM TASSI, BOB VAN SILFHOUT, JIM JONES, TED BAUGHMAN, JIM NELSON, JOHN ERWIN, CHARLES FINELY, MALCOLM ALBERES, MORRIS HUFF EDWARD DUGGAN, HERBERT PANKRATZ, BOB SANCHEZ, OTTO ANHALT, TOM GAMBUCCI, DICK CARPENTER, VIC NORLING, ATTILIO MONTEROSTELLI, EUGENE DORVSKY, SIGMUND SWINCHY, and MARK DOTY.

I must apologize to CAL DODSON, Mechanical Services, and to CAL EDDELMAN, Electro-Systems Engineering. Cal Dodson wanted a horse for Christmas. But, it was Cal Eddelman who went down in the annals of Astrogram history as the man who asked Santa Claus for a horse which could run six furlongs in 1.09 flat. Sorry about that Cal.

CONGRATULATIONS!

BARBARA GERMAN, Classification, and her husband Richard are celebrating the arrival of their first born. Her name is Donna Lynn and she was born on Nov. 4 at 2:57 p.m. in the El Camino Hospital. She weighed in at 8 lb. 2 oz., and measured 19".

APOLLO 16 EMBLEM . . . The Apollo 16 crew patch is dominated by an eagle perched atop a red, white and blue shield superimposed on a lunar scene, surrounded by a blue circle of 16 stars with the crew's surnames completing the bottom arc of the circle. Across the face of the shield is a gold symbol of flight outlined in blue, similar to that on the NASA agency seal and insignia. The design was created by a NASA artist from ideas submitted by the three crewmen: Astronauts John W. Young, commander; Thomas K. Mattingly, II, command module pilot; and Charles M. Duke, Jr., lunar module pilot.

GOLF

by Kay Bruck

The Ames Golf Club schedule for 1972 has been completed and reads as follows:

Feb. 5, San Jose Muni; Mar. 4, Las Positas; Apr. 1, Santa Teresa; Aug. 12, Aptos; Sept. 16, DeLaveaga; Oct. 14, Pleasant Hills; Nov. 4, Riverside; Dec. 2, Laguna Seca.

There will be two special tournaments during the year: Calero Hills, June 17 and a weekend tournament being planned for fall.

All Ames personnel and contractor personnel assigned to Ames, interested in becoming members of the Ames Golf Club may do so by contacting Clark White, Treasurer, ext. 3132, MS 210-9. Initiation fee is $2 and the annual dues are $4.

Ames Golf Club members and potential members are requested to pay their membership dues promptly.

Sport and Boat Show

Ames employees are invited to attend the 30th Annual San Francisco Sports and Boat Show at the Cow Palace January 7 - 16. This year the NASA-Ames Day is Sunday, January 16 from 11 a.m. to 7 p.m. Reduced rate coupons for that day are valued at $1 off the regular $2 admission and are available from Peggy Larson, Room 107, Bldg. 240, or at the ARA counter located at the east end of the Ames Cafeteria.

Ski Trip

SKI SUN VALLEY

Come with me, Bob Stroub, on a Sun Valley SKI HAPPENING, Feb. 5 through 12. Sun Valley, The place where warm and congenial people make skiing, learning-to-ski and apres skiing a fantastic experience to remember. Call me for details at ext. 2442. Transportation, lodging and lifts for $230.

WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in writing to The Astrogram, N 241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

AUTOMOBILES

For Sale-1963 Chev. Impala, 4-dr. hd. top, runs well, 70,000 miles, orig. owner. $400, 257-4110.

For Sale-1968 Pontiac Le Mans, P/S, R/H, practically new tires, very good condition all around, $1,300. Call 266-0251.

HOUSING

For Sale-Mountain Property, 4000 ft. elevation. New road and pad for cabin. Close to beautiful Highway 88 above Jackson, Peddler Hill and Silver Basin Ski Resorts. One acre $4000 or all 2 1/2 for $9000. Call 732-9441 after 5:30 p.m.

MISCELLANEOUS

For Sale-Siesta shell camper, 36" high, insulated and lined, two dome lights, overhead cabinets, fits 8' P.U. bed; $325. Also two Corvair bucket seats, red, $25. V.J. HERREN, HOME ph. 225-4065.

For Sale-Baby carriage, clean and in good condition, convertible to car bed, $20, call 961-3348.

For Sale-Conn Caprice organ, excellent condition. $495 or close offer. Yahama 60 motorcycle. Good first bike. $70. Call 365-1509.

For Sale-Sears Kenmore 700 Washer and Gas dryer, like new. Welbilt gas range. All coppertone. Also w/w carpeting. $400 all. 591-4777.

For Sale-Spanish guitar (made in Spain) with case, $75. Miles Murphy, 921-0902.

For Sale-Johnson 75 horse power outboard motor with Morris Single lever control. New condition. Call Reid-Selth, 377-5539.

For Sale-1966 Pontac Tempest 2-door coupe. Needs some mechanical work. Excellent buy for do-it-yourselfer. Call Brad Wilson, 262-4555.

the astrogram

VOLUME XIV
NUMBER 7
January 20, 1972

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

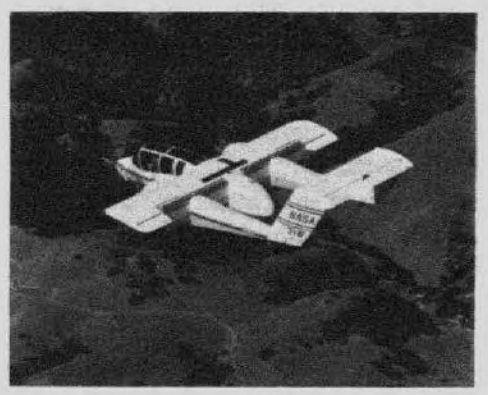
APOLLO 15 ASTRONAUT . . . James B. Irwin (left), Lunar Module Pilot for the 12-day Apollo 15 mission last July, stopped at Ames last week enroute to a speaking engagement in San Jose. While in the area he took the opportunity to present a photograph taken on the Moon and autographed by fellow Apollo 15 Astronauts David R. Scott and Alfred M. Worden. C.A. Syvertson (right), Ames Deputy Director, accepted the picture in behalf of the Director, Dr. Hans Mark.

AMES CONVAIR 990 LEAVES FOR TRINIDAD . . . to explore the clouds in the Intertropical Convergence Zone. Pictured above preparing the aircraft for the research flight are, Matthew M. Cucuzza (driving the fork lift), Ames' Metals Fabrication Branch; Jyrki Hameen-Antilla (standing at top of airstairs), University of Arizona; Dr. David L. Coffeen (lower right), University of Arizona. The scientific expedition, managed by Dr. Earl V. Peterson, Airborne Sciences Office, left Ames January 20 and will return January 30. The expedition will study various characteristics of clouds to the east of Trinidad in the Intertropical Convergence Zone. The northern hemisphere weather meets the band of equatorial weather within this zone. The purpose of the research is to define experiments for the Earth Orbiting Satellite to be launched in the summer of 1972.

Ames Accomplishments '71

With the beginning of each new year it is rewarding to look back at the continued progress of the scientific research and technical efforts at Ames Research Center. A few of the accomplishments are compiled here.

•The first aircraft to successfully demonstrate the rotating-cylinder-flap high lift concept in actual flight, the NASA/Army OV-10 aircraft, was initially tested last July.



OV-10 AIRCRAFT

•Modification of the C-8A de Haviland Buffalo to the Augmentor Wing Jet STOL Research Aircraft by the Boeing Company is nearing completion. Pre-flight ground tests are planned this month (Jan.) with first flight anticipated in Feb. The objectives of the flight research are to prove the augmentor wing concept for aerodynamics, performance, and handling qualities at low speeds in the near terminal area. In addition the aircraft will provide a flying test bed for the development of a research avionics system for navigation, guidance and control of STOL aircraft (STOLAND).

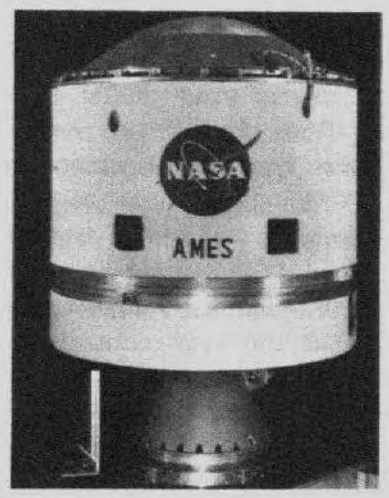
•Project responsibility for the QUESTOL aircraft was assigned to Ames. The objective of the QUESTOL Program is to provide a technology base from which environmentally acceptable, safe and economical fan-jet STOL Transport systems may be developed.

•A contract was awarded to American Airlines for an in-flight evaluation of the feasibility of performing two-segment noise abatement approaches using area navigation to provide the upper segment glide slope. Twenty-eight pilots representing the airlines, professional pilot associations, NASA, and the FAA participated. Further study is planned for 1972.

•An explosively-driven shock tube was used to perform tests for the first time with pressures and shock speeds that duplicate (and actually exceed) the entry conditions for a probe into the atmosphere of the planet Jupiter. These tests, which utilize the presumed Jovian atmospheric gas as the test gas, are providing important verification of theories used to predict heating rates to Jovian entry probes.

•A cooperative air pollution research program involving NASA scientists and California air pollution experts was initiated at Ames in July. A series of airborne investigations are being made in the San Francisco and Los Angeles air basins to measure the photochemical production and dispersion of pollutants in the atmosphere. Results of the airborne experiments will be combined with in-house laboratory studies.

•The Ames-managed PAET (Planetary Atmosphere Experiments Test) spacecraft was launched from Wallops Station on a Scout Vehicle June 20. A ballistic trajectory was flown, with the last two stages of the launch vehicle accelerating the spacecraft earthward to a velocity of 21,650 feet per second upon entry into the Earth's atmosphere. The successful flight was the culmination of more than eight years of research conducted here at Ames on atmospheric measurements from entry probes.



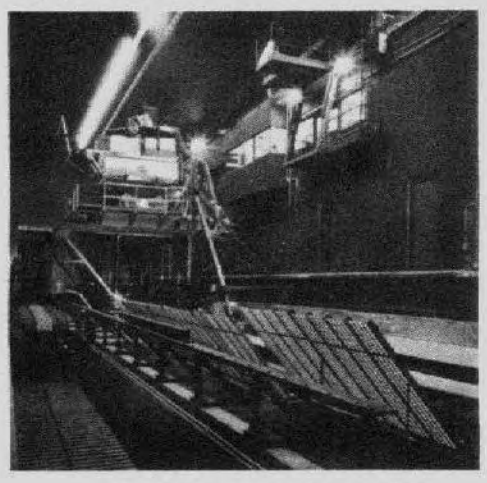
PAET SPACECRAFT

•The Flight Simulator for Advanced Aircraft was used for research projects involving STOL aircraft, Space Shuttle vehicle, military aircraft, and for continued

(Continued on Page 2)

Highlights of Ames Accomplishments for the Year 1971 (Continued from Page One)

international work on supersonic transport certification. Of particular interest was the reproduction of a jet transport training accident to aid the National Transportation Safety Board in determining the cause of the accident. As a result of the FSAA research a procedure was established whereby a similar situation could be averted in the future. Colaborative work between personnel in the 40-by-80- Foot Wind Tunnel and the FSAA made significant contributions to understanding the carrier landing problems of the F-14 aircraft.



FLIGHT SIMULATOR

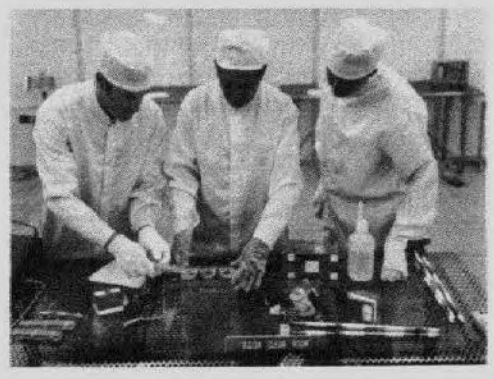
• In the area of transonic flow fields generalized relaxation techniques were extended to several two- and three-dimensional flow problems. Computer programs were developed for nonlifting bodies of revolution with arbitrary surface and free stream boundary conditions. In the supersonic flow fields area, computer programs employing the shock-capturing technique have been developed for the three-dimensional supersonic flow over delta wing body configurations being considered for the space shuttle orbiter.

• During 1971 a CO gasdynamic laser was developed, following an experimental demonstration that population inversions of anharmonic oscillators are produced in an expanding flow. This laser was the first new type to be discovered after the development of the initial gasdynamic laser which produced large amounts of continuous power.

• Two-dimensional computer simulations of the cryogenic flow in the Apollo 13 oxygen tank were carried out to study the effect of spacecraft rotation on the interaction between the density gradients and the acceleration field in a gravitationless environment. This interaction was found to produce mixing sufficient to reduce the possibility of pressure collapse without the use of stirring fans. By numerical simulation it was demonstrated that one of the contributory causes of the Apollo 13 mishap could be eliminated in subsequent missions.

• Non-nuclear survivability has been provided for the Navy's A-4 tactical fighter aircraft by the application of an Ames-developed lightweight fiber reinforced fire quenching foam plastic. Ames-developed intumescent coating systems are now in commercial production. They are applicable for fire protection in both commercial and military as well as for ballistic and missiles systems; also developed are new high temperature fire resistant transparent plastics derived from modified polycarbonates for aircraft safety windows.

• The Apollo 14 Lunar Portable Magnetometer (LSM), designed and built at Ames, was deployed on the lunar surface Feb. 6 at two locations 1 km apart. The field magnitude of 103 gamma at one site was over twice as high as measured at the Apollo 12 site and the large difference between measurements at the two Apollo 14 sites indicated that the structure of the local field is disrupted, probably by meteoritic impacts. The Apollo 15 LSM was deployed on July 31 continuing the investigation of the time varying lunar magnetic fields being carried out by Ames scientists.



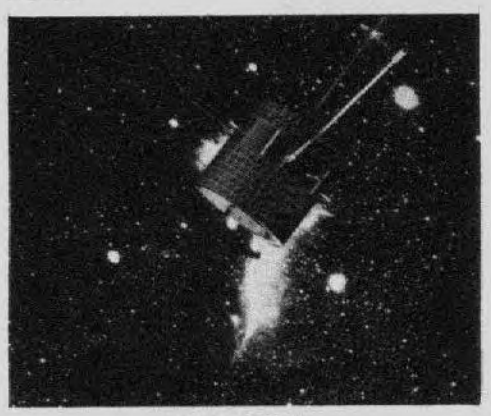
PORTABLE MAGNETOMETER

• Improved frictional material with outstanding wear resistance, potentially useful for aircraft and automotive brakes, has been developed from modified polyphenylene composites.

• Ames completed and delivered to North American Rockwell the pocket mouse-vinegar gnat circadian rythm flight experiment SO 71/72. That company will arrange for integration and test of the experiment with Skylab A.

• A heat pipe flight experiment for spacecraft environmental control has been developed by Ames. The flight units have been delivered to Goddard Space Flight Center for installation on OAO-C where they will provide tight thermal control for the on-board processor.

• Pioneer spacecraft 6 through 9 continue to provide data on solar radiation. Pioneer 6 was launched in December 1965 and has completed its sixth successful year in solar orbit.



PIONEER

• Following the discovery of organic compounds of biological importance in the Murchison meteorite, analyses conducted at Ames have been extended to the Murray, Orgueil, and Allende meteorites. These investigations have revealed the presence of pyrimidines in all four samples. Compounds of this type are components of the cellular nucleic acids.

• An aerobiology research program was initiated in 1971 to monitor the atmospheric content of Southern Corn Leaf Blight Spores. The Corn Blight Watch Program was a joint effort by NASA and the Department of Agriculture to detect the spread and severity of blight spores during the 1971 corn growing season using remote sensing techniques.

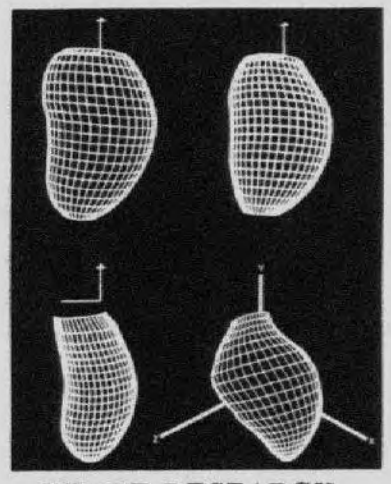
• A significant accomplishment in the field of biochemical endocrinology has been the isolation and characterization of enzymes, from various tissues of the body. They are important to "human ecology".

• Exoskeletal joint technology, originally developed for the Ames hard space suit program, is currently being utilized in a high performance master/slave manipulator system. The concept is also to be developed for use as an orthotic damping device and powered brace for the neurologically handicapped.

• After three years of design and development, Ames scientists have begun testing a high-g impact attenuating Integral Aircraft Passenger Seat.

• Ames researchers have developed a Visual Sensitivity Tester, a simply operated, accurate, and reliable device, which provides an indication of such visual disfunctions as glaucoma, abnormal scotoma, and para-central visual field loss. The system uses a modified super 8-mm movie projector and specially prepared films thereby making it possible for a relatively untrained medical technician to administer these vision tests.

• Scientists and doctors from Ames and Stanford University Medical Center have a new computer system under development which appears to be a major advance in the diagnosis of heart disease. The system projects a three-dimensional animated cartoon-like image of any desired chamber of the patient's heart, in lines of light on a computer display screen.



HEART RESEARCH

• Space Shuttle activities were many and varied: A major portion (approximately 6 percent) of Phase B wind tunnel tests in support of the shuttle contractors was performed at Ames primarily in the 6- by 6- foot and 3.5-foot Hypersonic Wind Tunnels; A Space Shuttle Aerothermodynamics Technology Conference was held at Ames in December with nearly 200 scientists participating; over $3 million was approved by Congress for the construction of a 60 megawatt Interaction Heating Facility; a Heterodyne-type gas sensor has been developed at Ames which indicates great promise for remotely sensing hazardous gases in the shuttle cabin.

• Major administrative appointments were: Louis H. Brennwald, Director of Administration; Merrill H. Mead, Deputy Director of Administration; and Dr. David L. Winter, Deputy Director of Life Sciences

• Honors and Awards: Donald E. Gault, Guggenheim Fellowship; Wallace H. Deckert, Dryden Fellowship; Alan E. Faye, Jr., Stanford-Sloan Fellowship; R.T. Jones, honorary doctorate; Dr. Stanley Ellis and Dr. John H. Wolfe, NASA Medal for Exceptional Scientific Achievement; Harry J. DeVoto, Jr., and C.A. Syvertson, NASA Medal for Exceptional Service; and Betty J. Baldwin, Top Ten Women of the Year Award.

Computer Application Meeting Jan.24-26

The family of the future may depend on a computer to solve such problems as menu planning and checkbook balancing. However, checkbooks may be obsolete by then. They will probably have been replaced by computerized credit cards. And, when a member of the family gets sick, his disease will probably be diagnosed and a treatment suggested by a computer.

At a 3-day conference to be held Jan. 24-26 at San Jose State College these and other computer applications will be explored. Entitled "Computer Communications, Cooperation or Confusion," the conference offers "A panorama of the data acquisition, teletransmission and remote computer processing fields."

An impressive list of experts will participate in five sessions called "Trends", "Applications", "Problems and Impairments," "Solution and Tools" and "Impact on Society and Education." Edgar M. Van Vleck, Ames' Space Utilization and Technology, will chair the session in "Applications."

Dr. Robert N. Linebarger, Computer Systems, is a member of the conference's Executive Committee and Publicity was coordinated by Bradford P. Gibbs, Communications Branch.

Co-sponsoring the conference are; San Francisco Peninsula Chapter ACM, San Francisco Communications Technology Group IEEE, Ames Research Center, Philco-Ford, Pacific Telephone and San Jose State College.

Conference fee is $20, or with IEEE or ACM membership card, $15. For more information contact Bradford Gibbs, extension 2001.

LIBRARY FACILITIES

RECON Also Located In Building 239

The NASA/RECON, a computer data bank to which all NASA installations are linked via phone lines, was described in the last issue of "The Astrogram." Only one Ames RECON (Remote Console) was mentioned in the article; the one located in the library. There is another RECON at Ames, located in the Life Sciences Library. Anyone wishing to use it should call extension 2141 for an appointment.

Credit Union To Hold Meeting

The Annual Meeting of the Moffett Field 'Employees' Credit Union will be held Friday, January 28, at 8 p.m. at the Old Plantation Restaurant on Bernardo and El Camino Real in Sunnyvale.

Election of officers as well as a review of the Credit Union's progress will immediately follow the dinner.

Board of Directors President John F. Pogue has stated that 1971 was a good year for the credit union. Many new records were established and assets soared to over $3.7 million. Loan volume for the year was $3.4 million. Since its organization in March 1957 the credit union has loaned over $15.7 to the members. Also voted was the transition from a part-time operation to a fully staffed credit union with the capability for full service to the growing membership.

STOL Engine Studies

NASA has issued requests for proposals to study new types of propulsion systems for short take-off and landing (STOL) aircraft.

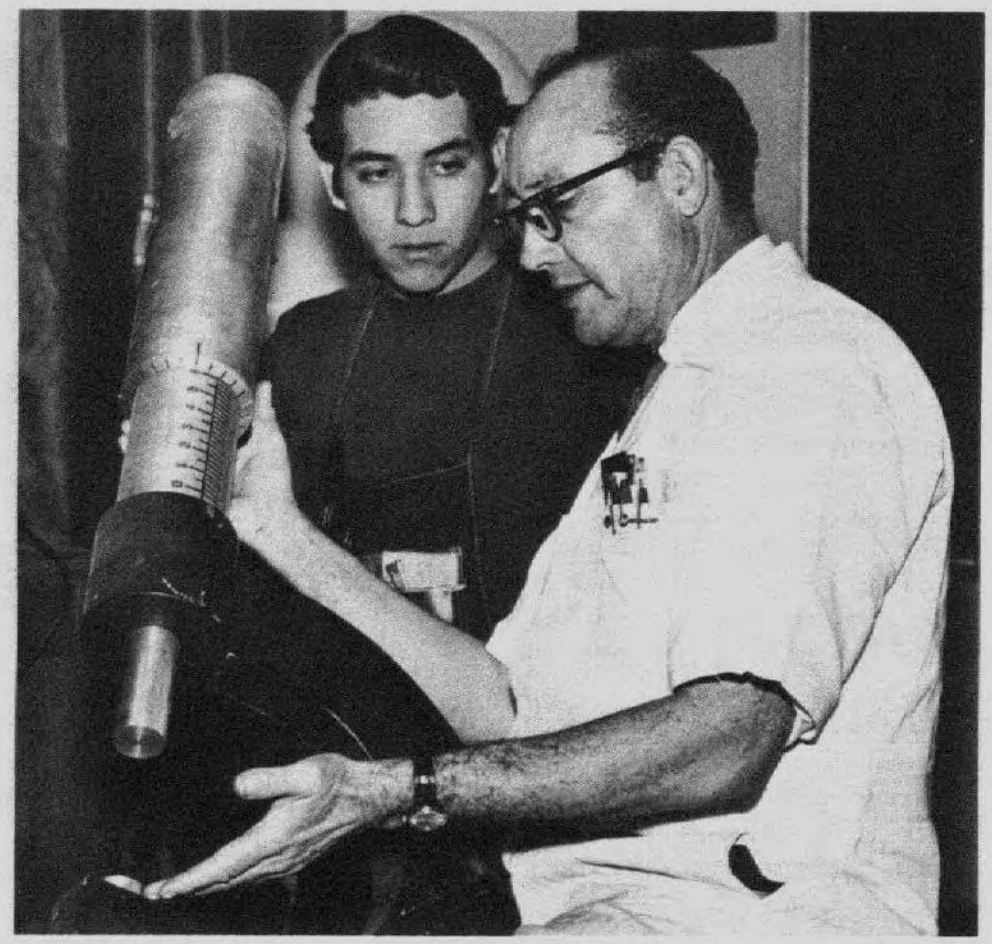
Two or more companies will be selected to conduct separate, six-month studies from the proposals which are due January 31, 1972.

Key requirements for STOL aircraft of the future are quiet and clean (low pollution) operation, goals which can be achieved only through advanced propulsion technology.

In the studies, prospective propulsion systems for STOL will be evaluated according to estimated noise and emissions levels as well as such factors as thrust performance, size and weight. Engine systems will be investigated for use with unique propulsive-lift concepts which employ jet engines to help produce the lift needed to take-off and land on short runways. Conventional take-off and landing aircraft rely upon aerodynamic lift alone to take off and land.

Based on these and other studies NASA plans to initiate the development of a quiet, clean STOL experimental engine. Requests for proposals for engine development are planned for issue in late 1972.

Lewis Research Center is responsible for project management of the experimental engine program.



NOW HE'S THE TEACHER . . . James Gabbard, Research Model Maker in Ames' Model and Instrument Machining Branch served an apprenticeship in model making at San Jose City College in 1948. Today, close to retirement from federal service, Jim is the teacher in the same classroom where he was once a pupil. According to Jim he is also using some of the same equipment to teach with that he used as a pupil. For this reason he is trying to arrange a loan of unused Ames equipment to the college.

He Teaches In the Classroom Where He Was Once A Pupil

Over the past several years James N. Gabbard has frequently worked as a leader or teacher for groups of youths. Last year, when instructors were sought for the De Anza-Foothill Work-Study Program Jim was a natural choice. He not only communicates well with groups of young piople, but is an expert model maker as well.

Shortly after he began teaching with the De Anza program, San Jose City College needed an instructor for its "Machine Tool Technology" course. Through a friend in the engineering department Jim was asked to fill the vacancy.

He accepted and is now teaching in the same classroom where he was once a pupil. In 1948 he took an apprenticeship in Model Making at the college.

Jim is now teaching at both De Anza and San Jose City colleges and working full-time at Ames. During a recent interview he said "I hope to retire soon and devote the next year and a half to teaching. Then my son will be in college and my wife and I will move to our farm in Oregon." Jim and his wife, Bonnie own ten acres of farm land in Oregon.

Wage Survey

The Mare Island Naval Shipyard, serving as the lead agency for the San Francisco Bay Area Local Wage Survey Committee, has been ordered to begin the Federal wage survey of private employers.

Although the Ames Center has not been officially notified, it is anticipated that the effective date of the new wage schedule resulting from this survey will be March 19. No retroactive pay has been authorized.

Elwood R. Leibfritz of the Ames Materials Processing Branch has been appointed to serve as a data collector with the survey committee.

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

Students May Take Part in Skylab

In 1973 high school students may be telling Skylab scientists what to do.

Through the Skylab Student Project 25 proposals by students or groups of students will be selected for experiments, demonstrations or activities to be performed by astronauts during Skylab missions. The project is designed to stimulate interest in science and technology by directly involving U.S. school students in grades nine through twelve.

More than 15,000 applications for participation in the Project have been requested of the National Science Teachers Association, which is managing the activity for NASA.

Deadline for the proposals to be submitted to the chairmen of one of the 12 regions established by the National Science Teachers Association is February 4, 1972. Regional winners will be judged by a national committee and 25 national selectees will be forwarded to NASA.

Final selection of the proposals which will actually fly on Skylab will be made from the national selectees by NASA on the basis of compatibility with Skylab requirements.

The 25 national selectees and their teachers will be invited to attend the Skylab Educational Conference and the presentation of awards to be held at the John F. Kennedy Space Center, Florida, at the time of the launch of Skylab. NASA will build the hardware, if any is needed, in consultation with the students.

Announcement of regional and national selectees will be made in April, 1972.

The Skylab will conduct scientific, technological and biomedical investigations from the vantage point of space. The first manned mission is scheduled to last for up to 28 days. The second and third Skylab missions will last for up to 56 days.

Official entry forms, rules and sample proposals may be obtained from: Mrs. Dorothy K. Culbert, National Science Teachers Association, 1201 16th Street, N.W., Washington, D.C. 20036.

The Civil Service Commission has announced that the open season for Federal Employees Health Benefits scheduled to end last December 31 has been extended through Jan. 31, 1972.

OLD JOGGERS NEVER TIRE . . . The senior (over 40) Joggernauts have been more active than the junior members recently. Pictured above after one of their frequent long distance races are; (l to r) Ted Passeau, Jim Woodruff, Laura Willoughby, Vito D'Aloia, Donn Kirk, and Dale Shute. Ted, Jim, Vito and Dale were members of the 7-man Joggernaut team that raced 72 miles around Lake Tahoe recently. Vito ran a twenty mile race in Sacramento Dec. 5 and the 26-mile Petaluma Marathon Dec. 12. Jim Woodruff got the year off to a running start with the midnight 5-mile Midnight Run at Foothill College on New Year's Eve. Dale Shute also ran the 26-mile Petaluma Marathon Dec. 12.

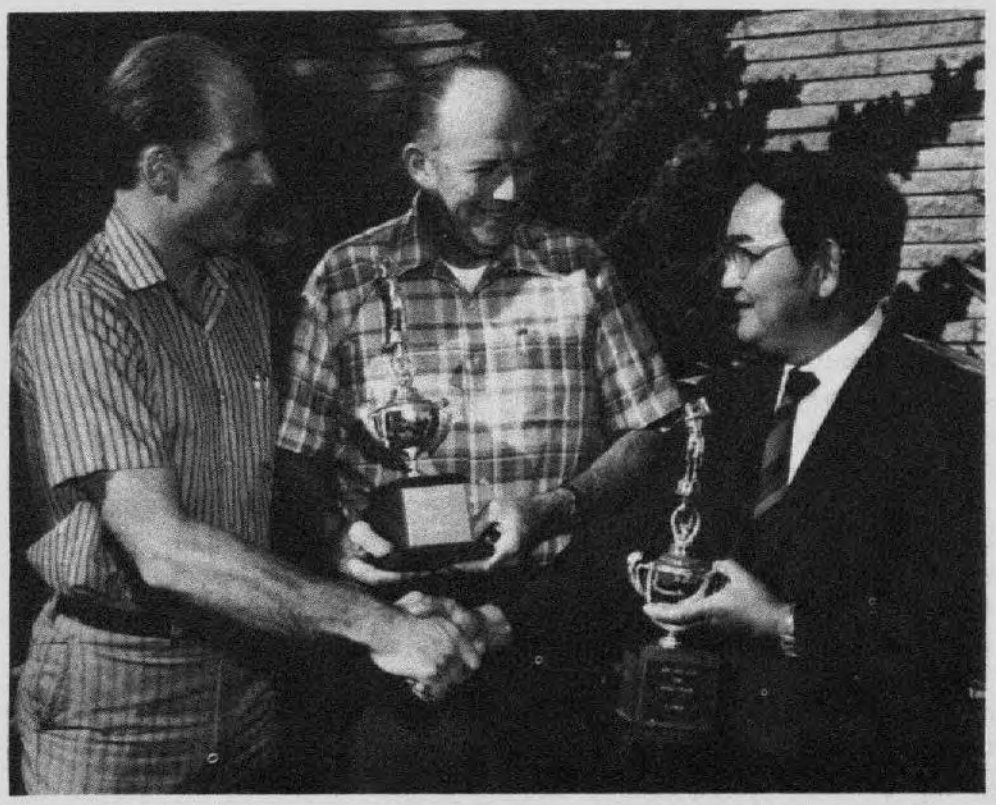
Summer Job Deadline

Young people seeking summer employment with the Federal government must file an application with the U.S. Civil Service Commission by Feb. 2.

Qualifying tests will be administered on March 11. For further information contact Beveraly Hawkins, extension 2021.

Chinese Dinner

A gourmet Chinese banquet will be served at the Golden Pavilion in Los Altos on Friday, January 28. No host cocktails at 6:45 p.m. with dinner at 7:45; $5.50 per person includes tax and tip. Call Guy Wong, ext. 2471, for reservations. Cut-off for payment or refund is January 26.



AMES GOLF CLUB PRESENTS ITS 1971 WINNERS . . . From left to right, Roger Hedlund, winner of the Club Championship title is pictured here congratulating Jim Nelan, winner of the Director's Cup and Vance Oyama winner of the Vardon Trophy.

WANT ADS

The Astrogram's ad section is provided as a personal, non-commercial service to Ames employees. Advertiser must be identified by name, extension and organization. The name may be left out of the ad but is needed for records. Ads must be submitted in writing to The Astrogram, N 241-4, by Thursday, a week before publication. The advertiser's home telephone number must be provided as a point of contact except in carpool notices.

AUTOMOBILES

For Sale-4' x 6' Stakeside trailer. Standard ball type hitch. $25. Call 327-1944

For Sale-1967 Chevelle 2-door sedan, auto trans., excellent condition, new shocks, brakes and tires. $850, 793-0722.

For Sale-1918 Buick 4-cyl. OHV engine, ser. no. 1075862. Mounted on Hudson-Essex frame with 1918 H.-E. radiator. Ran rip saw until four years ago, carefully stored since. $300 firm. Call E.A. Snetsinger, 326-1913.

For Sale-1970 Chevrolet 1/2 ton pick-up. 350 CID, 4-spd., heavy-duty springs, low mileage. $2600. 961-8239.

For Sale-Ford Galaxie 61, white, in good condition. $300. Phone 961-6835.

For Rent-A few spaces still available in ski rental group. Pleasant house located outside of Tahoe City. For information call L. Jahnke, 961-7157.

Broken leg and membership in ski cabin don't mix. Am offering one membership in 5-bedroom lodge. Near north end of Lake Tahoe, has fireplace, dishwasher, easy access from Highway 89. For more information, call Nancy at 867-2706.

MISCELLANEOUS

For Sale-Heath kit AJ-33A, AM/FM, multiplex tuner and twin HK-40 Harmon Kardon speakers, perfect condition. Best offer, 265-3869 after 6 p.m.

For Sale-Murray chain drive tricycle, $15. Murray chain drive tractor, $12. Both in excellent condition. Call John Ferandin, 327-7655.

For Sale-Hamilton Radio Corporation Model TCS-13, transmitter-receiver for short-range voice communications used in ships, motorboats, trucks. Invoice includes: 1 Transmitter, 1 Receiver, 1 Remote control box with loudspeader, key, 1 Transmitter power supply cable, 1 Receiver power supply cable, 1 Remote control cable, 1 A.C. Power Supply. Shipping weight about 330 lb. Transmitter still in original carton, receiver is operational. Original government cost nearly $1,000 - will sell complete for $75. 941-1506.

For Sale-Honda 90 SL, converted to dirt bike. Good condition. Motocross handlebars. Ideal for beginner. $200. 656-3889 after 7 p.m.

For Sale-Pool table, slate top, new balls, excellent condition $225. For more information call 257-5686 after 5 p.m.

NEEDED-Urgently needed, daily ride to and from vicinity of California and Rengstorff, 8 a.m. to 4:30 p.m. shift. Ext. 2694 or 2980.

For Sale-Child's skis (4'), wood with plastic base, bindings and poles. $12.50. Call 321-2380 evenings.

For Sale-Kona-Kai swim and racquet club membership. Santa Clara, phone 248-5640.

For Sale-Twin mattress, box spring (firm) and metal frame. Very good condition. $35. Phone 247-9219 after 6 p.m.

Washington's Birthday Ski Trip

The fourth annual Washington's Birthday Ski Trip will be Feb. 18 to 20. Everyone is welcome. A bus will leave Ames in the evening on Friday, Feb. 18 and return the evening of Feb. 20.

The cost is $49 for transportation, meals (except lunch), and $1.50 reduction on lift tickets.

For further information contact Bill Crawford at extension 2025. Reservations must be made before Jan. 23.