National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

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Swanson Receives Floyd Thompson Fellowship

Dr. Roy C. Swanson Jr., an aerospace technologist in the Theoretical Aerodynamics Branch, Transonic Aerodynamics Division, has been awarded the Floyd L. Thompson Fellowship for 1985-86 to study at Brown University in Providence, Rhode Island.

The Thompson Fellowship Program was established in 1977 to encourage the development of research potential among the Langley staff. The fellowship allows researchers who have demonstrated continued growth in research to spend up to 12 months at an educational or research institution. It is named in memory of Dr. Floyd L. Thompson, Langley Director from 1960 to 1968.

At Brown, Swanson will conduct research on numerical schemes for the three-dimensional Navier-Stokes equations, under the direction of Professor David Gottlieb, an internationally-known mathematician. Gottlieb, who will be on leave of absence from Tel Aviv University in Israel for the academic year, has conducted research in the principal features of the most widely used schemes (both explicit and implicit) for solving mixed hyperbolic-parabolic systems of partial differential equations, such as Navier-Stokes equations.

"The principal objective of my research is to investigate the numerical properties of existing and proposed schemes for solving the time-dependent, 3-D Navier-Stokes equations," Swanson explained. "Both the numerical and computational efficiency of these schemes will be evaluated. Then, efforts will be made to construct more efficient algorithms for solving the Navier-Stokes equations for flow over aerodynamic configurations."

In previous work, Swanson has investigated and applied both explicit and implicit numerical methods to the Navier-Stokes equations, both full and thin layer. At the present time, he is

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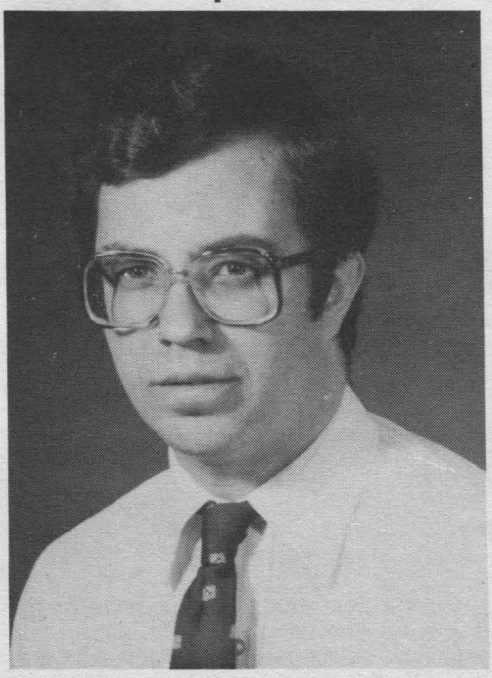

First Operational Spacelab Now in Orbit

The 51-B Space Shuttle mission, set for launch last Monday, April 29, began an era of routine flights for Spacelab, NASA's modular, reusable research facility developed by the European Space Agency.

Fifteen experiments are being conducted during the seven-day Spacelab 3 mission, including an investigation to provide a high-quality microgravity environment for delicate materials processing and fluid experiments.

Spacelab, developed specifically to be compatible with the Shuttle program, consists of various standardized parts including habitable modules, pallets and airlocks that can be assembled to fit the requirements of particular missions.

Spacelab 3 has a long habitable module, in which two scientists are working in a shirtsleeve environment, and an experiment support structure, a lightweight carrier that bridges the payload bay and holds experiments requiring direct exposure to space.

The lab is being operated from inside Orbiter

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WTKR Special on Langley Replayed

A series of television news reports on Langley research, broadcast on WTRK-TV, Channel 3, this week, will be replayed on the Langley Video Conference system during lunchtime next week. The program will be available in the cafeteria, the Visitor Center and the Activities Center.

Director's Comments

Open House Very Successful

The April 27 Open House was a great success. My wife, Jody, and I spent the entire day touring the facilities which were open to the public. I am very proud of the professional and enthusiastic way Langley employees showcased our work for the public.

More than 12,000 people attended the event. From observing the crowds, it was evident that the public interest in our work was very strong.

The Open House provided an excellent opportunity to inform the public of the valuable work that takes place at our center. It was such a success that we are talking about repeating it every three to four years.

My special thanks go to the Open House Planning Committee for their excellent planning and coordination of Open House activities and to the many individuals throughout the center who helped to mkae the day a success. It is an effort we can all be proud of.

Richard H. Petersen
Langley Director

51-E INSIGNA. The dominant feature of the 51-E emblem is an orbit formed by the U.S. flag and a Shuttle orbiter. The flag in orbit signifies the U.S. presence in space and pre-eminence in manned spaceflight as exemplified by the Shuttle. The orbiter flies out of the U.S. flag to indicate that it comes from this country and its people. The original (13-star) banner is used to symbolize a continuity of technical achievement and progress since colonial times. The name Challenger preceding the flag represents the spirit of challenge in exploring new frontiers which has been a hallmark of American people even before they were formed together as a nation.

First Operational Spacelab Now in Orbit

Challenger's payload bay, circling 219 miles above Earth and inclined 57 degrees to the equator.

The science experiments, which began five hours after Monday's launch, include 15 investigations in five research disciplines: materials science, life sciences, fluid mechanics, atmospheric physics and astronomy. Twelve of the experiments were developed by U.S. scientists, two by French scientists and one by Indian scientists.

The Spacelab 3 mission is called the "microgravity mission" because it is designed to provide a smooth, stable ride through space, reducing gravity and gravity-like forces to a minimum. Delicate crystal growth and fluid mechanics experiments are clustered near Challenger's center of gravity, its most stable area.

Challenger was maneuvered into a gravity gradient attitude 18 hours into the mission to reduce gravity effects and disruptive forces such as thruster firings. Challenger's tail is pointed toward Earth's center and its starboard (right) wing is pointed in the direction of travel. The Orbiter will remain in this attitude until the science experiments are completed.

Spacelab's habitable module contains two crystal growth facilities, an animal housing area with two monkeys and 24 rats, and two units for investigating fluid behavior in low gravity.

The seven crew members are working around the clock in two 12- hour shifts. The gold team consists of Commander Robert Overmyer, Mission Specialists Dr. Don Lind and Dr. William Thornton, and Payload Specialist Dr. Taylor Wang of NASA's Jet Propulsion Laboratory. The silver team consists of Pilot Frederick Gregory, Mission Specialist Dr. Norman Thagard and Payload Specialist Dr. Lodewijk van den Berg of EG&G Energy Management Corp., Goleta, Calif.

(NOTE: Pilot Fred Gregory, a U.S. Air Force Colonel, was a research pilot at NASA-Langley

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Swanson Gets Fellowship

investigating multistage time-stepping schemes combined with acceleration techniques, such as residual smoothing, for solving viscous flows.

"In the Theoretical Aerodynamics Branch, we are also working with 3-D multistage time-stepping schemes," Swanson said. "Therefore, I believe that a year of uninterrupted research on mathematical and numerical analysis of existing and potential schemes for 3-D viscous flows with Professor Gottlieb, will significantly enhance the rate of progress in TAB in constructing an efficient solver for high Reynolds number aerodynamic flows. Also, I believe that the cooperative effort between the TAB, the Computational Methods Branch, and the Analytical Methods Branch to develop a prediction code for 3-D flows based on an upwind scheme with relaxation, would benefit from the proposed research."

Swanson, a Langley researcher since 1977, said there are potential benefits for NASA-Langley in many areas of aerodynamic research that would result from accelerating the development of a practical Navier-Stokes code for 3-D flows.

A native of Baltimore, Md., Swanson received bachelor and master of science degrees and a doctorate in aerospace engineering from Virginia Polytechnic Institute in 1969, 1971 and 1974, respectively.

Swanson, his wife, Clara, and their son, Joe, live in Newport News.

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Langley Researcher

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Editor . . . . . Jean Drummond
Staff Photographer . . . . . Bob Nye

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The Godspeed Sails Again

-by Robin Hartigan

On Tuesday, April 30, 14 men sailed from London aboard the "new" Godspeed. The voyage is a re-enactment of the December 1606 launch from England that led to the start of a new nation.

Prince Philip, husband of Queen Elizabeth II, and Virginia Governor Charles S. Robb presided at the departure from London's Isle of Dogs.

The replica, 68 feet long, was built by the Jamestown-Yorktown Foundation for over $500,000. The Newport News Shipyard completed the interior work at no charge. The "new" Godspeed, completed in the fall of 1984, was then moored at a Gloucester marina to begin sea trials.

The Jamestown-Yorktown Foundation Board of Trustees' executive committee authorized the planning of this commemorative voyage in May 1983. The voyage was funded by donations from the private sector and funds raised by the crew.

Since the Godspeed has no engine, the trip from England to Jamestown is expected to take ten weeks, including stops in the Canary and Virgin Islands and at Cape Henry.

"This is a voyage of contrasts," says Jim Rollings, Curator for Exhibits for the Langley Visitor Center, "since sophisticated communication and navigation equipment will be used during the trip under some primitive conditions." For example, the ship has no sanitary facilities. The crew must also read and perform their duties and experiments using oil lamps for lighting.

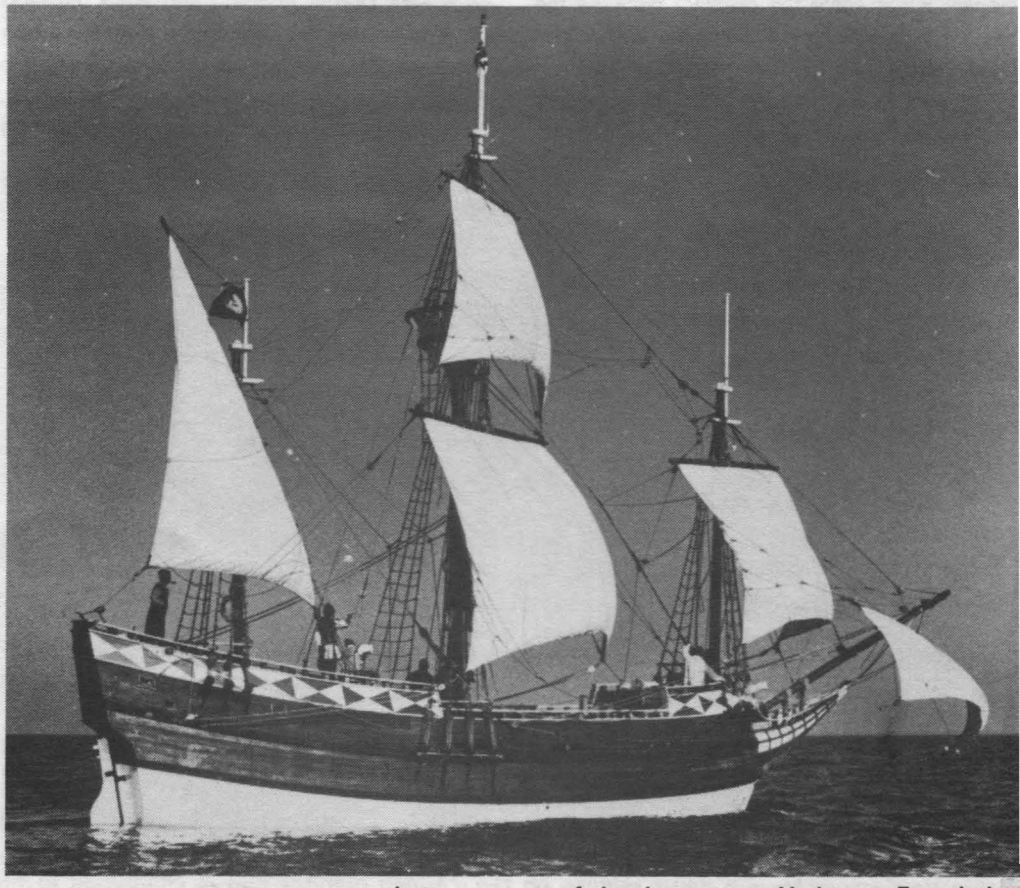
The crew is using the Global Satellite Navigation System, NAVSTAR, on the open seas and the coastal navigation system on coastal waters. SARSAT is used to perform location accuracy experiments. The crew also uses voice and code communication equipment, including OSCAR, which is an amateur radio satellite.

Modern technology will make this voyage safer and more comfortable than the original one. The crew's diet will consist of freeze dried and some cold foods kept in an ice box. "However, the voyage is not without risk, and is taken very seriously by the crew," says Jim Rollings. "It is not a joy ride."

"The purpose of the voyage is to call attention to the fact that America's first permanent English settlement was in Jamestown, VA. – not Plymouth Rock, Massachusetts," says Rollings. To further enhance the recognition of the Jamestown settlement, the 14 selected crew members are all native Virginians. They are all civilians with sailing experience.

George C. Salley and Joe C. Gowdey are Langley's representatives on board. Salley, a recently retired computer science research manager at Langley, is the ship's captain. His chief responsibility is to safeguard the vessel and its crew, assuring that the voyage is carried out successfully. He has just been named the first maritime director for the Jamestown-Yorktown Foundation.

Gowdey, head of the Electrical Systems Section at Langley, where he is involved in the design and construction of spacecraft power systems, is the safety officer and engineer for the voyage. He is responsible for ensuring safety and maintaining the ship's diesel generator and small engine.



-photo courtesy of the Jamestown-Yorktown Foundation

The reconstructed 17th century vessel Godspeed is seen on the lower Chesapeake Bay during a sea trial. On April 30, she began her re-enactment of the 1607 crossing from England to Virginia of the original Godspeed.

Spacelab Orbits Earth

Continued from page 2.

for two years during the mid- 1970's. Soon after his return to Air Force duty, he was chosen as a NASA Shuttle pilot in 1978.)

Scientists who developed Spacelab experiments are participating actively in guiding the mission. They are working in the Payload Operations Control Center (POCC) at the Johnson Space Center, and communicate directly with the scientists aboard Challenger to monitor, direct and control the experiments.

After the Spacelab experiments are completed, the crew will deploy two GetAway Special (GAS) satellites: the Northern Utah Satellite (NUSAT) and the Global Low Orbiting Message Relay Satellite (GLOMR). These two Earth observation satellites are the first to be deployed from GAS containers; they will not be recovered.

Challenger is targeted to land at 12:03 p.m. Monday May 6, at Edwards Air Force Base, Calif. The landing site was changed from Kennedy because of a braking problem that occured during the last landing. Strong crosswinds are thought to have put extreme pressure on Discovery's braking system, causing damage to two tires during landing. The runway at Edwards is longer, wider and smoother than the Kennedy runway.

Impairment Overcome Through Electronics Technology

-by Maurice Parker

Robin Hartigan is a visually impaired NASA employee who came to work at the Langley Research Center in June 1984 in NASA's Summer Aid Program. She was assigned to the Office of Public Services, part of the Office of External Affairs, typing, editing, sorting and distributing mail, and doing other clerical jobs.

Robin has congenital cataracts in both eyes. Her right eye vision is 20/80 and her left eye is 20/200, which is considered legally blind in the state of Virginia.

She used an electric typewriter for much of her work at Langley, but she wanted to learn computer word processing. The Office of Public Services uses an NBI 3000 computer with a standard 12-inch monitor. Because the monitor print size is so small, Robin had to sit so that her eyes were within two or three inches of the screen, which was uncomfortable and impractical. She got eye strain and headaches from squinting to read the small print.

This seemed a major obstacle, but Robin was encouraged by her office colleagues. Her supervisor, Gary Price, thought that a larger monitor might solve the problem because the print could be enlarged to twice the size of that on a 12-inch monitor.

Robin's colleagues asked Langley engineers and representatives of NBI how the problem might be solved. Several alternatives were attempted, including magnification goggles and large plastic magnification sheets, which were placed over the small screen. These devices enlarged the print, but they also distorted it.

Robin discovered that she could read the print on a 23-inch monitor that was connected to a word processor at Langley's technical library. She was ecstatic because she could sit at a comfortable distance from the screen and read the print with no difficulty.

"It was a momentous occasion," said Robin. "I've wanted to learn word processing and other facets about computers ever since I came to Langley, and now the field is open to me."

The next step was to modify an NBI computer unit to make it compatible with a large monitor. Robin, now working in Langley's Public Affairs Office, asked Langley engineers if they anticipated problems in adapting the unit. Tom Finley of the Instrument Research Division answered, "If we can put a man on the moon, we can certainly do this."

The mission was accomplished by Finley and engineers Darrell Andregg and Willis Jackson of Wyle Laboratories, a support contractor to Langley. They modified a computer in the Public Affairs Office and connected a large monitor. Robin has been using it ever since to edit stories for the Langley Researcher and even to write some news releases.

The successful experiment at work prompted Robin to buy an Apple IIc personal computer to use in her home. She is a graduate student at Old Dominion University, and she thinks the computer and word processing training she received at Langley are real assets to her education and career. She is so attracted to computers that she has changed her master's course of study from English to computer science.

The modification of the large computer screen, besides demonstrating Langley expertise, is also a personal triumph for Robin. "Many people with disabilities have low self-esteem because they are constantly reminded of what they **CAN'T** do. Perhaps for the first time in my life, I am working with people who accentuate the positive, remind me of what I **CAN** do and, most important, help me find a way to do it. I hope that I can someday repay Langley for everything it has given me in a few short months."

-photo by Bill Salyer

Robin Hartigan reviews a news release on the 23-inch monitor that is connected to the NBI 4000 unit in the Office of Public Affairs. A visually impaired employee, Hartigan had difficulty reading the print on a small screen monitor. The NBI computer unit was modified to make it compatible with the large monitor so Hartigan could edit stories for the Langley Researcher and write some news releases.

Thanks

Charlotte Craidon writes, "I would like to express my thanks to all who contributed to and attended my retirement luncheon March 15. The plaque, photo album and gifts will long be cherished and enjoyed. It was my privilege to work with such wonderful people at such a wonderful place as NASA Langley."

Small Business is 'Big Business' at Langley

President Reagan has proclaimed the week of May 5-11 as Small Business Week to honor the small business owners of our nation and Langley is helping celebrate.

For FY 1985, Langley's goals for contract awards to small businesses, minority/disadvantaged firms and women-owned firms are $82.5 million, $8 million and $4.25 million respectively.

It is NASA policy to place a fair proportion of its total purchases and contracts for supplies, research and development and services with small business concerns. Each year NASA Headquarters sets socioeconomic program goals for contract awards at each center.

The Acquisition Division encourages small business firms to contact the Industry Assistance Office for information regarding inclusion in Langley's Bidders Source System for fulfilling future contractual requirements.

'Spaceflight,' A Landmark Four-Part Documentary, Airs Over PBS

"We ask God's blessings as we embark on this, the most dangerous, the most hazardous and greatest adventure of all mankind." –John F. Kennedy

Since the first cosmonaut and the first astronaut blasted into space in 1961, a generation has grown to adulthood, a generation with no memory of the adventure, courage and determination of the early days of space exploration.

Now, for the first time, a prime time television series offers a comprehensive look at the history of manned space flight – American and Russian. "Spaceflight," a series of four one- hour programs, will be broadcast on four consecutive Wednesdays, premiering May 8 on Public Broadcasting Service (PBS), WHRO-TV, Channel 15, at 8 p.m.

From the rocket plane that first broke the sound barrier to the touchdown of the shuttle "Columbia," the series chronicles humankind's astonishing achievements in reaching for the stars.

The story of this journey into the unknown will be told by the people who know it best. "We've been very fortunate in assembling an incredible array of people who were there," said Executive Producer Blaine Baggett. "We've interviewed some 40 key participants – astronauts, people on the ground, scientists, historians – all the surviving Mercury astronauts..."

"It's been a thrill to meet these people. And we've had good luck with the Soviets, too. I got to meet the Russian science attache in Washington. He was very helpful, and gave me about ten hours of film footage to copy for use in the show. A few days later, however, the K.A.L. airliner was shot down, and my contact was deported as a spy. I even got calls from the FBI." As a result, viewers will see "some rare Soviet footage, some of which has never been shown on national TV before."

Among those interviewed for the series:

- Chuck Yeager, the first man to break the sound barrier;
- Scott Crossfield, the first to travel twice the speed of sound and to pilot the X-15;
- German scientist, Wernher von Braun, the genius behind the WW II blitzkrieg rockets who was brought to the U.S. to work on our rocket program;
- The first American in space and the first American to orbit the globe, Mercury astronauts Alan Shepard and John Glenn, respectively;
- America's first woman astronaut, Sally Ride;
- NASA ground crew members, Christopher Kraft, mission flight director, and Gene Krantz, ground controller and flight director.

Looking at Soviet space activities, the series seeks answers to some mysteries. Who was the "Chief Designer" of the Soviet space program? Why was Russia almost always first in the early days of space? For today and beyond, is the "race" in danger of becoming a deadly battle?

Probing into the future, "Spaceflight" examines space colonies, space stations and the possibility of an all-too-real Star Wars.

Award-winning actor Martin Sheen narrates the series. Sheen has a special affinity for the subject matter, having portrayed John F. Kennedy in the mini-series "Kennedy," and Robert Kennedy in the special "The Missiles of October."

Captain Charles E. Yeager of the U.S. Air Force, who on October 14, 1947, became the first man to fly faster than the speed of sound in level flight, is shown in the cockpit of the Air Force's Bell-built X-1 supersonic research aircraft. For this historic flight, made over Muroc Air Force Base, Calif., Yeager was named the 1948 recipient of the Mackay Trophy. His plane is nicknamed "Glamorous Glennis" in honor of his wife

Langley Expands Employee Program

Effective May 1, Langley expanded its Employee Assistance Program. This program provides a practical and constructive mechanism for dealing with employees' personal problems which affect the work situation, or as an aid to those employees and family members who voluntarily wish to use the program as a means of resolving a personal problem.

It is recognized that many personal problems can be successfully dealt with and resolved provided assistance is offered and referral is made to an appropriate form of care. In some cases, neither the effort of the employee nor the supervisor is successful in resolving the employee's problem. This applies whether the problem is one of physical, mental or emotional illness; alcoholism; drug abuse; marital or family distress; or financial or other concerns.

Voluntary self-referred employees or family members seeking assistance will be able to do so in complete anonymity. All records pertaining to the Employee Assistance Program will be treated with a high degree of confidentiality accorded to medical records.

The program is administered by the Office of Occupational Health Services and contracted through the medical services contract with the James Institute. Office appointments are scheduled from 7 a.m. to 6 p.m., Monday through Friday with Saturday appointments as needed. Staff people are on call 24 hours a day with crisis cases handled as needed. All employees or family members are offered their initial appointment within 24 hours and whenever possible the same day.

The Library -- A Most Important Resource

As Chairman of the Library Committee and a delighted "user," I note the occurance last week of National Library Week with distinct pleasure. I believe we have one of the finest technical libraries with a staff of unusual quality, dedication and professionalism.

Webster's definition of a "library" is "a place in which books, manuscripts, etc. are kept for use but not for sale." The definition of the word "librarian" is "a specialist in the care or management of a library." These definitions are not suited to our present or future needs.

Research engineers and scientists today experience such a wealth of information that their productivity depends on selectivity as well as diversity. A research library/librarian is the key to information access-information at your fingertips! Our library is not a static place of information storage, but rather a dynamic resource for information availability; not an explosion of data, but the right quality of selected information refined to satisfy the searcher's wants and needs.

In a similar fashion, the work of librarians has changed to the extent that they are information facilitators. They are people with the right background and specific training to find and store information so it can be found and made accessible from "any angle" of a search.

Our library system utilizes information experts to link people to information at the minimum time and expense. In my short 20 years at Langley, I have seen the library redefined in action and in deed. The staff of our most important research facility deserves a round of cheers for making our library a system of information. I look forward to the necessary and ambitious plans to continue that development and maintain the expert staff we require for our information future.

National Library Week is a time to reflect on the importance our library and our librarians play in our lives as engineers, scientists and managers. It is a time to thank the dedicated people who make yesterdays' information retrievable. It is also a time to look forward and insure that new information will be available tomorrow.

Joseph S. Heyman
Chairman, Library Committee

Retirement Parties

Albert W. Hall, who retires today, will be honored with a retirement social and dinner Wednesday, May 22, at 6 p.m. in the Activities Center. The cost, including dinner and gift, is $11 per person. For reservations, please contact Pat West, ext. 2037, Mail Stop 246A, by Monday, May 20. Gift contributions are welcome.

Jack H. Dysart, who retires today from the Low-Speed Aerodynamics Division, will be honored with a retirement party, Tuesday, May 21, at 5 p.m. in the Activities Center. The cost, including heavy hors d'oeuvres and gift, is $7.50 or $13 per couple. Gift only contributions of $2 are also welcome. Send checks, payable to Fred H. Austin, to Mail Stop 255, by Monday, May 20.

Robert P. Faust and Ernest C. Hooper, Flight Electronics Division, will be honored with a retirement social Wednesday, May 29, from 5 to 6:30 p.m. in the Activities Center. The cost, including heavy hors d'oeuvres and gift, is $7 per person and $12 per couple. Cash bar will be available. Gift only contributions of $2 are welcome. Send checks, payable to Dick Davis or Wayne Rohrbach, to Mail Stop 474 by Monday, May 20.

IBM Sponsors Workshop

How can the IBM personal computer help improve office productivity?

What is the IBM personal computer network?

What kinds of IBM personal computer applications are available for the engineer or scientist?

What is the IBM personal computer of tomorrow?

Find out answers to these questions and more May 14 at "Workstations for the 80's," an IBM-sponsored presentation at the Activities Center. The workshop starts at 1 p.m. and will include "hands on" demonstrations of IBM personal computer products.

In Memoriam

Mildred Josephine Reid, 88, died Thursday, April 11, in Walter Reed Convalescent Center. She was the widow of Henry J. E. Reid, Engineer-in-Charge and Langley Director from January 1926 through May 1960.

Retiree Dies

George C. Cluverius, Jr., 63, died April 12. He retired from the Fabrication Division in August 1976, after 31 years of service.

Cortright to Speak at AIAA Awards Banquet

Dr. Edgar M. Cortright, Langley Director from 1968 to September 1975, will be the guest speaker at the American Institute of Aeronautics and Astronautics Annual Awards Banquet May 15.

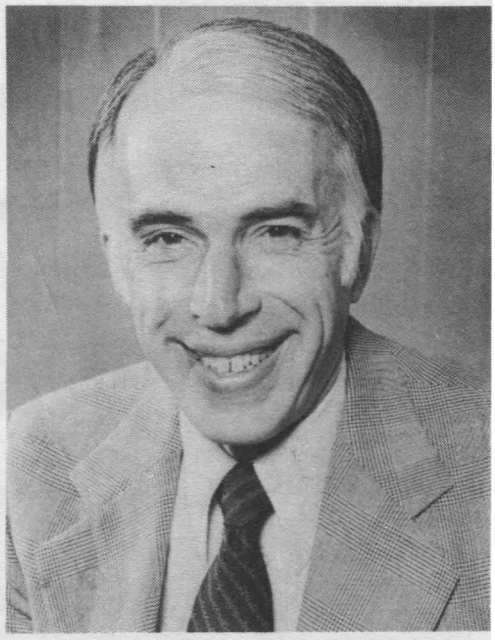
In his talk, "Being an Engineer," Cortright will relate some of his own perceptions and experiences in being an engineer.

During the program the first annual AIAA Hampton Roads Section scholarship will be awarded.

The banquet will be held in the Activities Center beginning with a social at 6 p.m.; dinner will be at 7 and the program at 8. The cost will be $10 for members and $5 for students.

Cortright, who retired from Langley in 1975 to become Corporate Vice President and Technical Director of Owens Illinois Corporation, was responsible for Langley's aeronautical and space research programs as well as the center's facilities, personnel and administration. While Director, he also served as an advisor to the NASA Administrator on NASA programs.

He stayed at Owens Illinois until 1978 when he was named Senior Vice President for Science



and Engineering at Lockheed. From 1979 to July 1983 he was President of the Lockheed-California Company. Since his retirement, he has returned to the Peninsula and is engaged in consulting activities.

Happenings

LAA SOCIAL. The Langley Activities Association will hold a social in the Activities Center today from 4 to 6:30 p.m. A special social is planned for May 17.

CALLIGRAPHERS GUILD of the Peninsula will sponsor a two-day workshop, "Fundamentals of Letter Structure," by Sheila Waters, Saturday and Sunday May 4 and 5, at Mary Immaculate Hospital. Waters is an internationally famous calligraphic artist. Her work is owned by royalty, museums, libraries, institutions, private collectors, and has been exhibited widely. The workshop is an overview of major alphabets from the standpoint of inner structure, which is explored in depth in the Foundational hand. Its structure is then explored to show how it can be used as a tool to produce variant hands such as Blackletter, Bartarde and Carolingian. The importance of negative space is also stressed, and a helpful method of producing optically even spacing between letters is offered. Cost is $55 for CGP members and $70 for non-members. Call Teta Kain at 850-2071 or Wanda Kinzie at 867-8658 for reservations and information.

AIAA TRIP. The Hampton Roads Section of the American Institute of Aeronautics and Astronautics will sponsor a one-day bus trip May 13 to the Air and Space Museum in Washington, D.C. There will be no charges for the trip. Reservations are required and must be made by May 10. Space is limited to 47 persons and reservations will be taken on a first come, first served basis. The bus will leave the Activities Center at 7 a.m. and can make a stop at the James York Plaza in Williamsburg if needed. The bus should arrive back at the Activities Center around 9 p.m. For reservations call the Fundamental Aerodynamics Branch, ext. 4004, or Larry Leavitt, ext. 2674 or 898-8126.

BIG BROTHERS/BIG SISTERS. "Bowl for Kids' Sake." May 11 at Denbigh Lanes from 10 a.m. to 4 p.m. Get family, friends, neighbors, co-workers to sponsor you and benefit Big Brothers/Big Sisters of the Peninsula. Recruit a team of four from your fellow workers and challenge another division to see who can raise the most dollars. Your support will help find a big brother or sister for some of the 8,000 youngsters on the Peninsula from single parent family homes. There will be prizes for highest pledges and a special NASA prize for the top team. The bowing game and shoes are free. Call Big Brothers/Big Sisters, 827-0110, for registration forms and more information.

DISCOUNT TICKETS to Busch Gardens, $12.25; Kings Dominion, $11; and Water Country, $8, are on sale at the Activities Center.

THE BEST OF BRITAIN AND IRELAND TOUR. There are a few spaces left on the Best of Britain and Ireland Tour. It departs Norfolk September 8 and returns September 22. The package includes air transportation from Norfolk to London and return, first-class hotel accommodations, modern motor coach sightseeing, most meals, all local taxes, and tips for baggage, handling and for hotel personnel; price $1389, double occupancy. For itinerary call Ernie Greene, ext. 2312 or 838- 0567.

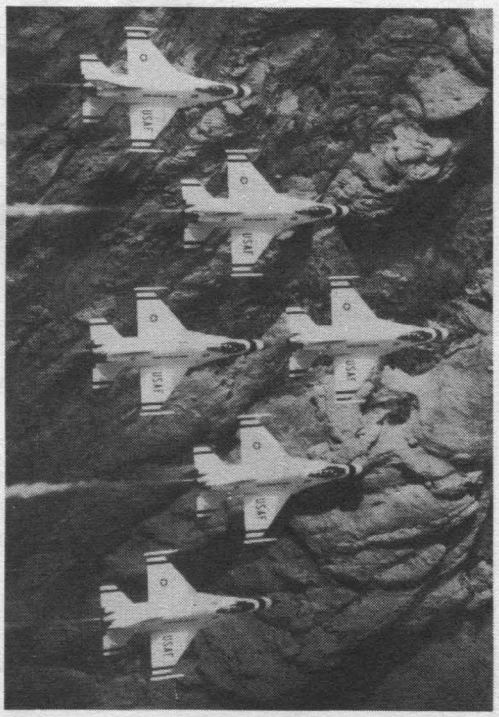
HANDICAPPED COMMITTEE. The Mayor's Committee on the Handicapped for the City of Hampton is an active organization dedicated to assisting disabled and handicapped citizens of Hampton. The areas of activity include education, health, recreation, employment and legislation. Anyone desiring to bring a matter of concern to the committee's attention should contact Phil Everheart, ext. 2621, or Bill Tennis, ext. 2032. Anyone, regardless of locality, desiring to receive the committee's quarterly newsletter should forward their name, address and zip code to Everheart, Mail Stop 158A, or Tennis, Mail Stop 166B.

WATER COUNTRY SPECIAL WEEKEND. Armed Forces Weekend will be held at Water Country Mary 18 and 19. The cost is $6.25 (a $9.75 value). Admission includes all attractions. Tickets are available at the Activities Office.

SEASON PASSES are available at the Activities Office for Water Country, $45.50, and Kings Dominion, $32.

BINGO is played every Thursday night in the Activities Center, beginning with an early bird special at 7:10 p.m. and regular games at 7:30.

AL-ANON and A-A. Are you concerned about someone's drinking? Al-ANON and A-A meetings are held every week during lunch time at NASA-Langley. For information, call Wayne Simonton, ext. 3600, or Virginia Jones, ext. 2605.



-photo courtesy of the USAF

THUNDERBIRDS IN FLIGHT. The U.S. Air Force Aerial Demonstration Squadron, the Thunderbirds, will be the featured attraction at the Langley Air Force Base Open House, May 5. The Thunderbirds show begins at 3 p.m. In addition to the Thunderbirds, the air show will feature aerial demonstrations of the A-10 Thunderbolt II, 1:20 p.m.; the F-15 Eagle, 1:40 p.m.; and a parachute jump by the U.S. Army's Golden Knights, 2:15 p.m. Gates open at 11 a.m., and the open house ends at 5 p.m.

Space Flight Participant Program Established

NASA has established the Space Flight Participant Program as a means to offer periodic opportunities for private citizens to fly on Space Shuttle missions. The first citizen to participate on a mission under this program will be selected from among the nation's elementary and secondary school teachers. The selection process is now underway, and the primary and backup candidates will be announced in September.

Eligibility requirements for subsequent Space Flight Participant opportunities will be announced through the media and through organizations affiliated with the selected category. The next Announcement of Opportunity, which outlines eligibility requirements, will not be released until later this year. In the meantime, NASA is not taking names and there is no waiting list. Individuals interested in the program are advised to stay tuned to media for further announcements.

If you have additional questions, please contact Alan Ladwig, Manager, Space Flight Participant Program, Mail Code ME, NASA Headquarters, Washington, D.C. 20546, or telephone (202) 453- 2556.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

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Langley Directives Distributed

DIRECTIVES NUMBER	TITLE	DATE	DATE T.S.#	DISTRIBUTED
CANCELLED:				
LHB 4210.1	Property Custodian's Handbook	May 1982	—-	3-12-85
LMI 1500.2	Office Copying Equipment	3-1-85	1386	3-18-85
NEW:				
NHB 4200.2	LaRC Modification-Equipment Management System (NEMS) User's Guide for Property Custodians	Feb. 1985	—-	3-12-85
REVISED:				
LHB 1710.15	Wind-Tunnel Model Systems Criteria, Change Number 1	Jan. 1985	—-	3-12-85
LHB 1450.1	Office Procedures, Change Number 4	Jan. 1985	—-	3- 14-85
LMD 1200.4	Redelegation of Authority to Classify Posisions	3-1-85	1383	3- 18-85
LMI 1107.2	Langley Research Center (LaRC) Organizational Structure, Functions and Responsibilities	3-1-85	1384	3-18-85
LMI 6000.3	Motor Vehicle Management	3-1-85	1385	3-18-85
LMI 1490.4	Office Copying Equipment	3-1-85	1386	3-18-85
LMI 1700.1	Safety Program	3-1-85	1387	3-18-85
LMI 4200.1	Attachment, Equipment Management-Designated Officials	3-1-85	1388	3-18- 85
LMI 1100.20	Attachment, Undergraduate Training Committee	3-15-85	1389	3-28- 85
LMI 1700.3	Attachment B, The Executive Safety Board and Its Committees	3-15-85	1390	3-28- 85
LMI 1100.11	Architect-Engineer Selection Board	3-15-85	1391	3-28- 85
LMI 1571.1	Word Processing Management Program	3-19-85	1392	3-28- 85
LMI 1100.6	Employee Suggestion Committee	3-20-85	1393	3-28- 85

cafeteria menu

Week of May 6 - 10

MONDAY: Old fashioned bean soup, stuffed chicken breast, eggplant parmigiana, Swiss style steak. Snack bar: NASA sub, 1/4 lb. cheeseburger.

TUESDAY: Seafood gumbo, braised beef and vegetables, fried filet of fish, burito and Spanish rice. Snack bar: Beef and cheese sub, chicken filet.

WEDNESDAY: Vegetable soup, fried chicken dinner, roast beef sandwich, beef liver and onions. Snack bar: Double cheeseburger, hot Italian sausage.

THURSDAY: Chicken gumbo soup, stuffed pepper, knockwurst and kraut, briased chicken livers. Snack bar: Turkey and bacon, club, pizza supreme.

FRIDAY: Bull Island clam chowder, fish dinner, smoked sausage and BBQ baked beans, breast of chicken teriyaki. Snack bar: Polish sausage, crab cutlet.

Week of May 13 - 17

MONDAY: Minestrone soup, chicken chow mein and fried rice, chuckwagon steak, western omelet. Snack bar: Ham and cheese club, 1/4 lb. cheeseburger.

TUESDAY: Turkey and rice soup, chopped steak, roast pork, tuna and noodle casserole. Snack bar: NASA sub, 1/4 lb. bacon cheeseburger.

WEDNESDAY: Vegetable soup, veal parmigiana, baked 1/2 chicken, franksa dn baked beans. Snack bar: Chicken filet, 1/4 lb. cheeseburger.

THURSDAY: Chicken noodle soup, beef stew, seafood quiche, sweet and sourpork. Snack bar: Beef and cheese club, pizza supreme.

FRIDAY: Bull Island clam chowder; fish dinner; beef, macaroni and tomatoes; baked breast of chicken and rice pilaf. Snack bar: Turkey and Swiss club, hot Italian sausage.

swap and shop

FOR SALE

Vehicles

1978 17 ft. fiberglass boat, 55 H Johnson motor, galvanized trailer, electric winch, fully equipped, good condition. Can be seen at 6 Powhatan Dr., Poquoson. Call 868-9583.

Garden plots are still available in the NASA Garden. Contact J. Timmons, ext. 4621, for further information.

WANTED

Carpool between Colonial Place and Riverview area of Norfolk (near ODU) and west area on 8 a.m. shift needs two more members. Call Dan Giesy, ext. 4591, or 625-7558 in Norfolk.

Thanks

Hugh Clark writes, "I want to express my appreciation and thanks to the many who organized, made presentations and attended the terrific retirement party recently given in my honor. The food, fellowship, fun and gifts were all outstanding, and it is a memory I shall always cherish."

National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 24, Issue 15 **July 26, 1985**

Bower, Harris Fill Management Positions

Robert E. Bower and **Roy V. Harris, Jr.** have been selected to fill management positions at Langley Research Center. Bower, former director for Aeronautics, has been reassigned to the Office of the Director and designated Associate Director of the Research Center.

Harris, former Chief of the High-Speed Aerodynamics Division, has been named Director for Aeronautics. He will now also temporarily serve as Acting Chief, High-Speed Aerodynamics Division.

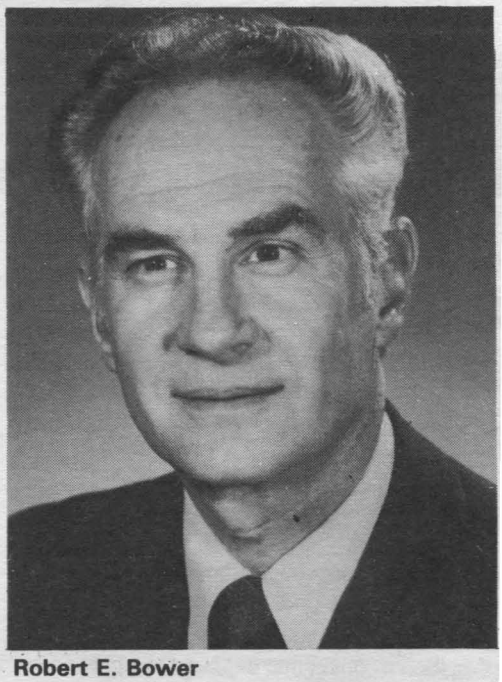
Bower, a native of Gloversville, New York, has been a reviewer for the Applied Mechanics Review, a member of the Society of Automotive Engineers Research and Development Committee, and has lectured at several universities, including the executive professional development program, of which he is an alumnus, at the Polytechnic Institute of Brooklyn.

He is a consulting editor for the McGraw-Hill Encyclopedia of Science and Technology. Bower is also an Associate Fellow of the American Institute of Aeronautics and Astronautics(AIAA). In May 1984 he was named Director-Region 1, and has served on Long Island and Hampton Roads Section Councils. He is a member of Sigma Xi and Tau Beta Pi professional fraternities.

In his 22-year career with Grumman Aircraft Engineering Corporation (now Grumman Aerospace), Bower served as a research engineer, research group leader, assistant to the Chief Technical Engineer, Chief of Engineering Development and Director for Advanced Development.

Bower, who had served as Director for Aeronautics since 1971, graduated from Rensselear Polytechnic Institute with bachelor and master of science degrees in aeronautical engineering in 1948 and 1949, respectively. He also served

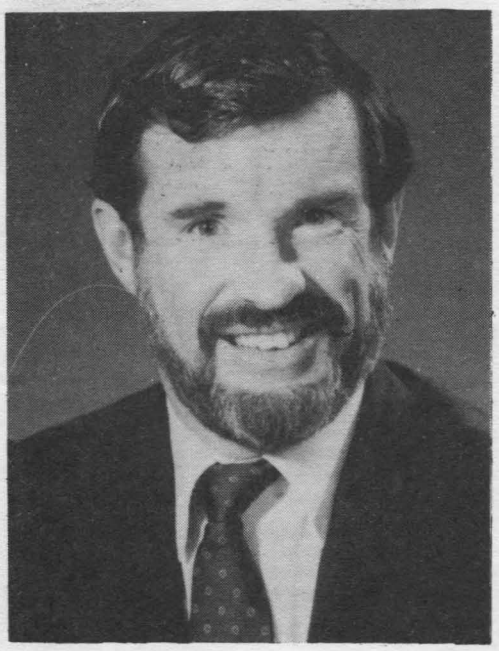
Continued on page 2.



Robert E. Bower

Creedon Heads New Langley Directorate

Dr. Jeremiah F. Creedon has been selected as Director for Flight Systems at the Langley Research Center. This directorate was recently formed in an organizational change in the Office of the Director for Electronics.



Jeremiah F. Creedon

The change involved removing the Flight Control Systems Division, Flight Dynamics and Control Division, two branches of the Flight Electronics Division and five employees from the Analysis and Computation Division from the Office of Director for Electronics,

These divisions are now under the Director for Flight Systems, and are known as the Advanced Transport Operating Systems Program Office, Information Systems Division, Guidance and Control Division and the Flight Management Division.

The Analysis and Computation Division, Instrument Research Division, and the remaining branches in the Flight Electronics Division all remain under William D. Mace, who will continue as Director for Electronics.

Creedon joined Langley in 1963 in the Avionics Technology Research Branch of the Flight Electronics Division. In 1969 he was named as Head, Control and Information Systems Section. In 1979 he was selected as assistant head of FED, where he served until attending Stanford University as a Sloan Fellow in 1981. Returning in 1983, he was Chief of the Flight Control Systems Division until named to his present position.

A graduate of the University of Rhode Island, Creedon received a bachelor of science degree in 1961 and a master of science in 1963. He graduated Cum Laude and was a member of Tau Beta Phi and Phi Kapppa Phi honorary fraternities. In 1970 he earned a doctorate degree from the same university. Creedon received a master of science degree in management from Stanford in 1982.

Creedon, the author of more than 20 technical publications, is a member of the American Institute of Aeronautics and Astronautics and serves on that organization's guidance and control technical committee.

Creedon and his wife live in Newport News. They have three daughters.

Shuttle Spacelab-2 Mission Delayed

The launch of Spacelab-2, aboard Challenger, has been delayed until Monday, July 29, because of a problem in one of the Orbiter's main engines.

The rescheduled mission will remain essentially the same, but the time of launch will change to 3:00 p.m. Two plasma physics experiments may be adversely affected by increased lunar light levels, and the Infrared Telescope experiment will lose about 20 percent of the sky during its observations.

At Researcher press time, engineers were still trying to find the exact cause of the engine failure that delayed the original launch. The July 12 countdown was halted less than two seconds before liftoff when the launch sequence computer detected a problem in main engine No. 2. The problem appeared to be in a coolant valve or actuator, but troubleshooting has failed to pinpoint the culprit.

The seven-day science mission will end August 5 with an Edwards Air Force Base landing at about 1:30 p.m. EDT.

The Spacelab-2 delay has caused changes for two other 1985 launches. The next mission, 51-I with Discovery, remains on schedule for launch August 24, but the following mission, 51-J, will slip from September 19 to October 3. That mission, with a Department of Defense payload, is the first flight of Atlantis. A launch pad test of the total Atlantis system had to be rescheduled because of the Challenger mission delay.

The next mission, 61-A, has been slipped from October 30 to November 7 to allow more turnaround time for Challenger. Launch dates for the 61-B Atlantis and 61-C Columbia missions remain November 27 and December 20, respectively.

In a related event, about 1,000 of Columbia's heat shield tiles were damaged by a rain shower as the Orbiter was being ferried across country atop the 747 carrier aircraft. From 200 to 300 forward-facing and window area tiles will require replacement. A more detailed damage assessment was to be made this week.

Bower, Harris Fill Management Positions

Continued from page 1.

in the U.S. Army from 1943 to 1946.

Bower and his wife live in Newport News. They have two sons.

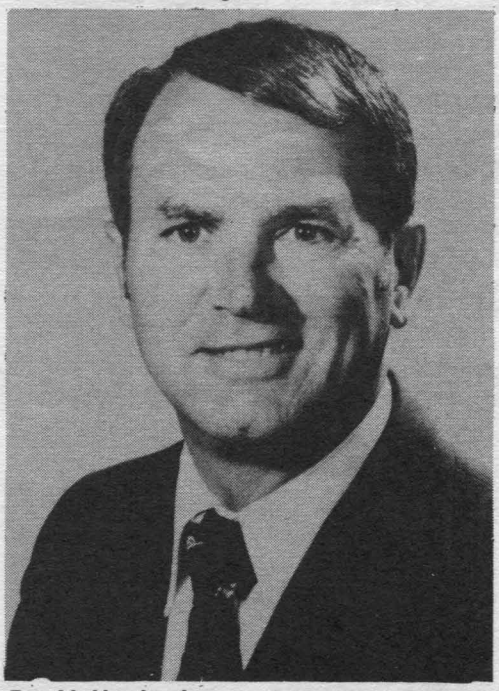
Harris, who is nationally recognized as an authority in the field of supersonic aerodynamics, joined the Langley staff in 1958 as an aerospace research engineer. From 1959 to 1962 he was an Air Force officer assigned to NASA. He was appointed Head of the Advanced Configuration Branch in 1963, and in 1974 was selected as Chief, High-Speed Aerodynamics Division, where he served until his present position.

In June 1980 Harris was part of a NASA delegation to China that explored the prospects for NASA/Chinese cooperation in aeronautics.

A native of Augusta, Georgia, Harris graduated from Richmond Academy in 1954 and earned a bachelor of science degree in aeronautical engineering from Georgia Institute of Technology in 1958. The author of over 30 technical publications, he holds a patent on a supersonic aircraft.

Harris is an Associate Fellow of the American Institute of Aeronautics and Astronautics and was recently elected AIAA Vice- President for Technical Activities. He has received both the AIAA Sperry Award and the NASA Special Achievement Award for exceptional Service in 1968. In 1982 he was awarded the NASA Medal for Outstanding Leadership, and in 1983 he received the Virginia Peninsula "Engineer of the Year" Award. In 1984 Harris received the Presidential Rank of Meritorious Executive in the Senior Executive Service of the U.S. Government.

Harris and his wife live in Newport News. They have two daughters.



Roy V. Harris, Jr.

Job Openings

The following Competitive Placement Announcements are currently open:

85-65–Supervisory Aerospace Engineer AST Control and Guidance Systems GM-0861-14 or 15 Flight Systems Directorate Guidance and Control Division Office of the Chief Closes July 26, 1985

85-66–Supervisory Electronics Engineer or Mathematician AST, Data Systems AST, Data Analysis GM-0855-14 GM-1520-14 Office of Director for Electronics Analysis and Computation Divsion Computer Management Branch Closes July 26, 1985

85-67–Administrative Assistant GS-0341-5 Flight Systems Directorate Guidance and Control Division Closes July 26, 1985

85-68–Engineering Technician GS-0802-8 or 9 Systems Development Branch Systems Development Support Section Closes August 1, 1985

85-69–Mechanical Engineering Technician GS-0802-11 or 12 Facilities Engineering Division Structural Design Branch Fracture Mechanics Engineering Section Closes August 1, 1985

85-40–Secretary (Stenography) and Secretary (Typing) GS-0318-4 or 5 Open Continuous Announcement Various Locations at Langley Research Center NOTE: Consideration for this announcement is restricted to persons with competitive Civil Service status.

Key Positions

Arthur E. Phelps has been selected Assistant Head, Subsonic Aerodynamics Branch, Low-Speed Aerodynamics Division, under Competitive Placement Plan 85-36.

National Aeronautics and Space Administration
Langley Research Center

NASA

Langley Researcher

The Langley Researcher, an official publication of the Langley Research Center, National Aeronautics and Space Administration, Hampton, Virginia 23665, is published every other week in the interest of its employees. Address contributions to the Editor, Mail Stop 115, telephone 865-3006.

Editor . . . . . Jean Drummond
Staff Photographer . . . . . Bob Nye

The privilege of advertising articles in this publication is restricted to employees of Langley Research Center. Articles advertised here must be offered without regard to race, color, religion, sex or national origin. All materials submitted are subject to editing.

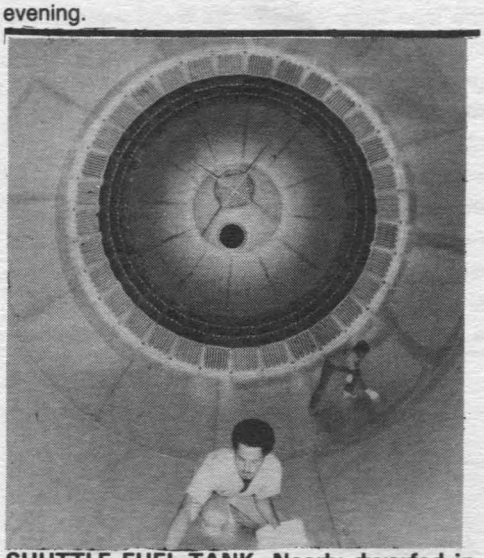
Langley Will Add to Annual Oshkosh Fly-in

In spite of a larger-than-ever showing of NASA's work in space technology, the agency's contribution to the 1985 annual "Oshkosh" gathering will strongly uphold the event's tradition of highlighting the latest news in aeronautics. The theme of NASA's exhibit this year is "The Shape of Things To Come."

The Annual EAA International Fly-in and Sport Aviation Exhibition – now permanently located at Oshkosh, Wisconsin – will be held from July 26 to August 2. Each year for the last several years, about 100,000 people and 10,000 privately-owned light airplanes have descended upon Oshkosh for the annual Experimental Aircraft Association meet.

This year, some visitors may even arrive in a British Airways Concorde, scheduled to make two round trips from London direct to Oshkosh. Plans call for the Concorde to make special fly-bys during the afternoon air shows.

Astronauts Robert Gibson and Robert Overmeyer will be guests of the EAA on Monday, July 29, and will participate in a program that evening.



SHUTTLE FUEL TANK. Nearly dwarfed inside a giant Space Shuttle fuel tank, Martin Marietta technicians clean the tank's interior after pressurization tests. Behind them are new fuel slosh baffles designed to reduce the weight of the tank by 630 pounds. Close monitoring of fuel motion during the early Shuttle flights indicated to engineers at Martin Marietta's Michoud Division the number and size of baffles could be reduced from eight to four. The baffles also function as support rings of the tanks. The weight reduction of 630 pounds in the tank increases the Shuttle's cargo-carrying capacity by nearly the same amount. Overall, Martin Marietta has reduced the weight of the Shuttle tank by 10,000 pounds. Martin Marietta manufactures the 154-foot long, 28-foot diameter external tank at NASA's Michoud Assembly Facility in New Orleans, La.

A 60 x 90-foot tent will house displays of NASA's research and techology development work in aeronautics, the space station, space shuttle and space exploration. Langley and Ames Research Centers will provide aeronautical exhibits, and Lewis will provide aeropropulsion and space exhibits. Goddard is scheduled to have its Search and Rescue Satellite van on hand while Johnson and Marshall will exhibit material on space research.

NASA's current activities in small engine aeropropulsion systems, advanced turboprops, stall-spin and aerodynamics research, storm hazards, de-icing, advanced structural materials, simulation and human factors research, and advanced tactical aircraft design will be featured as part of its aeronautics exhibit.

One of two Langley Aerovans will supplement the tent exhibits and Langley's Piper T-Tail aircraft, used for stall-spin research, will be on static display.

Two dozen NASA forum speakers will give live presentations covering every aeronautical discipline, with a handful from Lewis talking about space station.

Langley forum speakers and their topics are **Lou Williams**, aerodynamic considerations for advanced aircraft configurations; **Todd Hodges**, health & safety aspects of composite material fabrication; **Bruce Holmes**. natural laminar flow – achievability and maintainability; **Doug Garner**. microcomputers in the cockpit; **Mitch Thomas**, characterization of direct lightning strikes using an F-106 aircraft; **Dave Stephans**, aircraft interior noise reduction; **Dan DiCarlo**, NASA light airplane stall/spin research; **Tom Vranas**, Research Model use and fabrication; **Dan Somers**, airfoil and hi-lift system design considerations; **Al Wunschel**, fundamentals of flight testing; **Bob Doggett, Jr.**, keeping the flutter shakes away – causes, symptoms and cures.

Exhibits on the space station will explain how America's "next logical step" in space exploration will serve as a base for scientific, technological and commerical advances.

The space shuttle orbiter, operating at subsonic and hypersonic (Mach 5 plus) speeds in a flight environment never before experienced by a winged vehicle, is a unique test bed for a series of experiments that will provide design data for future trans-atmospheric vehicles. Langley is heavily involved in these orbiter experiments.

Exhibits in space exploration will cover two future steps in NASA's exploration of the solar system: Galileo, which will amplify earlier findings about the planet Jupiter, and Ulysses, which will orbit the polar regions of the sun. Both are scheduled for launch in 1986.

Upcoming Workshops

Review of CFD Contractors and Grantees. The Analytical Methods Branch, Theoretical Aerodynamics Branch, and Computational Method Branch will hold their annual review of contractors and grantees at the Activities Center, August 13-15. For more information, contact Jim Keller, mail stop 259, ext. 2627.

Control of Flexible Structures (COFS) Program will be held August 27-28 in the Activities Center. For more information, contact Connie Hoffman, mail stop 158, ext. 3968.

Petersen on State-of-the-Center

Langley Director Richard Petersen will address the subject, "The Langley Research Center - 1985 and Beyond," at the Activities Center on July 31 and August 1, 1985.

Five sessions have been scheduled as follows:

July 31, 1985

8:30 - 9:30 a.m. Systems Engineering and Operations Directorate (except for Operations Support Div.

10:00 - 11:00 a.m. Aeronautics Directorate, Operations Support Div.

1:30 - 2:30 p.m. Electronics Directorate, Flight Systems Directorate

August 1, 1985

8:30 - 9:30 a.m. Space Directorate, Structures Directorate, Projects Directorate

10:00 - 11:00 a.m. Director's Office, Management Operations Directorate

All retirees and support services contract personnel are also invited. These employees are encouraged to attend the session scheduled for the Directorate they support. Time should be charged to Job Order A-1980.

Langley History Series

Hansen Previews Langley's Early History

This is the first in a series of eight articles previewing "Engineer in Charge: A History of the Langley Aeronautical Laboratory, 1917-1958," by Dr. James R. Hansen. NASA will publish the book later this year as part of its prestigious History Series. Our first look at this much-awaited publication begins with excerpts from the book's preface, wherein the author explains three different facets of his book's title.

On the most superficial level, the title of this book refers to the officer who first headed Langley Aeronautical Laboratory, the original and, until 1941, the only research center of the National Advisory Committee for Aeronautics. In all of NACA history there were only two such officers: Leigh H. Griffith (1882-1940) and Henry J.E. Reid (1895-1968). Griffith served as engineer-in-charge from 1923, when NACA headquarters created the position, through 1925; Reid succeeded Griffith in 1926, filling the top slot at the lab until his retirement from the National Aeronautics and Space Administration in 1960.

For the last 12 years of his career, however, Reid managed Langley not as the engineer-in-charge, but as the "director." In 1948 the NACA changed his 22-year-old title in anticipation of Public Law 167 (passed 13 July 1949, 81st Cong., 1st session). This law authorized the chairman of the NACA to create "ten positions in the professional and scientific service" of the federal government, "each such position being established in order to enable the NACA to secure and retain the services of specially qualified personnel necessary in the discharge of the duties of the Committee to supervise and direct the scientific study of problems of flight with a view to their practical solution." Before this time Reid's salary as engineer-in-charge was boxed below $9,000 per annum by those civil service criteria which discriminated against engineers in favor of scientists. The decision in 1948 to change Reid's title to director was thus part of a larger NACA scheme to increase annual pay to its top executives, and enhance their social and professional status, by giving them academic-sounding titles like those borne by individuals in the higher grades of the federal bureaucracy. As Vannevar Bush, chairman of the NACA from 1939 to 1941, had once said, a scientist may sell a bill of goods to Congress when an engineer could not get a street car token on Capitol Hill.

Despite the increased pay, Reid was privately reluctant to have his official identity changed after so many years. Like Griffith before him, he was an engineer and proud of it. He had earned a bachelor's degree in electrical engineering nearly half a century before at Rensselaer Polytechnic Institute in Troy, New York, and much of his work, both before and after becoming Langley's engineer-in-charge in 1926, truly classifies as engineering. To have worked in the field of aeronautics in the 1920s and 1930s was to have been a participant in what was indisputably one of the greatest and most rapidly successful engineering adventures in all history. Born into a world without flying machines, his generation had known the airplane at a time when it barely worked, yet lived to see it perform wonders. These achievements, Reid believed, had been largely the result of practical engineering solutions to the outstanding scientific and technical problems of flight. Most Americans did not know how significantly the NACA laboratory of which he had been in charge had contributed, and was continuing to contribute, to these solutions; most Americans did not even know that the NACA existed. This anonymity frustrated Reid occasionally–though he knew it had certain political advantages. However irritating it had been to hear the unknowing public frequently giving scientists all the credit for accomplishments he felt rightfully belonged to engineers, the irritation never prompted him to question his organization, profession, or identity as the engineer-in-charge.

Neither Reid nor anyone else who knew anything about Langley ever doubted that at nearly all levels of laboratory research activity, not just at the top, it was the engineer who was in charge .... Wind tunnels and other test equipment–which required engineering talents for design, development, operation, and exploitation–formed the laboratory's backbone. By the end of the 1930s, 15 of the 18 aerodynamics sections at Langley were named after wind tunnels or another specific experimental setup. The only parts of the lab with names suggesting a theoretical approach to research were the Mathematical, Flutter and Vibration, and Propeller Sound and Noise research sections, all of which belonged to the small and somewhat isolated Physical Research Division ....

To a considerable degree, the empirical approach for which the agency became well known seems to have been dictated by the nature of the aircraft design problems confronting the laboratory after World War I and by the inadequacies of theory in addressing them. The generation of airplane designers responsible for some of the most famous World War I aircraft had used an intuitive, daring empirical engineering loosely connected at best with any theory of aerodynamics or structural integrity. Geoffrey de Havilland, Anthony Fokker, and Gianni Caproni, among others, produced stable and maneuverable airplanes using essentially a job-shop approach. The British designer

Continued on page 5.

Engineer in Charge Henry Reid sits at his desk April 24, 1928.

NASA Begins Simulated Airline Service Flights

NASA will begin a series of simulated airline flights to operationally test new techniques designed to help smooth the air flow over aircraft wings.

Previous research has shown that smooth or laminar air flow can reduce aerodynamic drag from 25 to 40 percent under laboratory conditions and could provide significant fuel savings. However, in actual flight, laminar flow can be disrupted and disturbed by insects, ice, and other obstructions adhering to the leading edges of an aircraft's wings.

NASA's Ames-Dryden Flight Research Facility has installed on its business-sized JetStar aircraft two experimental laminar flow control devices incorporating techniques to help prevent leading edge contamination. The program is a cooperative effort with Langley

The JetStar will be based at various NASA installations and at commercial airports and will fly in and out of different airports to obtain information on various takeoff and landing situations that might affect the test articles. NASA will conduct the simulated airline service flights just as an airline would under normal air traffic rules and regulations.

While based at the different installations throughout the country, researchers plan up to four flights each day during a 2- week period to gather as much information as possible on performance of the test articles.

The two leading edge test articles, one installed on each wing of the JetStar, incorporate insect and ice protection with laminar flow control. Tests conducted on the JetStar in 1976 showed that the leading edge could be kept free of insects if it was kept wet while encountering them.

The test article installed on the left wing uses suction through 27 (0.003-inch) spanwise slots on the upper and lower surface to maintain laminar flow. A propylene glycol methyl ether (PGME)/water mixture is discharged through several slots at the wing leading edge and flows back over the wing for insect impact protection. This article was manufactured for NASA by Lockheed- Georgia.

The test article on the right wing uses suction through approximately 1 million (0.0025-inch diameter) holes in the titanium skin to maintain laminar flow on the upper surface of the article.

The Ames-Dryden JetStar stopped briefly at Langley as part of its simulated service, Monday July 22.

For insect impact protection, a shield is extended much like a wing leading edge flap on commercial transports. The shield is retracted at 6,000 feet altitude. Spray nozzles behind the shield can be used to spray the PGME/water mixture on the test article for additional insect protection.

For ice prevention during winter conditions, glycol is forced through the right wing's porous metal section of the shield leading edge in addition to the PGME/water spray. This article was manufactured for NASA by McDonnell-Douglas.

Since the simulated airline service flights are planned to approximate commercial flights as closely as possible, NASA officials are meeting with commercial airline officials to define what test conditions they would like to see flown and will incorporate the results of these discussions into flight planning. Researchers also are contacting entomologists in areas of the country that the JetStar will fly to determine the insect activity in each area.

The JetStar is configured as a "flying control room" with test instrumentation aboard. There are three consoles with data displays for researchers, who also have the ability to adjust the suction on the test articles if conditions warrant.

The JetStar will carry the Knollenberg probe, mounted atop the aircraft, to precisely measure the number and size of ice and water particles encountered in flight. A charge patch, located on the pylon that holds the probe, measures the static electric charge caused by particles in the air rubbing across the patch surface and gives a qualitative measure of ice and water particles. Correlation of the probe and patch data could calibrate the charge measurement in a simple cockpit display. Pilots could use the display to detect ice particles.

The first series of operational flights began in for mid-July. The JetStar will fly in and out of Hartsfield Airport, Atlanta, Georgia.

Engineer in Charge

Continued from page 4.

Thomas Sopwith never put his early planes through a single stress test. One of his prototypes could be designed, constructed from full-size chalk drawings on the factory floor, and test flown in less than three months.

During the 1920s frail wooden biplanes covered with fabric, supported by wires, powered by heavy water-cooled engines, and driven by hand-carved wooden propellers still ruled the airways. This meant that very large gains in aerodynamic efficiency–perhaps even the biggest payoffs then possible–would follow almost immediately once the aviation establishment possessed correct answers to just a few questions, such as: Can drag be reduced without degrading cooling? If so, how? How can wings be shaped to increase lift at low speeds and decrease drag at high speeds? How and when do flaps work best? How can effectiveness and control force be accurately predicted for ailerons, elevators, and rudders? Is it worthwhile to retract landing gear?. . . Because it was staffed and managed basically by engineers and experienced an early proliferation of large and unique test facilities, like the variable-density, propeller research, and full-scale wind tunnels, Langley laboratory was admirably suited to handle the technological problems at hand.

The title of this book suggests a final meaning. Despite the influence of economic, political, and military objectives over NACA programs, Langley engineers enjoyed considerable freedom to advance research as they, not others, wanted. To a great extent, then, they were themselves "in charge" of what they did and how they did it . . .. In this context one may compare the position of a Langley engineer to that of an architect. Though "dependent upon commissions from patrons for the opportunity to work out his ideas," an architect "can usually design a building which reflects his personal artistic ideals and intentions as well as serving the client's needs." The best architects are also great artists, and so are the best engineers . . .. It is thus important to address not only the bureaucratic circumstances in which Langley engineers worked, but also the engineers' personal drives and intentions. We just may find that what excited Langley engineers most of all was the spirit of adventure and exploration.

In the next excerpt from "Engineer in Charge," Hansen explores the troubled early history of the laboratory in the period 1919-1920.

Survey Forms Needed

Employees who have not answered the questionnaire on employee transfers are requested to complete the survey and send it to mail stop 109 by July 30.

Bryan Invited to France and Belgium to Commemorate 40th Anniversary of Two World War II Battles

-by Robin Hartigan

Max Bryan, an engineering technician in the Facilities Engineering Division, was an honored guest at the French and Belgian celebrations of the 40th anniversary of two historic World War II battles.

Last summer, Bryan visited France to help the French government celebrate the 40th anniversary of the Southern France Invasion (D-Day – August 15, 1944), and in May he returned to Europe in commemoration of the 40th anniversary of the Battle of the Bulge (December 17, 1944 through January 20, 1945).

The three-day celebration in France culminated with the presentation of the French Silver Star Medal to Bryan by the French government.

The Belgian celebration took place in Odrimont, one of the historic sites in the Ardennes Forest where the battle was fought. Here, Bryan participated in the dedication of a bronze plaque as a monument in Odrimont, where much of the battle took place. The citation read, "This bronze plaque is dedicated to the officers and men of the 551st Parachute Batallion who fought here, December 27, 1944, while conducting the initial night raid in force against WAFFEN S/S enemy headquarters."

Bryan and one of his former comrades, after unveiling the plaque and folding the American flag that covered it, gave it as a memento of this commemoration to the daughters of Col. Wood G. Joerg, who led their batallion during the Battle of the Bulge.

The two-day celebration peaked with a speech given by the Mayor of the Lierneux Commune. He expressed his gratitude to the veterans as follows: "Dear American Veterans .... You accomplished the most beautiful and most magnanimous gesture that a man could accomplish for his fellow-men. Maybe the American people were the only ones capable of such a thing. Your people are admired around the world, but believe me, you will never be so admired as in this little corner of the Ardennes. Thank you dear friends, thank you for the freedom that you returned to us and that you have guaranteed us to this day. May our two countries live on in eternal friendship."

The two celebrations evoked many tearful memories from Bryan and his comrades concerning their war experiences.

Bryan enlisted in the U.S. Army as an infantryman, July 8, 1942, at age 17. He received training in a Test Battalion in Panama, where they tested different weapon systems. He was also in the 14th class to go through "jump" school in Fort Benning, Ga., which qualified him as a paratrooper.

At the onset of the Battle of the Bulge, there were 793 men in his parachute battalion, and ten days later, only 96 men and 14 officers were still available for combat. His battalion was then disbanded, and Bryan was placed in the 82nd airborne division, where he remained until he was wounded, and as a result, assigned to grave registration. His duties entailed taking food and ammunition to the battlefront and retrieving battle casualties.

Bryan's three and one-half years' service in the Army took him to 27 countries in Europe and Central America, where he endured traumas that he would never forget. "It was just unbelievable," says Bryan. "It was quite an education. I went in the Army when I was 17 and aged about 30 years in three. When I got out, it took me eight years to get straightened out. There aren't many of us left that went through all that."

At the celebration of the Battle of the Bulge, Bryan's son was astounded by the tales he heard, and commented, "Daddy, I used to think you were lying about some of your experiences, but everybody I talk to tells the same lies you do."

Bryan received 15 medals, including the Bronze Star Medal for "exemplary conduct in ground combat," and three purple hearts for being wounded in action.

At the celebrations in France and Belgium, Bryan was greatly moved by the gratitude of the people. "The people are still so grateful for what the Americans did for them," he says.

-photo by Bob Nye

Max Bryan proudly displays the medals he received as a result of his heroic actions as an infantryman and paratrooper during World War II. Bryan was invited to France last summer, where he participated in the 40th anniversary celebration of the Southern France Invasion; and in May he attended Belgium's 40th anniversary commemoration of the Battle of the Bulge – two of World War II's most historic battles. The two celebrations culminated with the presentation of the French Silver Star Medal to Bryan in France, and the dedication of a bronze plaque in Odrimont, Belgium in recognition and appreciation of the brave men who fought there.

Notable Quote

Richard Petersen, Langley Director, at Purdue University's "The Engineer for the Nineties" seminar, on the importance of the computer to the future "problem-solving" or "applied research" engineer at Langley:

"He (or she) will need to be sophisticated in the use of large computer systems. It seems clear that most engineers entering a university now ... would probably benefit from one or more lab courses in large-scale computing or parallel processors. He will require a broader education, perhaps, than he now gets in a typical curriculum; some degree of depth in his chosen discipline will obviously need to be sacrificed in order to acquire more fundamentals of other disciplines, including aerodynamics, structures, controls, propulsion and electronics. There is a shortage of such engineers now – the type who can reside in an experimental research group, providing computer- aided analysis expertise."

Retirees Die

Aldene L. Worthington, who retired in 1975 from the Research Information and Applications Division, died June 14. She was 60.

Wilson G. Winfree, Jr., who retired from the Operations Support Division in May 1972, died June 21. He was 76.

Henry H. Bunting, 80, died May 30. At the time of his retirement in April 1968, he was assigned to the Mechanical Services Division.

High School Students Participate in Summer Apprenticeship

Fifteen high school students are participating in an eight-week intensive science and engineering apprenticeship program at the Langley Research Center this summer.

The Summer High School Apprenticeship Research Program, which was started in 1980 by the Public Affairs Division of NASA Headquarters, Washington, D.C., is designed for high school students who have demonstrated aptitude for and interest in science and engineering careers. Students who live within commuting distance of a participating NASA center, are U.S. citizens, and will be 16 years old by the time the program begins in June are eligible to apply. The students selected are assigned to a mentor, who is a NASA scientist or engineer.

As apprentices, the students learn and earn. They participate in an orientation process that provides them with an overview of the NASA center's mission and the activities necessary to accomplish the center's goals and objectives.

During their apprenticeship, the students complete designated assignments, prepare written reports, make oral presentations, and participate in a variety of enrichment activities under the careful supervision of the SHARP program staff and mentors.

SHARP is a feeder program that is being used to build a resource pool of potential applicants for future NASA employment in the fields of science and engineering. SHARP is specifically designed to attract and serve minorities and women who are under- represented in the NASA scientific and engineering workforce. The program provides them with first-hand experience and information that will help them make decisions about a career in science, engineering or mathematics.

-photo by Bill Salyer

Area students participating in the eight-week Summer High School Apprenticeship Research Program at Langley are Pamela Ford, Menchville; Shannon Thornton, Bayside; Catherine Kuo, Lafayette; Thomas Yip, Ferguson; Karen Ramsey, Deep Creek; Anna Hugo, Kempsville; Michelle Block, Green Run; Henry Pogorzelski, Kempsville; Amanda Holt, Lafayette; Laura Reves, Warwick; Darron Fullwood, Bethel; Jane Nucup, Kecoughtan; Cassandra Jones, Hampton; Andrea Freeman, York; and Kerry Peters, Deep Creek.

Thanks

Thomas Ezell, Jr. writes, "I would like to thank everyone who contributed to and attended my retirement social at the Officers' Club. The gifts will help remind me of the many fine years here and everyone that I have been associated with during those years. Ann and I enjoyed it very much. Thanks again for this memorable ocassion."

Albert W. Hall writes, "Rosemary and I wish to thank all who participated in my retirement celebration. I can't imagine not having had the opportunity to work at Langley and be associated with such an outstanding group of people. We look forward to the continuation of friendships with you and your families that have developed through the years."

Child Development Center Nears Completion

-by Melissa Coleman-White

Excitement about the Sept. 3 opening of the Langley Child Development Center (LCDC) is at an all-time high among organizers, staff and parents! Community interest in this innovative employee-sponsored child care service is also spreading as local television and newspaper reporters request permission to do feature stories about the start of the program. Local universities and community colleges have also expressed an interest in using the LCDC as a practicum site for graduating students in early childhood education.

According to Art Friend, Chairman of the NASA Exchange Council, "The building is quickly reaching completion and is scheduled to be turned over to us by Aug.1. The Child Development Center will be a very attractive, happy place for children. It will be well-equipped with appropriate toys, educational equipment and a creatively designed playground."

Buena Crawford, Exchange Council member and liaison between the Council and the LCDC said, "The Center will be operated in a very professional manner, complete with an accountant on contract and and IBM personal computer. This computer will facilitate recordkeeping and house financial data which will enable easy management decision-making. We would also like to incorporate a personal computer into the classroom setting as a teaching aid for the preschoolers."

Five educational staff members have now been hired. Three teachers, with four-year college degrees and teaching experience, are Mrs. Kim Follman, Ms. Janet Soohy and Ms. Cassandra Duke. Mrs. Follman will also serve as assistant director. Two teacher's aides have two years of college and five years of experience working with young children. They are former Langley Air Force Base Child Development Program employees and have received extensive training in child development issues. All of the staff members will be present at an Open House on Aug. 26 at 10 a.m. to meet parents and children prior to the opening of the LCDC.

Enrollment in the LCDC can be made by calling me at Ext. 4463. There are still some preschool slots available for children 2-5 years old. If all slots are not filled by NASA employees and on- or near-site contractors by Sept. 1, enrollment will be opened to Langley Air Force Base employees.

Retirement Party

Edna G. Davidson, Business Data Systems Division, will be honored with a retirement social Wednesday, August 14, at 5 p.m. in the Activities Center. The cost, including heavy hors d'oeuvres and gift, is $7.50 per person or $12 per couple. A cash bar will be provided. Gift only contributions of $2.00 are welcome. Send checks, payable to Lisa Yu, to mail stop 179 by August 6.

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WANTED

Typists needed. From time to time the GWU Office at NASA gets requests for the names of individuals who will do after-hours typing of theses and term papers. Persons applying need to be able to type Greek terms and equations. If interested call the GWU Office, ext. 3124.

Carpool between Colonial Place (near Riverview and ODU) and west area for 8-4:30 shift needs another member. Call Dan Giesy, ext. 4571 or 625-7558 in Norfolk.

World Book Encyclopedia set, not over 5-8 years old. Phone 838-1575.

WANTED TO BUY: Auto, 4-dr, VGC or EC, American made, pre-1980. Van or S/W possibly. 850-1515.

FOR SALE

Vehicles

1971 Toyota Corolla. 1974 engine, recently rebuilt, auto transmission, front end damaged. Good repair project or for parts. $300. Call 838-4227 after 5 p.m.

Articles

Rocking chair—New—Colonial-type, cane back, cushioned. $90. Call 722-8641.

Manual typewriter, Simmons hide-a-bed sofa, maple drop-leaf table with four ladder-back chairs. Call Youngblood, 1-588-8617.

Hewlett Packard scientific/engineering calculator, 15-C, new. $100. Call 595-0014 after 5 p.m.

FOR RENT

Trailer: "Buzzards Roost" on Hatteras Island at Frisco; Oceanside, 50' house trailer, furnished, including dishes; 2 BR, full bath, sun porch, outdoor shower, AM/FM stereo, walking distance to beach and fishing pier, 5 min. drive to Sport Fishing Center and charter boats. $150/wk; $75/wknd; $25/wkdy. Available through October. Call Fogle, 826-6177.

Happenings

TOASTMASTERS CLUB. The NASA Langley Toastmasters Club congratulates Kennedy Space Center on their forming a second Toastmasters Club. Langley's newly founded club meets from 11:30 a.m. to 1 p.m. on the second and fourth Wednesday of each month in Room 120, Building 1229. Guests are welcome. Call Credeur, ext. 3467; Miserentino, ext. 2817; or Wright, ext. 4631, for more information.

LAA SOCIAL. The Langley Activities Association will sponsor a social today from 4 to 6:30 p.m. in the Activities Center.

LANGLEY KARATE CLUB, Harmony center, will be holding an introductory meeting for all persons interested in starting beginning classes in Cuong Nhu Oriental Martial Arts. The Meeting will be held at Poquoson Middle School Gym at 5 p.m. on August 5. An introduction to what Cuong Nhu has to offer and a demonstration of skills will be featured. Persons of all ages, interests, abilities and types are welcome.

The club meets regularly on Mondays and Wednesdays at 5 p.m.in the above gym. Costs are $15 a year for national dues and $6 a month for the gym. Contact Bill Olstad, Ext. 4534, or Guillo Gonzalez, Ext. 4621, for more information.

SHUTTLE CAR PASSES are available for every launch. Call Ann Suit, ext. 3967.

KINGS DOMINION COUPONS. July 14 through August 4 are Scooby Doo Days at Kings Dominion. The LAA Office in the Activities Center has 1/2-price coupons for children ages 3-12.

LANGLEY EMPLOYEE ASSISTANCE PROGRAM provides confidential, professional help when needed for personal problems such as alcoholism, drug abuse, emotional stress, etc. For help call 873-0228 or a 24-hour answering service number, 877-7083.

cafeteria menu

Week of July 29-August 2

MONDAY: Seafood gumbo, braised beef and vegetables, salmon cakes and slaw, beef liver and onions. Snack bar: NASA sub, hot Italian sausage.

TUESDAY: Ham and three bean soup, pork steak, meat loaf, chicken parmigiana. Snack bar: Ham and cheese club, pizza supreme.

WEDNESDAY: Fresh vegetable soup, roast turkey dinner, baked fillet of trout, veal cordon bleu. Snack bar: Chicken filet, 1/4 lb. cheeseburger.

THURSDAY: Chicken and rice soup, beef enchiladas, chuckwagon steak, grilled ham steak. Snack bar: Turkey and Swiss club, hot Italian sausage.

FRIDAY: Bull Island clam chowder, fish dinner, chicken breast teriyaki, chopped steak. Snack bar: Deluxe fish sandwich, 1/4 lb. cheeseburger.

Week of August 5-9

MONDAY: Bean soup, spaghetti and meat sauce dinner, baked chicken breast with rice pilaf, knockwurst reuben. Snack bar: Beef and cheese club, Polish sausage.

TUESDAY: Minestrone soup; pepper steak and rice; macaroni, franks and cheese; seafood quiche. Snack bar: Chicken filet sandwich, corned beef and Swiss.

WEDNESDAY: Fresh vegetable soup, baked 1/2 chicken, veal parmigiana, roast pork. Snack bar: NASA sub, pizza supreme.

THURSDAY: Chicken noodle soup, crab cakes and slaw, Polish sausage and kraut, braised chicken livers. Snack bar: Knockwurst, steak and cheese sub.

FRIDAY: Bull Island clam chowder; beef, macaroni, and tomatoes; chicken breast with mushroom sauce. Snack bar: Deluxe fish sandwich, hot Italian sausage.

Godspeed Update

Due to a three-week delay in the Godspeed's progress toward Jamestown, the voyage has been postponed until the end of hurricane season. "Inclement weather and poor sailing conditions in the English Channel between England and Tenerife caused much of the delay," said Allan Libby, Information Officer for the Jamestown-Yorktown Foundation.

The Godspeed left St. Thomas, in the Virgin Islands, July 18 and arrived in San Juan, Puerto Rico, where it will remain until the voyage is resumed after hurricane season. The crew has returned to Virginia and will remain here until the voyage continues.