National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 25, Issue 1 **January 17, 1986**

Schauer is Langley's New Personnel Division Chief

Irwin J. Schauer, former Head, Placement and Position Management Branch, Personnel Division, has been selected as Chief, Personnel Division. He replaces Mary R. Cline, who transferred to the Department of the Army, Fort Monroe, as Personnel Chief October 31.

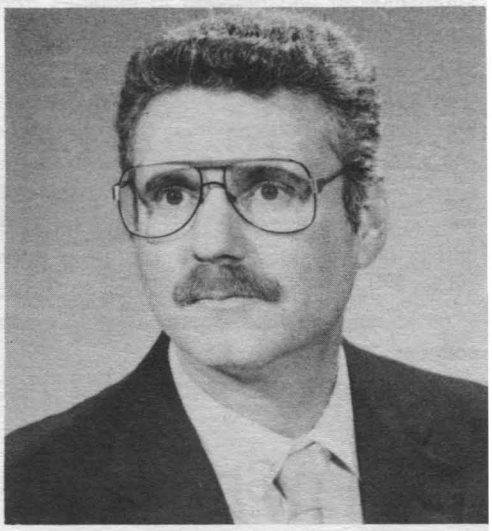
In his new position, Schauer is responsible for managing and developing comprehensive personnel programs, including recruitment, promotions, classification, employee benefits, employee and labor relations, employee development and occupational health. He also serves as a principle advisor to management concerning personnel matters and insures regulatory compliance with NASA Headquarters and Office of Personnel Management issuances.

Schauer began his NASA career at NASA Headquarters as Chief, Personnel Management Section, in October 1982. From May 1985 to August 1985 he was NASA's Employee Relations Officer. He transferred to Langley in August 1985 as Head, Placement and Position Management Branch.

Before joining NASA, Schauer was Chief, Classification and Staffing, Department of Transportation, Washington, D.C.; Senior Staffing Specialist and Chief, Employee Relations, Department of the Treasury, Washington, D.C.; and Personnel Management Specialist, Office of Personnel Management, Atlanta, Georgia, and Washington, D.C.

A native of Miami, Florida, Schauer received a bachelor of arts degree in psychology from the University of Miami in 1968 and completed two years of graduate study in psychology and industrial relations at Mercer University, Macon, Georgia.

He is a member of the International Society of Personnel Management and Langley Supervisors' Club and serves as the Agency Designated Grievance Examiner. For his work in personnel matters, he has received numerous cash awards and has had suggestions adopted



at the national level. He was presented a honorary badge from the Secret Service.

Schauer and his wife, Catharine, live i Poquoson. They have a daughter and a son

Hampton AIAA Named Outstanding Section

The National Board of Directors of the American Institute of Aeronautics and Astronautics (AIAA) has chosen the Hampton Roads Section of the AIAA as the Most Outstanding Large Section in the AIAA for the 1984-85 year. The AIAA is the national organization for aerospace engineering professionals.

With Robert Calloway as chairman, the Hampton Roads Section held nine general membership meetings at Langley Research Center; the Executive Council met four times; the Young Members Committee sponsored a Home Buying Seminar; and the Section sponsored two field trips, one to the Newport News Shipyard and one to the National Air and Space Museum in Washington D.C. In addition, 10 members were upgraded to Senior Members, 12 were

Continued on page 2.

Langley Sites Named Landmarks

Five sites at the Langley Research Center–three wind tunnels, the tower used by astronauts to practice moon landings, and a space docking simulator–have been designated by the Interior Department as national historic landmarks.

They were chosen because of their special importance in the early development of our nation's space program. Seventeen more sites in seven states throughout the country, many at other NASA centers, were also selected as historically important to the space program.

In a statement issued by Secretary Donald P. Hodel, he said the sites were "the best, most intact and most important examples of the technology which will interpret for future generations the early years of the American space program."

The wind tunnels picked by the Interior Department are the former Variable Density Wind Tunnel, the former Full-Scale Wind Tunnel and the 8-Foot High-Speed Wind Tunnel. The Variable Density Tunnel is now a 5,000-cubic-foot air storage vessel and the Full- Scale Tunnel is now the 30 by 60-Foot Tunnel.

The most recognizable of the landmarks the former Lunar Landing Research Facility was used to train Apollo astronauts to land the lunar module on the surface of the moon A lander simulator was suspended from the tower by cables that supported five-sixths of the lander's weight. The astronauts practiced steering the lander to the ground, which was made to represent the cratered lunar surface.

The structure later was used to test the crashworthiness of general aviation aircraft, which were also suspended from the tower by cables and swung pendulum-like to impact the ground.

The last landmark selected here by the Interior Department is the Space Docking Simulator used by Apollo and Gemini astronauts in the '60s for docking experience in mimicked zero gravity conditions. The simulator helped prepare the astronauts for vehicle docking maneuverability conditions present in space.

The simulator is still stored high up in the rafters of the Langley Hangar.

Green Appointed NASA Public Affairs Director

The appointment of Shirley M. Green as director of public affairs for NASA was announced in December by Thomas P. DeCair, associate administrator for external relations.

She replaces Frank S. Johnson Jr., who has been appointed assistant associate administrator for external relations (special projects).

Green comes to NASA with 20 years experience in communications and management. She will be responsible for planning and directing the full range of NASA activities to provide information to and respond to inquiries from the public and the media.

Since 1981, she has held the positions of deputy and acting press secretary to the Vice President of the United States. During that time she was responsible for planning and coordinating media activities for the Vice President on matters of domestic policy, including the Task Forces on Regulatory Relief and Drug Interdiction. She accompanied the Vice President to 61 foreign countries, coordinating all media activities.

In Memory of Martin Luther King

I Have a Dream

I have a dream that one day out in the red hills of Georgia the sons of former slaves and the sons of former slaveowners will be able to sit down together at the table of brotherhood.
I have a dream that one day even the state of Mississippi, a state sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice.
I have a dream today.
I have a dream that one day every valley shall be engulfed, every hill shall be exalted, and every mountain shall be made low, the rough places will be made plains, and crooked places will be made straight, and the glory of the Lord shall be revealed and all flesh see it together.
This is our hope. This is the faith that I will go back to the South with. With this faith we will be able to hew out of the mountain of despair a stone of hope.
With this faith we will be able to work together, to pray together, to struggle together, to go to jail together, to climb up for freedom together, knowing that we will be free one day.
This will be the day when all of God's children will be able to sing with new meaning. My country tis of thee. Sweet land of liberty. Of thee I sing. Land where my fathers died. Land of the Pilgrims pride. From ev'ry mountainside. Let freedom ring.
And if America is to be a great nation, this must become true. So, let freedom ring from the mighty mountains of New York.
Let freedom ring from the heightening Alleghenies of Pennsylvania.
Let freedom ring from the snow-capped Rockies of Colorado.
Let freedom ring from the curvacious slopes of California.
But not only that, let freedom ring from the Stone Mountain of Georgia.
Let freedom ring from Lookout Mountain of Tennessee.
Let freedom ring from every hill and mole hill of Mississippi and every mountainside.
When we let freedom ring, when we let it ring from every tenement and every hamlet, from every state and every city, we will be able to speed up that day when all of God's children, black men and white men, Jews and Gentiles, Protestants and Catholics, will be able to join hands and sing in the words of the old spiritual. "Free at last, free at last! Thank God Almighty, we are free at last!"

January Shuttle Missions Almost Overlap

Columbia's "flight before Christmas" turned into the flight well after New Year's. Once weather, faulty sensors and other vexations were overcome, however, the first mission of 1986 began with a beautiful, spectacular launch.

Columbia, outfitted with Langley's Orbiter Experiments, left a long exhaust trail in a clear sky as it headed for orbit Sunday morning, Jan. 12. As Columbia rose above Cape Canaveral, its sister Orbiter, Challenger, was already on Pad B, being prepared for the next launch.

Columbia was scheduled to land back at KSC this morning, Jan. 17, only seven days before Challenger's launch, rescheduled for the afternoon of Jan. 24.

Langley's OEX investigators will spend the next several weeks analyzing data on Columbia's aerodynamic and thermodynamic characteristics as it re-entered Earth's atmosphere early this morning.

The OEX experiments are the Shuttle Infrared Leeside Temperature Sensing (SILTS) experiment, the Shuttle Entry Air Data System (SEADS) and the Shuttle Upper Atmosphere Mass Spectrometer (SUMS). (They were described in detail in the Nov. 1 Researcher.)

The Columbia and Challenger missions are the first of 15 Shuttle flights planned this year. Nine of that number are to be launched from Pad B, which had not been used since the Skylab Program ended in 1974. Two launches are scheduled from the new polar orbit launch facility at Vandenberg Air Force Base, Calif.

The rest of the 1986 launch schedule calls for the next mission Mar. 6-15, two missions in May, one in June, two in July (including the first Vandenberg launch), one in August, three in September, and one each in October, November and December.

AIAA Award Presented

Continued from page 1.

elected Associate Fellows, and 52 sat on national technical committees.

The Hampton Roads Section also awarded their first scholarship under the "Futures in Aerospace" scholarship program. This scholarship award is based on academic excellence and leadership ability for a high school senior who intends to enroll in a field of study related to the aerospce profession. The scholarship was the result of three years of effort and represented the single most ambitious and innovative program in the Section's history.

New Year's Wish

To leave the old with a burst of song
To recall the right and forgive the wrong
To forget the things that bind you fast
To the vain regrets of the year that's past,
To have the strength to let go your hold
Of the not-worth-while of the days grown old
To dare go forth with a purpose true
To the unknown task of the year that's new.
To help your brother along the road
To do his work, and lift his load,
To add your gift to the world's good cheer
Is to have–and give–a Happy New Year.

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.

NASA Calls 1986 'A Year for Space Science'

NASA is preparing for its most productive year ever in space science activities. A variety of "space firsts" will be accomplished and several major scientific studies will be continued or begun in 1986.

The NASA Visitor Center will highlight the activities featured in this Year for Space Science, beginning with the Voyager-2 encounter with planet Uranus on January 24. Launched in September 1977, Voyager's imaging system and other instruments will provide data on Uranus never before available.

The Visitor Center will air a special video presentation updating the Voyager mission and highlighting information on Uranus continually throughout the month in the mini-theater. After the January 24 fly-by, the video presentation will be augmented with the latest photographs and data from Voyager. The Visitor Center will also feature Langley's **Cary R. Spitzer**, an authority on planetary research programs, as guest lecturer Sunday, January 26, at 2 p.m. in the theater.

Spitzer's slide presentation will highlight recent finds from planetary exploration including early results from the Uranus fly-by. Spitzer will discuss dust devils on Mars, volcanoes on Jupiter's moon Io and methane on Saturn' largest Moon Titan. He will introduce M Badger, Mr. Mole, Mr. Rat and Mr. Toad some of the named rocks on Mars.

Having never viewed Uranus except throug powerful telescopes from two billion mile away, Spitzer agrees that we can expect th unexpected. "We hope to have photos of th rings around Uranus and close-up photos of i satellites," he said. Following the presentatio he will entertain questions from the audienc

Uranus is one of the giants of our sol system. Easily recognized because of i unique rotation, it is theorized that a collisic with another planet-sized body may have tilte Uranus from its vertical axis to its prese orientation. Uranus is known to have fi moons and as many as nine rings.

Voyager-2 will come as close as 50,000 mil above the cloud tops of the planet. In addition t obtainin images of the planet and its moons ar rings, measurements of chemical compositio magnetic environment, rotation and weather w be taken.

Visitor Center Features Launch, Landing and Live Sessions for Teacher in Space Mission

The launch and landing of Orbiter Challenger's tenth flight– Space Shuttle Mission 51-L–and "space classroom" sessions will be shown live on the Langley Visitor Center large screen television.

The launch is set for 3:06 p.m. Friday, January 24, from Kennedy Space Center. This launch marks the first time pad 39-B has been usesd for a Shuttle mission. Landing at Kennedy is scheduled for Thursday, January 30; landing time will be announced later.

Public interests in this flight will focus on Payload Specialist Christa McAuliffe, NASA's Teacher in Space. McAuliffe was chosen from 10 teacher finalists who were sifted from 11,416 applicants to fly aboard this mission of the Shuttle Challenger. McAuliffe will conduct two live lessons from space on the sixth day of the seven-day mission.

The first live lesson, scheduled to be aired at 11:30 a.m., January 29, is titled "The Ultimate Field Trip," and will allow students to compare daily life on the Shuttle with that on Earth. McAuliffe will take viewers on a tour of the Shuttle, explaining experiments being conducted on the mission. She will also explain how daily life in space is different from that on Earth in the preparation of food, movement, exercise, personal hygiene, sleep and the use of leisure time.

The second lesson, scheduled to be aired at 1:30 p.m., is called "Where We've Been, Where We're Going." It will help the audience understand why people use and explore space by demonstrating the advantages of manufacturing in microgravity environment, highlighting technological advances that evolve from the space program and projecting the future of humans in space.

The primary mission of flight 51-L is the deployment of the TDRS- B (Tracking and Data Relay Satellite 2). TDRS is a 5,000 pound communications relay satellite that links orbiting spacecraft to a ground station located in New Mexico. Also deployed will be SPARTAN (Shuttle Pointed Autonomous Research Tool for Astronomy), a free-flying telescope released for two days to observe Comet Halley. Additional payload include three student experiments, Comet Halley Active Monitoring Program and a Hughes Aircraft fluid dynamics experiment.

The seven-member team for this mission includes Commander Francis R. "Dick" Scobee; Pilot Michael J. Smith; Mission Specialists Ellison Onizuka, Judith Resnik and Ronald McNair; an Payload Specialists Christa McAuliffe, teache and Gregory Jarvis, Hughes Aircraft.

Key Positions

The employees listed below have bee selected for the key positions indicated.

Jerry R. Newsome, Head, Aeroservoela ticity Branch, Loads and Aeroelasticity Divisio CPP 85-88;

Vernie H. Knight Jr., Head, Flight Instr mentation Branch, Flight Electronics Divisio CPP 85-90; and

Richard R. Nelms, Head, Advanced Sens Program Office, Flight Electronics Division, CP 85-91.

TV Schedule for Uranus Encounter

At Langley Researcher press time, the television schedule for the Voyager Encounter with Uranus had not been finalized. Employees will be notified about the TV schedule available on the NASA Net within a few days.

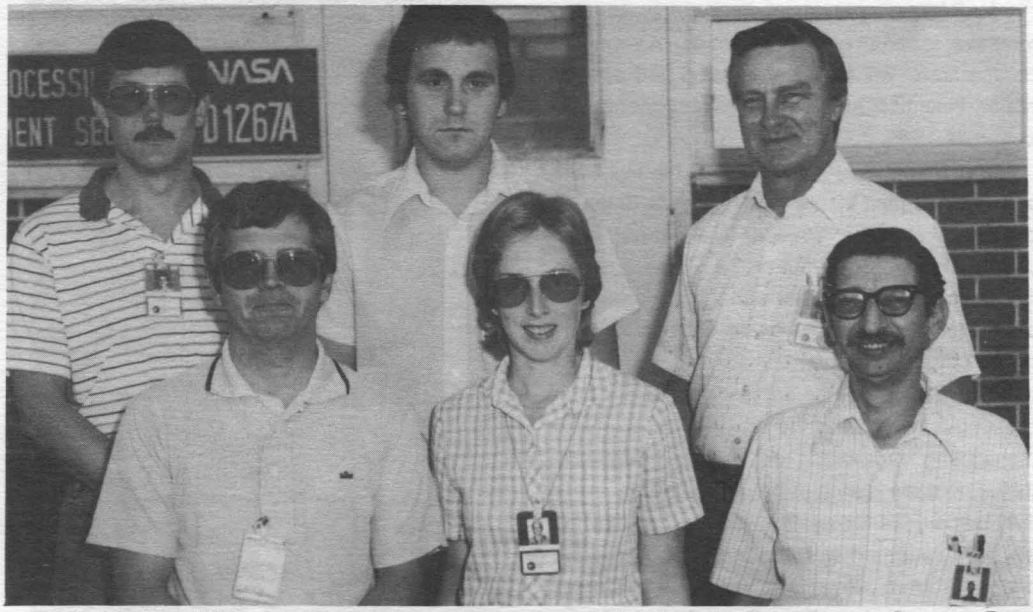
Quality Circles at the Langley Research Center

-by Allan C. Hanrahan

The **QUALITY PROCESSORS** Quality Circle draws its membership from the Materials Processing and Development Section, Fabrication Division. This is not one of the six charter circles but is one of the first in the expansion program.

In terms of formal presentations to management, the QUALITY PROCESSORS, with four such presentations, has acquitted itself well. Uniquely, a different member has served as leader for each of the presentations, one of which resulted in a Quality Circle Achievement Award: "Establishment of a Designated Area for Ultrasonic Contact Inspection." And along the way, the circle addressed and resolved up to a dozen Type I items. These are the problems that can be resolved without management approval by individuals acting independently.

Charles E. Johnson, Head, MPDS, and the management official to whom the first three of the presentations were made, retired March 29, 1985, but said this about the Quality Circle Program: "Oh, I think they're the real thing ...They get things done for you. Things I couldn't get done they did get done."



Members of the Quality Processors are (from left) Tom Hall, Lawrence Cooper, Ron Hermansderfer, Maggie Berry, Wayne Wright and Philip McElveen.

One of the circle members unknowingly echoed that same sentiment: "If it weren't for the circle, some improvements simply wouldn't have been made."

William L. Derby, the present section head and management official to whom the fourth, and last, presentation was made said, "It was a good presentation; they tied the whole thing down. It (the quality circle) got the ball moving. We're happy with it – all the people concerned with the quality circle were happy."

Management officials at both the FD level and Systems Engineering and Operations Directorate level have been present as observers at one or more of the presentations made by the circle.

Members of the Perfect Impressions are (seated from left) Alvin Buggs, Ben Defendeifer and Roland Hatten. Standing are Harold Orr, Ben Franklin and Tom Fowler.

The **PERFECT IMPRESSIONS** Quality Circle is unique because its membership is both Civil Service and contractor personnel. It issstaffed by people from the Publications Section and Photographics Section of the Research Information and Applications Division. The Klate Holt Company is the contractor.

The PERFECT IMPRESSIONS is the only one of the six charter circles in the Management Operations Directorate (the other charter circles are in the Systems Engineering and Operations Directorate), but PERFECT IMPRESSIONS has a good track record. It has made four formal presentations to management and three of those earned Quality Circle Achievement Awards, as follows:

"Improving the Method of Receiving a Processing Work Request," "Reducing the Cost

Continued on page 5.

Wenger Spreads NASA Word to Education Community

-photo by Fred Jones

Niki Wenger, one of the 10 finalists of the Teacher in Space Project, coordinates a workshop by phone from her office. Wenger spends more than 70 percent of her time traveling throughout the country conducting seminars and workshops and giving keynote speeches and presentations about NASA, particularly the educational aspects. Her purpose is to develop and implement projects to enhance, nationwide, the NASA/education partnership, and to inform her audience of educators, administrators, students and other interested organizations of this partnership.

Niki Wenger was one of more than 10,000 applicants eligible nationwide for the "Teacher in Space Project." In her home state of West Virginia, 122 applicants were narrowed down to six semi-finalists based on the content of the the applications. These six teachers were then interviewed in Charleston by the Teacher of the Year Panel, and two finalists plus a back-up candidate were selected.

On June 22 the 114 finalists from every state and several governmental departments convened in Washington, DC. A series of workshops on space education was conducted, with the final days devoted to the judging process. A panel of 20 judges, prominent figures from diverse fields, interviewed the 114 teachers and selected 10 to be further evaluated. The announcement of the winner was made at the White House July 19 by Vice-President Busch.

Wenger was assigned to Langley September 1 for one academic year for the purpose of developing and implementing projects to enhance nationwide, the NASA/education partnership. "Our purpose is to use our own area of expertise to impact education on a nationwide basis," says Wenger. "I spent more than a week and a half just going behind the scenes, learning what's happening at Langley and talking to many people to find out what I could do that would best use what I've been trained to do, along with what Langley's geared to do."

Wenger spends more than 70 percent of her time traveling throughout the country conducting seminars, workshops, and giving keynote speeches and presentations about NASA, particularly the educational aspects. Her audience includes groups such as educators, administrators, students and other interested orgainizations, and group size ranges from 100 to over 3000 people.

Before speaking to a group, Wenger ships such materials as space station and shuttle models, astronaut food, tiles, futuristic- looking airplane models and written material to her appointed destination. Topics she discusses include her training and selection experiences for Teacher in Space, NASA resources for

Continued on page 6.

Quality Circles

Continued from page 4.

theme: "It really helps the morale of the people to know they can go in and change things of Paper for Copying Machine" and "Reducing the Excessive Number of Overruns of Published Material." This latter item, because of its far - reaching effects, had to be approved by Headquarters; the approval was prompt.

Of the circle's work on this latter item, John F. Stokes, Director for Management Operations, made this observation: "It took a lot of creativity to bring that off." He felt particularly good about that presentation because "They (the circle members) felt good about it themselves; they had had an impact on the way we do business."

In an earlier, separate conversation with the circle members one had espoused the same positively." And "Yep" was the emphatic reply when the other circle members were asked if they felt the same way.

Speaking of the other quality circles in the Management Operations Directorate, as well as this one, Stokes voiced his feelings: "I try to go to the presentations unless there is an unavoidable conflict in my schedule. I would like to attend them all, the reasons being that I learn a lot, in addition to showing my support for the program. I am a strong supporter of the program," he emphasized.

In talking further about the quality circles, Stokes pointed out a recurring phenomena: "In the process of addressing major items, a lot of little items get solved along the way."

These Type I items Stokes was referring to number "At least eight, probably some more," one of the PERFECT IMPRESSIONS members had reported for his circle earlier. These items, acted on individually and independently by circle members, had improved productivity and efficience, but more importantly, in some instances had improved the safety of the workplace. Action was usually taken only after discussions with knowledgeable, non-circle member workers. As one circle member explained: "Anything we do to the work area or operation that affects another worker, we talk it over with them. We don't want to create a problem for someone else."

Gross Receives Award for Langley-Developed Invention

-by Robin Hartigan

Chris Gross, a former Langley employee, received a Certificate of Recognition and a $5000 check in December for his invention of Electronically Scanned Pressure (ESP) Sensors. By replacing a mechanically scanned pressure sensor, the use of the ESP sensor resulted in better data quality and significant cost reduction in wind tunnel pressure measurements.

Gross developed the ESP sensors about 10 years ago when he worked in the Instrument Research Division. These sensors are now being used worldwide in wind tunnel, aircraft and turbine testing. The ESP sensors can acquire pressure data at the rate of 20,000 readings per second, some 2,000 times faster than the pneumatically scanned pressure sensor they are replacing. This high data rate allows wind tunnel test time for pressure measurement to be reduced drastically. For example, Douglas Aircraft saved more than $1,000,000 in one test conducted at the Airforce's Arnold Engineering Development Center 16-Foot Transonic Wind Tunnel on the C-17A aircraft model.

In addition to reducing testing cost, improved accuracy is also an asset because the high data rate allows a snap shot measurement of the pressure distribution, thus eliminating errors that result from transient changes in the wind tunnel or turbine operating condition.

Under NASA's Technology Utilization Program, the ESP sensor technology was transferred to Pressure Systems, Inc., a company formed and licensed by NASA to manufacture and market the system. In October 1985 Pressure Systems, Inc. dedicated their headquarters building in the Langley Industrial Research Park in Hampton.

To date, Pressure Systems has sold more than 50,000 channels of ESP sensors to the major aerospace laboratories and companies of the free world. The $5000 award made by the NASA Awards and Contribution Board and presented to Gross by Langley Director, Richard Petersen, is in recognition of the expanded use, worldwide application and significant benefits resulting from this NASA technology.

Gross began his Langley career in 1962 and was Head of the Sensor Physics Section in the Instrument Research Division when he left in 1980 to join Pressure Systems, Inc. as a vice-president.

-photo by Terry Shepard
Center Director Richard H. Petersen presents Chris Gross with a Certificate of Recogniti and a $5000 check for his invention of an Electronically Scanned Pressure (ESP) Sens which replaced the mechanically scanned pressure sensor. This invention resulted in bett data quality and significant cost reduction in wind tunnel pressure measurements. Sin 1980, Gross has worked at Pressure Systems, Inc., a company formed and licensed l NASA to manufacture and market the system. To date, Pressure Systems has sold mo than 50,000 channels of ESP sensors to the major aerospace laboratories and compani of the free world.

Advanced Graduate Study Offered

According to the Government Employees Training Act (GETA) and provisions adopted by the Committee on Advanced Graduate Study, Career NASA employees may take up to 2080 hours for advanced training to support research accomplished here at Langley Research Center. If you are contemplating full-time graduate training away from the center, your request must by approved by the Committee on Advanced Graduate Study chaired by Paul Holloway, Deputy Director.

Employees who have reached this junction in their careers should contact the Employee Development Branch for information and a copy of "The Guidelines for Graduate Study." Time is of the essence for those looking toward leaving the center for full- time study to begin in the fall of 1986. Approval by the committee is also required for part-time study with a concentration in engineering administration.

The Committee on Advanced Graduat Study will be meeting in April to conside prospective full-time participants. Therefor if you are considering such a decision, conta George Allison in the Employee Developme Office, at ext. 2611, at your earliest convenienc

Thank You

Anne Baldwin writes, "I would like to thanl each one of you who donated blood on my behal at the November 27 bloodmobile at NASA; you kindness was most appreciated. May you live healthy and happy lives."

Doris Vandeveer writes, "I would like to thank all our friends at Langley for thei prayers during his illness and the expressions of sympathy upon the death of my son-in-law R. Wayne Pressley. The thoughtfullness of ou friends has been a great comfort to the family."

Happenings

LAA SOCIAL. The Langley Activities Association will sponsor a social January 24 from 4 to 6:30 p.m. in the Activities Center.

COUNTRY AND WESTERN DANCE. There will be a country and western dance January 18 at the Activities Center from 7:30 until 11:30 pm.

SKI TRIP. Ski camelback in the Pocono Mountains of Pennsylvania. Transportation, lodging, lift tickets for Feb. 8-9, breakfast and dinners. Cost is $141 per person. Call Mary Saylor, 865-0040 (work) or 722-5775 (home).

VIDEO PROJECTION DEMONSTRATION. There will be a video projection demonstration at the Activities Center January 22 (setup/test) and 23 (primary demonstration). Featured during the day will be GE-NTSC; Sony-NTSC/multi scan; Octorous, Conrac- Multi-Scan; IMI-NTSC; and miscellaneous assorted low budget alternatives. Signals include NTSC video, live and recorded; computer generated graphics and text; and live satellite downlink Voyager/Uranus Encounter. Fabrication and Facilities Engineering Division personnel and manufacturers'representatives will be available to discuss individual applications. For further information, please call Brad Ball, ext. 4534.

CALLIGRAPHY. A beginning calligraphy course will start Jan. 20 at Thomas Nelson Community College. Call the Office of Continuing Education, 825-2939 or 2935, to enroll. Wesley Berryman is the instructor.

LAA FILM FESTIVAL. The Walt Disney movie, "Robin Hood" will be shown in the Activities Center at 1 p.m. January 26. The cost is $1 per person and children under three are free.

WETTER THAN WATER. Virginia Stage Company inaugurates the second stage series with "Wetter Than Water," a new play by Virginia Beach playwright, Deborah Pryor. It will run through January 25 on Thursday and Friday nights at 8 p.m.; Saturday at 5 and 9 p.m.; and Sunday at 2 p.m. Tickets are $10. Call 627-1234 for further information.

FINANCIAL PLANNING. The AIAA will sponsor a program on financial planning Wednesday, January 29. Gail King, a certified financial planner, will discuss "Why People Fail Financially" at 5 p.m. in the Activities Center. Her discussions will include all forms of investments, stocks, IRA's, taxes, real estate and insurance. A social will begin at 4:30 p.m. No reservations are required.

PHOTO WORK. Original artwork and charts that were sent to the Photo Lab for making 35mm slides, color Vu- graphys and B/W and color prints must be picked up within 30 days or the work will be destroyed. The originals were too large to be put in distribution and employees failed to pick up the work upon notification. For further information, call Bob Nye, ext. 3521.

SKI NASA 86. Ski in the beautiful mountains of Virginia; travel to the slopes on buses in comfort with no worry about driving or road conditions. Arrive at ski slope refreshed and ready for a full day of skiing fun. Trip schedule: Massanutten (Jan. 23), Bryce (Jan. 30), and Wintergreen (Feb. 6). Bus departs Newmarket South in front of Hechingers at 5 a.m. and will arrive at the ski area by 9:30 a.m. Bus departs at 5 p.m. and returns home by 9:30 pm. Cost is $35 and includes transportation and lift ticket. For further information, call Richard Bennett, 599-5585.

BLOODMOBILE. The American Red Cross will sponsor a Bloodmobile in the Activities Center Wednesday, January 22, from 9 a.m. to 3 p.m.

PENINSULA RUGBY CLUB is seeking interested players. No experience is necessary. Practices are held at Warwick High School Thursdays at 6:30 p.m. For more information, call Gene, ext. 3585, or at home, 599-4930 after 6 p.m.

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 Virginia Jones, ext. 2605.

Wenger, Finalist in Teacher in Space Project

Continued from page 5.

educators – what is available and how to get it, NASA's Teacher in Space Project – the lessons from space, the role of NASA in education – present and future, NASA research in aeronautics and aerospace, the role of gifted and talented in NASA, the Space Shuttle Program, America's space program, women in NASA and NASA careers.

Wenger is coordinating a project to take place on the March 6 shuttle mission. The objective is to down-link directly from onboard shuttle computers into existing educational networks in the schools. The shuttle will carry two payloads designed to study Halley's Comet and this information will not only impact the schools but also the world.

Wenger received a bachelor of science degree in psychology from the University of Miami and a master of arts degree in gifted education from West Virginia College of Graduate Studies, Institute, W. Va. She has been a teacher of the gifted at Vandevender Junior High in Wood County, W. Va. for three years. Before that, she worked for the Calhoun County secondary gifted program as a teacher and an implementer for two years. She also teaches computer literacy and programming at Parkersburg Community College, Parkersburg, W. Va. and has presented workshops and seminars on gifted education and computer literacy for the past five years.

Organizations of which Wenger is a member include the West Virginia Gifted Education Association, the Council for Exceptional Children, the National Association for Gifted Children, Mensa, and Intertel.

During her few spare moments, Wenger enjoys riding Gunsmoke, her Tennessee Walking Horse Black Stallion, whom she keeps in a local stable. She also enjoys water skiing and playing the piano.

Wenger's husband and three sons have been very supportive of her work at Langley. In fact, two of sons hope to become astronauts. When asked aobut her reaction to being selected as one of the 10 finalists, Wenger said, "It was a dream come true. My dream was to go on a shuttle flight, and I haven't given that up yet. I'm hoping I'll still have an opportunity some time in the future. In the meantime, I'm really enjoying my work with the space program at Langley. It's like Christmas every day – it's magic. Here I feel like I'm a part of the future. It's like science fiction, only it's not; it's happening and it's real. This is a wonderful environment to work in. I enjoy every single thing I'm doing. Almost every job has something you don't like but this job is like a dream. It's too good to be true. I pinch myself almost every day so that I know it's real."

Wenger's plans for the future are indefinite. "I'm not looking ahead," she says. "I just want to enjoy every day as it's happening right now. This is the most incredible place I've ever worked in my life. It's so wonderfully exciting, and the people are like family to me."

Sympathy Extended

Sympathy is extended to the family of **Miles L. Lockard** who died December 18. Lockard retired from the Systems Engineering Division June 1, 1984 after 35 years of service.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 LANGLEY EMPLOYEE (LRC ADDRESS)
ROBERTSON, JAMES B.,
MAIL STOP 494 BLDG 1298
152E

Cafeteria Serving Area Improvements Underway

Cafeteria customers returning from the holidays have no doubt noticed some changes in the Cafeteria serving area. These changes, some subtle, some much more noticeable, are intended to benefit all customers, particularly during peak serving hours and the summer "peak" months. The changes, which will continue to be implemented as ordered equipment arrives and should be completed by early February, are highlighted as follows:

- New large salad bar.
- Cashiers' stands moved away from beverage island and toward main dining area.
- Relocated condiment area.
- A "new look" at the beverage island with ice dispensers and improved beverage access.
- A new ice cream line at the snack bar.
- Installation of partitions and rope devices to better define entrance and access to snack bar, entrees, ice cream, etc.
- Improved signs and menu boards to assist customers.
- Ice dispensers on the kiosks in the dining rooms.

The construction of the dining room addition with its seating capacity of 130 persons, has allowed these improvements to be undertaken by eliminating some seating adjacent to the serving area and permits the changes described above.

Please remember that our Cafeteria is intended to be a "scramble" system; that is, access to beverages and other areas is intended to be relatively random, except at the busiest times, when some lines are bound to form. It is not impolite in our Cafeteria to excuse yourself and step in for a beverage or salad. That can actually make for a smoother operation in most cases; just use good common sense. These changes were only undertaken with one objective in mind: to make the best Cafeteria in NASA even better for Langley personnel and our visitors.

cafeteria menu

Week of January 20-24

MONDAY: Closed for the holiday.

TUESDAY: Turkey noodle soup, Austrian ravioli, veal parmesan, hot roast pork sandwich. Snack Bar: NASA sub, 1/4 lb. cheeseburger.

WEDNESDAY: Vegetable soup, fried chicken dinner, beef pot pie, Polish sausage and kraut. Snack Bar: Chicken filet, Polish sausage on bun.

THURSDAY: Minestrone soup, beef macaroni and tomatoes, broccoli and cheddar quiche, braised chicken livers. Snack Bar: 1/4 lb. bacon cheeseburger, beef and cheese club.

FRIDAY: Fish dinner, ham and macaroni au gratin, BBQ chicken breast. Snack Bar: Brotwurst, deluxe fish sandwich.

Week of January 27-31

MONDAY: Chicken vegetable soup, hot roast beef sandwich, fried filet of flounder, cheese omelette. Snack Bar: Beef and cheese club, chicken filet.

TUESDAY: French onion soup, burrito and Spanish rice, chicken fried steak, lasagna. Snack Bar: Steak and cheese sub, ham and cheese club.

WEDNESDAY: Vegetable soup, turkey dinner, meat loaf, franks and baked beans. Snack Bar: Turkey and Swiss club, knockwurst and kraut.

THURSDAY: Cream of broccoli, chicken and dumplings, roast beef au jus, seafood quiche. Snack Bar: Hot Italian sausage, corned beef and Swiss.

FRIDAY: Bull Island clam chowder, fish dinner, chicken and noodle casserole, pepper steak and rice. Snack Bar: Footlong hot dog, grilled ham and cheese.

swap and shop

FOR SALE

Articles

Kroehler sofa and chair, traditional, off-white. Ethan Allen traditional solid cherry cocktail table. VGC $300. Call Fecondo at 642-4537

Vehicles

1981 Dodge Colt deluxe 2-door hatchback, EC, one owner, 4-speed standard with power shifter, new paint, $2350. Ca Boswell at 826-6430.

1975 Ford Pinto, 6 cycl., AT, AC, PS AM/FM radio with 8-track, 72,000 miles new tires and inspection. $1100 OBRC Call Sara at 766-1474.

1967 Mustang coupe, 6 cyl., 3 speec white with red interior. Goodyear eagl radials, have receipts for rebuilt motor an front end, good daily driver wants newe car, $2,500 OBRO. Call 898- 5113.

Retirement Parties

A retirement dinner for **Dr. Melvin S Anderson** will be held at 7 p.m. on January 31 1986, at the Blue Hawaii Restaurant. Anderso will be honored for outstanding contributions t structures research in over 30 years of servic to NASA. The buffet dinner and gift contributio is $12.50 per person. Individuals who canno attend the dinner may make gift contribution separately. Please contact Doug Heard, ext 2608 or mail stop 190; or Keith Belvin, ext 2446 or mail stop 230, for dinner reservation and gift contributions

Grace C. Sain will be honored at a retiremen social Tuesday January 28, 1986, from 5 to 8 p.m. in the Activities Center. There will be a cash bar and hors d'oeurves at a cost of $7 per person, including gift. Reservations mus be made by January 21, 1986; send paymen to Brenda Spencer, mail stop 123, or call he on ext. 4209.

A retirement dinner in honor of **Leo P. Daspit Jr., Anna P. Plott and Betty C. Pate** will be held at the Activities Center on January 22, 1986. Cocktails will be at 6 p.m. and dinner at 7. Cost is $11.25 per person and includes a donation for one gift. Please designate retiree you wish to honor and if you wish to contribute to more than one gift or if you wish to contribute while not attending the dinner, please send $2.00 and specify retiree. Make reservations by January 15,1986, by contacting and sending payment to Helen Bruce, mail stop 119, or Libby Bierie, mail stop 352

National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 25, Issue 11 **June 6, 1986**

Bower, Associate Director, Retires from NASA

Robert E. Bower, Associate Director of the Langley Research Center, retired May 30. In this position since April 1985, he was responsible for long-range facility planning and led an effort in strategic planning to determine future directions of the center. He also acted as Deputy Director of Langley from November 1985 until his retirement.

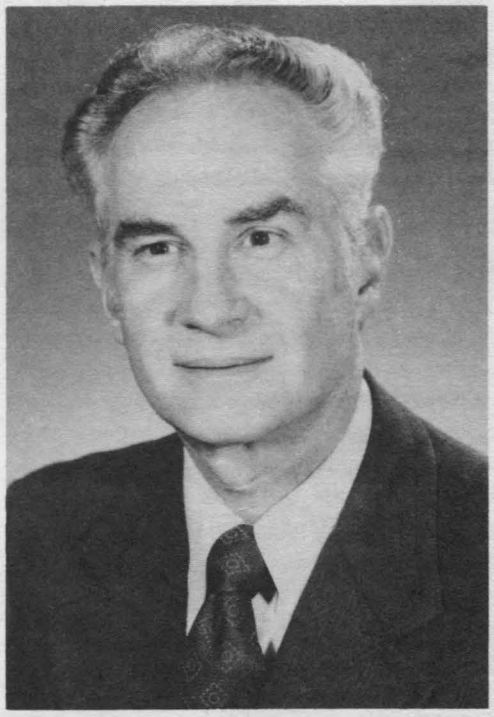
Bower joined NASA in September 1971 as Director for Aeronautics, directing three divisions – low-speed aerodynamics, transonic aerodynamics and high-speed aerodynamics – which have responsibility for over 15 major aeronautical facilities at the center. He had programmatic responsibility for approximately one third of the research effort at the center, including fluid mechanics, aerodynamics, flight dynamics, propulsion integration, hypersonic propulsion and flight environment.

He was co-chairman of an extensive study in 1975 to define the future outlook for aeronautics. This involved interviews with over 100 leaders in the aeronautical community to form national goals and the role of NASA in meeting this challenge.

Bower previously worked for 22 years at Grumman Aerospace Corporation. His last assignment there was Director of Advanced Development, responsible for the corporate independent and contractual advanced technology program. During his years at Grumman, he authored 20 technical reports in the areas of computational fluid dynamics and propulsion aerodynamics.

He has lectured extensively in the United States and Europe on the subject of aeronautical research and development and has been a guest lecturer at several university short courses. He has been a consulting editor for McGraw Hill Encyclopedia of Science and Technology and in 1981 was appointed Director of the Aircraft Design School of the International Center for Transportation Studies. Bower is also a member of the University of Tennessee Space Institute

Continued on page 2.

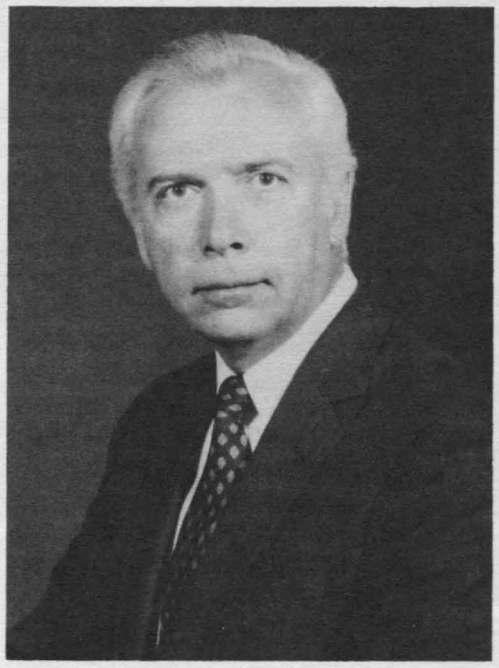


Piland Named Assistant to the Director at Langley

William M. Piland has been selected as Assistant to the Director at Langley. In this position he is responsible for providing technical advice and assistance to the director and deputy director in matters pertaining to management and operation of the center and recommending policy on programmatic and technical issues.

Piland began his Langley career in 1962 while on active duty with the U.S. Army, and following his Army tour, he accepted permanent employment at Langley in 1965. He first served as an aerospace engineer, working in the Applied Materials and Physics Division and then with the Manned Orbital Research Laboratory (MORL) Studies Office. In 1968 he was named Technical Assistant to the Chief, Flight Dynamics and Control Division, and in 1970 Technical Assistant to the Director for Space.

In August 1976 he was appointed Assistant Chief, Space Systems Division, where he assisted the chief in directing the division's research and technology activities in support of the Space Shuttle, advanced space transportation systems, advanced spacecraft systems and aerothermodynamics research. During his assignment as Assistant Chief, Space Systems Division, he served two tours with NASA Headquarters. From September 1980 to December 1981 he was the Deputy Director for the Administration and Program Support Division, Office of Aeronautics and Space Technology, and from November 1985 to May 1986 he served as NASA's representative to the Department of Defense Strategic Defense Initiative Organization for technology transfer.



Piland was born in Norfolk, Virginia. He earned a bachelor of science degree in aerospace engineering in 1962 from Virginia Polytechnic Institute and State University, graduating with honors as a distinguished military student. He has completed advanced engineer-

Continued on page 2.

Morgan to Address 'Touching the Future' at Colloquium

Barbara R. Morgan, Teacher in Space designee, will tour the Langley Research Center and will speak to employees at a colloquium Thursday, June 19.

In her talk, "Touching the Future," Morgan will discuss her NASA experiences and training. She will show and narrate a televised 28-minute video tape, beginning at 2 p.m. in the Activities Center. Following her presentation, she will answer questions and meet informally with attendees.

Morgan was selected as the backup candidate for the NASA Teacher in Space Project on July 19, 1985. From September 1985 to January 1986, Morgan trained with Christa McAuliffe at the Johnson Space Center in Houston.

Since the 51-L accident, Morgan has assumed the duties of the Teacher in Space and is working with the NASA Educational Affairs Division on a number of projects. She also is serving as the President of the Teacher in Space Education Foundation, an organization dedicated to fostering the pioneer space-age spirit in American education. The foundation is committed to expanding educational frontiers through challenging teachers to experience innovative educational ventures.

Morgan is a native of Fresno, Calif. She earned a bachelor of arts with distinction in human biology from Stanford University in 1973 and her teaching credential from College of Notre Dame, Belmont, Calif., in 1974. She taught in elementary schools in Arlee, Mont.; Quito, Equador; and McCall, Idaho, until she was selected as the backup candidate for the Teacher in Space Project.

She is married to Clayton M. Morgan.

Key Position

Arthur S. Johnson has been selected Head, Stock Management Section, Property Management Branch, Management Support Division, under Competitive Placement 86-28.

Bower Retires

Continued from page 1.

National Advisory Board. He is an Associate Fellow of the American Institute of Aeronautics and Astronautics and in May 1984 was elected Director of Region 1, which has 19 sections and over 30 student branches. In this role he serves on the Board of Directors.

Bower is a native of Gloversville, N.Y. He graduated from Rensselaer Polytechnic Institute with bachelor and master of science degrees in aeronautical engineering in 1948 and 1949, respectively. He was in the U.S. Army from 1943 to 1946.

He is a member of the Sigma Xi, Tau Beta Pi and Gamma Alpha Rho honorary societies.

Bower and his wife, Jane, live in Newport News. They have two sons, Charles and Thomas, and three grandchildren.

Positions Open

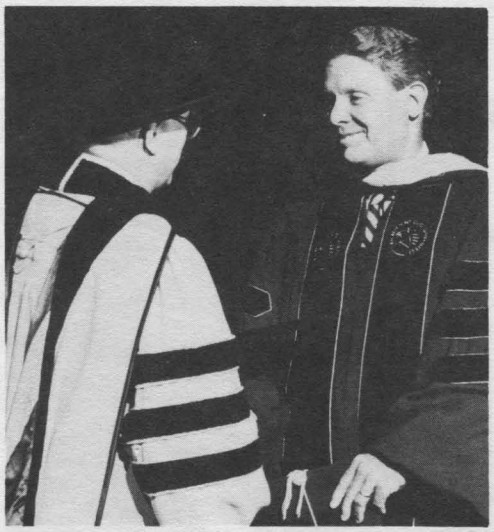
The following positions are open at the Langley Research Center:

86-40 – Electronics Technician, GS-0856-9, 10, 11, Flight Electronics Division, Electronics Branch; closes June 11.

86-41 – Electronics Engineer; AST,Instrumentation Systems; GS-0855-13; Flight Electronics Division; Electronics Branch; closes June 11.

86-42 – AST, Experimental Facilities Development; GS-0801- 13 or 14; Office of Director for Systems Engineering and Operations; Facilities Program Development Office; closes June 24.

G86-3 – Growth Opportunity Announcement: Management Assistant, GS-0344-5, Management Support Division, Logistics Management Branch, Equipment Management Section; closes June 13.



HONORED BY PURDUE. Langley Director Richard H. Petersen (right) is congratulated by Purdue University President Steven C. Beering after Beering conferred on Petersen an honorary doctor of engineering degree May 17 at Purdue's 138th commencement. Petersen was among ten who received honorary degrees from Purdue.

VHS Available on Godspeed Voyage

A one-hour color documentary on "Th Voyage of the Godspeed" is available in VH videocassette.

The fast-moving film is not only entertainin but educational, offering a lesson in America history while depicting the 1985 voyage of th Godspeed.

To order a cassette, send a $50 check payable to Jamestown- Yorktown Foundatior to Godspeed Film, P.O. Drawer JF, Williamsburg VA 23187, no later than June 20.

Piland Named

Continued from page 1.

ing and technical management courses at bot VPI and at George Washington University.

He has specialized in the fields of aircraft an spacecraft stability and control, human factor in space, and in the management of researc and development programs. He has authore numerous technical papers and has receive several Outstanding Performance Awards fo his work.

National Aeronautics and Space Administration
Langley Research Center

NASA

Langley Researcher

The Langley Researcher, an official publication of th Langley Research Center, National Aeronautics and Spac Administration, Hampton, Virginia 23665, is published eve other week in the interest of its employees. Addres contributions to the Editor, Mail Stop 115, telephone 865-300

Editor . . . . . Jean Drummond Cloug
Staff Photographer . . . . . Bob Ny

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

NASA Predicts Revolutionary Advances in Aircraft Performance

This is the second of a three-part series on advances in aircraft performance, written by Keith Henry. The next issue of the Langley Researcher will feature The Supersonic Revolution.

The Subsonic Revolution

To passengers, the airliner of the next century could be very different but look much the same.

Ironically, the most obvious difference might be a return to propellers – improving the turboprop of the 1950's and 1960's to tap its great potential for fuel efficiency. Working with the propeller industry, the Lewis Research Center, Cleveland, has taken advantage of several technology advances in propeller blade structures and aerodynamics to dramatically reshape the propeller. Mounted at the rear of the plane, the turboprop's huge, highly-swept blades might be in counter-rotating pairs on each side of the fuselage. Each propeller may have as many as eight or ten blades. This new system would carry people and cargo using 20 to 30 percent less fuel while matching the jet speed and cabin comfort of modern turbofan-powered aircraft.

Elements of NASA's advanced turboprop program include the "propfan test assessment" program to flight test a large-scale, single-rotation propeller in 1986. In one of several tests planned by NASA and industry in the next few years, a three- quarter scale, nine-foot diameter propeller will be put on an existing business jet to answer questions about structural integrity and noise levels.

More subtle innovations will include new materials and new structural concepts to make air transports of the 21st Century lighter and tougher. Thin filaments of graphite and epoxy – already being used in consumer products from tennis rackets to boats – could be wound in a continuous strand to form an airplane fuselage, much like rocket cases are manufactured. The layers could be part of a structural "sandwich" that would weigh 25 percent less than an aluminum-skinned and reinforced counterpart. Wing weight could be reduced even more through a combination of parallel advances. The net payoff would be significant. A further contribution to fuel efficiency would be made, of course, and manufacturing costs would be reduced – parts count in a composite fuselage would be cut in half.

NASA has invested about $160 million since initiating a cooperative program with industry in primary aircraft composite structures technology. Laboratory and flight tests have proven the toughness of large-scale advanced composite structures, successfully meeting damage tolerance and other criteria. A major program milestone was reached when five new transports were fitted with composite tail assemblies, marking the first use of composites for an essential transport structure. The aircraft are now in commercial service. NASA ended the program a few months ago, having provided a base which industry can now apply to new products. The agency will continue fundamental research into composite materials and structural concepts.

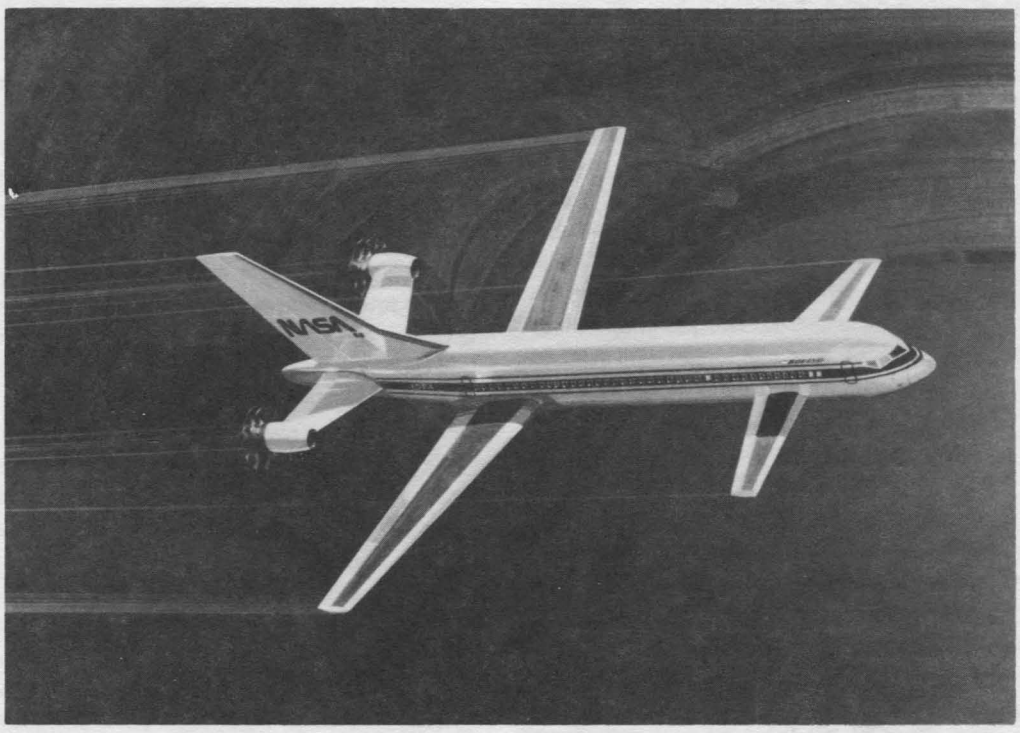
Passengers may look out their windows in the year 2005 and see long and slender wings, with aerodynamically shaped cross sections for optimal lift. The correct airfoil shape, combined with a perfectly smooth, wave-free skin, could result in "natural laminar flow," where thin layers of air slide over the wing surface with a minimum of skin friction drag. The wings might also have nearly microscopic perforations or slots allowing air closest to the wing to be pumped from the surface – again to reduce drag, but this time for active laminar flow control.

The larger surface of the fuselage, where turbulent flow is unavoidable, might have tiny grooves called "riblets" parallel to the direction of travel to reduce turbulent drag. The grooves could be made of self-adhesive tape and applied directly to the aircraft surface. With the discovery of riblet- like scales on the skins of fast-swimming sharks, nature has confirmed the results of NASA wind tunnel tests.

Aerodynamic discoveries may be accelerated when a powerful new supercomputer and simulation complex is fully operational at the Ames Research Center, Mountain View, Calif. Soon to be the most advanced computational system in the world for aeronautical research and development, the Numerical Aerodynamic Simulation (NAS) Program will perform one billion computations per second by late 1987 – more than three times faster than the previous generation of supercomputers. The computational fluid dynamics work possible with NAS will help researchers simulate conditions and flow phenomena difficult to measure physically, like the flows of air through the internal passages of turbine engines.

Passengers of the 21st Century might be surprised the first time they look into the cockpit to see computer terminals and

Continued on page 6



Subsonic transports of the 21st century might resemble this fuel-efficient turboprop concept, complete with forward wing surfaces called canards and slender, aft-located main wings.

Langley Detailees Experience Rewarding Year at Johnso

Twenty-five years ago Langley Research Center employees became a part of a new venture, that of space exploration, and began moving to the new space headquarters, Manned Spacecraft Center (now the Johnson Space Center) in Houston, Texas. Today, Langley employees are again participating in a new space venture, building a space station, and are moving to Houston for one year to pursue Phase B of that effort.

J.B. Lovell, Steve Katzberg, Roger Winebarger, Ray Haynes, Bob Jensen, Jack Neubauer, Dick Kurtz and Shelby Pickett Lawson are experiencing a great year at the Johnson Space Center.

"We are very fortunate to have qualified researchers from several NASA centers here helping us with Phase B," said **Norm Chaffee**, Deputy Manager, Systems Engineering and Integration, Johnson Space Center. "The agency decided to do its own SE&I work during Phase B and to send research detailees from several centers, by mutual agreement of the center directors, to help with this effort. The employees are experienced in their fields and add tremendously to the Space Station program."

Phase B of the Space Station program is the definition phase in which various concepts are evaluated from which a single configuration is selected and baselined for the design and development phases (Phase C/D).

J.B. Lovell, who heads the detailees in the Space Station Office at Houston, said the tour offers a chance to work on the program, which may not of happened if they were still at Langley, exposure to new areas in his career, and a chance to travel and sightsee without too much added expense. Lovell is originally from a nearby area and has enjoyed getting reacquainted with those he hasn't seen for years.

"Some of the employees were able to bring their families with them, which is a great experience for a family. It does present a hardship, though, in that socially some have a lot to give up by coming here for a year. However, it is a wonderful way to see this part of the country. Professionally, some of the detailees have questioned where this temporary assignment will put them on the career ladder when they return to Langley."

At Johnson since March, Lovell works in the area of evolution and growth for the Space Station, looking at additional capabilities that can be added once the Space Station is built. Lovell said, "The Space Station is viewed as a 'long term man's presence in space,' building now for something we expect to be operational in 1994. After it is operational, and as time, budget and priorities permit, it will grow needing additional capabilities. It will evolve because experiments and functions will change. It's hard to predict now what those requirements will be but this evolution is what we are trying to plan for."

Dick and Jenny Lou Kurtz found this year to be very rewarding for them. "We have family here," Jenny Lou explained, "family we haven't seen in a long time. Dick's and my cousins have included us in social and church functions, so we have adjusted very well. I have been fortunate to have people I could turn to, especially when Dick travels back to Langley.

The Kurtzes have done some traveling, square danced and enjoyed new friends. There are so many parks, theaters, restaurants and shopping centers to enjoy, according to Mrs. Kurtz. She said it is ideal for a family.

Their children, parents and house are in Virginia, though, so "it will be good to get home to them; although, I really hate to leave here." She said they have toured nearby areas as well. "My favorite place is Galveston; I feel at home there; it reminds me of the Outer Banks where we have a time- sharing condominium."

Kurtz's work on Space Station has been exciting for him. He has worked in the Customer Accommodations Office. "Our job in that office is to insure that the Space Station remains user or customer friendly and that the best interest of the customer is kept in the forefront during the design and narrowing of the options for the Space Station design itself.

"We work in a number disciplines, such as power, thermal, data, servicing, attach payloads as well as payloads in the pressurized modules."

Kurtz said that Langley is not one of the work package centers so he doesn't see any advantages to Langley having detailees at Johnson. However, he said detailees themselves are at an advantage in that they have "an opportunity to compare the management philosophies of the two centers. This is very unique contract with four centers bein involved in a program and I don't think this typ of situation has occurred before within NASA

He hasn't had to travel to Langley much thi year, which is good because employees los their per diem when they return to their hom center. That is the biggest disadvantage fo detailees, especially for those having families i Houston. "Living expenses still go on in Houstoı with no per diem to cover those expenses, plu we are caught at Langley without cars an can't get a Langley car to drive while there We have to depend on friends or other famil members for transportation. That's not good. Kurtz added.

Kurtz said he is not certain where he wi work upon his return from Houston. "I an looking at what opportunities are available t take advantage of the exerience I have gaine at JSC. The work I am doing on Space Statior will not fit into the program until a later period. probably will return to the Systems Engineerin Division, working on airplane problems an airplane payloads," he concluded.

Bob Jensen and his wife, Roselie, are another couple who traveled together to Houston. Jensen's wife took a year's leave of absence as a school teacher to accompany him. Her biggest job in Houston has been "taking care of me," Jensen explained.

"We have visited three cities in Mexico and have covered a good deal of Texas," Jensen explained. "Two highlights of our travels have been attending the reenactment of the fall of the Alamo in Brackettville, where John Wayne filmed the movie, and attending the 150th anniversary of Texas."

As far as Jensen's work assignment is concerned, "It has offered a growth opportunity in my career. I have worked with the mechanism team developing the requirements for the mobile service center and with the docking and berthing systems for the Space Station. I learned to operate the program computers which I didn't have access to at Langley; that's really an asset."

"I definitely recommend a year's tour at Johnson. I must go back to Virginia, though. My wife has to return to her teaching career; we have a house which is being watched for

us while we are away and we need to tend to that," Jensen added.

Steve and Jamie Katzberg really pulled up stakes when they left the Peninsula. They sold their house in Yorktown and transferred their children – Maegan, 8, and Joe, 12 – to Houston schools – hoping to stay longer than a year at Johnson.

"It hasn't worked out that way," Katzberg said. "We will go back this month, not by choice. We love the area and I have enjoyed my work in automation and robotics. It's the same type of work I did at Langley." Katzberg said his work is related to responding to a congressional initiative on using the Space Station to advance automation and robotics research, technology and applications particularly aimed at spinoffs of U.S.

"There is a lot going on all the time in Houston. The quality of life is absolutely excellent. I would highly recommend a tour here, providing the detailee can bring his family. We have had a perfectly wonderful time. I wish we could stay," Katzberg concluded.

Ray Haynes left his entire family in Virginia when he went to Houston. "I have four children in school and my wife and I felt it best for them to remain behind– so did the children," he explained.

"My wife has visited here and we have taken advantage of the many social opportunities, such as operas, plays, symphonies, the 150th anniversary and The Renaissance which is similar to Oktoberfest."

He has been working in the Verification Office, which is entirely different from his work at Langley, where he was a a project engineer in instrumentation. "My work here has been a challenge but it is not the work I want to continue doing for the remainder of my career. I needed to do something that I felt was a real challenge. This has been good for me."

As the first person in the Verification Office and with few guidelines to work from, Haynes recognized the need for, and developed a plan to identify the function and determine the performance time frame for the Level B verification task. He assembled, edited and distributed a listing of verification guidelines and assumptions from available sources to be used by all Space Station participants to formulate consistency across work package lines.

"I have participated in several long-range tasks including the identification of the software acquisition life cycle, establishing a compatible verification management and tracking scheme with all Space Station participants and monitoring the software verification requirements document for baslining as the Verficiation Office interface," Haynes explained.

Roger Winebarger has been at Johnson for 15 months. "It is a great opportunity for a single engineer without Virginia ties to spend a year in Houston. It has been good for my career and good financially. The greatest advantage has been to work on the Space Station program."

"I think I have one of the best positions in the Space Station Office. I work in the Customer Integration Office in the area of technology and Langley is the lead center for technology. There are about 70 technology development missions in the mission requirements data base. Everyone taking an experiment on the Space Shuttle to the Space Station is considered a customer and we are already looking at those Space Shuttle missions."

Jack Neubauer has extended his stay for another year and is looking forward to continuing his work in systems engineering and integration in the man systems group. The group is responsible for the habitat outfitting and crew interfaces.

His wife has been relaxing and has become very active in a church group. "It was like reacquainting ourselves to the area," Neubauer explained. "I worked at Johnson several years ago as a contractor. So my wife did have friends here which made it easier for her. We were happy to come back.

"This has been a good experience, especially for my career. The work is along the same lines of the work I was performing at Langley I enjoy it."

The situation that **Shelby Pickett Lawson** found herself in is probably the most unique of all.

Shelby was a co-op student assigned to Langley while attending North Carolina State University. After co-oping five times with Langley and graduating from college, she accepted an offer in the Acoustics Division.

She started working at Langley last June and completed her administrative intern program in six months. Planning to get married and with her future husband working for Rockwell in Houston, Lawson made the decision to leave Langley, hoping to get a job at JSC. Coincidently, Langley was looking for a detailee to work in the Systems Synthesis Office.

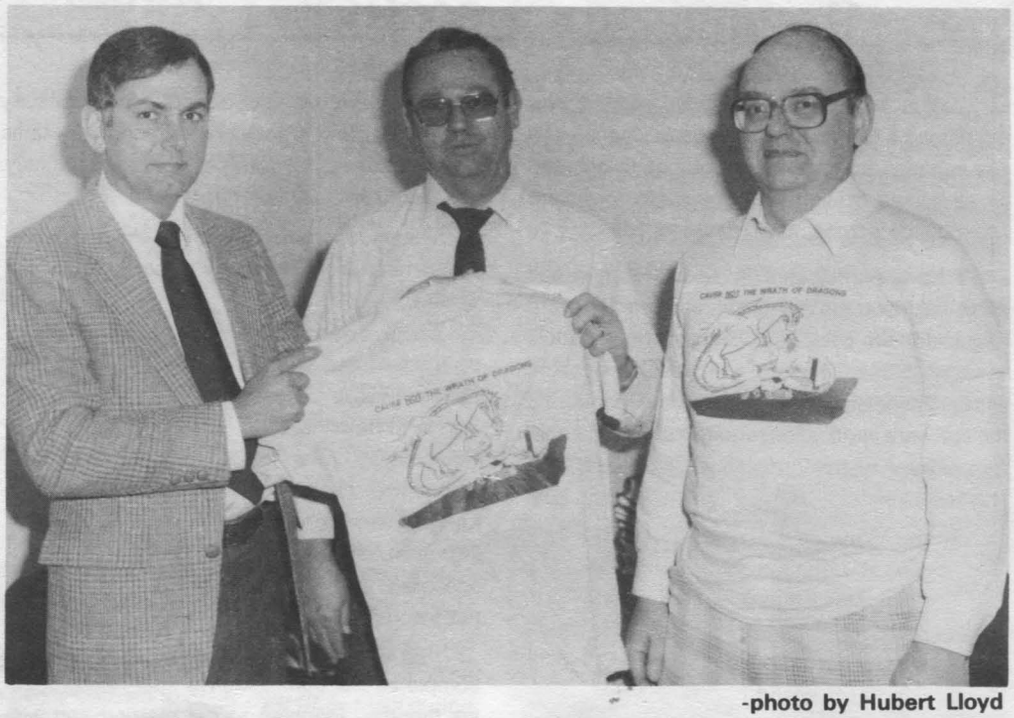
Subsequently, she got a job offer from the office manager, who had heard about her from Buddy DeRyder. "I accepted the job. I am still assigned to Langley, however, my permanent duty station is Johnson. I will become a permanent JSC employee in June or July.

"In the Systems Synthesis Office, I work with Ideas Squared software from Systems Dynamics Research Corporation in Cincinnati. Langley has spearheaded this software package development which is a key Level B systems analysis tool. We are able to do analysis of the Space Station using this software." This work includes making system level trade studies, analyzing configurational issues such as the effects of a docked orbiter, reviewing requirements for experiments and modules control system and stability requirements, and basic module pattern options."

"As a co-op I had some previous experience with this software when it was in the infant stages. This experience helped me to get my job at JSC. I also co-authored a paper with Langley's Jack Hall based on a program we had written on environmental control and life support system analyses for the Space Station, one of the programs in Ideas Squared.

"We like the area very much. There is so much to see in Houston and our jobs are exciting," Lawson said.

Continued on page 6.



-photo by Hubert Lloyd

8-FOOT HIGH TEMPERATURE TUNNEL PREPARATIONS. Richard Tyson (left), test conductor for the 8-Foot High Temperature Tunnel presents silkscreened shirts to Bob Basford, 8' HTT CofF project manager, and Carl Pearson, facility safety head. The shirts, designed by Tyson and Stan Ward, a contract specialist in the Acquisition Division, were presented as a "tongue-in- cheek" gesture to represent the tunnel's increased capabilities once the extensive oxygen-enrichment project is completed in about three years. The dragon represents the tunnel itself and the logo, "Cause Not the Wrath of Dragon," reflects the continual emphasis on safety at this complex facility. Each tunnel technician received a shirt to serve as a constant safety reminder.

Upcoming Workshops

Microcomputer Software for Project Management, an AMCEE Satellite Seminar for engineers, scientists, R&D personnel, data processing managers, construction managers and architects, June 12, Langley, via satellite; three-hour sessions consists of four lectures with breaks for questions and intermissions. Call George Allison, ext. 2611, for more information.

CEBAF 1986 Summer Workshop, June 23 - 27, at CEBAF; the workshop program includes planning the experimental and theoretical programs for the new facility, to review the preliminary plan for the initial complement of experimental equipment published recently in a report on CEBAF research programs and to discuss the formation of CEBAF/user group collaborations. Contact Ramona Rickman, 875-7877, to register.

Langley Details Employees to Johnson

Continued from page 5.

The Space Station Office at Johnson needs detailees in areas of man systems, automation and robotics, technical and management information, commercial/technology integration, structures and mechanisms, systems integration and evolution and growth. Aerospace technologists interested in going to Johnson for a year should discuss the possibility with their supervisor and contact the Space Station Office at Langley.

Dinkins, Peters, Yokum Re-elected to Board

At its 50th Anniversary Shareholder's Annual Meeting, Langley Federal Credit Union members re-elected James R. Dinkins, Burnette W. Peters Jr., and Jean M. Yokum to three-year terms of office on the Board of Directors.

Following a reorganizational meeting of the board, Dinkins was elected Chairman of the Board. Dinkins is Assistant for Management and Resources, Office of Systems Engineering and Operations. Other officers elected were George R. Hayes, First Vice-Chairman; Albert L. Braslow, Second Vice-Chairman; Yokum, Treasurer; Richard C. Meinberg, Secretary; and Lt. Col. James L. Frost (USAF Ret.), Assistant Secretary.

Chartered in 1936, LFCU is the largest credit union in Hampton Roads, with seven full-service branch offices. The federally- insured credit union has assets of over $239 million and serves over 65,000 members.

Revolutionary Advances Predicted in Aircraft Performance

Continued from page 3.

television-like screens in place of the usual myriad of knobs, switches, indicators and electromechanical displays. Gone may be the traditional columns and wheels, replaced by less bulky side stick controllers. This "desk top" design would use the latest improvements in electronics to help the pilot and first officer become effective managers of increasingly complex aircraft flight systems.

The NASA "Impact" study looked at combining these and other emerging technologies in a 200-passenger, 525 mph (Mach 0.78) airplane and concluded that the advantages – compared with an advanced aluminum airplane with turbulent flow and turbofan engines – are striking. According to the report, airplane weight would be reduced 30 percent and fuel efficiency would be more than doubled as a result of the combined technologies. At these values, the report goes on, "the airplane is more efficient than trains and buses in fuel consumption."

Radically new airplanes that would look and be very different promise even greater improvements if the aircraft industry, the public and financial institutions are willing to accept wide departures from conventional aircraft. Such a synergistic combination would result in maximum benefit of technologies expectec by the end of the century.

A twin-fuselage airliner, for example promises several advantages. Each of its twc aircraft bodies (separated by a central wing sec tion) could be the same size and constructior as single-body transports made by the same company, allowing significant savings through a "family concept" of aircraft. Preliminary NASA studies show that a twin-body arrangemen would be more aerodynamically efficient for th same payload and have much improved struc tural efficiency compared with an equivalen single-fuselage 400-passenger airplane.

Happenings

LAA SPECIAL SOCIAL. The Activities Association will hold a special social Friday, June 13, from 4 to 7 p.m. in the Activities Center. "Crabgrass" will provide musical entertainment for the evening.

MEET THE CARNIVAL MONARCH CONTESTANTS at a special social Friday, July 11, on the Activities Center grounds from 4 to 8 p.m. "Showcase," a six-member group will provide top 40, jazz and rock music. Special refreshments will be provided for the event. This will be a special kickoff for Carnival ticket sales and will give employees and contractors an opportunity to meet the Carnival Monarch contestants.

LARC TENNIS CLUB tournaments held this past month produced the following winners who deserve congratulations: John F. Wilson, winner of Fall/Winter Ladder Tournament; Faye Burris, winner of Women's Singles Tournament; and Dennis Bartlett, winner of Men's Championship Singles Tournament. Call Betty Hughes, ext. 3264, or Tom Yager, ext. 2796, if interested in joining the Tennis Club and participating in ladder competition.

LAA CARNIVAL time is approaching. The deadline for Carnival Monarch contestants to sign up in the Activities Office is June 16. The Carnival will be held August 22 and 23 on the Activities Center grounds. Games, raffle prizes, arts and crafts, casino, rides and assorted foods and beverages will be available for the two days of fun. To assist with the Carnival or to display arts and crafts, call Pat Gates, ext. 2058.

LAA Needs Bingo Callers

Bingo callers are needed for Thursday nights! According to Eugene Hicks, Social Chairman for the LAA, it is necessary to have at least two callers on duty each night–one prime caller and one floating caller

"Due to illnesses and personal business our present callers are finding it more difficult to make every night," Hicks explained. "By having two additional callers or more, we will be able to alternate work nights and relieve the load on each other."

Persons with even minimum experience should consider applying since on-the-job training will be provided. The time involved will be about four hours each Bingo night.

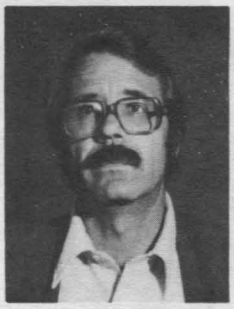
The need is **immediate**. Please contact Hicks, mail stop 132, ext. 3707 or 3074.

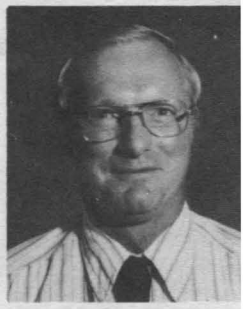
Recent Retirees

Reid Hull

Albert Schy

Betty Joyner


Jack Kaylor


Bruce Fowler

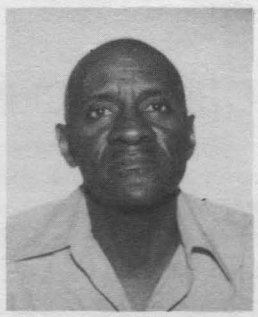
The following Langley employees recently retired:

Reid A. Hull, Systems Engineering Division, retired May 13.

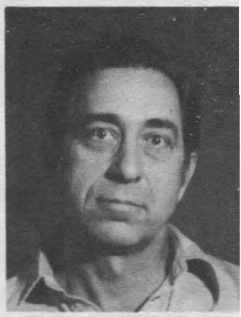
Retiring May 30 were **Albert A. Schy**, Guidance and Control Division; **Betty P. Joyner**, Office of the Director; **Virginia Gibson**, Flight Electronics Division; **Soloman Williams**, Fabrication Division; **William C. Carpenter**, Operations Support Division; **Raymond G. Cerny**, Fabrication Division; **Jack T. Kaylor**, Analysis and Computation Division;

Bruce Fowler, Programs and Resources Division; **Mary C. Moore**, Information Systems Division; **Billy B. Dancy**, Fabrication Division; **Henry T. Thornton Jr.**, Systems Engineering Division; **Aubrey E. Cross**, Guidance and Control Division; and **Charles L. Ruhlin**, Loads and Aeoelasticity Division, and **Trafford J.W. Leland**, Structures and Dynamics Division, not pictured.

Virginia Gibson

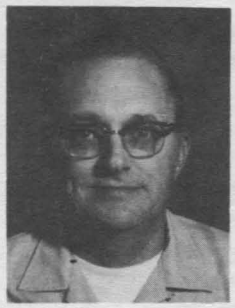

Soloman Williams

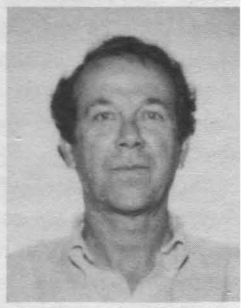
Mary Moore


Billy Dancy

William Carpenter

Raymond Cerny


Henry Thornton


Aubrey Cross

Sympathy is Extended

Sympathy is extended to the following families of Langley retirees:

Ballard E. Quass, who retired from HSAD in December 1980. He died April 7 at age 70.

Howard B. Miller, who retired from the Fabrication Division in May 1971. He died April 29.

Edward M. Brummal, who died May 2. At the time of his retirement in April 1973, he was assigned to HSAD.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 LANGLEY EMPLOYEE (LRC ADDRESS)
ROBERTSON, JAMES B.,
MAIL STOP 152E BLDG 1168

Runners' Club Holds Ribbon Day Races

The Runners' Club will hold ribbon day races Tuesday, June 17, starting on Doolittle Road. The races will be as follows:

5:00 p.m.	5000 meters
5:45 p.m.	100 yards
6:15 p.m.	440 yards
6:45 p.m.	2 x 1 mile, mixed relay*
	1 mile, open

* one male and one female or one child under 18

These events are open to all NASA and contractor employees and family members. Runners' Club members and their families may earn achievement ribbons.

Runners' Club membership is $1 per year. For more information, call Richard Shearer, ext. 4621.

Retirement Parties

Robert E. Bower, Associate Director, will be honored with a retirement dinner Wednesday, June 11, in the Langley Activities Center. A cash bar will begin at 6 p.m., followed by a prime rib dinner at 7. The cost is $13 per person or $25 per couple, including gift. Contributions of $1 for gift only are welcome. For reservations, send check, payable to Langley Conference Center, to Pat Gates, mail stop 496.

Harvey G. McComb Jr., Structures and Dynamics Division, will be honored with a retirement dinner Monday, June 16, at the Langley Officers' Club. A cash bar will open at 6:30 p.m., followed by dinner at 7:15. Prices of the dinner, including gift, are $16 for roast prime rib and $14 for chicken cordon bleu; prices per couple are $30 and $26, respectively; gift only is $2. Please send payment by June 9 to Barbara Eutsler, mail stop 244. Make checks payable to Jeff Stroud.

A retirement luncheon honoring **Lucille C. Merrill**, Fundamental Aerodynamics Branch, will be held June 24 at 11:30 a.m. in the Activities Center. The cost, including gift, is $7.50; $1.50 for gift only. Make check payable to Carolyn Watson and send to her at mail stop 170 by June 18.

Jack T. Kaylor, who is retiring after 30 years of government service, will be honored at a retirement party Saturday, June 21, at the Langley Activities Center from 6:30 to 9:30 p.m. Heavy hors d'oeuvres will be served and a cash bar will be available. The cost will be $9 per person, $15 per couple or $2 for gift only. Please send check to Sonia Herndon, mail stop 125-B, by June 13. Any persons wishing to participate in the Roast of Jack may call Eugene Hicks, ext. 3074.

Officers' Club Calendar

The Langley Officers' Club offers a delightful assortment of food specials in the Regency Room during June.

SUNDAY: Brunch from 10:30 a.m. to 1:30 p.m.

MONDAY: Member's night, prime rib dinner.

TUESDAY: Two for one fried chicken dinner.

WEDNESDAY: Beef and burgundy buffet.

THURSDAY: June 5 and 19 feature Mongolian barbeque; June 12, veal cordon bleu; and June 26, country fried steak.

FRIDAY: June 6 features trout Italiano or prime rib; June 13, veal cordon bleu or prime rib; June 20, chicken Louise or prime rib; and June 27, country and western buffet.

SATURDAY: June 7 and 14 Regency Room closed, mini buffet in new dining room; June 21 lobster tail with or without crab; June 28 live Maine lobster (reservations requested by noon Juhe 24) or prime rib.

Live music is provided most evenings for your entertainment.

NASA employees and contractors in the grade GS-7 or equivalent can become members of the club. Dues are $12 per month. To join the club or to make reservations, call 766-1361.

Club benefits consist of check cashing, charge and reciprocal club privileges – and need a haircut? Officers' Club members can get a hair cut in the Langley Barber Shop. Hours are Monday through Friday from 9 a.m. to 6 p.m.; closed on Saturday and Sunday.

cafeteria menu

Week of June 9 - 13

MONDAY: Chicken noodle soup, chicken chow mein dinner, baked New England scrod, quiche Lorraine. Snack bar: 1/4 lb. cheeseburger, pizza supreme.

TUESDAY: Tomato and rice soup, spaghetti and meat sauce dinner, seafood quiche, chuckwagon steak. Snack bar: Chicken filet, hot Italian sausage.

WEDNESDAY: Vegetable soup, roast turkey dinner, fried deviled crab, tuna noodle casserole. Snack bar: 1/4 lb. cheeseburger, ham and cheese club.

THURSDAY: Chicken vegetable soup, vegetarian lasagna, bacon and Swiss quiche, braised chicken livers. Snack bar: Chicken filet, steak and cheese sub.

FRIDAY: Manhattan clam chowder, fish dinner, chopped steak, stuffed chicken breast. Snack bar: 1/4 lb. cheeseburger, pizza supreme.

June 16 - 20

MONDAY: Chicken rice soup; baked 1/2 chicken; seafood quiche; beef, macaroni and tomatoes. Snack bar: Chicken filet, Polish sausage.

TUESDAY: Ham and lima bean soup; baked lasagna; clam strips; macaroni, franks and cheese. Snack bar: 1/4 lb. cheeseburger, pizza supreme

WEDNESDAY: Vegetable soup, fried chicken dinner, roast pork and dressing, beef liver and onions. Snack bar: Chicken fiet, NASA sub.

THURSDAY: Old fashioned bean soup, rib eye steak and vegetable, baked stuffed trout, savory baked chicken. Snack bar: 1/4 lb. cheeseburger, egg salad sandwich.

FRIDAY: Bull Island clam chowder, fish dinner, Austrian ravioli, franks and baked beans. Snack bar: Chicken filet and pizza supreme.

National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 25, Issue 15 **August 1, 1986**

Viking Scientists Still Dream of Return to Mars

Ten years after the Viking spacecraft began their exploration of Mars, more than 400 scientists interested in more missions to Mars gathered for three days in Washington, D.C., to reminisce about past triumphs and describe various plans for further explorations of the red planet.

The first Viking Lander touched down on the surface of Chryse Planitia July 20, 1976. The time was 5:12 a.m. at the Jet Propulsion Laboratory in California (8:12 a.m. at Langley). The Lander's twin electronic eyes registered on the scene immediately before it and began to transmit, pixel by pixel, strip by strip, a view of the rock-strewn, red desert on which the Lander rested.

The second Viking Lander touched down September 3 in Utopia Planitia. During four months of the primary mission, the two Landers and two Orbiters photographed, measured, sampled and studied Mars and its two moons, Phobos and Deimos, in great detail.

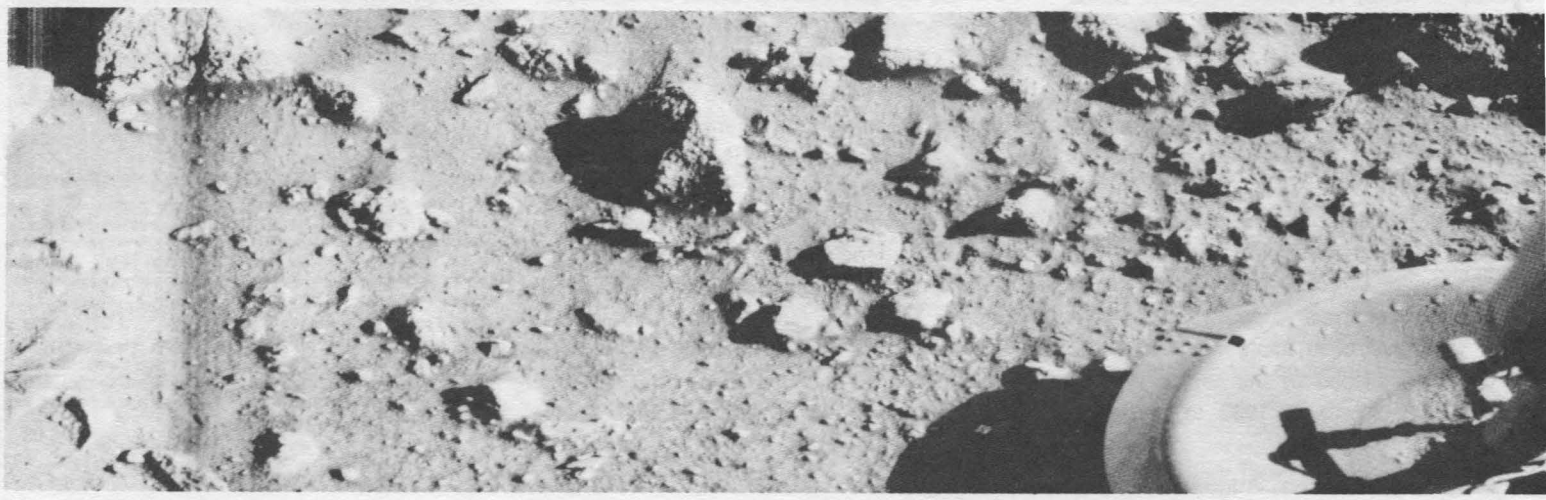
The four Viking spacecraft conducted thirteen separate, yet related, scientific experiments that greatly expanded our knowledge of the Martian atmosphere, physical properties, seismology, magnetic properties, meteorology, organic chemistry, inorganic chemistry, and possible biology, providing a monumental amount of data that continue to challenge scientific investigators.

A total of 56,039 photographic images were sent back to Earth during more than six years of operation. They testified to the beauty, the variety and the mystery of Mars, helping to fire the imaginations of scientists and lay people with the hope of someday returning to further explore this sister planet of Earth.

During the recent Mars Conference, scientists described a variety of missions: observers, sample returns, aeronomy, seismic networks and the 1988 Russian Mars program. They also discussed transportation systems, life support and key technologies required for humans to explore the planet.

Whatever the future holds, the Viking Project has been one of NASA's most successful planetary programs. The four craft operated almost flawlessly during the four-month primary mission and continued working well beyond their planned lifetimes. Lander 1, in fact, lasted until November 1982, although attempts to re-establish contact with it went on until May 1983.

Lander 1 was designated the Dr. Thomas A. Mutch Memorial Station on Mars in honor of the Viking Imaging Team Leader, who was killed during a 1981 mountain-climbing trip in the Himalayan Mountains of Tibet. Dr. Mutch was NASA Associate Administrator for Space Sciences at the time of his death.



ACCESS Astronauts to Attend Conference at Langley

A NASA conference to review present activities in space construction will be held August 6 and 7 at the Langley Research Center.

Speakers at the conference will include astronauts Dr. Mary Cleave and Lt. Col. Jerry Ross. They will make a presentation on their experiences in constructing two large structures aboard the Space Shuttle in November 1985.

The structures, ACCESS (Assembly Concept for Construction of Erectable Space Structures) and EASE (Experimental Assembly of Structures in Extravehicular Activity), demonstrated the feasibility of astronaut erection of large structures in the space environment.

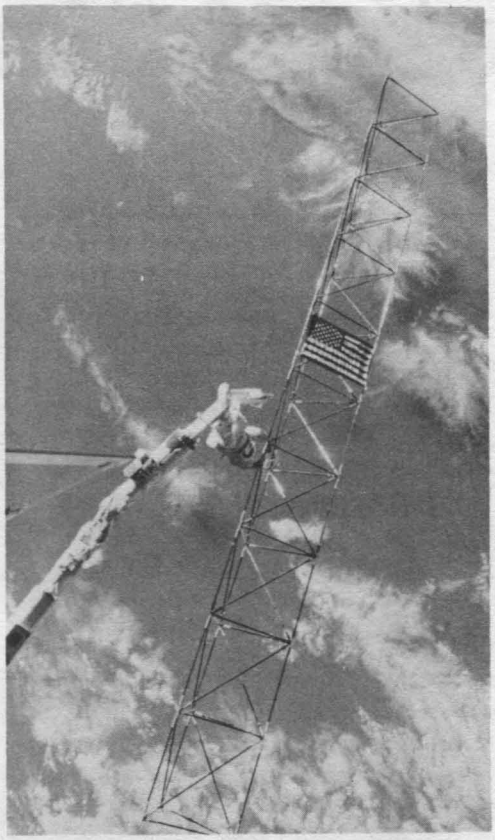
During the mission, Mission Specialists Ross and Sherwood Spring assembled and disassembled the two structures several times in the payload bay of the Orbiter Atlantis. Mission Specialist Cleave operated the Remote Manipulator System (RMS) during the experiments.

The conference will be divided into three programs:

- An in-depth review of the EASE and ACCESS flight experiments, including discussions of background, hardware, integration and results.
- Status of activities regarding future flight experiments and accompanying technology development, including discussions of a Space Station truss construction flight experiment, automation and robotics, and space suit technology.
- Remarks by the international partners of Space Station: the European Space Agency, Japan and Canada.

The two-day conference is sponsored by three NASA program offices: Space Flight, Aeronautics & Space Technology and Space Station.

Persons interested in attending the conference at the Langley Activities Center may call Jane Hagaman, Langley Space Station Office, at (804) 865-4834.



Astronaut Army Lt. Col. Sherwood C. Spring uses his hands to maneuver an ACCESS tower as long as a four-story building while he stands on top of the remote manipulator arm controlled by Mary L. Cleave. At the time Spring conducted the experiment, Atlantis was flying 200 miles high at 17,500 mph.

Employees Honored with CFC Awards

Langley employees who contributed $500 or more to the 1985 Combined Federal Campaign were honored at a special ceremony recently.

Langley Director Richard H. Petersen presented plaques, in special recognition of distinguished support and leadership in providing for the human care needs of our community, to **Richard R. Adams, Charles P. Blankenship, Dr. Robert E. Boughner, James J. Buglia, Dr. Michael F. Card, Kenneth N. Cole, Cornelius Driver, Barbara J. Durling, Dr. Douglas L. Dwoyer, Dr. Edwin C. Foudriat, Arthur R. Friend, Robert E. Grandle;**

Gale A. Harvey, Jane E. Hess, Robert V. Hess, Paul F. Holloway, Robert L. Kenimer, Reginald C. Rose, William I. Scallion, David R. Schryer, Dewey M. Smith, Dean W. Sparks, M. Leroy Spearman, Joseph W. Stickle, Robert L. Swain, John A. Tanner, Dr. Robert G. Voigt, Susan J. Voigt, Randall T. Voland, Erma T. Walker (retiree), and Dr. Bruce A. Wielicki.

Petersen said during the ceremony, "As Honorary Chairman of the 1985 Peninsula CFC, and as Langley Director, I personally thank you for your generous support. With your pledge, you have been named a pilot in the Keel Club, established by the United Way of the Virginia Peninsula in 1980 to recognize Peninsula residents who give $500 to the local CFC and/or the United Way."

The CFC is the only fund-raising drive sanctioned by the government for employee solicitation. The money collected during the campaign, which was supported by over 26,000 federal employees last year, enables participating organizations to help meet the needs of the people in our community.

'Free Rides' Offered

The "Seat Belt Convincer," a special device to demonstrate the effectiveness of seat belts, will be at the Langley Federal Credit Union August 21 and 22 from 9 a.m. to 3 p.m. The Virginia Safety Alliance and state and local police will be supporting the Safety Office's summer "Seat Belt and Buckle-Up" Program. The objective of the program is to increase staff and family use of seat belts.

Staff members and families may take a free ride, experiencing a 10-mile-per-hour deceleration, to better understand how seat belts, shoulder harnesses and similiar restraint devices work. The police will also demonstrate how to check the safe operation of the shoulder harness system "before" it is needed.

Mail Service Provided

For the employees convenience, a temporary U.S. mail drop for personal mail has been placed in the cafeteria, building 1213, next to the souvenir counter. This mail will be picked up daily by 2:30 p.m. If you have any questions, please call Barbara Newton, ext. 3221.

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 Clough**
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.

Elber Heads Army Aerostructures Directorate

Dr. Wolf Elber has been selected Director of the Aerostructures Directorate, U.S. Army Aviation Research and Technology Activity (USAARTA-AVSCOM), assigned to the Langley Research Center.

In this position, Elber plans and executes the research, exploratory development and advanced development programs for USAARTA in the fields of aerodynamics, dynamics and aircraft structures. The research includes design and configuration concepts for entire Army airmobile systems as well as component research through analytical and experimental methods.

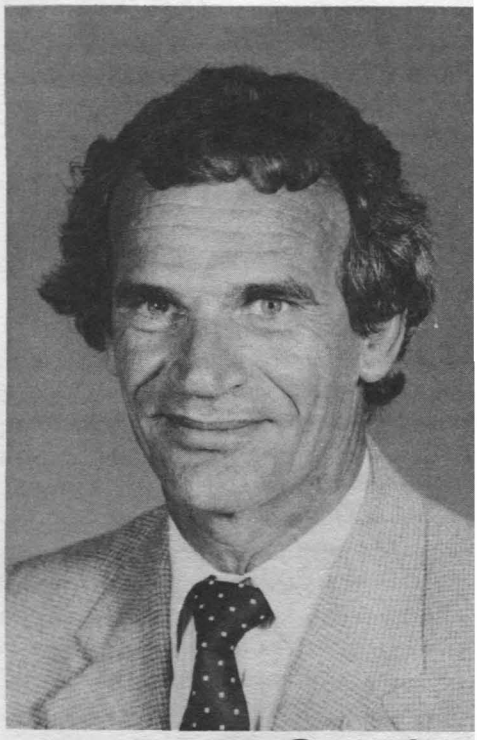
Elber joined his NASA career in 1972 as an aerospace engineer in the Materials Division. He has specialized in fatigue crack growth in metals and in fracture and impact resistance in composites. In 1979 he joined a special study group to perform a risk assessment for graphite fibers released into the atmosphere. In 1980 he became a member of the NASA Structures Team to verify the flight safety of the Shuttle's heat-resisting tiles.

Elber returned to fatigue and fracture research in 1983 and his work led to a better understanding of the impact sensitivity of composites. In that year he was named Assistant Head, Fatigue and Fracture Branch, and in September 1984, he was named Head of the branch.

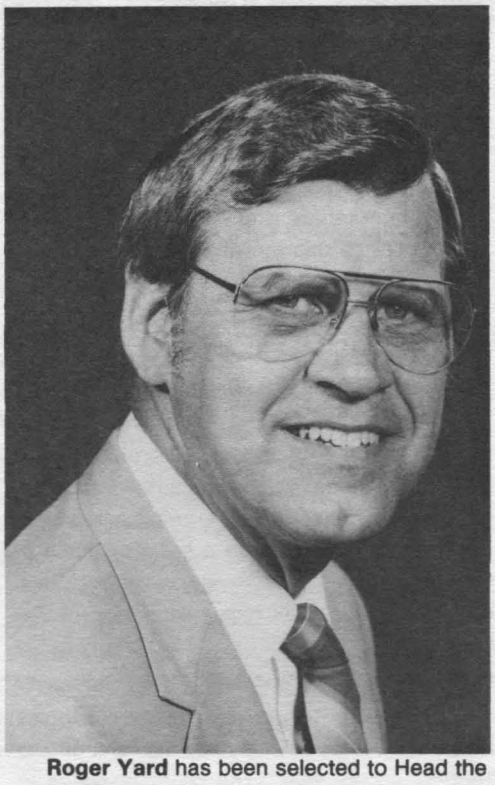
Before joining NASA, Elber was a research scientist at the Deutsche Forschungs-und Versuchsanstalt fur Luft-und Raumfahrt (DFVLR), the German equivalent of NASA, in Mulheim, West Germany, and a teaching assistant and lecturer in Sydney, Australia. From 1970 to 1972 he conducted research at the Langley Research Center as a National Research Council Post-Doctoral Fellow.

The author or co-author of 24 technical publications, Elber attended elementary school

Continued on page 5



Yard Joins NASA Management Staff as Division Chief



Roger Yard has been selected to Head the Business Data Systems Division at the Langley Research Center. Yard joins the Langley staff following a 27-year career as a civilian with the U.S. Air Force.

Yard replaces Sidney F. Pauls, who was recently chosen as Assistant Director for Management Operations.

In his new position, Yard is responsible for providing computer systems capabilities to support the center's on-going and new requirements for business and administrative information, data analysis, data presentation, reporting and decision making.

Yard's last assignment with the Air Force was Deputy Director of the Logistics Managment Systems at Hill Air Force Base in Utah. He was responsible for providing a full range of information systems to support the Air Force Logistics Command (AFLC) and tenant organization missions. This involved support for approximately 20,000 people.

Yard began his government career in 1959 as an industrial engineer in the office of the Deputy Chief of Staff for Maintenance Engineering at Wright Patterson Air Force Base, Ohio. In this assignment, he co-developed a command methods and layout improvement program which, by 1963, had resulted in a cost savings of$82 million. He also pioneered the development of the use of predetermined time standards and the mechanization of work measurement.

After serving as a Senior Consultant, Yard was promoted to the Directorate of Operations where he was responsible for professional leadership for all industrial engineering programs within the command. During this assignment he served as command representative to a Department of Defense productivity progran called the Defense Integrated Managemen Engineering System (DIMES). His leadershi in the planning for command scientific an engineering computer support in 1967 led to a operations research assignment in the Advance Logistics Systems Center and to his career i information systems.

Yard worked in information systems plan ning, integration, resource and systems deve opment management positions at Headquarter AFLC. He was the test and implementation direc tor for the Uniform Cost Accounting System a very significant systems development an modification project within the command.

In 1979 Yard became the Chief of Dat Automation at Hill. In 1984 he was personall selected by the Vice Chief of the Air Forc as one of the AFLC's representatives to th A.F. Management Analysis Group to study dat automation in the Air Force. In July 1984 the dat automation function was elevated to directorat level and Yard became Deputy Director c Logistics Management Systems.

Prior to his government career Yard was research, development and industrial enginee with the Lebanon Steel Foundry in Lebanor Pa., from 1955 to 1959.

A native of New Jersey, Yard earned bachelor of science degree in 1954 and a maste

Continued on page

Jaws -- The Paper Dolly, Makes the Job Easier

-by Louise Stokes

A hydraulic paper dolly designed, developed and manufactured at Langley is the latest equipment addition to the Publication Section of the Visual and Printing Services Branch.

"Jaws," as the dolly is affectionately called by the pressmen, was created to alleviate the inherent back stress and muscle fatigue associated with print shop activity.

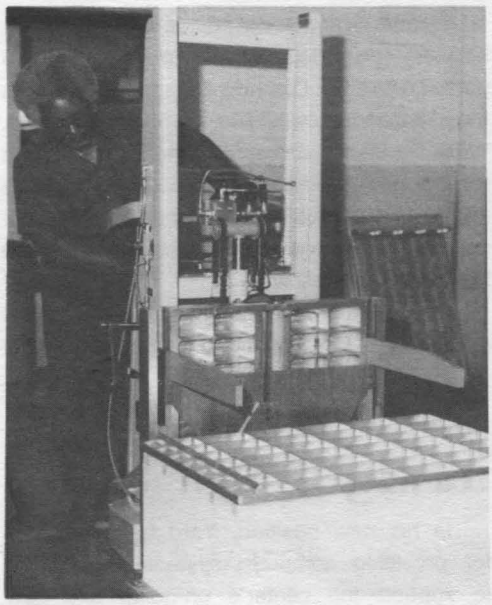
Unlike a newspaper press, which simultaneously prints on both sides of a page with a dual-head machine, the single-head printshop press prints only on one side. Before "Jaws" was developed, a ream of paper (500 pounds) was picked up in sections by the pressmen, turned over and carefully repositioned on the press to be printed on the other side. According to Frank Williams (pictured), senior pressman, he would bend, stoop, lift, reverse and reposition the paper an average of 16 times a ream.

Q. C. Davis, former employee of the Advanced Machining Section, originally conceived the idea that a hydraulic system could be used to rotate a ream of paper for the press in one operation. In reponse to a request by the print shop, Davis, now deceased, accepted the challenge to design a safe and easy-to-use device to reverse the load of paper for the Langley presses.

Mel Scruggs, machinist technician, describes Davis as a "brilliant individual" who took a great deal of satisfaction in solving technical problems. Using the basic design of a forklift, which normally lifts straight up and down, Davis created a device with an innovative hydraulic system that allows it to safely rotate up to 600 pounds.

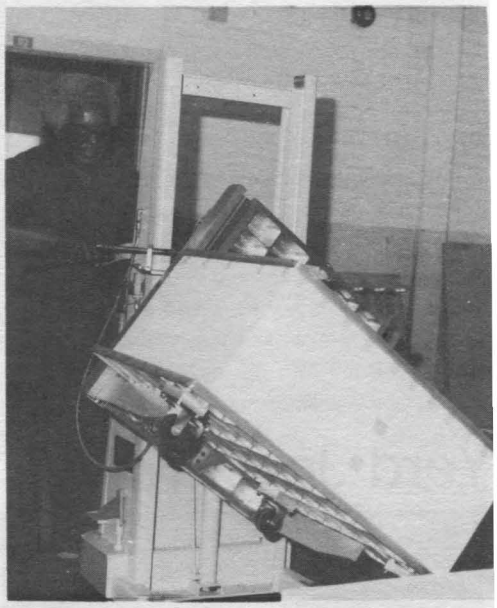
"What you see looks fairly simple compared to what is involved in the actual process," said Scruggs. "This thing had to lift the load, turn it upside down and then safely set it down. A great deal of time was spent ensuring that it would be a safe device to operate," he said.

A unique cap was also designed, allowing "Jaws" to hydraulically sandwich together the paper using 1500 psi of pressure. The device could then lift and rotate without the chance of losing its grip or the alignment of the paper. "Manufacturing the device was not as difficult as creating the design," said Scruggs.



The staff at the print shop definitely thinks that "Jaws" was well worth the time and effort involved in its development. In addition to supporting Langley in its printing requirements, the shop reproduces research and technical reports for all the NASA centers and Headquarters. The device is principally used during the the operation of those presses that print the research and technical publications.

Frank Moore, section head, reports that "Jaws probably saves us about an hour more production a day. The men who have to do the physical work certainly notice the difference at



the end of the day."

Editor's Note: Louise Stokes, a journalism major at Christopher Newport College, is doing her senior practicum in the Public Affairs Office this month. She will graduate from CNC in January 1987.

Michener Scholarship Winners Announced

Rebecca L. Miller, daughter of Ames Research Center employee, Robert J. Miller, and Peter S. Shawhan, son of NASA Headquarters employee, Stanley D. Shawhan, have been selected to receive the two $l,500 scholarship grants awarded by the NASA College Scholarship Fund, Inc. for 1986-87.

Miller graduated June 1984 from Lynbrook High School, San Jose, Calif., ranking 1 of 392 graduating students. She had a 3.98 grade point average with a score of 1540 (of a possible 1600) on the SAT examination. She is pursuing a degree in chemistry and has completed her second year at Pomona College, Claremont, Calif.

Shawhan graduated June 1986 from Springbrook High School, Silver Spring, Md., ranking 1 out of 420 graduating students. He had a 4.0 grade point average with a score of 1580 on the SAT examination. Shawhan intends to pursue a degree in physics at Washington University.

The scholarship fund, established in 1982 through an endowment from Pulitzer Prize winning author, James Michener, has awarded eight renewable grants to NASA employee dependents intending to pursue a college course of study in the field of science or engineering. Each recipient has been an outstanding student that has continued to achieve academic excellence in his/her respective college or university.

There were 18 applications from Langley Research Center submitted to the fund for the 1986-87 school year. The program needs to grow in order to award scholarships to deserving NASA children. Tax-deductible contributions may be made to the following adddress:

NASA College Scholarship Fund, Inc.
NASA Johnson Space Center
Mail Code BY5
Houston, Texas 77058

Newman Receives 1986 ASTM Award of Merit

Dr. James C. Newman, a senior scientist in the Materials Division at Langley has received the 1986 ASTM Award of Merit.

Newman received the award at a ceremony hosted by the ASTM Committee on Fracture Testing held in July in San Antonio, Texas. He was honored for distinguished service in advancing the voluntary standardization of test methods for fracture and fatigue-crack growth, and for dedicated service as chairman of a task group, secretary of the Subcommittee on Fracture Mechanics Test Methods, member-at-large of the Fracture Testing Executive Committee and as vice chairman of the Committee on Fracture Testing.

The Award of Merit, and the accompanying honorary title of Fellow of the society, were established in 1949 to recognize productive service to ASTM, marked leadership, outstanding contribution or publication of papers. The ASTM, the American Society for Testing and Materials, is a management system for the development of voluntary consensus standards for materials, products, systems and services. ASTM has 30,000 members from around the world representing industry, governments, academia and consumers.

Employed at Langley since 1964, he received his present title in 1980 and has specialized in fracture mechanics, elasticity, plasticity and metals.

A native of Tennessee, Newman received a bachelor of science degree in civil engineering, with a structures specialty, from the University of Mississippi in 1964 He earned a master of science degree and a doctorate in engineering mechanics from Virginia Polytechnic Institute and State University in 1969 and 1974, respectively.

The author or co-author of over 70 technical publications and presentations, Newman has received two Special Achievement awards and four Group Achievement awards. He received the George R. Irwin Award in fracture mechanics in 1981 from ASTM.

Newman and his wife, Frances, live in Newport News. They have four children.

Nominations Open for Fellowships and Management Programs

Langley is seeking nominations for FY 1987 management fellowships and education programs. A memorandum has been sent to each directorate, division and project office describing the programs and eligibility requirements. The grade requirement is as low as the GS-12 level for one program, while some require a grade of Senior Executive Service.

The memorandum describes nationally prestigious fellowship programs which are competed for on an agency-wide basis. The programs include:

Carnegie-Mellon University: Senior Executive Seminar

Dryden Memorial Fellowship

Harvard University's:

- Program for Management Development
- Senior Executive Fellows Program
- Senior Managers in Government Programs

ICAF (Industrial College of the Armed Forces)

MIT: Advanced Study Program

Simmons College: Middle Management Program for Women

Sloan Programs:

- MIT
- Stanford

Syracuse University: Maxwell Midcareer Development Program

FEI Executive Excellence Program

OPM Executive Development Seminar

In addition, a new Langley fellowship program is included. It is for the College of William and Mary's Executive Master of Business Administration Program, and is expected to be of special interest to managers in the administrative support area.

Langley had a very successful year in competing for these fellowships in FY 1986 and won five of them.

All of the programs are described in the circulating memorandum, and a list of recent participants who can provide more information is included. The programs represent a good opportunity for career development and a broadening of one's administrative and managerial perspective.

The nomination deadline is in mid-August. For specifics contact division or directorate offices, or Joe Mathis, Employee Development Branch, ext. 2611.

Elber is New Army Head

Continued from page 3.

and part of high school in West Germany and completed his high school education in Sydney, Australia. He earned bachelor of science and doctorate degrees in civil engineering from the University of New South Wales, Australia, in 1964 and 1968, respectively.

Elber holds three patents and has received four Group Achievement awards, three Special Achievement awards and three Outstanding Performance awards. He was awarded a NASA Exceptional Scientific Achievement Medal in 1983 for "pioneering discoveries in fracture mechanics, and his unique analytical solutions to the behavior of engineering materials that have enhanced the performance and safety of aerospace structures." He received the Commander's Award for Civilian Service in January 1986 for his technical and managerial leadership while serving as the chairman of the Independent Review Committee for Fatigue Methodology in Helicopters, established by the U.S. Army Aviation Systems Command.

Elber and his wife, Frauke, live in Newport News with their son.

Thanks

Buddy Southall writes, "I wish to thank all my friends who made my retirement a memorable occasion."

Lucille C. Merrill writes, "I wish to thank all my friends and co-workers who attended or contributed to the lovely luncheon given in my behalf. I enjoyed working with you and miss you very much."

Langley Colloquium

Ballato Addresses Frequency and Time Sources

Frequency control and time-keeping will be the topic of the August 11 Langley colloquium.

Dr. Arthur Ballato, U.S. Army Electronics Technology and Devices Laboratory, Fort Monmouth, N.J., will discuss "Frequency and Time Sources – Past, Present and Future," in the Activities Center at 2 p.m., followed by a question and answer session.

Time as a concept is older than the pyramids. Instruments for marking its passage, such as sundials, have been used for millenia, and have been systematically improved, particularly within the past few centuries, when precise astronomical observations became possible, according to Ballato. But the idea of frequency as measuring the number of repetitive events in an unit time is considerably younger than the idea of time.

Ballato said generation and measurement of frequencies to accuracies comparable to those attained for timekeeping did not become possible until the advent of electronics when the quartz oscillator was introduced. Since then, time and frequency generation, control, measurement, and distribution have experienced explosive rates of growth in accuracy, availability and convenience. He explained that the ever-present quartz wristwatch delivers time accuracies to seconds per month in a nonlaboratory environment for very low cost, while frequency has advanced to become the most accurately measureable entity known to mankind.

The talk considers landmarks in the history of frequency control and time keeping, then passes to the technologies involved in the latest classical and quantum mechanical standards, with a discussion of present capabilities and their areas of application. In conclusion, Ballato will gives projections of future applications and stability requirements, barriers to their realization an potential means of overcoming these barriers

Ballato received a bachelor of science de gree in electrical engineering from the Mas sachusetts Institute of Technology in 1958, master of science degree in electrical eng neering from Rutgers University in 1962 and doctorate in electrophysics from the Polytechn Institute of New York in 1972. He has bee designated the fifth National Lecturer for th IEEE Sonics and Ultrasonics Group.

Yard is Chief of BDSD

Continued from page 3.

of science degree in 1955, both in industrial engineering from Pennsylvania State University. He is also a 1978 distinguished graduate of the Professional Military Comptroller School and a 1983 graduate of the Federal Executive Institute.

Yard has received numerous letters of commendation, performance awards and the Meritorious Civilian Service Award. His organization was designated AFLC's Data Processing Installation of 1982. He has received special management recognition from the Federal Manager's Association and the American Society of Military Comptrollers. He has serve as chairperson of the Applied Research Com mittee, member of the board of directors c the Methods Time Measurement Associatio for Standards and Research and was designe as the U.S. representative at an internationa applied research meeting in Skovde, Sweden He is a registered professional engineer and a member of the Institute of Industrial Engineers American Society of Military Comptrollers an the Air Force Association.

Yard and his wife, Sylvia, live in Tabb. They have three daughters and a son.

SHARP UNDERWAY AT LANGLEY. Sixteen local high school students are participating in Langley's Summer High School Apprenticeship Research Program. The eight-week intensive science and engineering apprenticeship program is designed for high school students who have demonstrated aptitude for and interest in science and engineering careers, and provides students with first-hand experience and information that may help them make decisions about a career in science, engineering or mathematics. 1986 SHARP students and NASA mentors are (front row, from left) Russell Totten, Patrick Bastek, Kevin Lee, Steven Faltz, Brian Bryd, Morry Brown, Christopher Barfield; (middle row, from left) Geoffrey Tennille, Jeff Cleveland, Lori Guy, Leah Parks, Monica Gaines, Dr. Sheila Long, Jenny Manucal, Elizabeth Carlton, Susan Dean, Zanette Larrimore, Walter Darden; (back row, from left) Roger Hathaway, Ray Whipple, Jack Damsky, Sherry Mings, Dr. Edward Long, Long Yip, William Scallion, Leslie Puckett, David Schryer, John Stadler, Rick Sailey, William Mayes, James Meyers, Patrick Minnis, Ray Mineck and John Cox. Not pictured: Gordon Bullock, Michelle Ferebee and Melvin Ferebee.

Happenings

LAA SOCIAL. The Langley Activities Association will hold a social Friday, August 8, from 4 to 6:30 p.m. in the Activities Center.

CEBAF. The CEBAF Summer Study Series continues with a lecture Monday, August 11, by Gerald van der Steenhoven on "Effect of the Nuclear Medium on the Electron-Proton Coupling." The lecture will begin at 11 a.m. at CEBAF in room 53.

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. If anyone is interested in working as a bingo caller, call Eugene Hicks, ext. 3737.

PROBLEMS? NASA Civil Service employees may call the Employee Assistance Program at 873-0228 for confidential, private counseling.

MOVIE TICKETS are available in the Activities Office for Coliseum Cinemas I and II for $3.25 each and for Riverdale, Beechmont and Williamsburg theaters for $2.75 each.

WILLIAMSBURG MUSIC. Mike Seeger will present music of rural America Sunday, August 17, at 3 p.m. in the Arts Center Theatre, Williamsburg Regional Library. According to the Chicago Tribune, "His concerts are invariably traditional treats." Tickets are $4. Call 229-7326 for more information

LAA CARNIVAL. The Langley Activities Association will hold its annual Carnival Friday, August 22, and Saturday, August 23, at the Activities Center. Featured during the weekend will be crowning of the Carnival Monarch, arts and crafts, rides, casino, cash prizes, good food.

LIKE TO TRAVEL? Langley Air Force Base Recreation Office has scheduled trips to places, such as Atlantic City, Burlington, N.C., Pimlico Race Track, Kings Dominion, Disney World. Call the Activities Office, ext. 3139, for more information concerning the Air Force-sponsored trips.

TOASTMASTERS. Regular meetings of the NASA- Langley Toastmasters Club will be held August 13 from 11:30 a.m. to 1 p.m. in the Activities Center. Guests are welcome.

BUSCH GARDENS tickets are on sale at the Activities Office for $13.

KINGS DOMINION admission tickets are available at the Activities Office for $11.50.

COLONIAL WILLIAMSBURG patriot passes are available at the Activities Office for $17.50

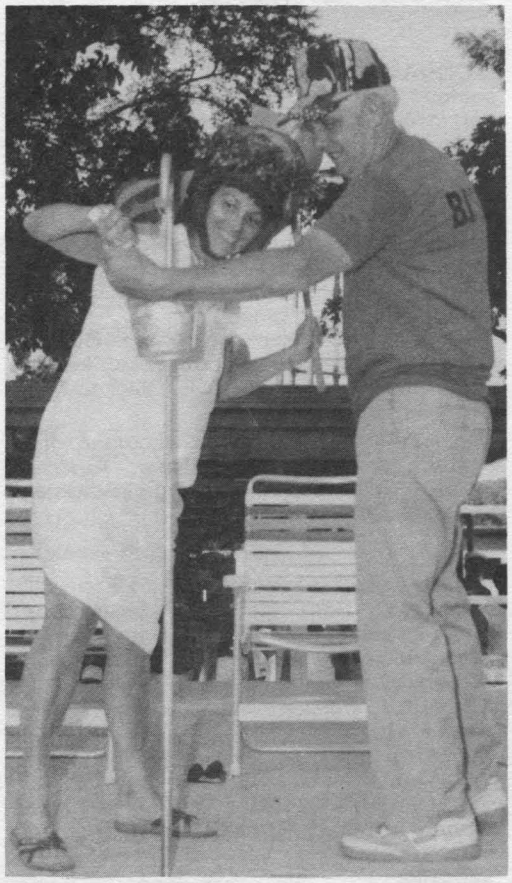
Test Pilot Fulton Retires

Fitzhugh L. "Fitz" Fulton Jr., a NASA research pilot whose test pilot career has spanned over 36 years, has retired from the Ames-Dryden Flight Research Facility.

Fulton, the NASA facility's chief pilot, was project pilot on all the flight tests of the 747 Shuttle Carrier Aircraft which was used to air-launch the Space Shuttle Orbiter Enterprise during tests at Ames-Dryden in 1977.

He has continued to fly ferry flights of shuttle orbiters returning to Kennedy Space Center after their missions in space.

Fulton joined NASA in 1966, flying research flights of the large supersonic XB-70. He has flown over 15,000 hours in over 200 types of aircraft, including the B-52, YF-12 Blackbird X-15 and the B-58.



MO OLYMPICS HELD. Ms. MOO Liberty, Barbara Newton (left photo), Head, General Files and Mail Section, Management Support Division, lights the torch to open the 1986 Management Operations Olympics (MOO), with the help of Fred Moore, Business Data Systems Division. Ms. MOO Liberty, carrying the Olympics torch, traveled on motor cycle to the Olympics stands. Following competition in volleyball, relays and other related sports activities, BDSD (right photo) was declared the 1986 winner. Joe Struhar (left), Chief, Financial Management Division, last year's winner, is having a little problem handing over the trophy to Moore. This year's MOO day had the largest participation, with over 200 NASA and support service contractor employees, representing BDSD, FMD, MSD, Programs and Resources Division, Research Information and Applications Division, Personnel Division and Acquisition Division, competing in the events held recently at the Activities Center.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 LANGLEY EMPLOYEE (LRC ADDRESS)
ROBERTSON, JAMES B.,
MAIL STOP 152E BLDG 1168

Langley Positions Available

The following positions are open at Langley:

86-1: Secretary (Stenography), GS-0318-4, Space Station Office Technology Office, open continuous.

86-62: Supervisory Quality Assurance Specialist (Aerospace), GS-1910-11 or 12, Low-Speed Aerodynamics Division, Aircraft Operations Branch, Quality Assurance Office; closes August 5.

86-63: Procurement Analyst, GS-1102-11 or 12, Acquisition Division, Acquisition Operations Branch; closes August 4.

86-64: Supervisory Electronics Engineer, AST, Electronic Instrumentation Systems, GM-0855-14, Flight Electronics Division, Flight Instrumentation Branch; closes August 5.

86-65: Public Affairs Specialist, GS-1035-11 or 12, Office of External Affairs, Office of Public Affairs; closes August 12.

86-66: AST, Project Management, GM-0801-14, COFS Project Office; closes August 7.

86-67: Personnel Clerk (Typing), GS-0203-04 or 05 (1 or more vacancies), Personnel Division, Placement and Position Management Branch; closes August 8.

Officers' Club Calendar

The Langley Officers' club offers a delightful assortment of specials during August.
MONDAY: Member's night, prime rib dinner.
TUESDAY: Two for one fried chicken dinner.
WEDNESDAY: Beef and burgundy buffet.
THURSDAY: August 7, beef and shrimp buffet; August 14 and 28, Mongolian barbeque; August 21, chicken stuffed with crab.
FRIDAY: August 1, steamed shrimp; August 8 trout Italiano; August 15, live Main lobster; August 22, teriyaki steak w/shrimp, chicken breast stuffed w/scallops; August 29, mini buffet in new dining room. Prime rib served each week except August 29.
SATURDAY: Candlelight dinner. Stuffed flounder, chicken cordon bleu, prime rib and fried shrimp; dinner includes a choice of soup, mixed garden salad with assorted dressings, glass of wine, coffee or tea, and choice of Creame de Menthe, Amaretto or Kahlua parfait.
SUNDAY: Brunch.

Learning Center Offers New Courses

L20T30	Artificial Intelligence Applications
L5PD81	Lowering the Risks for Coronary Artery Disease
L2CS51	NOS Common Graphics Library
L2CS52	NOS NGS Usage
L5LA22	Portuguese
L2CS50	UNIX (June 1986)

swap and shop

FOR SALE

Articles

Hand hooked rug, multicolor, 5 x 7 1/2 feet, authenic early American, eagle design, $75. Call 838-1575.

Full-size pool table, price neg. Call 596-9504.

Vehicles

Morgan 28 sloop, inboard, 5 sails, 5 berths, exc. cruising boat, recently hauled, $16,000. Call 851-0552.

1973 Datsun 240Z, new Weber carbs, exhaust, front carpeting; 2- tone Imron paint; super clean car in exc. mech. cond., $3,450 OBRO. Call 826-0473 eve., 865-2184 days. Ask for Stan.

FOR RENT

Nags Head, cottage available weekly and daily, sleeps 6, 2 baths, fully equipped kitchen, 1 block to beach, $375/wk. Call 868- 6427.

Trailer: "Buzzards Roost" on Hatteras Island at Frisco, oceanside: 50' house trailer, furnished, including dishes; 2 BR, full bath, sun porch, outdoor shower, AF/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; rustic but fun. Call Fogle, 826-6177.

LOST

Wallet: Blue nylon with velcro closing, lost in Building 1232A July 23. Call Leah Parks, ext. 3892.

cafeteria menu

Week of August 4 - 8

MONDAY: Split pea soup, veal parmesan, seafood au gratin, quiche Lorraine. Snack bar: 1/4 lb. cheeseburger, pizza supreme.
TUESDAY: Chicken noodle soup; spaghetti dinner; fried filet of flounder; macaroni, franks and cheese. Snack bar: Chicken filet, steak and cheese sub.
WEDNESDAY: Vegetable soup, roast turkey dinner, baked New England scrod, chuck-wagon steak. Snack bar: 1/4 lb. cheeseburger, Polish sausage.
THURSDAY: Chicken veg. soup, chicken chow mein dinner, veal cordon bleu, knockwurst and kraut. Snack bar: Chicken filet, egg salad sandwich.
FRIDAY: Manhattan clam chowder, fish dinner, braised chicken livers, Austrian ravioli. Snack bar: 1/4 lb. cheeseburger, hot Italian sausage.

Week of August 11 - 15

MONDAY: Ham and lima bean soup, chopped steak, fried flounder, ham and macaroni au gratin. Snack bar: Chicken filet, pizza supreme.
TUESDAY: Chicken and rice soup, baked Italian lasagna, beef tips over rice, fried fish nuggets. Snack bar: 1/4 lb. cheeseburger, steak and cheese sub.
WEDNESDAY: Vegetable soup, fried chicken dinner, baked stuffed trout, beef liver and onions. Snack bar: Chicken filet and Polish sausage.
THURSDAY: Bean soup, luncheon rib eye steak and vegetable, seafood quiche, stuffed chicken breast. Snack bar: 1/4 lb. cheeseburger, fried cod fish sandwich.
FRIDAY: Bull Island clam chowder, fish dinner, meat loaf, baked beans and franks. Snack bar: Chicken filet, hot Italian sausage.

National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 25, Issue 16 **August 15, 1986**

Conway to Attend Harvard's Management Program

Bruce A. Conway, Assistant Chief, Flight Electronics Division, has been chosen to attend the 1986 fall session of an education program at Harvard University.

The Program for Management Development is an intensive, 14-week program created by the faculty of the Harvard University Graduate School of Business Administration. Successful middle managers, whose future responsibilities in general management will demand skills and knowledge beyond their present expertise, are taught how to develop resourceful solutions to the managerial problems they will encounter as they grow with their organizations.

As a Langley assistant division chief, Conway is responsible for assisting the chief in directing a broad program of spacecraft and aircraft instrumentation engineering research and applications. He participates in the overall management and technical direction of electronics sensor and information systems technology activities in support of Langley's spacecraft flight projects and research programs.

Conway explained that while at Harvard he will be studying with about 120 other participants from major corporations in the United States and abroad to acquire a broad understanding of what it takes to successfully run a business. "Part of the program will be conducted using the case study method popular at Harvard, which allows in-depth penetration of issues related to areas such as finance and marketing decisions," he said.

"I think the concentrated course of study, class discussions and interaction with my peers from business and industry will provide me with better insight into the NASA and Langley

Continued on page 2.

NASA Technician Makes Breakthrough in Air Pollution Control

-by Jean Drummond Clough

An electronic controller, developed to reduce particulate air pollution at the Langley Research Center's Refuse-Fired Steam Generating Facility is called "a major technology breakthrough" by two major, international suppliers of pollution control equipment.

David F. Johnston, an electronics technician in the Microelectronics Development Section, invented the automatic voltage controller for the facility's electrostatic precipitator. The precipitators remove particle matter from the combustion gases prior to their release into the atmosphere.

Jointly operated by NASA, the U.S. Air Force and the City of Hampton, the facility disposes of all trash from the research center, Langley Air Force Base, other area government installations and about 70 percent of Hampton's municipal trash. Principal financier for the project, Hampton earns revenues from trash disposal fees and the sale of steam to Langley Research Center. The steam generated by burning waste also reduces the fuel normally used at the research center by about two million gallons a year.

The controller proved to be the answer to efficient precipitator operation at the Hampton facility and is adaptable to any electrostatic precipitator. Advanced features have been added to the controller, offering a reliable, high technology method of upgrading existing precipitators, whether they burn coal, oil or refuse.

Application of this pollution control equipment has been expanded from refuse-fired incinerators to include power plants/utilities, steel mills, pulp and paper mills, cement plants and automobile industry incinerators.

Use of Johnston's equipment at chronic air pollution trouble spots has produced millions of dollars in savings in equipment and operation costs, including thousands of man-hours for installation and maintenance time. The controller, during testing, was projected to produce a $400,000 (43 percent) annual savings in operating power costs and to reduce equipment cost payback time to eight months at a coal-burning power plant in Saskatchewan, Canada.

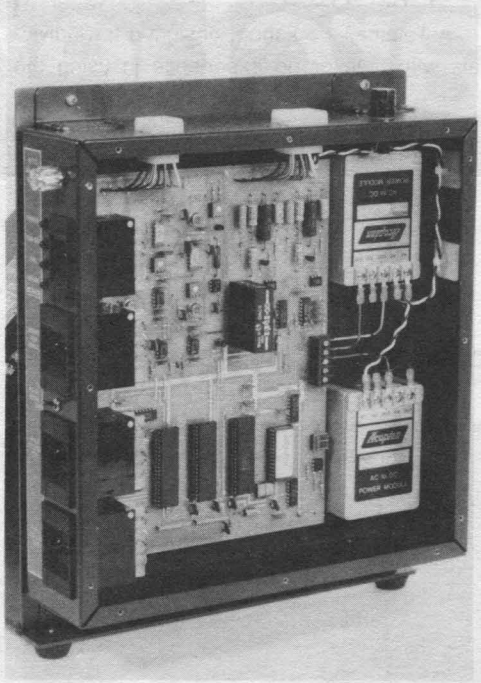
A cement plant in Michigan was confronted with air pollution standard violations. Johnston's invention not only produced a $2.9-million equipment cost savings and a 90-percent reduction in installation time, but also reduced the pollution level to 75 percent below Environmental Protection Agency standards.

At a steel mill in Kentucky, in violation of pollution standards, installation of Johnston's controller assured compliance with EPA particulate air pollution regulations in only one day

Continued on page 2.

Air Pollution Control Device Invented

Continued from page 1



The automatic voltage control for electrostatic precipitators shows the electronic package which automatically senses the changes in gas composition and adjusts the precipitator voltage and current to permit maximum particle collection. The control, now marketed worldwide, was developed by David Johnston, Fabrication Division, who received a NASA Space Act Award for his invention.

and, in addition, produced a 50-percent savings in equipment cost.

Effective air pollution control required development of an advanced electronic control for the Hampton facility's electrostatic precipitators, which remove particulate matter from the combustion gas before it is expelled through a smokestack. The gas is passed through a precipitator chamber and exposed to an electrostatic field. Particles in the gas become electrically charged and attracted to collecting surfaces under the influence of the electric field, thus cleaning the smoke.

To maximize particle capture, a precipitator must operate at the highest practical voltage. Limiting operational factors are the phenomena known as "sparking" and "arcing," essentially electrical breakdowns of the gas that, uncontrolled, would damage the precipitator.

After the Hampton facility was built, researchers encountered a problem, according to Johnston. When standard fuels are burned, the smoke is of constant composition and the highest practical voltage is fairly constant. Once the voltage is set, only small changes in precipitator voltage are needed, as long as the same type of fuel is used.

When trash is used as fuel, however, the composition of the smoke changes continuously, requiring corresponding changes in precipitator voltage over a very wide range. Johnston explained that if a constant voltage were applied in a refuse-burning facility, the voltage would have to be set very low to prevent sparking. Therefore, the precipitator would be less efficient.

To insure minimal atmospheric pollution, Johnston developed a microprocessor-based control that automatically senses changes in smoke composition and adjusts the precipitator voltage and current to permit maximum particle collection.

In addition to the international recognition received for his invention, Johnston recently was presented with a NASA Space Act Award of $5,000. Johnston's invention is now marketed worldwide by a California company.

Conway Attends Harvard Management School

Continued from page 1.

organizations, particularly with respect to their current and future place in the world of technology," Conway said. Iq'After all, one could think of NASA as a research and development 'business.'

"Finally, as one of only a few government participants in the program, I hope to be able to provide a representative view of NASA in working with the other participants," he concluded.

Conway joined the NASA staff in 1961 as a student trainee in the cooperative engineering program between Langley and Virginia Polytechnic Institute and State University. From 1965 to 1972 he was an aerospace technologist. He served as the Technical Assistant, Flight Dynamics and Control Division, from 1972 to July 1975. From August 1975 to July 1976 he served a one-year tour as Chief of Avionics at NASA Headquarters in Washington, D.C., as part of the NASA Career Development Program.

Upon his return to Langley in August 1976, Conway became Staff Assistant to the Director for Electronics. In March 1981 he was appointed Technical Assistant, where he assisted the Director for Electronics in the conception, monitoring and implementations of research programs in electronics for aerospace applications. He also participated in the management of directorate activities, such as computation and instrumentation which support virtually all of Langley's in-house research programs.

Conway received a bachelor of science degree in aerospace engineering from Virginia Polytechnic Institute and State University in 1965. He earned a master of science degree in aerospace engineering from George Washington University in 1974.

The author or co-author of nine technical papers, Conway has received two Langley Group Achievement Awards, a NASA Group Achievement Award and a Skylab Achievement Award.

Conway and his wife, Carol, live in Seaford. They have two children.

Sykes Wins Award

George F. Sykes Jr., a research scientist in the Materials Division, was recently presented the Frye-Parry Award for the best paper presented at the Society for the Advancement of Material and Process Engineering Symposium. Sykes' paper was on reinforced, nonmetallic materials.

During the 30th International SAME Symposium/Exhibition, 81 members were recognized for distinguished service and technical contributions to material and process engineering and over $24,000 given in student scholarships.

Thanks

Wallace J. Nelson writes, "I would like to convey my sincere thanks to all who participated in my retirement party, including those who planned the event, provided the entertainment, attended the dinner and contributed to the gift. It was a memorable evening for my family and me and will be long remembered. It's always gratifying to know that you have friends and I hope to continue to see all of you often."

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 Clough
Staff Photographer . . . . . Bob Ny

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.

General Management Status Review Set

The monthly General Management Status Review (GMSR) will be held Monday, August 18, from 9:30 to 11:30 a.m. in Building 1219, Room 225.

Following the Director's comments and program directors' status reports, program accomplishments will be given by Langley scientists.

TIME	TITLE OF TALK	SPEAKER
10:00	High Resolution Measurements of Cloud Fields	Bruce Wielicki (Space/ASD)
10:15	A Multifunction Recognition Operator for Telerobotic Vision	Plesent Goode (Flight Systems/ISD)
10:30	Evolutionary Time-Based Terminal Flow Control Concept	Leonard Credeur (Flight Systems/FLMD)
10:45	NDE and Fracture Mechanics Applied to Impact Damage in Thick Composites	Eric Madaras (Electronics/IRD)
11:00	High-Angle Flight Tests of a .22-Scale X-29 Drop Model	David Fratello (Aeronautics/LSAD)
11:15	Unusual Instability Boundary for DAST ARW-2 Found to be Narrow Transonic Response Region	Maynard Sanford (Structures/LAD)

Telemail Workshop Planned

A Telemail workshop, designed for individuals with little or no experience in using the feature, will be offered in the Microcomputer Training Center Thursday, August 28.

The lecture/hands-on training will cover:

- Telemail overview
- Basic commands

Scan	Purge
Read	Unpurge
Compose	Forward
Check	Answer
Passkeys	Bye

- Online assistance
- Online tutorial
- Connect/Disconnect
- Bulletin boards

Call Fay in the MTC, ext. 3391, to enroll.

Clouds May Be Offsetting 'Greenhouse Effect'

-by Maurice Parker

Recent measurements of Earth and its atmosphere by NASA scientific instruments give evidence that clouds may have a significant effect on our climate and weather patterns.

Early data from NASA's Earth Radiation Budget Experiment (ERBE) suggest that clouds reflect more heat than they retain. Clouds appear to cool Earth's climate, possibly offsetting the atmospheric "greenhouse effect."

The ERBE instruments identify clouds and clear parts of Earth so accurately that the measurements should help resolve many scientific controversies about the future of Earth's climate.

The instruments measure Earth's heat "budget," the amount of sunlight that reaches and is absorbed by Earth and the amount of energy radiated back to space. Even small changes in any component of the budget can have important effects on weather and climate.

Scientists have known for decades that the atmosphere acts like a greenhouse, letting in sunlight and preventing much of the heat from escaping. Most atmospheric scientists agree that the greenhouse effect has been increasing for about 50 years. The increase will continue as long as people burn large amounts of fossil fuels–gasoline, oil and coal–that release carbon dioxide into the atmosphere, blocking heat from escaping to space.

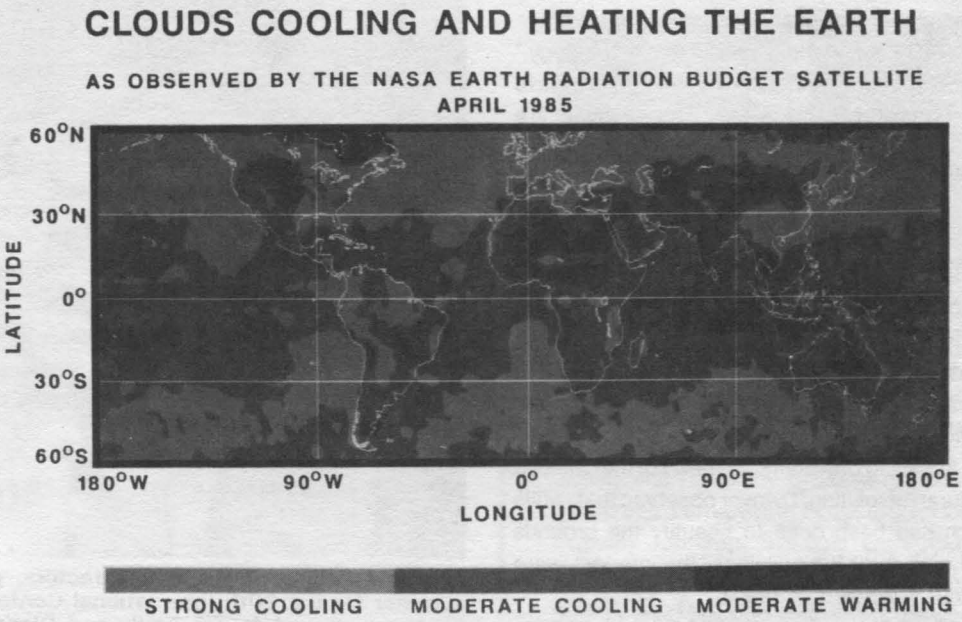
Recent evidence suggests that increasing the amounts of other trace gases, such as methane and chlorofluoromethane, can have the same effect as carbon dioxide. The greenhouse effect has been increasing, but its impact on the atmosphere has not been clearly demonstrated.

Scientists don't agree on whether an expanding greenhouse effect

will increase or decrease cloud cover over Earth. They also disagree about the effect of any change in cloudiness: some think that more clouds will increase the amount of reflected light, cooling Earth and decreasing the impact of rising levels of carbon dioxide. Others think that more clouds will cause the atmosphere to retain more heat and increase the impact of carbon dioxide.

Mathematical analyses alone cannot resolve the controversies. A recent comparison of

Continued on page 6.



CLOUDS COOLING AND HEATING EARTH, as observed by the Earth Radiation Budget Experiment in April 1985. Clouds are generally observed to have a cooling effect on Earth's surface. A few regions, mainly in the tropics, were warmed because of the greenhouse effect of thin, high clouds. Other kinds of clouds had a cooling effect over most regions.

Langley Scientists Attend Conference in China; Families Tour Major Cities

-by Louise Stokes

Dr. Douglas L. Dwoyer, Head of the Computational Methods Branch, accompanied Langley scientists, contractors and grantees who presented papers at the 10th International Conference on Numerical Methods in Fluid Dynamics held this summer in Beijing, China. Ten research papers were presented from Langley, more than any other single organization represented.

Dwoyer, is chairman of the organizing committee for the 11th conference which will be held in Virginia and hosted by Langley and the Institute for Computer Applications in Science and Engineering (ICASE) in June 1988.

"A major feature of any conference is the interchange between scientists," said Dwoyer. "This conference has been very successful in attracting papers from all over the world, including Russia. It is one of the few times when you can talk to scientists from behind the Iron Curtain."

Fluid dynamics is a broad subject that ranges from blood flow in the arteries to ocean circulation and hypersonic aerodynamics. The basic equations that govern the motion of air or any other fluid have been known for over a hundred years, but they are so mathematically intractable that engineers and scientists can only solve them, in an approximate way, using tremendous computer resources.

"NASA is a world leader in this technology," said Dwoyer. "Both Langley and Ames have major efforts in this area. The Chinese are about 15 years behind the United States in computational fluid dynamics, and it is one of the areas that they would like to pursue in their modernization."

Dwoyer found the Peoples Republic of China a land of contrasts. In Beijing, its capital city, modern air-conditioned buses share the road with bicycles and horse-drawn carts. The streets are filled with people and vehicles without any traffic control.

At Beijing University, the heart of the Chinese Cultural Revolution, Dwoyer observed that, while much had been done to beautify the grounds and outside of the buildings, the interiors were seriously in need of repair.

"The food was wonderful," he said, "but we could not drink the water because of dangerous parasites. Each city had its own brewery. The choice of drink was either beer or a sticky, sweet, orange soda."

It was incongruous to see farmers working the fields by hand and then lay their harvest on a nearby modern roadway to dry and be swept up at the end of the day, said Dwoyer. He was surprised to learn that the Chinese farmers could own land and their houses.

During the week of the conference, the Dwoyer family toured a kindergarten, an elementary school and a Neighborhood Committee Commune. The Chinese people were extremely friendly, stopping them on the street to ask where they were from and what it was like in the U.S. The official Chinese tour guide made no attempt to prevent anyone from speaking to the visitors from America.

The Dwoyer children provided an avenue through which the family was able to talk to many Chinese. "Everywhere we went, the people were fascinated with the children. They wanted to take pictures of them, our kids with their kids."

Their most interesting experience occurred on the waterfront in Shanghai. Dwoyer and his younger daughter, Emily, 6, were looking at boats in the harbor. He turned to see Mrs. Dwoyer and their older daughter, Diana, 10, talking with a young Chinese man. Before long, they were surrounded by 50 Chinese interested in the United States.

The young man had taught himself English and had read American history and literatur He asked the Dwoyers what were the capita of the United States besides Washington, D. He asked what state were they from and sai "Oh, yes. Two states used to make up Virgini The capital of West Virginia is Charleston. Th capital of Virginia is Richmond."

"He wanted to know if we had read P. Snow, Hemingway, and Shakespeare," sa Dwoyer. "He said that he had an awful tim with Chaucer."

Over 300 international participants are e pected to attend the eleventh conference. Som will bring their families with them to experienc a different culture as the Dwoyer family did th summer.

Positions Open

The following positions are open at th Langley Research Center:

86-72: Supervisory Aerospace Enginee AST, Structural Mechanics, GM-0861-14 or 1 Materials Division, Fatigue and Fracture Branc closes August 25.

86-73: Supervisory Aerospace Enginee AST, Navigation, Guidance and Control System GM-0861-14 or 15, Guidance and Contr Division, Spacecraft Controls Branch; close August 25.

These Langley employees, contractors, grantees and family members visited China th summer for the 10th International Conference on Numerical Methods in Fluid Dynamic First row, from left, are Emily and Diana Dwoyer; second row are Bob Walters, Virgin Polytechnic Institute; Liz Carter, Phil Drummond and Doug Dwoyer, Langley; third row a Terry Walters, Nancy Dwoyer and Gordon Erlebacher, Langley; and Carolyn Melnik; four row are Jim Carter, United Technologies Research Center; Bob Clark, Los Manos Nation Laboratory; Bob Melnik, Grumman Aerospace Corp.; and Kathy Clark. Not pictured: M Yousuff Hussaini, ICASE; Mujeeb Malik, High Tech Corp.; Eddie and Grace Liu, Langle

Taback to Receive Degree, Honored at Reception

Israel Taback, a Langley Research Center retiree, will be honored by Old Dominion University and Langley this weekend for his scientific contributions to NASA and the community.

He will receive an honorary doctor of science degree from the university Saturday, August 16, and will be the guest speaker for the commencement. On Sunday, August 17, his friends will honor him at a reception at the Langley Activities Center.

Taback made substantial contributions to the aeronautical and space flight research programs during his 35 years of service to NASA and its predecessor agency, the National Advisory Committee for Aeronautics. He was chief engineer for Langley's Viking Program which successfully landed the first spacecrafts on the planet Mars in 1976.

He has been a consultant for Bionetics for 10 year.

The reception will be held at Langley from 4 to 6 p.m; a cash bar will be provided and spouses are welcome. For reservations, please call Ansel Butterfield or Bob Kenimer, 865-0880

Graduation exercises will begin at 9:30 a.m. on the Williamsburg Lawn on the ODU campus.

Runners Club Plans Carnival Races

The Langley Runners Club will hold the following races Saturday, August 23, during the LAA Carnival:

10:00 a.m. 5-Mile Race

1:00 p.m. 4x440 Interdirectorate Relay

The 5-mile race will start on Doolittle Road and is open to all NASA and contractor employees, family members and friends. The 4x440 relay will start in front of the Activities Center and is open to four person teams from each directorate or contractor.

For more information and to enter relay teams, call Richard Shearer, ext. 4621.

Thanks

The family of **Virginia Fretwell** would like to thank each and every one who donated blood for their sister and daughter. "Her life was made better by your gift. Thank you from our hearts."

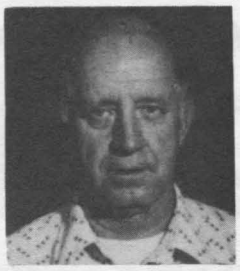
Langley Directives Distributed

DIRECTIVES NUMBER REVISED:	TITLE	DATE	DATE T.S.#	DISTRIBUTED
LMI 1200.18	"Delegation of Authority Concerning Architect-Engineer Services"	6-6- 86	1471	6-24-86
LMD 1200.20	"Power and Authority - To Approve Distribution of NASA Computer Programs"	6-6- 86	1472	6-24-86
LMI 1200.11	"Delegation of Authority to Approve Presentation and Publication of Scientific and Technical Papers and Reports for Professional Audiences"	6-6- 86	1473	6-24-86
LMD 1200.13	"Redelegation of Authority to Approve Hours of Duty and Related Matters"	6-6- 86	1474	6-24-86
LMD 9500.1	Attachment, NMI 9501.1, "NASA Contractor Financial Management Reporting System"	6-9- 86	1475	6-24-86
LMI 1300.5	"Technical Conferences, Special Events, Technical Briefings, Guest Visits and Tours"	6-11- 86	1476	6-24-86

New Langley Forms Announced

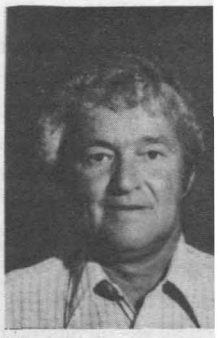
FORM NO.	TITLE	DATE OF FORM
NEW:		
SF 704	Secret Cover Sheet	February 1986
SF 705	Confidential Cover Sheet	February 1986
OF 303	Employee Suggestion	April 1986
LF 65	Certification Letter for Classified Documents	April 1986

Recent Retirees



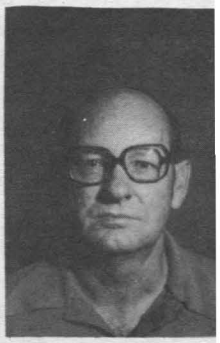
Raymond DeLozier

Azura Yamamoto

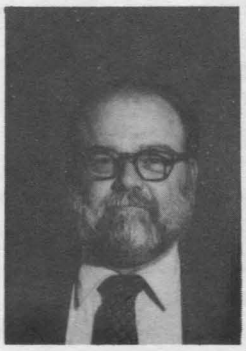


Warren Johnson

Larry Hall



Moody Topping



Bruce Flagge

Jeanette Genung

Raymond L. DeLozier, Systems Safet Quality and Reliability Division, retired July 2

Azusa Yamamoto, Scout Project Office, **Warren Johnson**, Systems Engineering Div sion; **Larry B. Hall**, Flight Electronics Divisio **Moody O. Topping**, Operations Support Div sion, and **Bruce Flagge**, Instrument Researc Division, retired August 1.

Jeanette T. Genung, Industry Relatior Office, retired August 3.

ERBS Takes Measurements of Earth and Atmosphere

Continued from page 3.

computer models that predict heat loss from the atmosphere showed a 10 percent disagreement, even when the models were limited to cloudless conditions.

The change expected for an increased greenhouse effect, caused by increased carbon dioxide, is less than one percent. Scientists think that even this small amount of change will be significant, and could be associated with droughts and rising sea levels rather than cloud changes.

Even if computer models of heat loss under cloudy conditions were perfect, scientists still don't agree on exactly how clouds form, how long they last, and why they disappear. Reliable estimates are not yet possible of how Earth's climate will be altered by the greenhouse effect.

Winds and ocean currents are another important influence on Earth's climate; they are closely related to the flow of energy from the sun. Some scientists think that changing cloud patterns will alter the energy flow and influence the amount of heat stored in the ocean, thereby modifying the movement of heat from one part of the ocean to another.

The importance of understanding heat transfer in the ocean is dramatically illustrated by a natural phenomenon called El Nino, a disruption of weather patterns over the equatorial Pacific Ocean. A 1982-1983 disruption caused the reported deaths of more than 850 people from drought in Indonesia and floods in Peru, Ecuador and the United States. Australia lost $2.5 billion from drought and related fires. Americans east of the Rocky Mountains, however, saved a similar amount in heating costs because their weather was mild.

Earth's energy budget has been studied for decades with sounding rockets, balloons and satellites, but the studies have been limited by incomplete coverage and sporadic observations.

ERBE is a three-satellite project that began in October 1984, when the Earth Radiation Budget Satellite (ERBS) was deployed into orbit by Astronaut Sally Ride from the Shuttle Challenger.

A second ERBE instrument package is aboard NOAA-F, a National

Oceanic and Atmospheric Administration weather satellite launched into polar orbit in December 1984. A third ERBE package is scheduled to be sent into polar orbit aboard the NOAA-G satellite later this year. The satellites were developed by NASA's Goddard Space Flight Center.

The ERBE instruments measure the average monthly heat budget on regional, zonal and global scales; track the seasonal movement of heat from the tropics to the poles; and determine the average daily variation in heat on a 1,000-kilometer (620-mile) regional and monthly scale.

Each ERBE package contains two radiometer instruments, called a Scanner and a Non-Scanner. The Scanner is a narrow field-of-view scanning radiometer that makes shortwave measurements of reflected solar energy and long-wave measurements of Earth-emitted energy.

The Non-Scanner has two wide field-of-view sensors that view the entire disc of Earth from limb to limb, two medium field-of-view sensors that view a 10- degree region of Earth and a solar monitor that measures the total output of the Sun's radiant heat and light.

Scientists and engineers at the Langley Research Center, working with other NASA centers, government agencies, universities and private industry, developed the ERBE instruments. For the next several years, a team of scientists from around the world will examine data from the ERBE instruments. They will try to determine whether the Sun's heat varies, and try to improve our understanding of the complex global heat flows that interact to keep Earth's climate in balance.

LAA Carnival Special Events Planned

The Langley Activities Association has planned some special entertainment for this year's Carnival. In addition to the game booths, arts and crafts, children's entertainment and the casino, the following is planned:

Friday, August 22

6 p.m.: 1986 Carnival Monarch Coronation

8 p.m.: "Caravan East" mid-east dance group.

9 p.m.: Music group.

10 p.m.: $1200 grand prize drawing.

Saturday, August 23

10 a.m.: 5-mile run.

1 p.m.: 4x440 Inter-Directorate relay.

5 p.m.: Two-Stepping Panhandlers, country and western dancers.

8 p.m.: "Aman Rah" mid-east dance group.

9 p.m.: "Champagne Knights," 40s and 50s dance band.

10 p.m.: $1500 grand prize drawing.

The 1986 LAA Carnival will be held from 5 to 10 p.m. Friday and from 10 a.m. until 10 p.m. Saturday. The casino will remain open until 11 p.m. both evenings. Prize drawings will be held every half hour each day.

The Carnival is the biggest fund-raiser that the LAA sponsors. Support the LAA by participating in the weekend events. There will be fun and games appropriate for each family member and plenty of food and beverage.

Key Positions

John H. Crosby III has been selected Supervisory Engineering Technician, Fatigue Research Laboratory, Technical Support Section B, Laboratories Operations Branch, under Competitive Placement Plan 86-47.

Robert M. Stewart has been selected Supervisory Engineering Technician, Structures and Materials Research Laboratory, Technical Support Section B, Laboratories Operations Branch, under Competitive Placement Plan 86-48.

Retirement Parties

Charlie Crowder of the Contracts Branch will be honored at a retirement picnic Wednesday, September 10, at 4:30 p.m. at the Activities Center. The menu will feature fried chicken and steamed shrimp. Beer, wine and soft drinks will be provided. The cost will be $7.50 per person, including gift; gift only contributions of $2 will be accepted. Please send payment to Stan Ward, mail stop 126, by August 29.

Earl R. Askew will be honored with a retirement party Wednesday, August 27, in the Activities Center. A cash bar will begin at 6 p.m., followed by a dinner at 7. The cost, including gift, is $11 per person. Cash contributions for gift are welcome. Send checks or cash to Don Shortt or Jerry Nichols, mail stop 171, by August 20.

Happenings

THE LAA SOCIAL will not be held Friday, August 22, due to the LAA Carnival.

VEGETABLE GARDENS CLUB. An end of the season meeting will be held Tuesday, September 9, at l2 p.m. in Building 1209 auditorium. All persons wishing to participate in plans for the 1987 season are invited.

RUGBY. The Newport News Rugby Club is seeking interested players; no experience necessary. Practice will be held at Warwick High School on Thursdays, at 6:30 p.m. For more information, call Gene, 599-4930 after 6 p.m.

TENNIS CLUB NEWS. The new security system for the tennis courts should be implemented in the near future and lock keys may be obtained from the LAA office. Over 200 matches have been played in tournaments, ladder and league competition so far this summer. Ladder tournaments are scheduled to start September 12. Tennis players interested in joining the Langley Tennis Club can pick up an application form at the tennis court sign-in board or the LAA office.

AFGE Local 2755 regular monthly meeting is scheduled for Wednesday, August 20, at 4:30 p.m. in the Union Office, Building 1232B.

COLONIAL WILLIAMSBURG patriot passes are available at the Activities Office for $17.50.

PROBLEMS? NASA Civil Service employees may call the Employee Assistance Program at 873-0228 for confidential, private counseling.

BUSCH GARDENS tickets are on sale at the Activities Office for $13.

DREAM RIDE. A one-day DREAM RIDE for the benefit of the Sunshine Foundation will take place October 5. Checkpoints will be located throughout the six-state region of Virginia, West Virginia, Maryland, Pennsylvania, New Jersey and Delaware. All bikers are welcome. Pledge cards for a tax deductible, dollars or cents per mile donation are available. Those wishing to pledge or ride should contact Dennis McMillan, ext. 3421, for more information.

MOVIE TICKETS are available in the Activitie Office for Coliseum Cinemas I and II fo $3.25 each and for Riverdale, Beechmont an Williamsburg theaters for $2.75 each.

BINGO is played every Thursday night in th Activities Center, beginning with an early bir special at 7:10 p.m. and regular games at 7:3 If anyone is interested in working as a bing caller, call Eugene Hicks, ext. 3737.

Carnival to Provide Entertainment for Childre

This year's Langley Activities Association Carnival will be very special for children. The list of the weekend activities, sponsored by the Langley Child Development Association, has something of interest for children of all ages.

Highlighting the children's stage entertainment is the delightful entertainment of life-size marionettes, the thrilling antics of the Power House Bicycle Team, the talents of Bossie and Freckles – a ventriliquist and magic act, the rhythmic drill team efforts of the Zem Temple Youth Patrol and the ethnic violins and dancing of the Michas Polish Dance Ensemble. Talent from Langley Air Force Base will also be featured, as well as the NASA Child Development Center children.

In addition, there will be a variety of other interest. Clowns from Hampton Baptist Church will help apply face make-up and hand out free gifts to the children, compliments of WTAR-WLTY Radio; a NASA robot and animate characters will be available to pose for picture with children; strolling costumed character such as Sparky the Fire Dog, Peter Panda fro Children's Palace, Mr. Peanut from Planter Peanut World, and McDonald's Ham Burgl will be there to say "hello" to the tots. C Saturday from 5 to 6 p.m., children's game and races are scheduled from cake walks relay races.

Science will not be ignored, complimen of the NASA Visitor Center staff. Live lecture for children on "Eating and Sleeping in Spac will be provided on both days of the Carniva as well as videotape productions entitled, "Toy in Space," "The Space Shuttle: An America Adventure," "To Fly: Early Years of Man's Flight "A Man's Reach: The History of Space Fligh and "The Universe."

The Child Development Center Associatio is also sponsoring baked goods, a children' book fair and a toy raffle. The grand prize fo the toy raffle is a Cabbage Patch astronaut do

For informationcall Melissa Coleman-Whit ext. 2191.

CARNIVAL ENTERTAINMENT. The Two Steppin' Panhandlers, a country-western dance group, will perform at the LAA Carnival Saturday, August 23, at 5 p.m. Members of the dance group are (kneeling) Sam Sokol and Betty Bailey; (standing) Don Ferguson, Donna Ferguson, Jerry Nichols, Lana Nichols, Larry Tupman, Debbie Tupman, Chuck Kessler, Barbara Galloway, Jean Burdick, John Stallings, Diana Hebert, Phil Hebert, Claudia Caricofe, Bob Caricofe, Pat Watts and Claude Watts.

Training Classes Offere

The following classes will be offered th month and in September in the Microcompu Training Center.

- Advanced PC DOS (9 hours)
- Introduction to Microcomputers and PC D (4 hours)
- Introduction to dBASE III (8 hours)
- Introduction to Lotus 1-2-3 (8hours)
- Advanced Lotus 1-2-3 (15 hours)

To enroll, call Fay Hoerger, ext. 3391.

LAA Office Closes

Due to Carnival activities, the Langley Activities Association Office will be closed Friday, August 22, and Monday, August 25.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 LANGLEY EMPLOYEE (LRC ADDRESS)
ROBERTSON, JAMES B.,
MAIL STOP 152E BLDG 1168

swap and shop

FOR SALE

Vehicles

Aristo Craft 19-foot fiberglass boat with 50 hp outboard Chrysler motor; tilt bed trailer; EC; $3,800 Call 877-9555 from 9 a.m. to 5 p.m. and 595-0184 after 6 p.m. on weekdays.

1983 Nissan Sentra, 2 DR, MPG, DLX, AC, 27,000 miles, EC, must sell, $4500. Call Rajan, 838-6503 after 5 p.m.

Thanks

Jean M. LaNeave and Nancy S. Murawski write, "We deeply appreciate and thank you for your thoughtfulness and concern during our father's recent illness and death. Thank you for the visits, food, flowers, calls, cards, and especially for the donations pledged in our father's name at the bloodmobile and for the memorials given to the American Cancer Society in remembrance of him. Your kindness has been comforting to us; we are truly blessed to have such wonderful, caring friends."

Emilio Alfaro writes, "Thanks to all my friends who attended my retirement party and especially those who organized the luncheon and participated in making it a memorable occasion. I have enjoyed working with you and being part of the NASA team. I have cherished the camaraderie that helped alleviate the burden in difficult times and made the good times a little better. To the many friends I made at Langley: I will always remember you."

James Justice writes, "I would like to thank everyone who took their time in arranging, attending and contributing to my retirement party and in making it a time to remember. My only regret about retiring is not seeing and working with my good friends and co-workers each day."

Speakers Bureau

Leroy Spearman discussed Soviet technology and philosophy at the Christ United Methodist Church Men's Club meeting June 16.

Phil Brown gave a presentation on the Langley Stall/Spin Program to members of the NASA Goddard Flying Club June 10.

Rosa Webster spoke at the Chesapeake Public Library June 18 on Toys in Space.

James Patton addressed the Experimental Aircraft Association's Tidewater Chapter June 21 on NASA's General Aviation Stall/Spin Program.

Frank Quinto talked about aerospace careers to students at Kempsville High School in Virginia Beach May 23.

Dr. Sam Massenberg gave a eulogy to the Challenger astronauts during a Memorial Day Service, Cedar Hill Cemetary, Suffolk, May 26.

Robert Calloway spoke on "Forces in Flight" to the Royal Ambassadors at Thalia Lynn Baptist Church in Virginia Beach May 30.

Jim Patton and Paul Stough presented an invited lecture on NASA Research on Spin Resistance June 10 at the University of Tennessee Space Institute's short course, "Flight Testing and Stability and Control."

Mary (Nell) C. Moore writes, "My family and I deeply appreciate the retirement party given for me Friday, July 25, at the Fort Monroe Officers' Club. I do thank everyone for attending and expressing their kind thoughts. I will enjoy using the gifts. I enjoyed working with my NACA/NASA co-workers so much and will miss them. My only regret about retiring is the disassociation from all my good friends and co-workers."

cafeteria menu

Week of August 18 - 22

MONDAY: Split pea soup, veal parmesan, seafood Newburg, quiche Lorraine. Snack bar: 1/4 lb. cheeseburger, pizza supreme.

TUESDAY: Chicken noodle soup; spaghetti dinner; savory baked chicken; macaroni, franks and cheese. Snack bar: Chicken filet, steak and cheese sub.

WEDNESDAY: Vegetable soup, turkey dinner, beef liver and onions, chuckwagon steak. Snack bar: 1/4 lb. cheeseburger, Polish sausage.

THURSDAY: Chicken vegetable soup, crab cakes and slaw, roast pork and dressing, chicken livers. Snack bar: Chicken filet, egg salad sandwich.

FRIDAY: Manhattan clam chowder; fish dinner; beef, macaroni and tomatoes; chicken and dumplings. Snack bar: 1/4 lb. cheeseburger, hot Italian sausage.

Week of August 25 - 29

MONDAY: Ham and lima bean soup, chopped steak, fried filet of flounder, ham and macaroni au gratin. Snack bar: Chicken filet and pizza supreme.

TUESDAY: Chicken and rice soup, lasagna, beef tips over rice, fried fish nuggets. Snack bar: 1/4 lb. cheeseburger, steak and cheese sub.

WEDNESDAY: Vegetable soup, fried chicken dinner, baked stuffed trout, beef liver and onions. Snack bar: Chicken filet, Polish sausage.

THURSDAY: Bean soup, luncheon rib eye steak and vegetable, seafood quiche, stuffed chicken breast. Snack bar: 1/4 lb. cheeseburger, fried cod fish sandwich.

FRIDAY: Bull Island clam chowder, fish dinner, baked meat loaf, baked beans and franks. Snack bar: Chicken filet, hot Italian sausage.

Fay Moore and his wife would like to express their thanks and appreciation to all who made his retirement picnic such a wonderful occasion for him and his family and for the gifts he received. "I will cherish and remember the day with my many friends for the rest of my life," Moore said.

National Aeronautics and
Space Administration

Langley Research Center

NASA

Langley Researcher

Volume 25, Issue 22

October 24, 1986

National Aero-Space Plane Organization Set

NASA's initial organization of its National Aero-Space Plane (NASP) program is complete. While some elements of the agency's program had been in place for some time, others have more recently been set. NASA will continue its significant support and interaction with each organizational level of the multi-agency program.

Overall NASP program organization includes a Program Management Office (PMO) in Washington, D.C., a Joint Program Office (JPO) at Wright-Patterson Air Force Base, Dayton, Ohio, the NASP Office in the Office of Aeronautics and Space Technology (OAST) at NASA Headquarters, NASP substructures at each of the NASA research centers, and multi-agency technology teams (see accompanying chart on page 2).

NASA, and especially Langley, is contributing an impressive share of key individuals to all these organizations.

At the NASP PMO, Washington, D.C., Langley's William M. Piland has been named Director for NASA. Piland was formerly Assistant to the Center Director at Langley. The PMO is headed by the Defense Advanced Research Projects Agency (DARPA) and serves as Washington interface for the program.

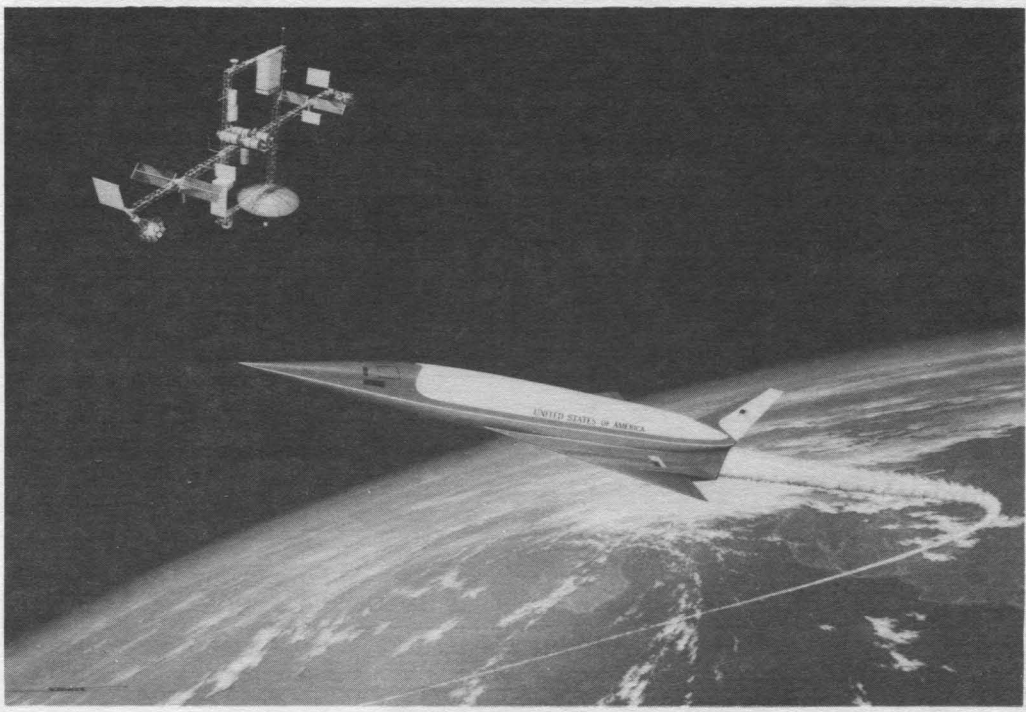
At the NASP JPO, Wright-Patterson, Langley's Howard T. Wright is installed as the NASA Deputy, one of three deputies who report to Brig. Gen. Kenneth E. Staten. Also at the JPO is Langley's Joe D. Watts, Manager, Technology Maturation Directorate, responsible for directing advanced technology development for the program. Working for Watts is Richard G. Culpepper, formerly on Langley's roles but serving as NASA liaison to Wright-Patterson. The JPO is responsible for the awarding and monitoring of the main airframe and engine contracts in the program. To date, five major airframers and two engine companies have been awarded NASP contracts.

At NASA Headquarters, in the Office of Aeronautics and Space Technology (OAST), Duncan E. McIver will head NASA's NASP Office. McIver began his NASA career at Langley in 1958, and he was the Assistant Chief of the Flight Controls Systems Division when he was transferred from Langley to NASA Headquarters in 1982. He has just returned from a one year industry assignment with the Bechtel Group, Inc., San Francisco, Calif., as a participant in the President's Executive Exchange Program. His responsibilities as Director, NASA Headquarter's NASP Office will include working with both multi-agency offices and with the several NASA centers supporting NASP.

At Langley, Robert A. Jones will resume his duties as Chief of the High-Speed Aerodynamics Division, which has major responsibilities for development of technology for Aero-Space Plane, to include scramjet testing and the study of computational fluid dynamics.

The newly-established Langley Aero-Space Plane Office will be managed by Gregory M. Reck, who came here from Lewis to work on NASP. The office is established under the Office of the

Continued on page 2.



Aero-space plane requires great technological advances to take off horizontally, fly through the air like an airplane and boost itself into orbit.

CFC Contributions Mounting

At **Langley Researcher** press time Langley personnel and NASA affiliated organizations had donated $195,678 to the 1986-87 Combined Federal Campaign. This figure represents 83 percent of Langley's $235,000 goal.

Langley has a long history of outstanding participation in community activities, especially in times of community need. The CFC is the one time each year when that community need is made known to us. Please consider those needs and make your pledge if you have not already done so. Your contribution will help Langley meet its goal, and in turn, will help our community be a better place in which to live and raise our families.

NASP Organization Complete

Continued from page 1.

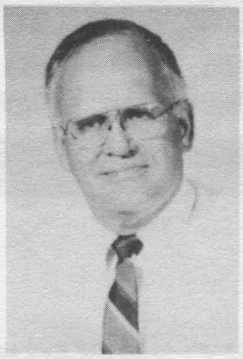
Director for Aeronautics to conduct "conceptual studies in support of the NASP program and to coordinate Langley technical activities for NASP." At the Langley level, this will result in a cohesive program of NASP research where one office will coordinate the efforts of the entire center and represent the center's interests to the agency and the multi-agency offices.

The Langley office consists of three major

William Piland

Howard Wright

elements. In addition to the Conceptual Studies Office, managed by James L. Hunt, two managers report directly to one of the JPO directorates at Wright-Patterson. From



Joseph Watts

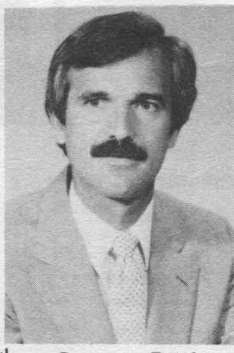
Robert Jones

the office at Langley, L. Robert Jackson and Allen H. Whitehead manage two of seven NASP Technology Teams – Jackson for Structures, Whitehead for Aerodynamics – that support the Technology Maturation Directorate. The efforts of the widely-dispersed teams, made up of both NASA and Department of Defense personnel, must be coordinated and focused on the challenges of their particular disciplines.

The technology team approach is part of NASA's manpower commitment. Of the 90-some people that make up the seven teams, more than half are from NASA (with half of those contributed by Langley). Two additional teams are headed by a NASA person.

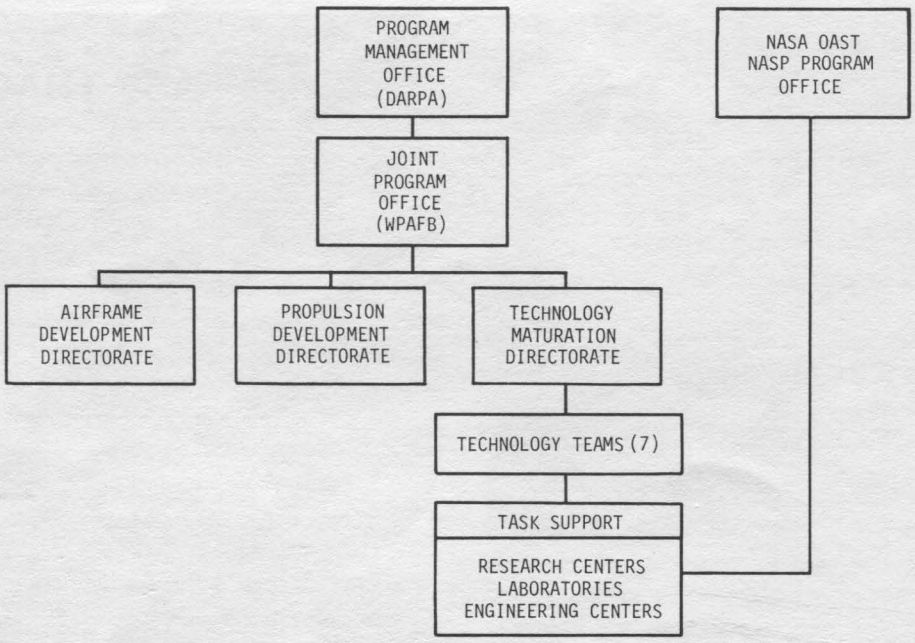
NASA has the lead role for technology maturation. Langley's long involvement with hypersonic technology leading to the Aero-Space Plane program will ensure a continuing key role for the center.

Other NASA people assigned to key NASP positions include Thomas J. Gregory of Ames, Joint Program Office Director for Airframe Development, and John E. Rohde of Lewis, Joint Program Office Deputy Director for Propulsion Development.



Gregory Reck

SIMPLIFIED NASP MANAGEMENT STRUCTURE



Myers Named NASA Deputy Administrator

The White House has announced that Dr. Dale D. Myers has been named NASA Deputy Administrator. The announcement was made official after Congress confirmed the appointment, October 1. Myers will be replacing William Graham, who becomes Director of the White House Office of Science and Technology Policy.

Prior to his appointment, Myers served as an at-large member to the NASA Advisory Council, an organization created to provide advice and counsel to NASA top management on aeronautics and space programs.

Myers, who served as President and Chief Operating Officer of Jacobs Engineering Group Inc., Pasadena, from 1979 to 1984, has also served as Under Secretary to the U.S. Department of Energy from 1977 to 1979. From 1974 to 1977 he served as Vice- President, Rockwell International and President of North American Aircraft in El Segundo, California. Myers was the Associate Administrator for Manned Space

Continued on Page 6.

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 Friday in the interest of its staff. Address contributions to the Editor, Mail Stop 115, telephone 865-3006. Articles are due at noon on the Thursday following the date of this issue.

Managing Editor . . . . . Jean Drummond Clough
Editor . . . . . Tamara J. Kreb
Photographs . . . . . Photo Lab

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

Happenings

A CEBAF SEMINAR will be held at CEBAF, Thursday, October 30, at 11:00 a.m., in room 53. Guest lecturer Abolhassan Jawahery of Cornell will give a presentation entitled, "b- quark Physics with the CLEO Detector at CESR." The CEBAF seminars are technical talks intended for a scientific audience. All members of the CEBAF staff and the public are welcome.

LAA SOCIAL. The Langley Activities Association will hold a social Friday, October 31, in the Activities Center from 4 to 6:30 p.m.

SIGMA CHI CENTENNIAL LECTURE. Dr. Ronald D. Ekers, Assistant Director of the National Radio Astronomy Observatory, Socorro, New Mexico, will give a lecture entitled, "Revealing the Invisible Universe," at the Virginia Beach Pavilion Theater, Thursday, November 6, at 8 p.m. Tickets for the lecture are on sale at the Virginia Beach Pavilion box office; cost is $2 for adults and $1 for students and senior citizens. For more information contact Dr. Keith Carson, Department of Biological Sciences, Old Dominion University, Norfolk, VA 23508, (804)440-3595. The lecture, which is part of the Centennial Lectureship Program celebrating the 100th anniversary of the founding of Sigma Xi, is being hosted by the Tidewater Virginia Chapter of Sigma Xi. Ed Prior, Technical Assistant to Langley's Chief Scientist, will introduce the speaker.

PENINSULA APPLE CORE. The Apple computer users group meets on the first Wednesday of each month in the Thomas Nelson College cafeteria. Topics of interest to beginners and experienced users are discussed. The next meeting is November 5th at 7:30 p.m. Financial management programs will be discussed. All are welcome.

LAA ANNIVERSARY. The Langley Activities Association celebrates its 40th anniversary next month and has planned two special events. On Friday, November 14, there will be an Open House in the Activities Center for all NASA and contractor employees. Snacks will be served from 11 a.m. to 1 p.m. and special guests include LAA past presidents and board members. That afternoon there will be a Special Social from 4 to 8 p.m. with live entertainment providing pop, jazz and rock music. During the social, beverage prices will be reduced.

ARTS & CRAFTS SHOW AND TURKEY SHOOT. The Langley Activities Association will sponsor an Arts and Crafts Show and Turkey Shoot Saturday, November 15, at the Activities Center. The shoot begins at 9 a.m. and the show at 10. Food will be available and door prizes will be given away. Raffle tickets are available at the Activities Office.

ALL-BREED DOG SHOW. The Langley Kennel Club will sponsor its annual fall All-Breed Dog Show, Sunday, November 2, at the Virginia Beach Pavilion. The show is part of a three-day circuit that starts Friday, with the Virginia Beach Kennel Club, and continues Saturday with the Tidewater Kennel Club sponsoring. Shows start at 8 a.m. each day and run until 8 p.m. Admission is $2 for adults and $1 for children (6-12 years).

MOVIE TICKETS are available in the Activities Office for Coliseum Cinemas I and II for $3.25 each and for Riverdale, Beechmont and Williamsburg theaters for $2.75 each.

New Computer-based Tutorials Available in the Microcomputer Training Center

The following new computer-based tutorials are available in the microcomputer training center (MTC):

INTRODUCING R:BASE 5000 is an interactive, computer-based tutorial for use on the PC. The tutorial is published by Dialogue Software. The training program simulates the menus and functions of R:BASE 5000, providing hands-on experience in working with the system.

R:BASE SYSTEM V LEARNING GUIDE is an interactive tutorial for use on the PC from Microrim. The actual R:BASE System V software is used.

IBM PC COMMUNICATIONS USING THE CROSSTALK PROGRAM is an interactive, computer-based tutorial from CDEX Corporation. Learn basic communications concepts and how to set up and use the CROSSTALK program.

HOW TO USE THE IBM AT WITH PC DOS is an interactive, computer-based tutorial from CDEX Corporation. The tutorial provides an introduction to the terms and concepts necessary to work with personal computers in general and the IBM AT in particular, hardware and software components of the AT, DOS and DOS commands, and hierarchical directories. DOS runs concurrently with the training program. You can easily switch from the training program to DOS to practice using the skills learned in the training program.

THE EXPERT SERIES PROGRAM FOR dBASE III/III PLUS is an interactive, computer-based tutorial from CDEX Corporation. dBase III/III PLUS can run concurrently with the training program. The user can switch from the training program to dBASE III/III PLUS and practice using the skills learned in the training program. The new features of dBASE III PLUS, including Assistant, Screen Painter and Advanced Query, are covered.

For more information or to enroll in a class, call Fay Hoerger in the MTC, ext. 3391.

Bloodmobile Supported by Langley Staff

Langley employees, retirees and contractors donated 349 pints of blood during the September 24 visit of the American Red Cross Bloodmobile.

Achieving gallon status were:

16 gallons - **Charles E. Edmiston**.

11 gallons - **Raymond E. Midden**.

8 gallons - **Aubrey Raiford**.

7 gallons - **Sharon K. Crockett**.

6 gallons - **Joseph C. Davis**.

5 gallons - **Lloyd Nelson, Billie J. Neil, L. Conway Rogers Jr., Frank L. Bayer and Rodney D. Russell**.

4 gallons - **Edward P. Self, Spike Stubbs and James B. Williams**.

3 gallons - **Cadd T. Moore, Augustine R. Dovi and John R. Huffman**.

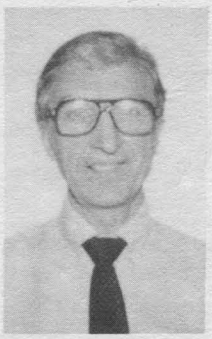
2 gallons - **Velma R. Martin, James K. Charnock, James Fields Jr., Margaret T. Hall and Roslyn L.McCreery**.

1 gallon - **Timothy G. Wood, Thomas J. Burns, Jeff M. Thompson, Timothy Harris III and Evert R. Griffin**.

Donating blood for the first time were **Agnes Evans, Brenda Harris, Mary Hylton, Jimmy McRae, Glenn Knutson, Margaret Heaney, Elizabeth Minier, John Crisp, David Cordner, Maryann Ward, Ralph Will and Sandra Nolon**.

NASA Coordinators were **Virginia Jones and Annette Forrest**.

Recent Retiree



Charles H. Russell, Instrument Research Division, retired October 3.

National Aeronautics and
Space Administration

Langley Research Center
Hampton, Virginia
23665

Official Business
Penalty for Private Use $300

BULK RATE
POSTAGE & FEES PAID
NASA Washington, DC
Permit No. G-27

27-01 LANGLEY EMPLOYEE (LRC ADDRESS)
HATHAWAY, ROGER A.,
MAIL STOP 154 BLDG 1153

Visitor Center Hosts Newport News Schools

As part of the Physical Science Extended Classroom Project, 2,200 eighth grade science students are touring the NASA Langley Visitor Center during October and November. The project - a cooperative venture of the Visitor Center and Newport News Public Schools - is designed to include community resources in public instruction.

The student visits concentrate on physical science aspects of NASA research. At the Visitor Center the students are participating in a program related to the fourth flight of the Space Shuttle Discovery. Mission tasks on this flight included launching two communications satellites and conducting several on-board experiments, including one nicknamed "Toys in Space." This Visitor Center program emphasizes Newton's Laws of Motion and the forces involved in those laws.

On April 12, 1985, Discovery transported some familiar motion toys into the weightless environment of space. Each toy carried along the questions of all the curious children, teachers and researchers who had suggested toy experiments and predicted possible results. The students see, via video tape, how several hours of free time donated by five enthusiastic astronauts and one space-bound U.S. Senator brought the experience of weightlessness and an understanding of gravity's pull to public attention.

Prior to their visit, the students view a video tape that comprises a guided tour of the Center's Aeronautics and Space Galleries. Highlights include discussions of wind tunnels from the Wright Brothers' primitive design to the National Transonic Facility (NTF), the newest wind tunnel at Langley and evolution of spacecraft from the Mercury program to today's space probes and the Shuttle. Following the theater presentation, the students scour the galleries in search of answers to a series of surveys that will form the basis of a follow-up activity and evaluation of their trip.

The program was initiated by Thomasena H. Woods, Science Supervisor for the Newport News City Schools, who calls the experience "an exciting and worthwhile adventure. The NASA extended classroom project is the most innovative and exceptional science program available in the area."

Sympathy is Extended

Sympathy is extended to the families of:

Walter N. Montgomery, who died June 28. Montgomery retired from the Analysis and Computation Division in 1975, after 34 years of service.

Beverly Z. Henry, who died August 29. She retired in 1980 from the Space Sytems Division after 37 years of service.

Eugene C. Marts, who died August 13. Marts retired in 1973 from the Facilities Engineering Division, after 31 years of service.

Winfrey E. Arnold, who died September 5. Arnold retired in 1979, after 39 years of service; he was assigned to the Fabrication Division.

Upcoming Workshop

Hampton Roads Chapter Classification and Compensation Seminar, to be held at the Langley Research Center Activities Center, October 30. Contact will be Donald S. Petrine, ext. 3007.

swap and shop

FOR SALE

Vehicles

1979 Ford Fairmont SW, silver-gra w/roof rack, 6 cyl, new radials, VGC, $1,50 OBRO; call 898-6512.

Real Estate

Time-share condo at Powhatan Planta tion in Williamsburg, spring week; currentl valued at $10,900; will sell for $7,900. Ca 838-0641 after 5 p.m.

cafeteria menu

Week of October 27-31

MONDAY: Chicken & rice soup, mexica dinner, stuffed chicken breast, broiled se trout. Snack Bar: 1/4 lb. cheeseburge pizza supreme.

TUESDAY: Ham & lima bean soup, spaghet & meat sauce dinner, fried flounder, chuck wagon steak. Snack Bar: Chicken file steak & cheese sub.

WEDNESDAY: Fresh vegetable soup, roas turkey dinner, seafood quiche, fried fis nuggets. Snack Bar: 1/4 lb. cheeseburge Polish sausage.

THURSDAY: Chicken vegetable soup, lun cheon strip steak w/veg., Cajun frie chicken, braised chicken livers. Snack Ba Chicken filet, egg salad sandwich.

FRIDAY: Manhattan clam chowder; fis dinner; beef, macaroni & tomatoes; savor baked chicken breast. Snack Bar: 1/4 lb cheeseburger, sausage pizza.

Week of November 3-7

MONDAY: Split pea soup, chopped stea au jus, New England scrod, chicken breas parmesan. Snack Bar: Chicken filet, pizz supreme.

TUESDAY: Minestrone soup, lasagna, bee tips over rice, crab cakes & slaw. Snac Bar: 1/4 lb. cheeseburger, steak & chees sub.

WEDNESDAY: Fresh vegetable soup, frie chicken dinner, seafood cacciatore, bee liver & onions. Snack Bar: Chicken filet sausage pizza.

THURSDAY: Old fashioned bean soup stuffed flounder, broccoli & cheddar quiche meat loaf. Snack Bar: 1/4 lb. cheese burger, egg salad sandwich.

FRIDAY: Bull Island clam chowder, fish din ner, BBQ chicken breast, smoked sausag & macaroni au gratin. Snack Bar: Chicke filet, hot Italian sausage.