Project engineer for these new facilities is George Kinney and the assistant project engineers are William Anderson and Lou Rieman.

In our present Rocket Laboratory there are many active members in the Cleveland-Akron Section of the American Rocket Society, in fact, John L. Sloop, Chief of the Rocket Branch, is one of the co-founders of this local chapter. Other active participants in the Section's organization this year are Adelbert O. Tischler (Vice President), Gerald Morrell, Howard Douglass, William Tomazic, and Edward Rothenberg.

Architect's Drawing of Operations Building

Rocketry has gained much notice in the public eye recently concerning the NIKE Missile, the MOUSE (Minimum Orbital Unmanned Satellite of the Earth), rocket sleds and proposed rocket ships to outer space. So with the completion of the new Rocket Laboratory facilities Lewis Laboratory will be better equipped to keep 'out in front' in the field of rocket research.

LORENZO & GODWIN WIN ARS - CHRYSLER AWARD

Two men of the Rocket Systems Branch, Carl F. Lorenzo and Thomas W. Godwin, Jr., received the 1958 American Rocket Society - Chrysler Corporation Student Award.

In addition to plaques, Lorenzo and Godwin shared the award of $1000 for their research on flourine gas reaction on missile metals at high temperature. Their work was done as undergraduates of Fenn College and cooperative students at Lewis Research Center.

"Data collected as a result of the flourine gas tests will be useful in designing combustion chambers for rocket engines of the future," Lorenzo and Godwin said. "Interest has always been high in whether flourine gas could be used as a rocket propellant. However, there were no facts on its reaction on metals at high temperatures such as encountered in missiles and rockets."

"In our tests, reported Lorenzo and Godwin," we isolated the purified metals in a special cylinder designed to withstand pressures as high as 3000 pounds per square inch. By filling the chamber with flourine gas and heating the metals electrically, we were able to record the temperatures at which metals would ignite. This data was never before available."

Presentation of the award was made at the annual ARS meeting in New York City the week of November 17th. Lorenzo read their winning paper at the student conference November 19th.

Members of the student chapter of the ARS of Fenn College were generally recognized as leaders by the other college students present. Allan J. Smith, Jr., present chairman of the Fenn student chapter and coop student at Lewis, presided over their conference. Lorenzo, Godwin and Smith were instrumental in organization of the Fenn Rocket Club, the first student chapter of the ARS in Ohio. Smith is active as a Lewis coop student, as are 40% of the Rocket Club members. The guiding hand of the club is Prof. Albert Lord of Fenn's mechanical Engineering Department. Prof. Lord was a member of the Lewis staff for many years before joining the Fenn staff.
Personnel in the Materials and Rockets Branch, the largest at Lewis in terms of manpower, are proud of their technical support to some seven research divisions ranging from rocket engine testing to processing sub-micron powder used for producing new materials.

Headed by George Tunder, the 145 aerospace mechanics, electricians, electronic mechanics, electrical equipment operators, and apprentices set up, operate, and maintain research equipment in more than 10 areas around the Lab. Three section heads: Louis Herman, William Lang and Joseph Kulik supported by nine supervisors oversee the branch’s activities.

About 45 percent of the Branch’s personnel is assigned to the Materials and Structures Division. There the technicians support engineers involved in studying refractory materials, metals and advanced superalloys. Located in the Materials Processing Laboratory is the branch’s toxic machine shop — the only one of its kind within a five-state area. Manned by trained personnel, it is equipped with absolute filter systems, and all radioactive and toxic materials requiring machining are checked regularly by the Health Physics Section.

At the Rocket Engine Test Facility, Tunder’s men are converting that facility to test the Research Propulsion Module components. Tunder’s men are involved in almost every type of research program at the Lab, providing needed highly skilled technical support. Initials like RCL, HEFL, SPL, ORL, MPL, LMCL, RRTF, BML, FML, and M&S are all familiar to these men. They are initials for facilities where much of the Lab’s research is being conducted and where the Materials and Rockets Branch plays a very vital support role to bring about the success of the various projects.
Camera club announces its winners

William F. Lang, Jr. of the Test Installations Division was awarded the top two prizes for black and white prints in the Lewis Camera Club competition held January 18 in the DEB Building.

Krawczonek named chief

Eugene M. Krawczonek has been appointed Chief of a newly organized Engineering Operations Branch in the Chemical Propulsion Division. The branch was formed when the Propellant Behavior Operations Section, formerly of the Spacecraft Technology Division, was added to Krawczonek’s supervision in addition to his Rocket Operations Section.

Krawczonek has worked for Lewis since 1955 in rocket research operations. He was graduated from Fenn College, now Cleveland State University, in 1961 with a Bachelor’s degree in mechanical engineering. For four years he worked as a civilian engineer for the Naval Ordnance Department in California.

In 1967, Krawczonek became section head of the Rocket Operations Section, a position he held until his present appointment.

FEB youth committee tells about its Federal programs

The Cleveland Federal Executive Board’s Youth Committee is finding better ways “to rap” with people, especially young people, about Federal programs.

The new committee is leading off this year with a panel discussion for college administrators, businessmen, students and junior Federal managers, on Phase II of the President’s economic program. The event will be held on February 17 in the Federal Building. Approximately 250 persons will hear representatives from the Cost of Living Council, Internal Revenue Service, business and academia.

According to Thomas A. Cozzens, an employee of the Cleveland IRS office who heads the committee’s College Advisory Board, “The panel is a first step toward improving communications between the Government and local academic institutions.” He points out young Federal employees are meeting on a continuing basis with representatives from area colleges to discuss other approaches.

The FEB’s Youth Committee is also concerned about how to reach the general public. Under the direction of William R. Tisdall, committee chairman and Deputy Director of the Defense Contract Administration Services Region, plans have been made for a series of television specials. Cleveland’s WKYC (Channel 3), an NBC affiliate, will produce and air 20, one-half hour programs on Federal activities of the Greater Cleveland area. The shows will begin late this summer as part of WKYC’s “Station Exchange” series.

Other innovative programs are being planned by the Youth Committee “to make Government more visible to the community in general and to the academic institutions in particular,” says Tisdall.

Richard D. Clapper of the Personnel Division is the Lewis member of this year’s Youth Committee.

FEB youth committee tells about its Federal programs

Sandra J. Hines (left) and Ruth Bercaw are surrounded by some of the winning photos from Lewis Camera Club contest recently held at the Lab. The two women were the judges for the contest. (Martin Brown photos)

FEB youth committee tells about its Federal programs

William F. Lang’s “Stump.”

Lang’s black and white print, “Bird Lover,” was judged number one, and his black and white print entitled “Stump,” garnered a second place award.

Stanley J. Marsik of the Office of Advanced Research was awarded a third place for his entry entitled “Try Me Again.” Honorable mentions went to Warren Philipp of the Office of Advanced Research and Charles C. Gimati, Jr., of the Physics and Chemistry Division.

In the slide competition, Regia F. Leonard of Physics and Chemistry won the top two honors while Edwin T. Muckley of Launch Vehicles was awarded third place. Leonard E. Anderson of the Engineering Design Division and Frank Slovak of the Equipment and Supply Division received honorable mentions.

The judges were Sandra J. Hines of Management Services and Ruth Bercaw, wife of Lewis employee Robert W. Bercaw.

Camera Club President Donald F. Ledel announced that another competition featuring color prints is being planned for March or April.

The following new publications are available at Lewis’ Technology Utilization Office, Room 228, Ad. Bldg., PAX 5233 or 8049.

TU Publications

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TECH BRIEFS

Variable Order Integrators for the Numerical Solutions of Ordinary Differential Equations, Jet Propulsion Laboratory under contract to NASA Pasadena Office, B71-10248.
Advancement in the exploration of space, depends on the advancement of propulsion and launch vehicle technology. A chemical rocket program at Lewis is aimed at improving performance, reliability, re-useability of rocket engines while at the same time, reducing the development time and cost of tomorrow's rocket engines.

They solve energy problems; aid Shuttle technology

Jack A. Saltzman (left), Tom A. Coney, Daniel D. Chrulski and Ralph J. Slavik launch sounding rocket in preparation for atmospheric pollutant tests.

Ray G. Sotos examines new drop vehicle at Zero Gravity Facility.

Handling the operation of facilities for conducting these and other tests are members of the Propulsion Operation Branch headed by Eugene M. Krawczonek.

To a farmer, the “south 40” could be the back 40 acres of worthless bottom-land, but Lewis’ “South 40” houses such impressive facilities as the Rocket Engine Test Facility, the Fracture Mechanics Lab, Calorimeter Test Facility and the Laser Rig. All these facilities are actively running in support of various Lewis programs by members of the Propulsion Operations Branch.

In addition to the South 40 area, personnel of the branch also handle operations at the Zero Gravity Facility and several cells at the Rocket Lab.

The Zero G Facility recently completed its 1000th drop and has “demonstrated a remarkable versatility in adapting drop packages to the needs of the various research programs it serves,” Krawczonek said. Averaging about one drop per day, the facility is providing continuing support to Centaur, Viking and various other Center projects.

At the Rocket Lab, Krawczonek’s men recently completed a Shuttle Attitude Control Rocket program which amassed probably a world record total of 51,000 firings on one engine. Affectionately dubbed the “belching dragon” because of the cycle mode of testing, the contractor-designed engine operated well beyond its normal expected life, according to Krawczonek. “Tests like these provide in-house verification of possible designs for various Shuttle engines and significantly contribute to that overall effort.”

From energy problems to Space Shuttle technology, members of the Propulsion Operations Branch are providing their services and expertise to run the facilities.
Edward M. Krawczonek (left) accepts incentive award letter from Branch Chief George Tunder.

TID leads idea parade

Test Installations Division employees dominated the list of the latest Incentive Award winners with five of the six cash award recipients assigned to this division.

Edward M. Krawczonek led all recipients with a cash award of $285 for his suggestion to eliminate processing unimportant test run films. The suggestion is expected to save the Government over $4200 during the first year.

Paul M. Antczak is $200 richer because he suggested using a modified concrete radial drill stand in certain drilling situations. His idea saves time, improves methods and simplifies work.

Charles R. Martin, discovered an easier method of replacing couplings on the Wind Turbine at Plum Brook. His suggestion earned him $140 and resulted in $1700 in savings to the Government.

Fred R. Murray suggested eliminating changing fixed probes for each angle surveyed during variable angle survey probes. Murray’s idea was worth $100.

Allen L. Bollman received $75 for his idea covering the modifications to adapt the existing 1000 amp power supply for temperature cycling metal fiber composites.

Leonard L. Leopold of the Fabrication Division is $50 richer for his suggestion on the reconditioning of used stainless steel fittings.

LAGEOS tests

LAGEOS, a geophysics research satellite, expected to last several million years, completed tests toward the end of January at Goddard Space Flight Center, and will soon be available to aid scientists in predicting earthquakes.

The Laser Geodynamic Satellite (LAGEOS) will be shipped to the Western Test Range in California the first week in February, for launch in late April.

LAGEOS, looking like a cosmic golfball, is designed to provide a stable point in the sky to reflect pulses of laser light. By timing the return of the laser beam to an accuracy of about one 10^-9th of a second, scientists expect to measure the location of participating ground stations within a few centimeters (about an inch). Using this data, scientists can develop and improve models of the Earth’s crustal motion—models that will be useful in predicting earthquakes.

The satellite, 60 centimeters (2 feet) in diameter and weighing 411 kilograms (906 pounds), carries 426 special reflectors designed to return laser pulses to their exact point of origin on the

(Continued on page 3)

Notes of Appreciation

“May I offer a big thank you to all my friends at NASA for a truly wonderful farewell party.” Darlene Hemmerich

“Many thanks to my friends and co-workers for all the visits, cards and phone calls received during my recent hospitalization and recuperation at home. Your kindness was gratefully appreciated.” Rosemarie P. Jocke

“I wish to express my sincere thanks and appreciation for my retirement luncheon and I am happy so many of you shared it with me. I cherish the beautiful gifts and will proudly display and use them. Many thanks again to everyone who made my retirement party a day I will never forget.” Edward G. Spieh

“I wish to express my thanks to the members of the Turbine Branch and friends at the Center for the wonderful gifts and expressions of good wishes at my retirement party. At such a time one really appreciates the friendliness and thoughtfulness shown by colleagues and friends. It was an evening which will always be remembered by me and my wife.” William Nusbaum

“Your kind expressions of sympathy following the death of my mother was deeply appreciated.” Ruth C. Hanna

“I wish to thank everyone who contributed to making my retirement party such a huge success and so much fun! I will always remember the many fine people with whom I had occasion to work, and the many friendships which developed in my years at NASA.” Mary Dominick

Lewis Choral Group

The Lewis Choral Group, which provides musical entertainment in the Cleveland area, is always open to new members. The group practices every Thursday evening from 5:45-6:15 p.m. in the DEB Cafeteria. Prospective members with or without singing experience are invited to join. If interested, call Robert Friedman, PAX 8516.

The Choral Group recently completed a singing engagement at the Eliza Jennings Home for the Elderly. Their Bicentennial program featured American patriotic, folk, and old time music including a medley of George M. Cohan songs. The next engagement, according to Friedman, is planned for May.

Small talk

AND NASA-Lewis, working with their personnel to increase the share of procure-ment contracts and purchase orders awarded to small businesses and minority businesses. (Martin Brown photo)
Lewis honors

62 for top job performance

Sixty-two employees were honored for superior job performance at the 31st Annual Special Achievement Award ceremony held November 8 at Lewis.

Individuals and groups were honored, sharing more than $28,000 in monetary awards. Acting Director Dr. Bernard Lubarsky presented the awards.

Individuals receiving awards were Bill D. Ingle, Michael Baldiszzi, Walter W. Ponevans, Jr., Andrew Pindor, Fred J. Loost, Jr., Richard W. Niedzwiecki, Robert C. Seidel, Michael F. Valerino, John F. Cassidy, James P. Cusick, Daniel L. Deadmore, Norman W. Orth and Ira T. Myers.


GROUP ACHIEVEMENT AWARDS


Most persons have probably seen signs on street repair work which read: "Temporary inconvenience for permanent improvement."

That is precisely the situation at Building 15 which is getting a completely new face and remodeling job.

According to Jesse L. Strickland, of the Architectural Design Section, renovation of the south wing and center section of the building will be completed first.

These portions are being managed by Neel D. Fauber who has responsibility for all interior and exterior work as well as construction of parking facilities.

Following completion of that work about mid-1978, Phase One of the Main Cafeteria complex rehabilitation will start. The work includes the cafeteria's main seating area and serving area. A new exterior corridor and entrance will be added, plus landscaping, new lighting, ceiling, floors, sound and safety systems. Strickland is project manager for this phase, scheduled for completion by late 1979.

Phase Two is scheduled to begin immediately after Phase One's completion. Phase Two includes the rehabilitation of the kitchen service and serving areas.

"This mainly involves purchasing equipment and installing that equipment," Strickland said. "The cafeteria will not be closed during construction. There will be subsequent Lewis News stories on the progress we're making," he added. He urged employees to see the architectural display on the proposed work in the Main Cafeteria.

Because of construction in progress, the Post Exchange will be temporarily moved and partitioned off in the northwest corner of the Main Cafeteria dining area. The move is scheduled for early January 1978. Plans are for the PX to be in the temporary quarters for about six months.

Karate classes begin here November 28

The NASA Karate Association, entering its second decade at Lewis, will have registration for a new quarter of karate classes on November 28. A new feature will be situation self-defense classes. Registration will be in the Main Cafeteria.

The fee is $20 per quarter for individual members; $20 for one member of the family; $15 for a second member of the family and $10 for each additional member.

According to Harold Sliney, beginners karate classes will be held 7:30 p.m. to 9:30 p.m. on Mondays with an optional class on Thursday from 5:30 p.m. to 6:30 p.m.

"The type of karate taught here is called kajukenbo which combines the classical kicking and striking techniques of karate with some of the more effective throws from judo," Sliney said.

If interested, call Sliney, PAX 2142 or Lawrence Andrews, PAX 2215.

Army changes name

To clarify and simplify the designation of the U.S. Army R&D laboratories at various NASA Centers, the Department of the Army has rechristened the group.

Formerly called the U.S. Army Air Mobility Research and Development Laboratory, the group is now designated the U.S. Army Research and Technology Laboratories.

Headquarters is at NASA's Ames Research Center. The four directorates are now known as the Aeromechanics Laboratory, located at Ames; the Propulsion Laboratory, here at Lewis; the Structures Laboratory, at NASA Langley, and the Applied Technology Laboratory, Fort Eustis, Virginia.

Union meets management

The first meeting ever between top NASA agency managers and representatives of the International Federation of Professional and Technical Employees (IFPTE) and the American Federation of Government Employees (AFGE) was held recently in Washington, D.C.

Lewis Engineers and Scientists Association (LESA) members Lyle O. Wright and Edward L. Warren attended the Washington, D.C. meeting which also included NASA Administrator Dr. Robert Frosch.

Wright stated that Dr. Frosch discussed the views and future growth of NASA and answered questions from the representatives. "The NASA Administrator sees NASA's ultimate mission as providing services to other public agencies and private customers, including foreign governments," Lyle stated.
Continued from Page 5

vehicle contractors as well as the propulsion system manufacturers because the vehicle and propulsion designs are interdependent. At a conference held here in April, the interchange between propulsion and vehicle specialists and users from government and industry reinforced the need for joint decisions in this area to meet the future transportation needs. Another facet of the Space Transportation System is the Space Station. It has unique requirements for onboard propulsion and Lewis already has a significant role: to provide the technology for propulsion systems of less than 100 lbf. thrust. The chemical propulsion approach is a gaseous hydrogen/oxygen system using thrusters capable of thousands of exactly controlled firings. It will need reliable and lightweight igniters and propellant pressurization systems, and our researchers are tackling and solving these problems and others.

What should you think about when someone mentions the Space Transportation System? Think about all the contributions that Lewis and its people continue to make to help get us from the Earth to the stars.

THRUST CHAMBERS

Major activities in the thrust chamber area are associated with enhancing the energy extraction from the propellants.

Standing, from left, George Repas, Harold Price and John Kazaroff, with Gary Halford (seated left) and Al Pavli are concerned with combustion chamber materials and chamber wall cooling.

Combustion chamber wall coatings evaluation is conducted at the "South 40" Rocket Engine Test Facility by (clockwise from 6 o'clock) John Kazaroff, Dennis Thompson, Bob Paiaez, Clarence Wem, George Repas.

And by (clockwise from 6 o'clock) John Kazaroff, Dennis Thompson, Bob Paiaez, Clarence Wem, George Repas.

Facility operation and test monitoring is conducted in the ROB Control Room by Wayne Thomas, (left), Wendall White, Ed Krawzecnek, Mark Klem, Dick Quentmeyer.

And by (seated l-r) Neal Wingenfeld, Joe Etzler, and (standing l-r) Jim Glomini and Terrell Jansen.

PROGRAM MANAGEMENT

These people are involved in SSME and OTV programs.

From left Greg Reck, Jody Getz, Don Petrash and Sol Gorland.

From left Pete Wanhalin, Carl Aukerman, Sol Gorland and Greg Reck.

PROCUREMENT

The OTV has a number of large contracts handled by this group: (from left), Shirley Boyer, Reggie Paginton, Tony Long, Larry Cooper, Fran Driscoll, and Dori Sharp.

These are the people who handle the contracts and grants for the SSME program. From left, Kurt Brocone, Mary Kovach, Boyd Bane, Willie Fleming, Tony Long, Glen Williams and Sol Gorland.

Debbie Ryan Rachul (left) was the coordinator for the OTV Propulsion Conference held in the DEB on April 3-4, 1984. Donna Bao of Martin Marietta Denver Aerospace spoke at the dinner about the Manned Maneuver Unit used for the Solar Max repair on the recent Shuttle flight.

LEWIS AWARENESS

Awareness photos by John Marton.
Design and artwork by Charles Meyers.
Team Leads: Marty Braun, Stan Maralk, Larry Cooper.
Robert Lawrence Appointed Chief Of Office Of Equal Opportunity Programs

Robert F. Lawrence has been named chief of the Office of Equal Opportunity Programs at Lewis. He replaces Ken Agualar, who has been named deputy chief of the Personnel Division.

The Office of Equal Opportunity Programs assists management in developing initiatives and strategies to recruit and develop a highly qualified, integrated workforce.

The new chief came to Lewis in 1984 from the Veterans Administration Regional Office in Cleveland where he headed the Office of Equal Employment Opportunity Programs. Lawrence has also served as deputy chief of the Office of Equal Employment Opportunity Programs in 1979, and as deputy director of the Office of Equal Employment Opportunity Programs in 1984.

From Aircraft Mechanic To Inventor Fortini began his career at Lewis in 1943 as a apprentice aircraft mechanic. After serving in the Air Force and earning bachelor’s and master’s degrees in aeronautical engineering from Purdue University, Fortini worked at the Lewis Aeronautics and Industry Programs, will serve as deputy director. David Poferl, formerly deputy director of Aeronautics, has been appointed the new director of Technical Services.

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Mixed Fleet Manifest Gives Major Science Payloads High Priority

A new mixed fleet manifest reflecting primary payloads for Shuttle missions through 1990 and expendable launch vehicles (ELVs) through 1995 was announced Oct. 22.

Five major science payloads are scheduled for launch in 1989. Four will be launched on the Shuttle: Magellan, which will map Venus with high-resolution images of the planet; the Modular Space Science microsats by fully utilizing ELVs. For example, the Ringer Nucleus is being planned for launch on a Delta in February 1990, and the Extreme Ultraviolet Explorer is planned for launch on a Delta in August 1991.

In October 1990, the Ultymus mission, to observe the polar region of the sun, is scheduled to be launched on the Shuttle.

Space Act Awards Given To Inventors Of Rocket Altitude Test Facility

NASA Administrator Dr. James Fletcher recently granted Space Act Awards of $10,000 each to Lewis retiree Anthony Fortini and the estate of Pearl Huff in recognition of the scientific and technical contributions Fortini and Huff made to the Rocket Engine Test Facility.

Dr. Fletcher granted the awards based on the recommendations of the NASA Inventors and Contributions Board in accordance with provisions of the National Space Act of 1958.

Wildly Used Facility Saved Costs

In the mid-1980’s Fortini and Huff invented a rocket testing facility which uses the engine being tested to create its own high altitude environment. Rocket engine altitude test facilities use their concept were instrumental in the development of the RL-10 engine for the Centaur rocket, the J-2 engine for the Saturn rocket and the Space Shuttle Main Engine.

The rocket engine altitude test facility basically is a capsule which encloses the engine and provides an outlet for its exhaust through an ejector tube. As the engine exhaust passes through the ejector tube, air molecules are also pulled out, reducing pressure in the capsule until it equals that found at high altitudes.

Because it eliminated the need for large, tank-type altitude chambers in rocket engine testing, the concept saved millions of dollars in capital investment.

After Fortini and Huff built a model at Lewis to demonstrate the feasibility of their rocket altitude test facility, full-scale facilities were built at many rocket test facilities throughout the industry.

A rockets altitude test stand using Fortini and Huff’s concept was added to Lewis’ Rocket Engine Test Facility in 1983 and is currently being used for advanced rocket technology research.

Anthony Fortini (seated, right) and his wife Lorene display the Space Act Award certificate signed by NASA Administrator Dr. James Fletcher. Fortini was recognized for their invention in 1963, when they shared a $5,000 award. The $10,000 awards were granted in the result of a Space Act Award application Fortini submitted in 1986.
Douglas Bewley, 46, passed away suddenly November 30. Bewley worked for 10 years at Glenn as a civil servant providing engineering support to the Rocket Engine Test Facility (RETF) in the South 40, and had been working with QSS Group since 2001 on the relocation of the South 40 facilities as part of the Airport Expansion Project. He was recently ordained as a deacon at the Assumption of Mary Catholic Church in Brook Park. Bewley leaves behind his wife, Kathy, and 8 children, as well as many friends here at Glenn. A fund has been set up for the family under the "Douglas P. Bewley Family Fund." Donations can be made at any Key Bank branch office.

Joseph Klosck, 85, recently died. He retired in 1975 after 30 years of NASA service. Klosck served as a warehouse leader. He is survived by his wife, Gladys Klosck, who also worked at the Center until 1974.

Eugene McIrvin, 67, recently died. McIrvin retired in 1990 with 33 1/2 years of NASA service. He served as an electronics technician.
In Memory

Tadeusz Guzik, 79, who retired with 33 years of Government service in 1979, recently died. Guzik served as a model fabrication manager for the Fabrication Division.

George Repas, 65, who retired with 35 years of Government service, including 31 to NASA until 1995, recently died. Although he was employed as an aerospace engineer at the Lab and gave his all for the Agency, Repas also offered his boundless energy to the local community.

Repas' name is listed on the National Wall of Honor at Dulles International Airport, Reston, VA, for his contributions to the aerospace industry, including design, fabrication, and installation of complex chemical propulsion test hardware, in addition to his engineering assistance to the U.S. Department of Defense. He was one of the test engineers who brought fame to the Cleveland Center's Rocket Engine Test Facility, a historic monument that had to be demolished last summer for Cleveland Hopkin's Airport expansion.

More recently, Repas supported Glenn's Space Combustion and Microgravity Test Engineering Branch as a part-time employee of QSS, an onsite contractor providing test engine services, and mentored many of the new hires. He also consulted on the major renovation of Purdue University's Rocket Lab, a one-of-a-kind-propulsion facility, to perform full-scale testing for NASA, the U.S. Air Force and U.S. Army, and other Federal agencies and aerospace companies.

Perhaps Repas' friends will remember him most of all for the enthusiasm, creativity, and talent that he lavished on the Center's Children's Holiday Show for more than 30 years. He served as organizer and chairperson, wrote plays, organized practices, encouraged other participants, decorated sets, sang, and contributed all the other intangible things that went into creating magic and lifetime memories for Center employees, their families, and guests.
Thomas E. Cowell, 66, who retired in 1996 with 16 years of federal service, died Aug. 21. Cowell was a U.S. Air Force veteran of the Vietnam War who joined the NASA workforce as a photographer. He served as a member of the Photolab & Illustrations Team, Technical Information and Services Division. Cowell was also a performing tenor with the Cleveland Orchestra Chorus and the Cleveland Opera Theatre Ensemble.

Eugene “Gene” Krawczonek, who retired from NASA in 1988 with 33 years of federal service, died July 27. Krawczonek joined NASA in 1955 from the Naval Ordinance Department (Calif.) He began working as an operations engineer on installation of the Rocket Engine Test Facility, where he worked the bulk of his career. Krawczonek was a former chief of the Engineering Operations Branch, Chemical Propulsion Division.

S. Stanford Manson, 93, who retired in 1974 with 32 years of NASA service, died July 7. Manson was a metals researcher whose decades-old formulas are still in use to predict metal fatigue on Earth and in space. He transferred from NACA Langley to NACA Lewis in 1943. He wrote several books and helped discover the Manson-Coffin Law and the Manson-Hirschberg Method of Universal Slopes—findings crucial to space engines and heat shields. Manson retired as Materials and Structures Division chief.

Lee Harold Wagner, 94, who retired in 1988 with 31 years of federal service, died Aug. 15. Wagner began his
Army/Air Force having served during World War II and the Korean conflict. He began his NASA career working at the Plum Brook Station (PBS) in 1961. He served in the PBS Facilities Division as head of the Thermocouple Unit for experimental aviation and later, head of the Research Instrumentation Unit. In 1973, he transferred to Lewis Field's Instrumentation Branch, Fabrication Division, for 2 years before retirement.

Edward M. Krawczonek, Sr., 81, who retired in 1988 with 38 years of federal service, died Jan. 23. Krawczonek was a U.S. Army Veteran, who joined the NACA/NASA workforce as an apprentice in 1949. He became an aerospace mechanic and dedicated member of the Test Installations Division. He largely supported the Materials and Rockets Branch that provided technical support to various research divisions ranging from rocket engine testing to processing submicron powder used for producing new materials. He also helped set up, operate and maintain research equipment for major lab activities, such as converting the environmental chamber in the Rocket Engine Test Facility. He was one of four Krawczonek’s working at Lewis in the 1960s. His is survived by his brothers Walter and Eugene, who are NASA retirees.