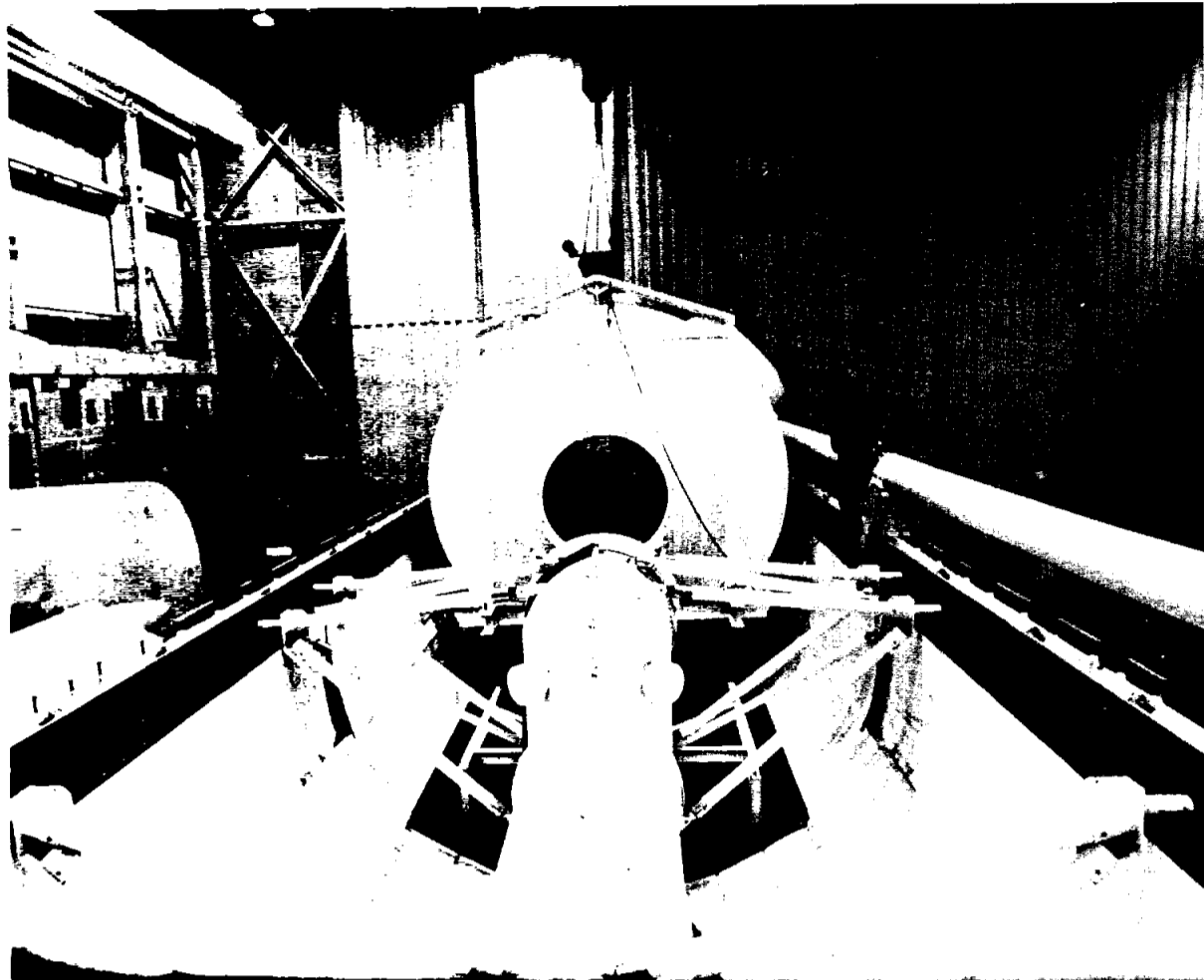


Space News Roundup

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National Aeronautics and Space Administration



A Spacelab mockup was lowered into the Full Fuselage Trainer in Bldg. 9A last week in support of a new Spacelab familiarization class now being organized. The class will be used to provide initial training to future flight crews as they prepare for Spacelab missions.

SRB tests underway

NASA has begun a series of tests designed to verify the ignition pressure dynamics of the Space Shuttle solid rocket motor field joint. The series will be conducted over the next year at Morton Thiokol's Wasatch Division in Utah and NASA's Marshall Space Flight Center in Huntsville, Ala.

Morton Thiokol is NASA's prime contractor for the solid rocket motor, and the Marshall Center manages the motor program for NASA.

The tests, the first of which was conducted Aug. 14 in Utah, use full-sized field joint test articles which duplicate the ignition and pressurization characteristics of the motor.

The test articles incorporate three single motor segments linked by two extensively instrumented joints. Each joint can incorporate different configurations or test conditions, and may also be environmentally conditioned.

The segments are loaded with only about 400 pounds of actual propellant, plus inert propellant and insulation which duplicate the physical properties of a fully-loaded motor but are not consumed during a test. At ignition, the charge of live propellant burns to duplicate the

first few seconds of motor operation, the time during which joint sealing and rotation are most critical.

The test articles will be refurbished and used many times. Between tests, data taken from instrumentation will be analyzed, and physical inspections of the joint and seals will be performed.

Initial tests in the series, utilizing existing hardware, will be conducted only in Utah. The Aug. 14 test, for example, was conducted to gather baseline data on the original joint design. Tests using improved joint configurations being studied by NASA will be utilized beginning in early 1987 in Utah and about mid-1987 at the Marshall Center, when the first tests are conducted there.

The test article at Morton Thiokol is called a Joint Environment Simulator and the one at Marshall will be dubbed a Transient Pressure Test Article.

The series of transient pressure tests, in conjunction with full-scale motor firings and other tests, are expected to lead to qualification of an improved solid rocket motor joint design and delivery of the first flight motor set near the end of 1987.

Two teams study Space Station issues

Andrew J. Stofan, NASA's Associate Administrator for Space Station, has announced the formation of two teams to review Space Station design and work package assignments and functions.

A Space Station Configuration Critical Evaluation Task Force, headed by W. Ray Hook, Manager, Space Station Office at NASA's Langley Research Center, will conduct a technical review of Space Station architecture and systems. The task force will conduct their activities at Langley. An Executive Technical Committee, headed by Stofan, will provide oversight and guidance to the task force and will assess the impact of any design modifications or changes

on individual NASA center and contractor roles.

Stofan's actions are in response to NASA Administrator James C. Fletcher's July 31 directive to conduct a thorough review of all aspects of Space Station design and to hold off the implementation of work package realignment for a period of up to 90 days.

Approximately 35 people will serve on the task force full time. Several hundred more will take part in the technical evaluation, including NASA personnel for the work package centers and from outside of the program, Phase B contractors, and representatives from user groups and the inter-

national partners.

The Executive Technical Committee will include representatives from engineering organizations at the five prime Space Station centers, the flight crew office and the user community. The acting Space Station program manager and project managers from the five Space Station centers also will serve on this committee.

The task force will critically examine all aspects of the current Space Station baseline configuration. It will evaluate the configuration in terms of the amount of extravehicular activity required for assembly and maintenance of the station, launch capacity of the Shuttle fleet when again opera-

tional, assembly sequence of the baseline configuration, any resultant impact to the utilization of the station, potential impact on international partners and overall performance and integrity of the station.

The Executive Technical Committee will approve the assumptions, engineering and technical constraints identified by the task force and will oversee their activities. The committee will examine work package assignments from the standpoint of changes required due to the impact of any design iterations, minimizing development costs and achieving simple, controllable interfaces.

Results of the overall evaluation will be factored into the request proposals to be released to industry in the next fiscal year beginning Oct. 1, 1986. Selection of contractors to design, build and test Space Station hardware is scheduled to take place in 1987.

President Reagan, in his 1984 State of the Union message, directed NASA to develop a permanently manned Space Station within a decade. The Space Station, comprised of a manned base and unmanned platforms, will provide a multi-purpose facility in low-Earth orbit for the conduct of science, technology and commercial activities.

McCartney to head KSC

Lt. Gen. Forrest S. McCartney, Commander of the Space Division, Air Force Systems Command, Los Angeles, has been named Director of the Kennedy Space Center, Fla. On assignment from the Air Force, he is expected to report to NASA around October 1.

"General McCartney's close association with our nation's space program and his outstanding management record make him an excellent choice to become director of the Kennedy Space Center. I am pleased that the Air Force has allowed him to take on this assignment with NASA," said NASA Administrator James C. Fletcher.

McCartney succeeds Richard G. Smith, who retired from NASA July 31.

Born March 23, 1931, in Ft. Payne, Ala., McCartney received a bachelor of science degree in electrical engineering from the Alabama Polytechnic Institute, Auburn, in 1952 and earned a master's degree in nuclear engineering from the Air Force Institute of Technology, Wright-

Patterson Air Force Base, Ohio, in 1955. He also is a graduate of the Armed Forces Staff College, Norfolk, Va.

McCartney's Air Force assignments have included the Satellite Control Facility, Sunnyvale, Calif., as a satellite controller during early space operations; the Office of Space Activities, Headquarters Air Force Systems Command, Andrews Air Force Base, Md., as a project officer in the Titan III program and various Air Force communication satellite programs; the Directorate of Space at Headquarters U.S. Air Force, Washington, D.C., as the program element monitor for satellite communications programs and other selected space-related efforts; and the Air Force Eastern Test Range, Patrick Air Force Base, Fla., as director of range engineering.

In June 1974, McCartney was assigned to the Space and Missile Systems Organization at Los Angeles Air Force Station as the systems program director for Fleet Satellite Communications Systems. In August 1976, he was reassigned

within the organization as deputy for space communications systems.

McCartney moved to Norton Air Force Base, Calif., in September 1979, as vice commander of the Ballistic Missile Office and was named commander of the Ballistic Missile Office and M-X program director in November 1980. He became vice commander of the Space Division in May 1982 and commander, Space Division and vice commander, Space Command in May 1983. Upon activation of the U.S. Space Command, he was redesignated commander of the Space Division in October 1985.

His military decorations and awards include the Distinguished Service Medal, Legion of Merit with one oak leaf cluster, Meritorious Service Medal and Air Force Commendation Medal with three oak leaf clusters. He also wears the master missile badge and the master space badge.

McCartney and his wife, the former Ruth Griffis of Memphis, Tenn., have two daughters, Margaret and Worthy.

51-L salvage operation ends

The massive marine salvage operation which began within hours of the Space Shuttle Mission 51-L accident on Jan. 28 came to an end effective Thursday, Aug. 28.

Rear Adm. Richard H. Truly, NASA Associate Administrator for Space Flight, said the three vessels engaged in the recovery—the *Freedom Star*, *Liberty Star* and *Independence*—returned to port at the end of the day on Aug. 28 to close the seven-month-long recovery effort.

The Department of Defense Managers' STS Contingency Support Office involved in the 51-L accident investigation was terminated at the same time.

The U.S. Navy's salvage operation center at Cape Canaveral Air Force Station also closed.

Characterized as the largest ocean recovery operation in history, the 51-L effort consisted at its peak in February of 22 ships, 6,000 NASA, Air Force, Navy, Coast Guard and contractor personnel and numerous aircraft.

Working in the Atlantic Ocean in water up to 1,100 feet deep to the east and northeast of the Kennedy Space Center, the crews involved in the operation retrieved a large proportion of the Orbiter *Challenger* and other Shuttle flight systems.

According to Truly, the search yielded up from the sea about 45 percent of the *Challenger*, 50 percent of the external tank and twin solid rocket boosters, 95 percent of the Spartan-Halley spacecraft, 35 percent of the Tracking and Data Relay Satellite and 90 percent of the Inertial Upper Stage.

Bulletin Board

Challenger Seven Park dedication set

Dedication ceremonies for the *Challenger* Seven Memorial Park will be held at 3 p.m. Sept. 21 at the park site at 2302 West NASA Blvd. Guest speakers will include U.S. Rep. Jack Brooks of the 9th Congressional District and Astronaut Col. Guion S. Bluford. Music will be performed by the Clear Lake High School Band. The ceremonies will also include a salute by the WABC Karate Do organization. For more information, call 991-6881.

PSI to meet Sept. 10 at UH-CL

The next monthly meeting of the Clear Lake/NASA Area Chapter of Professional Secretaries International (PSI) will be held at 7 p.m. Wednesday, Sept. 10, in the Forest Room of the Bayou Bldg. at the University of Houston-Clear Lake. There will be a featured speaker and election of officers for the coming year. All clerks and secretaries are invited to attend, said Betty Cobb, membership chairman. Memberships will be accepted on a continuing basis, but only those who apply before Sept. 22 will be classified as charter members of the new chapter, she said. For more information on membership, call Cobb at x3811 or Jessie Gilmore at x2411.

Hispanic heritage program planned

The JSC Hispanic Advisory Committee will present the annual Heritage Day program at 1:30 p.m. Sept. 18 in the Bldg. 2 Auditorium. Speakers will be Dr. Fern Ramirez, Dean of Student Development at GMI Engineering and Management Institute in Flint, Michigan, and Arturo A. Jacobs, Director of the Houston office of the Internal Revenue Service. Entertainment will be provided by Fiestas Patrias. The theme for the program is Ayer Hoy y Manana. For more information, call Yolanda De Hoyos at x2953.

Goddard Scholarship to be awarded

The National Space Club will award a \$7,500 scholarship for the 1987-88 academic year to a college student interested in a career in aerospace. The scholarship is in memory of rocket pioneer Dr. Robert H. Goddard. The student must be at least a junior in an accredited university pursuing studies in science or engineering. Selection will be based on the student's college transcript; letters of recommendation from faculty; accomplishments which demonstrate creativity and leadership; scholarship plans which would lead to a career in aerospace or a technological field; proven past research and participation in space-related science and engineering; and personal need, although that is not a controlling factor. Applicants should apply by letter before Jan. 16, 1987 to: National Space Club/Goddard Scholarship, 655 15th St. NW, Suite 300, Washington, D.C., 20005. Notification of award will be prior to March 1, 1987.

Brown Bag Seminars planned

The weekly Brown Bag Seminar scheduled for the remainder of September and October includes a report on the recent Planet Mercury conference and Karl Henize's account of space astronomy aboard STS 51-F/Spacelab 2. The informal programs are held each Wednesday from noon to 1 p.m. in Bldg. 31, Conference Room 193. On Sept. 17, Dr. Stephen Clifford of LPI will discuss the atmospheric effects of a nuclear war. On Sept. 24, Spacelab 2 mission specialist Dr. Karl Henize will discuss that space flight. On Oct. 1, Dr. Faith Vilas of JSC will discuss the Planet Mercury Conference. Dr. Mike Zolensky of JSC will discuss the search for presolar dust Oct. 8. Oct. 15 will be an open discussion meeting. On Oct. 22, Dr. A. A. Jackson of CSC will discuss "The Ghost of Spaceflight Past," a slide show of dreams of spaceflight from an earlier day. On Oct. 29, James Oberg of Rockwell will discuss Soviet space disasters. For more information, call Al Jackson at 280-2285.

Alley Theater tickets available

The Alley Theater corporate "Dinner and the Theater" subscription program is again being offered to NASA and contractor employees. Ten open passes and 20 two-for-one dinner certificates will be available for \$99.90. Employee Activities Association representatives, bulletin boards around site and the cafeterias have flyers on hand with order forms that explain the program. Subscribers should send the completed forms to Doris Wood, FD4, before Sept. 19, or should mail them directly to the Alley. For more information, call Wood at x5263.

COM offers courses at Deauville

College of the Mainland will offer non-credit continuing education courses at Deauville Mall during September and October. Class fees range from \$10 to \$56 and topics include approaches to problem solving, weight loss, stress management, defensive driving, assertiveness, CPR, financial management for small businesses and effective public speaking. Classes will meet in the Community Room, next to the Eatery, at Deauville Mall on Bay Area Blvd. and I-45. For information, call 486-8272 or (409) 938-1211, x437.

NARFE meeting set for Oct. 7

The NASA Area Chapter of the National Association of Retired Federal Employees will hold its next meeting at 1 p.m. Tuesday, Oct. 7 at the Harris County Park Bldg. at 5001 NASA Road One. The guest speaker will be Dr. Pat Koeppel from the University of Texas Medical Branch in Galveston. She will discuss various aspects of preventive medicine. For more information, call Dick Jacobs at 532-1075 or Burney Goodwin at 326-2494.

AIAA sponsoring computer security conference

A conference on computer security will be sponsored in December by the American Institute of Aeronautics and Astronautics, the American Society for Industrial Security and the Department of Defense Computer Institute. The conference will be held at the Tysons Westpark Hotel in McLean, Virginia Dec. 3 and 4, 1986, and will be preceded by a one-day tutorial program. Donald C. Latham, Assistant Secretary of Defense for Command, Control, Communications and Intelligence, will be the keynote speaker. The purpose of the meeting is to provide a high level technological exchange of information and concepts essential to the protection of electronic information. Sessions will cover legal issues, civilian government security, trusted operating systems, space issues, C3I systems, and network security issues. For information on submitting papers, call Steve Walker at (301) 854-6889. For information on the tutorial program, call Chris Perry at (703) 883-6235. For general information, call Dr. Joel Levy at (301) 670-2161.

IEEE videoconference scheduled Sept. 24

The Clear Lake Council of Technical Societies, the IEEE and the ISA will offer a one-day videoconference on sensing technology, computer hardware/software and machine vision for process control and manufacturing applications. The videoconference will be held from 9:30 a.m. to 3:30 p.m. Sept. 24 at the Gilruth Center. Advanced registration is required. For more information, call Ray Baker at x4509 or Bill Densmore at x6108.



TOP: Students honored at the Awards Banquet were, left to right, LaTonya McMahon, Kay McDaniel, Felecia Jacob, Tammie Hebert and Carolyn Johnson. BELOW, left to right, Robert Fields, Alicia Deyon, Jesse Eliaz and Ernest Hayes.



Outstanding Office Education Students for 1986 are, left to right, Lavonna Batts, Julie Holiman, Cindy Van Huynh and Mae Decker.

Summer Awards Banquet held

A number of summer employees were honored Aug. 15 when JSC held its annual Summer Employees Awards Banquet. Approximately 200 people attended.

Officials nominated 35 of the 57 student employees for awards, and 15 were approved for awards by a selection committee.

Four students were honored as Outstanding Office Education Students and were awarded \$300 each. They were Lavonna Batts of Washington High, Mae Decker of Santa Fe High, Julie Holiman of Clear Lake High and Cindy Van Huynh of Clear Creek High.

Five students were honored as Outstanding Communities in Schools Students, all from Ball High School in Galveston. They were Alicia Deyon, Jesse Eliaz, Robert Fields, Ernest Hayes and Jasmin Lerma.

Honorable Mention Office Education Students, who received a \$100 award, were Tammie Hebert of Clear Creek High, Felecia Jacob of Jones High, Carolyn Johnson of Jones High, Kay McDaniel of Alvin High, LaTonya McMahon of Hitchcock High and Kim Ridley of Dickinson High.

51-L OFK items to be presented

During the mission 51-L salvage operation, several items from the Official Flight Kit (OFK) and Personal Preference Kits (PPK) were recovered. Some of the recovered OFK items were flown for and will be presented to specific institutions or organizations, while others were flown by NASA without predetermined recipients, in anticipation of the presentation of post-flight awards and mementos.

The PPKs contained personal items flown at the request of each individual crew member and those items recovered will be returned to the crew families.

NASA will suitably prepare and present to each state and territory one 51-L crew patch, one United States flag and the respective state

or territory flag, with a request that these items which were flown on 51-L be displayed appropriately in memorial to the crew. In addition, NASA will present one memento to the National Air and Space Museum, which is the national repository for items depicting the history of the space program.

NASA will present those recovered items which were flown for a specific organization or institution to the intended recipient. Where multiple items were flown, one will be presented and the remainder placed in permanent storage. NASA will announce the recipients of the items to be presented after all have been notified. All items not flown for a specific organization or institution will be placed in permanent

storage in a location to be determined by the NASA Administrator.

In announcing the disposition of these items from the mission 51-L Official Flight Kit, Dr. James C. Fletcher, NASA Administrator, stated, "Since our space program is the nation's program, all its people should have a reminder of the *Challenger* and its crew. I believe that providing a suitable remembrance to each state and territory, as well as our National Air and Space Museum, serves this purpose."

Attached is a list of all items carried in the OFK. A list will be available describing those OFK items recovered and their recipients after recipients have been notified.

NASA exhibits featured at Texas State Fair

Texas astronauts will highlight a NASA exhibit which will include large models of the Space Shuttle, the Space Station and video presentations at the Texas State Fair, to be held Sept. 26-Oct. 26 in Dallas.

Thirteen astronauts were born in Texas, and two, William Fisher and the late Elliott See, were born in Dallas. Alan Bean, David Scott and Edgar Mitchell have walked on the moon, and Texan Robert Crippen has made five Shuttle flights.

Hanging in the Centennial Building above the National Aeronautics and Space Administration display will be large murals of space scenes and a figure of an astronaut free-flying with a manned maneuvering unit.

Other elements of the display include a rotating, 6-foot model of the Shuttle Orbiter and a 16-foot square model of NASA's next major project, the Space Station. Large format photography accom-

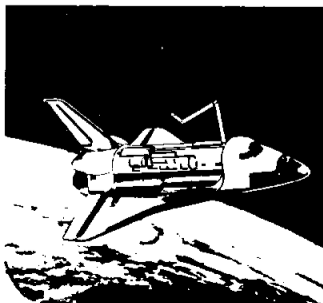
panying the models will show how the Shuttle will play a role in the construction of the Space Station in Earth orbit. A video and music presentation in this exhibit shows work being performed at Houston's Johnson Space Center.

The exhibit will be complemented by a NASA Theater featur-

ing "Journey Into Space," a music video with highlights from the 24 Shuttle missions. Included in the video are scenes from launch, on-orbit operations and landing. Viewers will also be treated to spectacular still and motion-picture shots of the Earth as if they were on a private tour of the world.

NASA
Lyndon B. Johnson Space Center

Space News Roundup



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Editor: Brian Welch

Perspective

NASA: The Vision and the Reality

From the outside, looking in, a hopeful view of our troubled times

The following essay, written by Dr. Erasmus Kloman, a senior research associate of the National Academy of Public Administration, represents the view of a man who has long studied NASA from the outside, looking in. Kloman, a 16-year veteran of the National Academy, has served as the staff director of eight studies of various aspects of NASA management. In October 1985, the Academy published a Kloman paper titled, "NASA: The Vision and the Reality," which summarized the author's observations about NASA's management and administration. A second edition of that paper was published in April to meet the demand fostered by renewed interest in NASA following the Challenger accident. What follows is Kloman's forward to the current edition.

One of the lessons the nation is learning as a result of the Space Shuttle Challenger accident investigation is that the men and women of NASA are human. Despite their demonstrated capability to design and operate some of the most advanced technologies conceived on this planet they are not infallible. Like other mortals, they may misinterpret the significance of masses of technical data or fail to grasp the implication of critical events. In times of crisis they are vulnerable to the same stresses and emotions as ordinary humans.

What we have yet to learn in the aftermath of the accident is to what extent a national asset of incalculable value is being jeopardized by the effort to discover the cause or causes of what went wrong. In the agonizing about the explanation for the technical failure or failures and who is responsible for mistakes in judgment, the nation is in danger of losing sight of what will happen to NASA as an institution and the civilian space program as a resource. While post-accident polls demonstrate continuing strong popular support for the space program, not many Americans are fully aware of how vital this program is to the nation's political economy.

NASA's importance can be demonstrated by many sets of values — economic, geopolitical, scientific, and perhaps most important, motivational or inspirational. In economic terms alone the value of the civilian space program must be considered immense. Over the 27 years of its existence the program has received roughly \$111 billion in federally appropriated funds. Nearly 90% of those funds have gone into contracts or grants awarded to the aerospace industry, and to scientific and academic institutions involved in aeronautics and space. These funds have been essential in building and maintaining the U.S. leadership position in these two increasingly competitive fields. More difficult to measure but enormously important is the technology spinoff from NASA to our domestic economy in terms of new concepts or products. The multiplier effect of funds spent through NASA is visible in nearly all high technology industry but especially in the areas of electronics and telecommunications. Thus the \$111 billion investment has returned many times that amount into our economy.

In geopolitical terms, the civilian space program represents a critical element of American foreign policy. The 1958 Space Act establishing NASA declared the intent of the nation to reserve activities in space "to peaceful purposes for the benefit of all mankind." It directed NASA to cooperate with other nations in space activities and to share the benefits of such joint space research. NASA has entered into over one thousand agreements with other nations for the conduct

of cooperative projects. Cooperation in space science has become a critical element in U.S. relations with its major allies in the industrial world, with the developing nations of the Third World and with the Soviet Union and other communist nations. As a vital communications link among scientists throughout the international community, the space program offers a unique opportunity for improving international relations through the universal language of science. Although the rapid build-up of the U.S. military space program, including the Strategic Defense Initiative, runs directly counter to the pledge in the Space Act, NASA keeps that pledge alive.

Expanding man's knowledge of the universe is the highest and most rewarding goal of the space program. While some public doubt may be expressed as to the value of increased knowledge of outer space, the benefits of such knowl-

the moon riveted the attention of people the world over as have few other events in man's history. The United States was back in Number One position. Since then the space program has continued to enjoy strong popular support.

Not only was America's self-image restored, but world opinion was also influenced in the most positive manner by the American presence in space symbolizing the nation's technological prowess. The openness of the space program to public scrutiny garnered global admiration and respect. Soon other industrialized nations began to pay the highest tribute by seeking to copy what the U.S. had done, thereby turning space into a multinational arena and increasing the global competition for leadership.

Yet, despite all the positive forces working to reinforce a strong national space program and in contrast with its image as an agency that delivers success, NASA is now

- whether NASA's organizational structure for operating the shuttle is suited for the job at hand;

- whether a better informed management could have prevented the Challenger accident.

Behind the difficult management issues regarding the shuttle program lie some basic policy questions which have sparked controversy from the program's conception. In the wake of the Apollo program NASA felt the need for another manned flight project to serve as a next step into space and a driving force for the agency and the aerospace industry as a whole. Whereas a broad consensus had been achieved in support of the Apollo program as a demonstration of America's capability to meet a major technological challenge within specified time limits and largely in response to a perceived threat of Soviet domination of

costs of operating the shuttle fleet, however, have far exceeded projections while the revenues from users have fallen far short of early targets. Nevertheless, after Apollo and the attenuated Skylab program, the shuttle came to be America's next giant step into space. Its early launches captured the public's imagination. But after 24 successful launches the public and the media accepted the wishful thinking that the shuttle was in fact a routine operational transportation system somewhat equivalent to long distance air travel. Shuttle flights had become so commonplace that none of the major networks felt it worthwhile to cover the fateful launch. Indeed President Reagan had declared the system to be "operational" after its fourth developmental flight was completed on July 4, 1982. Congress, in approving subsequent annual NASA budgets, had pressed NASA to cut the costs and speed up the schedule while accepting the original plan to phase out the unmanned expendable launch vehicle (ELV) systems.

That move now appears to have been highly questionable. Without ELVs, customers whether governmental or private, seeking to launch their payloads have no place to go in the U.S. except to NASA. While other nations are developing launch vehicles to the point where supply will eventually exceed demand, the only current alternative to the shuttle is the French Ariane system. That system takes American space dollars abroad, and it has had three failures in 16 launch attempts. Efforts to continue the U.S. ELV systems on a commercial basis have so far failed to take hold, though prospects for these initiatives may have improved because of unmet near term demand in the wake of the shuttle accident.

Although attention has understandably focused on NASA following the accident, the policy climate surrounding the origins of the shuttle is highly relevant to an understanding of the present problem. In the early development phases, OMB which controls the purse strings, imposed severe budgetary limits on the shuttle program. While Congress favored building a fifth orbiter as a spare, OMB resisted. Once the developmental phase was completed political pressures increased for speeding up the schedule and reducing delays. Just a day before the January 28 launch a GAO official called NASA to say that a Senator had requested a GAO study of shuttle delays and cost overruns. After the accident the official called to say that the proposed investigation had been dropped.

The Congressional Office of Technology Assessment, charged with responsibility for assessing the impacts of technological policies and programs, has made a number of studies of NASA and the civilian space program. Yet OTA has never been asked to study the consequences of a shuttle accident. For whatever reason, no member of Congress or Congressional committee requested such from the organization best equipped to perform the task. A well documented assessment of the high risks associated with the complex technologies involved in the shuttle would have alerted policy makers to the need for contingency planning in the wake of a highly probable loss of a shuttle orbiter.

The point in citing these facts is not to deflect attention away from NASA which obviously is responsible for the shuttle but to show the importance of the political environ-

"The value of the space program as a motivational or inspirational force may be the most significant of all the measures of its worth."

edge are readily apparent even to an informed layman. We need only recall the impact of the first pictures of Earth sent back from Apollo and pre-Apollo flights to recapture the sense those pictures conveyed of a small planet enveloped in a fragile environment hurtling through space. Those pictures alone added enormous impetus to the efforts to raise environmental consciousness throughout the world. Earth remote sensing data beamed from satellites bring us valuable new information about our planet every day. Scientific probes of outer space tell us not only about our own solar system but other systems in other galaxies and the universe as a whole. To contemplate the termination of these explorations is no more thinkable today than a decision at the end of the 15th century to discontinue voyages of discovery after the first voyage of Columbus.

The value of the space program as a motivational or inspirational force may be the most significant of all the measures of its worth. Before NASA was formed, the United States had been on what seemed the losing end of a race into space with the Soviet Union. Americans were dismayed by a series of failures of early rocket launches while the Soviets were apparently scoring a series of successes culminating in the sudden appearance of the first orbiting satellite, Sputnik. The formation of NASA and the declaration three years later of a national commitment to land a man on the moon restored the nation's lagging confidence and created an entirely new atmosphere in determining America's self-image.

The space program became a source of great national pride. The astronauts became folk heroes inspiring a whole generation of young Americans who found a new reason to study mathematics and the sciences. The first landing on

exposed to the unwelcome glare of a public probe into a failure of great consequence. How could an agency's fortune change so abruptly?

The charge by the President's Commission that NASA's decision-making process was "flawed" in the case of the go-ahead to launch the Challenger on January 28 leads to the broader question of the adequacy of the process as a whole. Related questions which have become matters of public debate concern the general competence of NASA managers and the effectiveness of agency management systems and organizational structures.

NASA has always prided itself for its high levels of management skills, its adaptive organizational structures, its "can-do" ability to deal with problems and its emphasis on the safety and well-being of all personnel, including especially the astronaut corps. Thus the agency finds its present position particularly galling. The same people who have established such a remarkable record of success, including the salvaging of seemingly failed missions, find it unusually hard to deal with a major setback such as the Challenger accident.

Yet evidently there are serious problems within NASA which will not yield to "quick fixes" or "positive thinking" or strictly technical solutions however important these may be. Testimony given to the Presidential Commission has already raised questions about:

- whether and how information about technical problems or "bad news" travels up the chain of command reaching everyone who has a need to know;

- how an ambitious launch schedule can be achieved without the sacrifice of human safety;

space, a similar consensus had never been developed for the shuttle program. That program involved a "tough sell" on the part of NASA in dealing with Congress and the OMB. Some critics still argue that NASA made unwise concessions on the configuration of the shuttle in bargaining to obtain funding. After it moved out of its ten year developmental phase, questions began to be raised within NASA and outside the agency as to where the best organizational base would be. It has never fitted well into the structure of an agency whose prime mission consists of R&D projects of limited time duration. Proposals to find another home for the shuttle have failed to win support because no other agency has all the infrastructure and know-how required to carry out this demanding task.

To make the case for the shuttle, NASA promoted the idea that it could become a "low risk" operational system that eventually would earn sufficient revenues to cover the costs. James Fletcher, as Administrator of NASA in 1972, wrote that the "shuttle will provide quick and routine access to space." In the same letter he said: "The low risk access to space possible with the shuttle will increase commercial interests in exploiting space in a wide variety of beneficial applications." In retrospect the selling of the shuttle by its advocates seems not very different from the support engineered for many high technology projects whether in the civilian or military fields. Not all of them live up to their original promise, and some fall far shorter than others.

Designed as an advanced technology national launch system with greater capabilities than existing systems, the shuttle took longer to build than projected though its developmental costs were not far out of line with estimates. The

(Continued on page 4)

NASA: The Vision and the Reality

(Continued from page 3)

ment as an influence on NASA. That political environment forced a tradeoff — the phasing out of ELVs in order to develop the shuttle — with serious adverse consequences for the U.S. space program.

Testimony before the Rogers Commission now indicates that serious questions were being raised by Morton Thiokol engineers about the cold weather reliability of the solid rocket boosters. Concerns of these engineers, although reevaluated in the final analysis by Thiokol management, apparently were not brought to the attention of NASA managers who made the final decision to launch. This difference of views apparently was considered to have been fully and properly resolved within the delegated authority for booster hardware reserved to the Marshall Space

Flight Center. Whether or not temperature is eventually determined to be a principal cause of the accident, the fact remains that there appears to be an organizational cause for the failure of significant technical concerns to flow to the top shuttle decision-makers.

The tendency for bad news not to travel up is a common phenomenon in nearly all organizations in both the public and private sectors. While many bosses may insist that they want to hear the bad news early to avoid unpleasant surprises later, human nature operates in such a way as to postpone the delivery until all other options have been tried to cushion the bad news in some way to reduce its impact. One can imagine that in the current climate of NASA the flow of such information, however unwelcome, will be far freer.

One of NASA's long-standing problems, which is common to

many high-technology, information-intensive organizations, is how to separate from the massive flows of data and the numerous reporting systems the significant information needed by each level in the chain of management. NASA has always followed the principle of redundant reporting systems in the belief that through one or another channel, important information would float to the top, gaining the attention of key decision-makers. Experience associated with the *Challenger* accident seems to call into question the validity of this assumption.

As for the question of whether the organizational structure for the operation of the shuttle was right for the job, evidence suggests it was not. The special problem facing NASA, in this regard is its set-up as an R&D agency with semi-autonomous field centers each responsible for their particular areas of program specialization. The pre-

sent organization for the shuttle is embedded in the agency structure. Urgently needed is a new organization separating out the operational responsibility for the shuttle and establishing a clear line of authority, responsibility and accountability at all levels among personnel whose sole function is the operation of the shuttle.

Despite the accident occurring on the shuttle's 25th flight, the system must be regarded as a highly successful achievement. While it may never become truly routine or low-risk, it provides a flexibility and versatility to explore and exploit the space environment not offered by any other launch system. It is indispensable as a part of the U.S. national security system. Until a new generation space transportation system can be developed, perhaps toward the end of the century, the shuttle will remain an essential element of both-

the military and civilian space programs.

NASA has survived other failures and crises in the past. Even though this experience will take a toll the agency will come through again — wiser and stronger. However, the damage to the agency and to the nation as a whole will be far greater than it needs to be if the process of investigation fails to take account of what is at stake. The over-zealousness of some elements of the media and the posturing of others within NASA pointing the finger of blame while absolving themselves can cause irreparable damage. What is needed is a recognition of the generally high quality of NASA management and the dedication of its employees at all levels. A constructive approach can do far more to move the agency and the nation through this difficult period than recrimination and "cheap shot" criticism.

Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

Property & Rentals

Sale: 101 acre ranch, tractor, equipment, fruit & nut trees, tanks, fenced, buildings, corral. \$700/acre. 488-8105.

Sale: University Trace townhouse, corner unit, 2-2.5-2 CP, oversized patio, W/D, refrig., stove, dishwasher, mini-blinds, ceil. fans, fpl., new paint, near pools, clubhouse. \$56,500. 488-1953.

Sale: House, Oakbrook, 4-2-2A, oversized lot w/many trees, new vinyl kit/bath floors, water heater, paint, wallpaper, custom drapes, util. room, ceiling fans, storage space. \$84,900. 488-1953.

Sale: Kirkwood South, 3-2-2-loft, 2 fpl., util. rm, microwave, elec. garage door, covered deck, atrium, ceil. fans, this house wants for nothing. 481-8731.

Lease: Tranquility Lake condo for lease, 1 br., all appl., fpl., W/D, security gate, pool, jogging, fishing, \$375/mo. 486-4466.

Lease: Townhouse, 3-2.5, all appl., inside util. rm, near Hwy 146 & Fairmont, \$495/mo.; 2 br. condo on seawall avail wk of 9-6 to 9-13, \$500. 486-4466.

Lease: Seabrook townhome, 2-3-2, study (or 3rd br.), fpl., newly painted, \$600/mo. Claire, 488-6808.

Lease: El Dorado Trace condo, 2-2, wet bar, fpl., ceil. fan, tennis, pool and sauna, \$445/mo. Pete, x6141 or 480-4525.

Lease: Pasadena 3-1-1, large den, refrig., stove, carpet, drapes, fenced yard, close to schools, no pets, \$400/mo. 941-5908.

Rent: 2-2 University Trace condo, W/D, microwave, refrig., FPL, reserved covered parking, \$420/mo. Rodney, x4393 or 480-1340.

Cars & Trucks

1984 Z28, 5.0 HO, white/blue, fully loaded, warranty, alarm, T-tops, low miles, new tires, \$10,500 OBO. Beth Ann, 333-6191.

'75 Toyota Corolla wagon, 4 dr, std, AC, AM/FM, runs well, \$850. Bob, x5553 or 488-1931.

'81 Toyota Corona, beige, 60,000 mi., ex. cond., PS, PB, AC, auto, stereo. Bo, x4716 or 326-1437.

'69 Volkswagen Campmobile, ex. mech. cond., recent engine overhaul, nearly new tires, batt., shocks, brakes, etc. \$1,850 OBO. Steve, x5111 or 480-9715.

'85 Chevy S-10 Blazer, power locks & windows, cruise, tinted windows, rally wheels, luggage rack, Sony AM/FM/cass. w/equalizer, \$9,700. 482-7643.

'79 Chevy Malibu Classic, white, V-8, rebuilt auto trans., good body, new rear tires, auto manuals, minor work req., \$1,350. Mark, 534-3317 or 534-6662.

'76 Datsun 280Z, dark green, AC, runs well, new tires, \$2,600. Rodney, x4393 or 480-1340.

'83 Toyota, 2 dr., clean, auto w/overdrive, PS, tilt, tach, stereo, AC, well running machine, \$4,900. Briggs, x5165 or 333-2717.

'76 VW Bug, AC, AM/FM radio, 84 K mi., ex. cond., gold, \$2,200 OBO. Julia, x3221 or 434-8926.

'85 Honda Accord LX, AM/FM, cruise, tinted glass, AC, \$10,000 firm. Julia, x3221 or 434-8926.

'71 Ford LTD, needs engine, body in good shape, no rust, 2 new tires, \$350 OBO. Kathryn Gulley, x3911 or 480-5478.

'77 Toyota truck, needs front end repair, \$400. Bob, x3582 or 472-2163.

'77 Buick LeSabre, AC, AM/FM, clean, no rust, very good cond., \$1,600. Bob, x3582 or 472-2163.

'76 Plymouth Valiant for parts, good 225/6 motor, 3-spd manual trans., new ignition parts, \$200. Ruth, x4757 or 480-4553.

Cycles

1985 Honda TRX 125 4-wheel motorcycle w/elec. start, rear rack, like new, \$1,100. Bob, 280-1599 or 482-7942.

Boats & Planes

Ultralight airplane w/3-axis controls, Rotec-Ralley-2B, \$950 OBO. Wayne, x6226 or 486-7141.

24' Starfire Deep-V, always kept inside, 225 hp omc I/O, 60 gal., chart recorder/flasher, cudy cabin, w/tandem tilt trailer, elec. winch, many extras, \$7,500. 481-8731.

Audiovisual & Computers

New Radio Shack printer controller, 62 K RAM, \$75; new modem/fone 100, 300 bps, \$75; PC-5 pocket computer, 4K, printer, cass. interface, \$75. Tom Clark, x7445.

McIntosh MC 2100 amplifier, 105 W/ch., \$550. Tom Clark, x7445.

Zenith B/W TV, working cond., \$15; Commodore/Centronics parallel printer interface, \$30. Jeff Hanley, x3696 or 480-6839.

Household

Navy blue flip chair, perfect for dorms, \$20; new queen size reversible comforter, navy solid/flowered print chintz, \$25. Jeff Hanley, x3696 or 480-6839.

Sewing machine in cabinet, works, all instructions and accessories, \$35. Pfaff, 388-1250.

Antique oak side board w/two leaded glass doors, four drawers, \$395; antique oak rocker, mission type, newly upholstered, \$150; beautiful antique cabinet w/hand painted doors, dated 1875, has twisted legs, \$250. 488-5564.

Olympia elec. typewriter, \$135; Cedar cut elec. wall clock, \$25; desk light, fluorescent, \$15; small 8-track player w/AM/FM radio and case of tapes, \$30. 488-5564.

Sealy posturpedic box spring, never used, still in plastic, does not fit antique bed, 482-8729.

Dining room set, butcher block design w/chrome, 4 swivel chairs, \$180 OBO; buffet/bureau, dark brown, 3 drawers, 2 side cabinets, 5'x1.5', \$50 OBO. Valerie, x2208 or (409) 935-1149.

15 cu. ft. refrigerator/freezer, ice-maker, 2 yrs old, \$250 OBO. Valerie, x2208 or (409) 935-1149.

Rattan coffee and end tables, 3, w/glass top, ex. cond., \$250 OBO. 484-9180.

French provincial coffee table, \$40; two antique chairs, \$20; large wagon wheel light, \$20. 482-7546.

Sofa, ex. cond., cream/brown/rust, \$150; two brass and bamboo lamps, one hanging, one pole, \$75 for both. E. Guyton, x4611 or 280-8196.

Dinette with 4 chairs and extra leaf, chrome legs, \$200; double bed box spring & mattress, like new, \$100. B. K. Singh, 5972 or 280-0896.

Going cruising—must sell everything. 2-2.5-2 townhome plus all furnishings, incl. waterbed, stereo, TV, dishes, etc., etc., package deal at \$60,000. Avail. 1 Oct. Jansen, x3751 or 538-2262.

Miscellaneous

Riding lawnmower, 8 hp B&S engine, elec. start, 30" cut, runs well, \$175. Dick, x2744 or 482-1535.

Smith Corona letter quality printer, Model TP 1, 12 cps, ex. cond., manuals and extra ribbon cartridge included, \$100. John Herrmann, x3501.

Boy's jeans, almost new, 3 pair Jordache, size 10L, 1 pair OP, waist 22, paid \$30 each, asking \$10; boy's jacket, M, perfect cond., black, \$7.50. 388-1250.

Rossignol skis, 175 cm., well cared for, no bindings, \$50 OBO; Garmont Omnilite ski boots, women's 9, \$30 OBO. Karen, x3576 or 520-8348.

Fornsby furniture refinishing kits, four complete kits, \$7 each. 482-8729.

Pets

Free to good home, loving, personable cats, great for older person, moving to smaller residence. 486-8534.

Free to good home, male, black Lab., approx. 3 yrs old, ex. w/kids, moving, cannot keep. 486-8534.

Musical Instruments

"Bundy" clarinet w/case and stand, ex. cond., \$150. Marie, x3606.

Cookin' in the Cafeteria

Week of September 8 — 12, 1986

Monday — Cream of Potato Soup; Franks & Sauerkraut, Pork Chop, Potato Baked Chicken, Meat Sauce & Spaghetti (Special); French Beans, Buttered Squash, Buttered Beans. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Navy Bean Soup; Beef Stew, Liver & Onions, Shrimp Creole, Smothered Steak w/Dressing (Special); Corn, Rice, Cabbage, Peas.

Wednesday — Seafood Gumbo; Roast Beef, Baked Perch, Chicken Pan Pie, Salmon Croquette (Special); Mustard Greens, Italian Green Beans, Sliced Beets.

Thursday — Beef & Barley Soup; Beef Tacos, Diced Ham w/Lima Beans, Stuffed Cabbage (Special); Ranch Style Beans, Brussels Sprouts, Cream Style Corn.

Friday — Seafood Gumbo; Fried Shrimp, Deviled Crabs, Ham Steak, Salisbury Steak (Special); Buttered Carrots, Green Beans, June Peas.

Week of September 15 — 17, 1986

Monday — Cream of Chicken Soup; Beef Burgundy over Noodles, Fried Chicken, BBQ Sausage Link, Hamburger Steak (Special); Buttered Corn, Carrots, Green Beans. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef Noodle Soup; Baked Meatloaf, Liver & Onions, BBQ Spare Ribs, Turkey & Dressing (Special); Spanish Rice, Broccoli, Buttered Squash.

Wednesday — Seafood Gumbo; Broiled Fish, Tamales w/Chili, Spanish Macaroni (Special); Ranch Beans, Beets, Parsley Potatoes.

Thursday — Navy Bean Soup; Beef Pot Roast, Shrimp Chop Suey, Pork Chops, Chicken Fried Steak (Special); Carrots, Cabbage, Green Beans.

Friday — Seafood Gumbo; Broiled Halibut, Fried Shrimp, Baked Ham, Tuna & Noodle Casserole (Special); Corn, Turnip Greens, Stewed Tomatoes.

Week of September 22 — 26, 1986

Monday — Chicken Noodle Soup; Wieners & Beans, Round Steak w/Hash Browns, Meatballs & Spaghetti (Special); Okra & Tomatoes, Carrots, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef and Barley Soup; Beef Stew, Shrimp Creole, Fried Chicken (Special); Stewed Tomatoes, Mixed Vegetables, Broccoli.

Wednesday — Seafood Gumbo; Fried Perch, New England Dinner, Swiss Steak (Special); Italian Green Beans, Cabbage, Carrots.

Thursday — Cream of Chicken Soup; Turkey & Dressing, Enchiladas w/Chili, Wieners & Macaroni, Stuffed Bell Pepper (Special); Zucchini Squash, English Peas, Rice.

Friday — Seafood Gumbo; Baked Cod, 1/4 Broiled Chicken w/Peach Half, Salisbury Steak (Special); Cauliflower au Gratin, Mixed Vegetables, Buttered Cabbage, Whipped Potatoes.

AT BUILDING #3

On Wednesday we feature The Reuben: Corned Brisket, Swiss Cheese on a bed of Sauerkraut, Poupon Mustard on Rye and 1/4 Pickle. Delicious!

Monday and Thursday check out our French Dip Sandwich.

Gilruth Center News

Call x3594 for more information

Ladies weight training — This popular course begins Sept. 8 and runs for 4 weeks. The class meets Mondays and Wednesdays from 7 to 8 p.m. The cost is \$20 per person.

Defensive driving — Learn to drive safely and qualify for a 10% reduction in your auto insurance for the next three years. This all day Saturday class meets from 8 a.m. to 5 p.m. Sept. 20. Space is limited.

Tennis lessons — Beginning and intermediate tennis classes are scheduled to start Sept. 8 and Sept. 10, respectively, at the Rec Center. The 8-week sessions run from 5:15 to 6:45 p.m. and cost \$30 per person.

Exercise class — Come stretch with the gang and feel physically fit. This 4-week class begins Sept. 8 and meets Mondays and Wednesdays from 5:30 to 6:30 p.m. The cost is \$12 per person.

Dancercise — Part dance, part exercise and all fun, this class works on toning and will gradually get you in shape. This 6-week course begins Sept. 9 and meets Tuesdays and Thursdays from 5:15 to 6:15 p.m. The cost is \$25 per person.

Computer class — This beginner's course will enable the student to understand the use of computers in our society. Students will learn about hardware and software, applications and everything from bits to bytes to boxes. This 6-week course meets from 7 to 9 p.m. Wednesdays starting Sept. 3.

SCUBA — This basic SCUBA course begins Sept. 22, meeting Mondays from 6:30 to 9 p.m. and Wednesdays from 7 to 9:30 p.m. for pool sessions in LaPorte. The cost is \$45 per person. Additional charges will be made for pool and equipment rental. The course lasts 6 weeks.

Country western dance — This course teaches the basic fundamentals of dance, as well as teaching you to do the two-step. The courses for beginners meet either from 7 to 8:30 p.m. or from 8:30 to 10 p.m. Sept. 15. The cost is \$20 per couple.