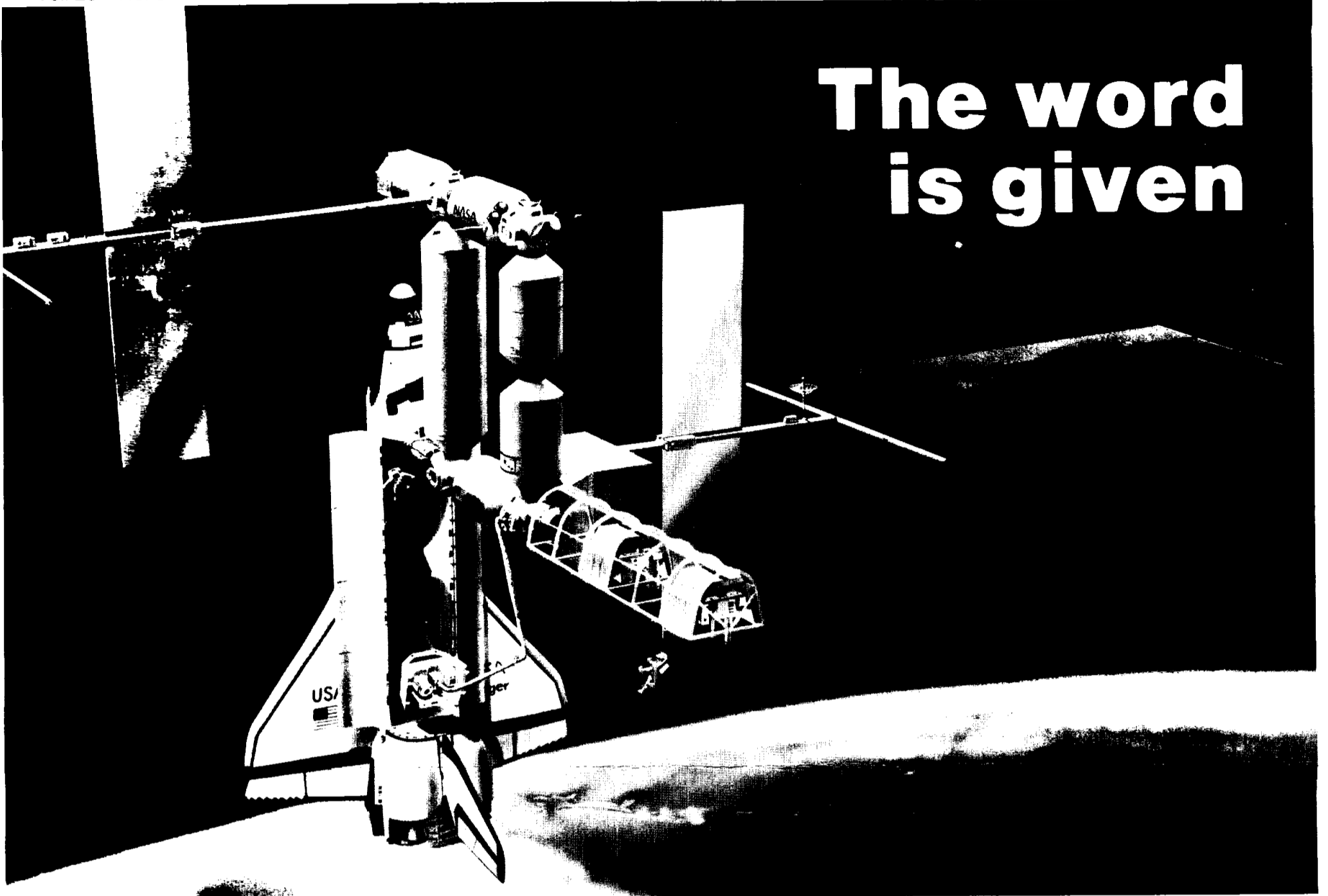


Space News Roundup

Vol. 23 No. 3

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National Aeronautics and Space Administration



The word is given

Reagan gives Space Station go ahead

"It's one of those mornings when everything seems right with the world. The space program is alive and well, and we have a new initiative," Administrator James M. Beggs said on the morning after.

The reason for his elation, and the elation of thousands of NASA employees around the country, came the night before, when President Ronald Reagan stood before both houses of Congress and said, "Tonight I am directing NASA to develop a permanently manned Space Station and to do it within a decade."

With those words in his State of

the Union address, President Reagan set in motion an initiative which now goes back to Congress in the budget cycle that could result in an \$8 billion program getting underway and bending metal well before the end of the decade.

The Space Station, Beggs said, "will give us a permanent presence in low Earth orbit by the early 1990s and will be the cornerstone of our activities in space through the end of the century and beyond. Needless to say, we are proud and pleased".

"Reagan's initiatives", Beggs

said, "are the right ones for the right time in our history. They

"... Tonight I am directing NASA to develop a permanently manned Space Station and to do it within a decade. The Space Station would permit quantum leaps in our research in science, communications, in metals and in life-saving medicines which can be manufactured only in space."

RONALD REAGAN

come at the dawn of a new era in space, a time when not only can we dream great dreams, but also

have the tools to bring them to reality. They represent a specific response to state-of-the-art technology and to what we have already proven that we can do in space. They will open new avenues of opportunity to benefit our life on Earth and they will enable both government and industry to forge a new partnership to realize the commercial potential of space."

As now envisioned, the first two years of the new program will be spent in extended definition, seeking the best design to satisfy commercial and scientific requirements. Hardware definition will

follow, but Americans will be living and working in space within a decade.

At present, NASA and its industrial partners see a number of potential commercial, scientific and medical benefits coming out of the project. Those forecasts include:

- The refining of biological materials to develop improved treatments for such diseases as certain cancers, diabetes and certain kidney diseases;

- The development of ultra-pure semiconductor crystals for use in super-fast computers and elec-

(Continued on page 2)

NASA's FY'85 request is \$7.5 billion

NASA's \$7.5 billion Fiscal Year 1985 budget request represents a \$274 million increase over FY '84 and provides for three major new initiatives.

The Space Station project, the Mars Geoscience/Climatology Orbiter and the Upper Atmospheric Research Satellite are all funded under President Reagan's budget plan.

JSC's budget for research and program management would be \$214,105,000, an increase of about \$8.5 million over FY '84, and the number of permanent civil service slots here would remain at the FY '84 level of 3,209.

The budget format represents something of a departure from previous budgets, according to Administrator James M. Beggs.

There are four major appropriations: Research and Development, \$2.4 billion; Space Flight, Control and Data Communications (a new category), \$3.6 billion; Construction of Facilities, \$160 million; and Research and Program Management, \$1.3 billion.

"This partial reordering of categories reflects the appropriations structure Congress created in FY '84 to mirror NASA's operational role in the Shuttle program," Beggs said. "In previous years, production and operations had been included in the R&D account."

For the Shuttle program itself, the budget plan falls into two major categories. Under Shuttle Production & Operational Capability, the plan calls for \$606.8 million for Orbiter costs, \$234.8 million for

launch and mission support, \$599 million for propulsion systems and \$25 million for changes and systems upgrading. Under Space Transportation Operations, the plan calls for \$316 million for flight operations, \$758 million for flight hardware and \$265 million for launch and landing operations, or a total of \$1.33 billion for Shuttle operations. A third category, Space Tracking & Data Acquisition, calls for \$795.7 million.

In Planetary Exploration, NASA is asking for a total of \$286.9 million. The breakdown is \$16 million for the Mars Geoscience/Climatology Orbiter, \$56.1 million for Galileo development, \$9 million for the international Solar Polar Mission, \$92.5 million for the Venus Radar Mapper and \$113 million for

mission operations, research and data analysis.

The Hubble Space Telescope development budget for the fiscal year is \$195,000, while the Upper Atmospheric Research Satellite start up funding is \$60.7 million.

Under Aeronautical Research and Technology, NASA is requesting \$233 million for its research and technology base, \$26.5 million for rotorcraft systems technology, \$21 million for high performance aircraft systems and technology, \$19 million for subsonic aircraft systems technology, \$16 million for advanced propulsion systems technology and \$26.5 million for the Numerical Aerodynamic Simulation program.

The Upper Atmospheric Research Satellite will, for the first time,

make a comprehensive, global measurement of the stratosphere, one of the most important yet least understood elements in the Earth's massive weather and climatology mechanism. The Mars Geoscience/Climatology Orbiter will measure the planet's geologic and climatic evolution and would be launched in 1990. It is the first of a new series of relatively low-cost planetary exploration vehicles.

Beggs said the budget request for FY '84 and the one for FY '85 will allow NASA to keep its civil service complement at a steady 22,000 people. "As a consequence, we have been able to hire almost 600 recent science and engineering graduates in 1983, reversing the upward rise in the average age of our technical work force."

Space News Briefs

SCA Inflight refueling tests begin

Initial flight tests began last week at the Dryden Flight Research Facility to see if inflight refueling during Shuttle ferry flights is feasible. Nine flight tests are scheduled with the Shuttle Carrier Aircraft (SCA), NASA 905, six of them with the prototype Orbiter *Enterprise* aboard. The first three flights will use just the SCA and test refueling procedures with KC-135 and KC-10 tankers. The other six flights, with the *Enterprise* aboard, will also test both types of tanker aircraft. Each flight will be about two and a half hours at speeds and altitudes simulating actual ferry missions. Both the *Enterprise* and the SCA are being instrumented to evaluate structural and other effects of the refueling procedure. *Enterprise* has 31 pressure sensors and nine accelerometers aboard, as well as two jet exhaust sensors in the payload bay to monitor any possible contamination from the tanker engine wash. Ballast has been added to the Orbiter to simulate a representative ferry weight of 182,000 pounds. A major motivation for inflight refueling is to improve SCA capabilities should an overseas Shuttle landing occur. Fitzhugh Fulton and Thomas McMurtry of the Ames Research Center and Gordon Fullerton and A. J. Roy of JSC are flying aboard the SCA during the tests.

Asteroid discovered trailing Mars.

JPL's Eleanor Helin has discovered what appears to be the first Trojan-class minor planet, or asteroid, of Mars. The discovery came during the night of Jan. 3/4, while Helin and JPL colleague Scott Dunbar were conducting their regular observations for NASA's Planet-Crossing Asteroid Program, a systematic search begun in 1973. They were using the 48-inch (1.2-meter) Schmidt telescope at the Palomar Observatory. The asteroid, designated 1984AB, is in an orbit about the Sun basically the same as that of Mars although tipped upward 12 degrees. It has the same eccentricity of orbit and is 1.533 astronomical units from the Sun, compared with 1.524 AU for Mars. The asteroid always trails Mars in its orbit by about 65 degrees and never catches up. Helin estimates 1984AB to be about two to three kilometers across. Jupiter is known to have associated asteroids at its two libration points. The first such Jupiter Troja, Achilles, was discovered in 1906. Today, some 35 have been cataloged and a number of others are known but as yet uncataloged. Follow-up observations are proceeding at the Infrared Telescope Facility on Mauna Kea, Hawaii.

Bulletin Board

Solar eclipse tour planned

Another in a series of worldwide expeditions is being mounted by the JSC Astronomical Society to Papua, New Guinea, and Australia Nov. 9 to 25 to observe and photograph the total eclipse of the Sun. This will be the ninth such expedition led by Paul Maley. Tax deductible benefits may be available to qualified individuals who participate in a research project to measure the solar radius variation. For additional information, contact Maley at x5378.

Golf Association season begins Feb. 20

The 1984 JSC Golf Association season will tee off at Texas City Feb. 20 with a Florida Scramble. Courses lined up for this season include Willow Creek, Columbia Lakes, Texas National, the Woodlands and what some consider the best course in Houston, Walden. For an application form, call Jerry Shinkle at x2201. The deadline to play at Texas City is Feb. 14.

Roundups sent directly to retirees

Recent NASA retirees from JSC and those scheduled to retire in the future need take no special action to ensure that copies of the *Space News Roundup* are mailed to their homes. The Personnel Office automatically adds retirees to the *Roundup* mailing list, and you should start receiving the paper about two to four weeks after your retirement date. If you need to change your address for the mailing list, call Wanda Price at x2135.

Space Camp opens in March

The U.S. Space Camp is being extended to 34 weeks in 1984 to accommodate increased interest in the youth science program at the Alabama Space and Rocket Center in Huntsville. Space Camp this year will run from March 11 to November 16 and will accommodate almost 3,400 boys and girls aged 12-14. Time to register for 1984 is short, however. Some 11,000 youngsters applied for the 1,400 openings last year, and applications are not automatically carried over to the next year. The camps run for one week and host 100 youngsters at a cost of \$350, which includes meals and housing. For more information or a registration form, call (205) 837-3400. There are also a few application forms available at the *Roundup* Office, Bldg. 2, Rm. 147, x5111.

'Best Little Gem Show' opens Feb. 18

Demonstrations of stone cutting and polishing, silversmithing and the faceting of gemstones will be taking place during the weekend of Feb. 18 and 19 during the ninth annual "Best Little Gem Show in Texas" at the Pasadena Convention Center, 79002 Fairmont Parkway. Educational lectures, slide and film programs and other features will be continuously presented during the show hours. Competitive and non-competitive exhibits of lapidary work, jewelry, minerals and fossils will be on display for the visitors to view. A 13-carat faceted topaz gemstone set in a 14k gold pendant is the grand prize to be given away during a drawing. For more information, call D. Mack Robinson, x2868 or 534-4696.

NASA
Lyndon B. Johnson Space Center

Space News Roundup

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Asst. Editor: Betty Johnson

New crews announced for 51-A and 61-D in '85 and '86

The crew of a 1985 Space Shuttle mission and a partial crew for a 1986 mission have been announced by the National Aeronautics and Space Administration.

The flights are mission 51-D, scheduled for launch in February 1985, and 61-D, forecasted for January 1986.

Commander of 51-D will be Brewster H. Shaw, Jr. (Lt. Colonel, USAF), 38, of Cass City, Mich. Shaw was pilot of the Orbiter *Columbia* on STS-9, the first Spacelab mission flown in November and December 1983.

Shaw's crew will consist of Bryan D. O'Connor (Major, USMC), 37, of Twentynine Palms, Calif.; Pilot; and Mission Specialist Mary Cleave, Ph.D., 36, Southampton, N.Y.; Sherwood C. Spring (Major, USA), 39, Hartford, Conn.; and Jerry L. Ross (Major, USAF), 35, Crown

Point, Ind.

Mission 51-D is to be the 21st Space Shuttle operation and the ninth flight of the Orbiter *Challenger*. Principal objectives of the six-day flight will be deployment of a SYNCOM communications satellite, and retrieval of the free-flying Long Duration Exposure Facility. The LDEF is scheduled to be deployed in April on mission 41-C, and contains experiments which require long-term exposure to space.

Mission specialists for mission 61-D will be James P. Bagian, M.D., 31, of Philadelphia; and Rhea Seddon, M.D., 36, of Murfreesboro, Tenn. John M. Fabian (Colonel, USAF), 44, of Pullman, Wash., will fly as one of the three pilots on 61-D.

NASA intends to have three-member crews share flight deck

responsibilities on future Spacelab-type missions. The commander and another pilot for 61-D will be announced at a later date. Mission specialists are frequently selected earlier than flight crews since their training is more specialized and requires more time.

Fabian is an Air Force pilot with more than 3,500 hours of flying time. He flew as a mission specialist on STS-7 in July 1983, and is also scheduled to be aboard mission 51-A in October as a mission specialist. Dr. Seddon is also scheduled to fly on mission 41-F in August. Mission 61-D will be Dr. Bagian's first space flight.

Mission 61-D will be the fourth Spacelab flight and will focus on experiments in the field of life sciences for its seven days in space. It will be the ninth flight of the Orbiter *Columbia*.

Canadian to fly on 51-A in October

NASA will fly a Canadian as a payload specialist on Space Shuttle mission 51-A, set for launch in October, in addition to two Canadians already scheduled earlier for Shuttle flights.

The announcement was made by Donald J. Johnston, the Canadian Minister of State for Science and Technology. NASA offered Canada the opportunity to fly a payload specialist this year in keeping with President Reagan's initiative to increase international cooperation.

The Canadian crew member and backup for the October flight will

be announced in March. Selection will be made by the National Research Council of Canada from a team of six chosen Dec. 5, 1983. Canadians will also fly on Shuttle flights in 1985 and 1986.

Shuttle Flight 51-A in October will be a six-day flight, carrying Telesat Canada's ANIK C-1 satellite and a Getaway Special experiment designed by two Canadian high school students.

NASA Administrator James M. Beggs stated, "We are happy to make this offer to Canada, one which will enhance the already long-standing strong cooperation

between our two countries in space activities."

"NASA's offer at this time is an additional recognition of Canada's contribution to the Space Shuttle—in particular, the delivery of CANADARM, the robot arm now part of the Space Shuttle."

In response, Minister Johnston said, "I am pleased to accept the offer of an extra mission. This exciting opportunity to have a Canadian astronaut in space so quickly is of great importance to the eventual success of both experiments and a major step towards expanding Canada's space capability."

Black history activities planned

In observance of National Black History Month, JSC will present two activities commemorating the 58th annual recognition of contributions Black Americans have made to American life and culture. Initiated in 1926 by Dr. Carter G. Woodson, Black History Month is now observed nationwide during February. This year's theme is "Black Americans and the Struggle for Excellence in Education."

The first JSC event, a luncheon at the Gilruth Recreation Center on Friday, February 24, will feature Mr. Fred Hampton, Administrator

of the Houston Preparatory School, as keynote speaker.

Mr. Tony Brown, host and executive producer of *Tony Brown's Journal*, a national public television program which appears on Houston's Channel 8, will be keynote speaker for the second event, a program on Feb. 28, at 1:30 p.m. in the JSC's Olin E. Teague Auditorium, Bldg. 2.

Brown, a popular and much-quoted television host, is seen weekly nationwide on more than 240 public television stations. The nation's longest running national

Black-Affairs television series, his program boasts five million viewers.

JSC and contractor employees, as well as the general public, are invited to both events.

Tickets to the luncheon on February 24 are \$7 each and may be obtained from: Billy Hervey, Bldg. 1, x2908; Yvonne Simon, Bldg. 30, x2504; Diane Pegues, Bldg. 37, x4264; John Robert Jones, Bldg. 45, x6251; or Vergis Bourgeois, CSC, 486-8153, x172. The deadline for purchasing tickets is February 16.

Pilot NET program underway

Employee involvement in problem solving is the focus of a pilot program underway at JSC. NASA Employee Teams, or NETS, made up of small groups of employees doing related work, will meet one hour weekly to define problems and recommend solutions to management. In announcing the establishment of the program January 13, R. Wayne Young, Director,

Administration, and Chairman of JSC's Productivity Committee, acknowledged that JSC has always used a team approach. However, he pointed out, the NETS concept is designed to use the knowledge and ideas of employees more fully and increase their involvement in management decisions.

Briefings to interested division and branch chiefs were held the

week of Feb. 6, with employee briefings scheduled for the week of Feb. 13 in branches where there is potential for successful implementation of the NETS concept. The next step will be selection of prospective employee teams from the volunteering organizations. Training for team leaders, facilitators and members will be held in March.

Cookin' in the Cafeteria

We regret that the cafeteria menu for the next two weeks was unavailable from the NASA Exchange at press time. For information on JSC cafeteria offerings, call the Exchange Store at x2363.



People Helping People
The United Way

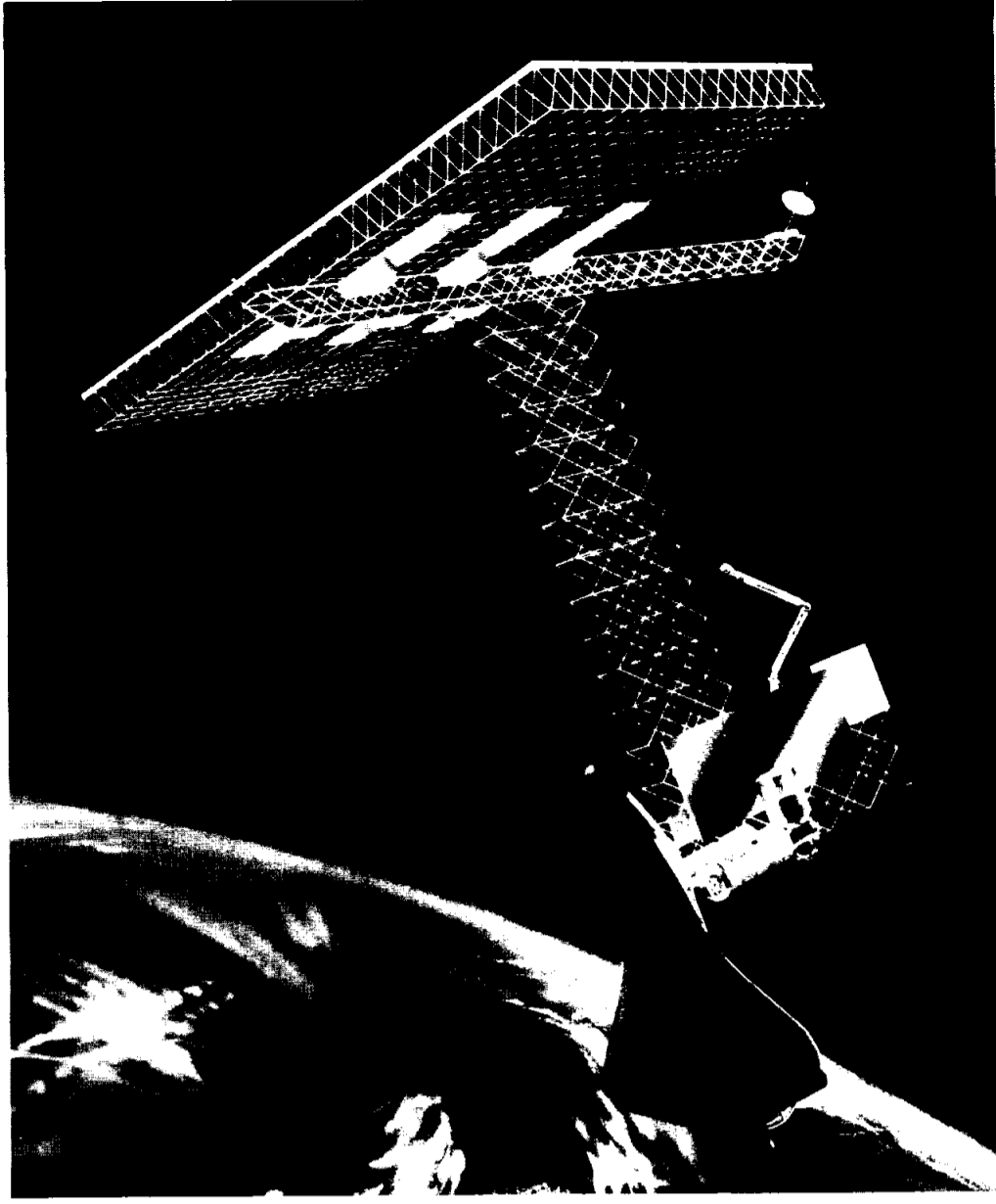
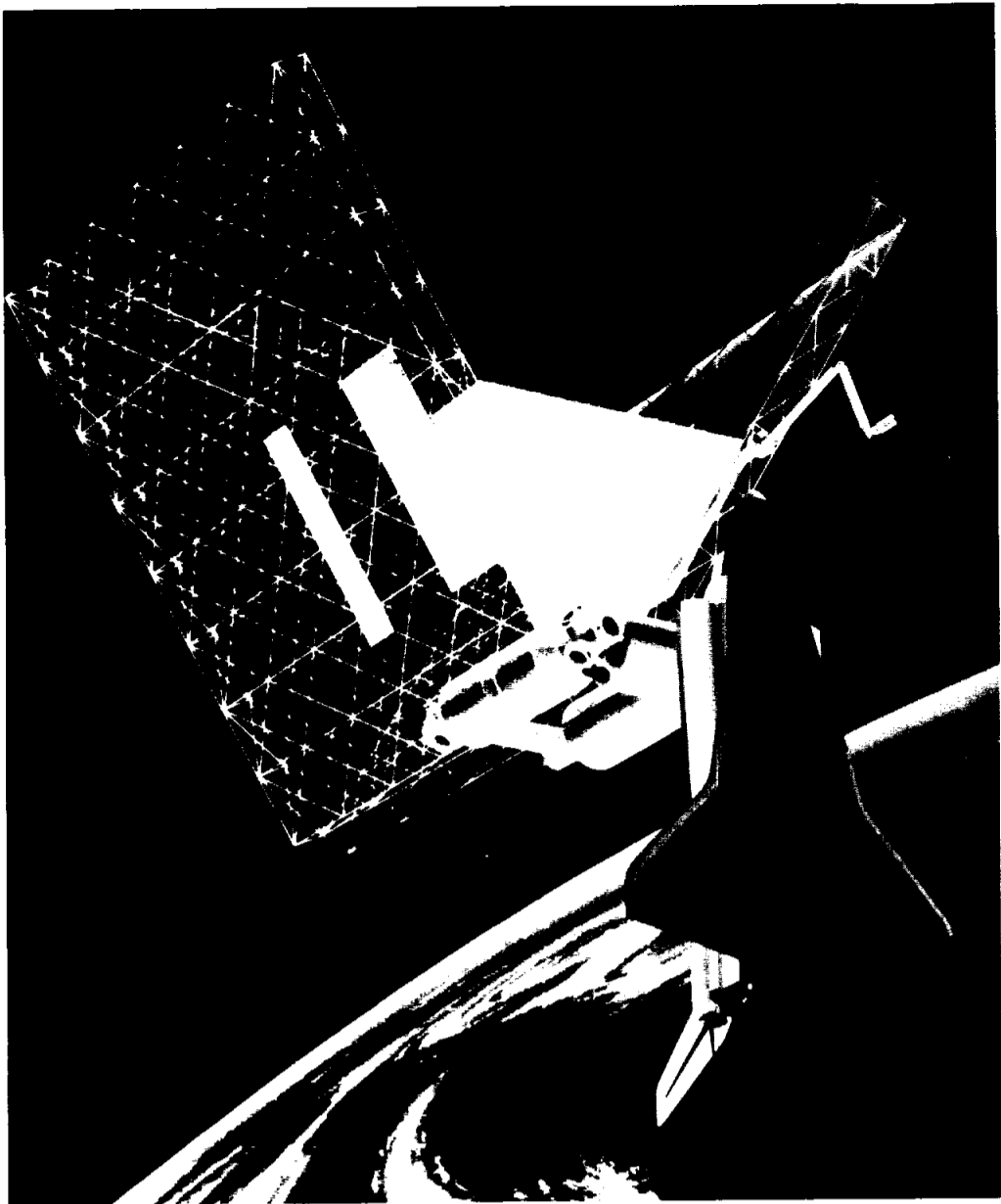
Correction

In the last issue of *Roundup* we reported the new road along JSC's north perimeter would not have an effect on the deer population inside the gates. While road construction itself is having no impact on the JSC deer herd, the traffic which will use that road and the people who drive those cars are expected to cause severe problems for the

deer.

Human beings already have an adverse effect on the animals, according to Ray Meyer, technical manager of the groundskeeping contract, who says poaching on JSC land is an ongoing situation. Finding the remains of deer who have been killed during the night is

no unusual occurrence. For these reasons and several others, JSC officials have requested that the Texas Parks and Wildlife Commission move part of the herd, which numbers more than 100, to East Texas, where the whitetail deer herd is being reestablished. In our next issue we will have the details on that move.



Three classes of Space Station designs are under consideration. The one atop page one is the Building Block approach. Shown above are, left, the Delta

configuration and right, the Big T configuration. Design studies for the Station will continue for at least another year.

Station design process now underway

(Continued from page 1)

tronic devices of interest to defense electronic industries;

- The productivity of super-light, high-strength materials which could lead over the next several years to high performance substances for everyday uses.

- New business in communications for electronic mail and computer-to-computer communications that will change our current concept of sending the written word, dramatically reduce the cost of doing so, increase tax revenues and improve the overall productivity of the nation.

While it is too early for anyone to say exactly what a Space Station will look like when it is finally built, JSC's input into possible Space Station configurations will be significant.

Possible configurations for a permanently manned, Earth-orbiting facility have existed within NASA for some time. Recently,

Space Station concept work intensified when Headquarters established the Concept Development Group (CDG) within its Space Station Task Force. Made up of people from NASA centers detailed to the task force, the CDG work is supplemented by tasks performed in-house at JSC and other centers.

Under the umbrella of JSC's Space Station Project Office, a tiger team called the Space Station Special Emphasis Study was led by Bass Redd of Systems Engineering in a brief (six-week), intense effort to generate JSC input into the initial configuration design process. Also incorporating the results of prior studies, three classes of configurations came out of that effort: the Building Block, the Delta and the Big-T approaches.

According to Clarke Covington, Manager of the Space Station Project Office, common denominators of each design class are modularity and evolutionary capa-

bility. Each is made up of modules in which people work and live and where supplies are stored—modules which can be carried into orbit in the Shuttle's payload bay and assembled by a manipulator system.

The three illustrations are drawings of initial configurations produced by the JSC tiger team in December 1983. Because the initial station established in the early '90s will not be what is needed 10 years later and replacement is not feasible, the station will be designed and built in such a way to facilitate additions to enhance capability and cost-effective performance.

The Building Block approach (see photo, page 1) is the one most often seen and is the easiest and cheapest way to build a space station, minimizing structure and subsystem hardware. The pressurized modules form the structural foundation of the station, which is Earth-oriented. The Sun-oriented

solar arrays are mounted out on booms for proper clearance and to minimize the effects of plume impingement from Orbiter engines when docking.

However, missions requiring very large electrical power levels would mean the solar arrays would become very large, presenting problems involving the dynamic characteristics of large masses mounted on limber booms.

One way to solve that problem would be with the Delta type of configuration (see photo, page 3), which uses a triangular truss structure for independent attachment of station elements. This structure maximizes rigidity and enhances controllability and mission versatility. The Delta is approximately solar-oriented with the array mounted on one face of the triangle at a constant angle to the orbit plane. A potential problem with the Delta approach is in deployment of the big structure and installing

lines and wires over a larger area.

The Big-T approach (see photo, page 3) to tracking the Sun is somewhere in between the Building Block and Delta, involving rotation of the arrays to track the Sun as the Space Station orbits the Earth. The solar array is on a stiff structure, but as the Sun's Beta angle changes during the year, the large T-structure with the solar array is tilted more toward the Sun. Thus the array can be made a bit smaller than the one on the large Delta, even though it does not totally track the Sun the way the Building Block configuration does. The "T" is Earth-oriented and is arranged for gravity gradient stability. The solar array is approximately twice as large as a fully-oriented array.

The Big-T also uses a truss structure for enhanced rigidity, element independence and mission versatility. Area is available on the truss substructure for affixing hardware and mission equipment.

Global survey underway for remote sensing data acquisition needs

A group called the Geostat Committee is conducting a survey of Earth's most promising exploration areas as data acquisition and archiving demands increase now that six distinct remote sensing platforms are being readied for launch.

Those platforms include Landsat D' (pronounced D-Prime), which will become Landsat 5 in March after it replaces the troubled Landsat 4.

The Geostat Committee, a group of geological exploration and engineering companies, is conducting the global survey in conjunction with the National Oceanic and Atmospheric Administration (NOAA), which has operational control of U.S. Landsat and other remote sensing satellites.

The need for the survey, according to both NOAA and Geostat Committee President Dr. Frederick

Henderson, is especially pressing now that six different remote sensing platforms are being readied for launch over the next few years. The first to go up will be Landsat D' in early March atop a Delta rocket launched from the Western Space and Missile Center near Los Angeles.

Others to follow over the next several months are France's SPOT, the European Space Agency's radar ERS-1, Canada's RADARSAT, West Germany's SPAS/MOMS (SPARX, a commercial version of this configuration, will fly aboard *Columbia* during Mission 41-G in August) and Japan's JERS-1.

"We are urgently requesting that anyone who is likely to need geological data from satellite systems, whether to remain commercially competitive during the next decade or for academic research, participate in our survey," Henderson said. "All information received

from individuals or corporations will be kept strictly confidential. Participants will be noted in the final report provided to government agencies, but they will not be linked to any particular area of interest," he said.

The committee will compile the responses, which consist of a short questionnaire and a grid map of the world on which significant areas of interest can be marked, and will provide them to appropriate decision-making agencies around the world.

"If this survey represents a credible response by the geological community," Henderson said, "governments should take it into account in satellite scene selection. Without a widespread response to this survey, however, there is no assurance that data needed during the next decade will be available when researchers and exploration companies decide they want them."

While that effort proceeds, NASA

and NOAA are preparing Landsat D' for launch on or about March 1. The earlier than anticipated launch of this satellite is necessary due to unexpected problems with Landsat 4. Those problems include a failure of the solar array cables, which has caused a serious power supply problem and the possibility that Landsat 4 could cease operations at virtually any time. At the first signs of further failure, NOAA plans to bring Landsat 4 down to a parking orbit where it could potentially be retrieved during a Shuttle flight. Shuttle Flight 62-B, scheduled for launch on April 1, 1986, has been mentioned as a possibility.

Other problems with Landsat 4 include a failure of the central unit, a failure of the wideband communication module which shut down X-band transmissions (and the Thematic Mapper), and persistent noise patterns in multispectral scanner video data.

The power cables, solar array diode module, sun sensor cable connectors, the Central Unit and the prime frequency source amplifiers in both X-band and Ku-band systems were all redesigned for Landsat D'. The new Landsat's orbit will be phased in with respect to Landsat 4 in much the same way that Landsats 2 and 3 were phased. Landsat 5 will pass over the same ground track traversed by Landsat 4 exactly eight days later. In all other respects, the two satellite orbits will be identical (sun-synchronous, 16-hour repeat coverage at an altitude of about 450 miles).

Those wishing to take part in the Geostat Committee survey should immediately contact the organization at 153 Kearny . Suite 209, San Francisco, 94108, or call (415) 981-6265. A photocopy of the survey form is available in the Roundup office, Bldg. 2, Rm. 147, x5111.

