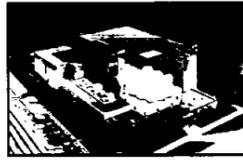




Looking back

Pictures tell the story of an eventful year for NASA and JSC, from *Discovery's* return to flight to development of a robot that can fetch. Photos on Page 3.



Research power

A new facility for testing Space Station *Freedom* power sources will be dedicated Monday at NASA's Lewis Research Center. Story on Page 4.

Space News Roundup

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No. 1

Apollo anniversary celebration taking shape

Early plans call for July parties, lectures, open house

Plans are taking shape for an Apollo 20th Anniversary Celebration at JSC in July, including a re-creation of the Apollo splashdown parties, an extended center open house, a lecture series and a special Space News Roundup issue.

The celebration is scheduled to begin July 16, the 20th anniversary of the Apollo 11 blastoff that started

Astronauts Neil Armstrong, Mike Collins and Buzz Aldrin on their way to the Moon. It is scheduled to end July 23, just a day before the 20th anniversary of the Apollo 11 splashdown.

Most of the dates and activities are still in the planning stages, and details may change as the schedule evolves. Corresponding festivities are being

planned at NASA Headquarters, Kennedy Space Center and Marshall Space Flight Center. The NASA centers are trying to coordinate their events and prevent conflicts.

JSC Director Aaron Cohen is chairman of the celebration, and former JSC Directors Robert Gilruth, Christopher Kraft Jr., Gerald Griffin and Jesse Moore will serve as co-chairmen.

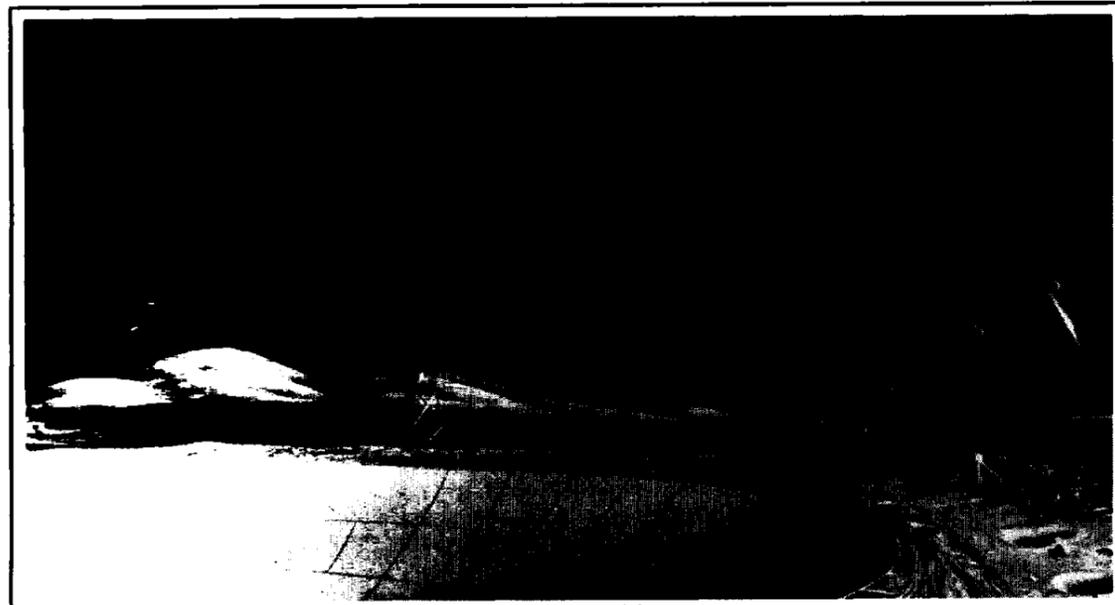
"We want this to be an event worthy of the Apollo program and the people who made it happen," Cohen said. "I hope everyone at JSC will pitch in to help us mark this significant milestone in the history of our country and the world."

Cohen said the celebration will commemorate not just Apollo 11, but all of the Apollo missions and the

extensive preparations that preceded them.

"Each of the missions before Apollo 11 was an important step on the road to a lunar landing," he explained, "and we learned new things on all of the following missions. It is this accumulated knowledge and experience we are celebrating."

Please see APOLLO, Page 4



NASA illustration by Mark Dowman

An observatory on the far side of the Moon is one of several options JSC's Lunar and Mars Exploration Office is helping to study. A large fixed radio telescope such as the one in this illustration would be shielded from the electronic noise generated by the Earth.

Report has broad implications for JSC

By James Hartsfield

The first report from NASA's 18-month-old Office of Exploration (OEXP) is an agencywide effort to chart a course for an extraterrestrial America, a course with broad implications for JSC, say officials in the center's Lunar and Mars Exploration Office.

The report essentially brings order out of chaos, attempting to sharpen the agency's focus on the infinite possibilities for this country's first steps into the Solar System, said Mark Craig, chief of the Lunar and Mars Exploration Office. But, perhaps even more important, Craig said, it may be the first time the agency has worked together to look at such things.

The report focused on four case studies: a manned flight to Mars; a manned flight to Phobos, one of Mars' moons; establishing a manned science observatory on the far side of Earth's Moon; and a methodical process of founding a

Moon base and then proceeding to Mars and its moons.

Regardless of where America's space explorers are headed, NASA has extensive work to do. "The options the report presented aren't the important thing," explained Barney Roberts, manager of JSC's Planetary Surface and Human Systems Office. "The important things are the common elements, the certain things we've got to do in the coming years to prepare for any of them."

The common preparations cited by the report should give momentum to much of JSC's work, Roberts added. Those preparations include a heavy emphasis on completing Space Station *Freedom*; continuing Project Pathfinder; increasing Life Sciences Research; improving Earth-to-orbit transportation; developing a heavy-lift transportation system; researching artificial gravity; and testing for new technologies such as propellant handling in space,

aerobraking and closed-loop life support.

JSC is either already deeply involved in almost all of these areas, or well suited to the tasks. The OEXP report's conclusions should add momentum to that work, Roberts said.

Still, OEXP's first report only scratches the surface of what things must be determined to enable Americans to permanently inhabit, or only visit, other worlds in the coming decades. This year, the studies will be taken a step further.

"We must look at everything in greater depth," Craig said. "You know, it's easy to explain something with a wave of the hands, but to check its feasibility is another story."

One example is the report's discussion of mining the Moon or Mars for rocket propellants and establishing surface habitats on those worlds. "NASA can build a spacecraft. We've got good experience at designing

Please see REPORT, Page 4

Crews prepare *Discovery* for move, mating

Preparations are in high gear at Kennedy Space Center to roll *Discovery* over to the Vehicle Assembly Building (VAB) for mating with the rest of the STS-29 Shuttle components, a move that may occur Jan. 19.

Discovery is scheduled for launch no earlier than Feb. 23, according to internal working targets. The exact date won't be released until after the Flight Readiness Review (FRR) scheduled for Feb 8-9.

Roll out to Launch Pad 39-B

should take place about one week after the Orbiter is moved to the VAB, possibly Jan. 26. Some work on the thermal protection tiles of *Discovery* was accomplished during the Christmas and New Year's holiday week by volunteers, but now a full complement of technicians is back on the job and work is proceeding smoothly.

In the VAB, the fully stacked STS-29 solid rocket motors (SRMs) and the external tank await *Discovery*. *Discovery*, which has been powered up in Bay 1 of the Orbiter Processing Facility (OPF), underwent tests of the communications and main propulsion systems early this week. The payload bay doors were opened Tuesday to allow final preparations for STS-29.

The Orbiter's power redundancy systems were checked out Wednesday, along with the waste containment system and continued tile work.

Meanwhile, Tracking and Data Relay Satellite-D (TDRS-D) was mated to the Inertial Upper Stage that will carry it to a 22,500-mile high geosynchronous orbit once deployed by *Discovery*. An end-to-end test, a check of electrical and mechanical connections between TDRS-D

and the IUS, was conducted earlier this week.

TDRS-D is scheduled to be taken to Pad 39-B to await installation aboard *Discovery* no earlier than Jan. 17. TDRS-D will be the third TDRS to be placed in orbit and STS-29's primary payload.

Secondary payloads to be in *Discovery's* payload bay on STS-29

include the Space Station Heat pipe Advanced Radiator Element (SHARE) and the

Orbiter Experiments Autonomous Instrumentation System-1 (OASIS-1). SHARE is a flight experiment of a 58-foot long radiator element being designed for Space Station *Freedom*. OASIS-1, a payload also carried on STS-26, will measure stresses on TDRS-D and in the payload bay during the flight.

Secondary payloads to be on *Discovery's* middeck include an IMAX motion picture camera, a camera that takes high-fidelity, large-frame films; the polymer morphology (PM) unit, an experiment that tests the melting of polymers in weightlessness; the CHROMEX experiment, a test of the growth of plant roots in zero-G; and the protein crystal growth (PCG) experiment, an array of protein crystals grown during a mission useful in devising new medications.

Two student experiments also are to fly aboard STS-29: Chicken Embryo Development in Space and the Effects of Weightlessness on the Healing of Bone. A test of the Air Force Maui Optical System (AMOS) also will be conducted on STS-29, a tracking test as the Orbiter flies over an Air Force electro-optical facility.



Successful return to flight highlights 1988

New beginnings were a theme at NASA throughout 1988, a theme capped by the September launch of *Discovery* and the nation's return to piloted spaceflight.

Followed two months later by the *Atlantis* mission in early December, the agency now looks forward to seven Shuttle flights planned this year, flights that will deploy scientific spacecraft to map Venus in great detail, to probe the mysteries of Jupiter and to look toward the very edge of the universe.

Also in 1988, Space Station *Freedom* planning accelerated and the United States signed final agreements

with its foreign partners to develop the permanently inhabited, Earth-orbital space facility.

It was the year that America returned to space; it was a year of transition from past to future.

Return-to-flight activities paced the first nine months of 1988, moving ever more rapidly before *Discovery* rose from Pad 39B on Sept. 29. STS-26 was one of eight NASA launches in 1988: two Shuttle flights and six expendable rocket launches, all of them successful.

In January, the Space Shuttle main engines were shipped to Kennedy for installation on *Discovery* and work

began on improving the Shuttle Landing Facility. Also, two new abort landing sites were brought on line in Africa during the early months of '88, one near Ben Guerir, Morocco, and another at Banjul, The Gambia.

In April, a telescoping pole, designed, developed and built at JSC, was chosen as the egress method for the Shuttle's crew escape system.

Three full-duration test firings of the redesigned solid rocket motor (SRM) were conducted at Morton Thiokol's Wasatch Facility near Brigham City, Utah. The first, qualification motor-6 (QM-6), was in April; the second, QM-7, was in June; and the third, a

deliberately, severely flawed motor designed to test the fail-safe modifications and designated production verification motor-1 (PVM-1), was in August.

On July 4, the assembled Shuttle was rolled out to the pad. On Aug. 10, a successful, 22-second flight readiness firing of *Discovery's* main engines was conducted.

On Sept 29, America returned to space with the launch of STS-26, a four-day flight. Crewmembers were Commander Rick Hauck, Pilot Dick Covey and Mission Specialists Mike Lounge, Pinky Nelson and Dave Hilmers. The primary payload, a

Tracking and Data Relay Satellite, was deployed on schedule and is expected to be fully operational this month.

On Nov. 2, *Atlantis* was rolled to Pad 39-B for STS-27. Launch was on Dec. 2, after a 24-hour scrub due to uncooperative weather. The crew for the dedicated Department of Defense mission was Commander Hoot Gibson, Pilot Guy Gardner and Mission Specialists Mike Mullane, Jerry Ross and Bill Shepherd.

In August, NASA issued a request for proposals inviting industry to compete for the design, development,

Please see 1988, Page 4



THANKS, TEACH—High school office education coordinators are treated to a tour of JSC's computer Product Demonstration Facility in Bldg. 12. Freda Marks, far right, JSC's Office Education coordinator, accompanied the group on its tour, which included a welcome by Jack Lister, director of Human Resources, and Astronaut Story Musgrave.

JSC

Space Shorts

National Space Society launches new magazine

The National Space Society, a non-profit organization that actively promotes space exploration, will publish the first issue of its new space magazine, "Ad Astra," this month.

"Ad Astra" will provide society members with updates on Shuttle missions, lunar and planetary exploration, space politics, astronomy and other topics.

Leonard David has been appointed editor, Kate McMains will be managing editor, and Susan Sutphin will be associate editor.

Kennedy contracts computer upgrade

Kennedy Space Center has awarded Honeywell Federal Systems Inc., McLean, Va., a contract to upgrade the hardware and software of two computer systems in the Complex 39 Launch Control Center (LCC).

The initial fixed-price contract began Dec. 29, 1988, and runs until Sept. 30, 1989, and is valued at \$7.2 million. There are four fixed-price options that could extend the contract to 1993 for a possible total contract value of \$26.2 million.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m. to 2 p.m. weekdays:

General Cinema (valid for one year): \$3 each.

AMC Theater (valid until May 31): \$2.95 each.

Sea World—San Antonio (year): children, \$13.56; adults, \$15.96.

The Arkansaw Bear (Feb. 18, 7 p.m., Bayou Theatre, UHCL): \$3.

JSC

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2.

Property

Sale: League City, 3-2-2, cul-de-sac, landscaped, \$3,000 down, FHA 10% fixed assum. David, x35464.

Sale: Pasadena: Deer Park, 1980 14' x 60' Redman mobile home, 2-1.5, covered patio deck, shed, skirting, \$14,000 principle or VA, OBO. Jim, 280-2226 or Faye, 998-0719.

Sale/lease: Near Alameda Mail, 3-1.5-2, CA/H, x33656 or 486-8276.

Sale: '82 Fleetwood Festival mobile home, 14' x 72', 2-2, CA/H, appl., ex. cond., \$9,000, OBO. (409) 925-5554 or 474-4306.

Sale/lease: Friendswood, Forest Bend, 3-2-2, den, screened-in-porch, ceiling fan, new paint, assume 9.5%, \$515/mo. Nick, x31920 or 995-7917.

Lease: Sterling Knoll subdivision, 2-1, new carpet, new paint, W/D hookup, ex. cond., \$325/mo. 480-9363.

Sale/lease: Brookforest, CLC, 4-2.5-2, 2,500 sq ft., lovely contemporary, all formals, beautifully landscaped, near schools, \$1,100/mc. or \$129,900. x37016 or 488-7224.

Rent: League City, Glen Cove, 4-2-2A tri level, family room FPL, fans, Jen Aire, W/D, refrig., fenced, sec. lights, CA/H, comm. park and boat ramp, \$650/mo., \$600/dep., no pets, 337-4051.

Lease: Seabrook, 1-1, W/D, FPL, upstairs, pool and tennis courts, \$290/mo., co-op lease avail. 681-4732.

Sale/lease: 10 acres, near FM 517 & hwy. 146, on FM 517, barn, utilities, stocked ponds, and more, 484-7834.

Sale: Middlebrook, 3-2-2, study, FPL, wet bar, covered patio, large lot, ex. cond., FHA assum., 10%, 480-9363.

Sale: Bolivar Island, North Jetty, 2 lots, 25 x 140 each, 6K for both, or \$100/dn., \$82/mo. 332-0365.

Rent: Mobile home lot, \$85/mo., \$50/dep., Oklahoma and Kinne, Bacliff, 488-1758.

Rent: Lake Tahoe, Heavenly Valley, 3 BR condo, ski resort avail., Feb. 11-Feb. 18, Casino's nearby, \$700. Terry, 480-5545 or 941-1324.

Sale: Friendswood/Sun Meadow Estates, wooded lot in estab. neighborhood, cul-de-sac by stream and golf course on 2 sides, approx. 245' deep and up to 86' wide, approx. 1/3 acre, util. on site, \$31,500. Doug, x32860 or 486-7412.

Sale: Near Lake Livingston, 43 acres w/ house & cottage, deep water well, pond, mostly wooded, fenced, beautiful setting, 1 1/2 hr. drive, \$135K. 532-4420.

Sale: Heritage Park, 3-2-2 custom home, tile entry, walls of windows in living and dining rooms, beautiful custom kitchen, new deck and

fence, both baths redone and vanities custom, new paint inside and out, wallpaper, miniblinds, \$58,500. Tony or Lori, 482-5139.

Rent: Vail, Colorado condo, large, sleeps 10, 3 baths, adj. clubhouse, indoor/outdoor pool, hot tubs, racquet bar, ski March 18-25, \$1,000. (303) 484-1888.

Sale: Hwy. 6 and Westheimer area, 2-2, brick, large fenced yard, FPL, \$950/dn., \$425/mo. 332-0365.

Sale: 650 acres, 3 mi. from Karnes City, TX., on Hwy. 80, 50 mi. from San Antonio, rolling hills. 783-9164.

Cars & Trucks

'67 Mustang, 289 V-8, 3 spd., new paint, AM/FM stereo, A/C, lots of new parts, runs/looks great, \$2,995, OBO. x38169 or 482-8496.

'80 Citation, 4 cyl., 4 spd. manual, 2 dr. hatchback, luggage rack, white, sunroof, AM/FM, A/C, P/S, P/B, adj. steering wheel, inter. windshield wipers, new stl. belted radials, 72K mi., \$1,400. 486-7831.

'29 Mercedes Replicar, still in kit, unassembled, Ford frame, retail, \$8K, was \$6,500, now, \$5,500. 484-7834.

'76 Oldsmobile Cutlass, green, 8-track, AM/FM radio, new tires, new belts, \$1,000, OBO. Rick, 480-5545 or 486-8276.

'72 Datsun 240Z, 4 spd., AM/FM, A/C, all orig., good cond., good tires, runs great, looks great, \$2,500, OBO. Ben, x36795 or 332-5090.

'83 Buick Regal, A/T, A/C, cruise, tilt, AM/FM cass., 80K mi., very clean, \$3,750. 488-3265 or 486-4014.

'78 Ford pickup F-150, A/T, P/S, P/B, \$1,295, OBO. x33656 or 486-8276.

'59 Mercedes Benz 220S, \$3,000. David, x35464.

'75 Lincoln Towncar with new engine less than 10K mi., ex. tires., \$700. Scott Morris, x37663 or 482-7775.

'77 customized Ford van w/refrig., sink, closet, 351 w/P/S, P/B, new tires, runs real good, \$1,600. Scott, x37663 or 482-7775.

'84 Ford EXP hatchback, 40K mi., sunroof, red w/black trim, AM/FM cass., new brakes, \$3,000. Sally, x37485 or 488-5501.

'85 35' Mallard motor home, loaded, low mileage, \$34,000, OBO. 337-4051.

'79 Toyota Celica GT, A/C, AM/FM/cass., good cond., \$800. Jim, x30742 or 480-8776.

'78 Mitsub. Colt, 32 mpg hwy., 4 spd., A/C, AM/FM, 4 dr., reliable, 125K mi., no rust, uses no oil, clean in/out, \$1,300. Wally, x36440 or 326-2664.

Wards vacationer tent travel trailer, sleeps 4 adults, 4' x 7' mahogany boat fits as a cover, set of oars, winter price, \$450, without boat and oars, \$400. Art, 282-4821.

'77 Dodge custom van, P/S, P/B, A/C, Captain's chairs, sofa, \$1,895. Tom, x39040 or 332-6419.

'36 Holiday Rambler travel trailer, ex. cond., ready to move to hunting lease, lake property or just to travel. Pepper, 333-6469 or 339-1337.

'83 Ford Mustang, blue, auto., V-6, cruise, tilt steering, P/S, A/C, ex. cond., \$4,000. 333-

1427 or 282-3800.

'81 Diesel Oldsmobile, brown Delta 88, loaded, 4 dr., body in ex. shape, new tires, new A/C, runs good., \$2,200, OBO. 495-1040.

'76 T-Bird, creme/gold, great cond., all power, new tires, \$900, OBO. Moses, x35847 or 437-6727.

'84 Ford EXP, hatchback, 40K mi., sunroof, red w/black trim, 5 spd., AM/FM cass., \$3,000. Sally, x37485 or 488-5501.

Cycles

'79 Yamaha XS 750 Special, 1 owner, windjammer, AM/FM cass., new tires, lots of extras, \$1,250, OBO. Rich, x34818 or 480-8335.

'84 Honda Shadow, VT 700, black, 12,700 mi., looks and runs like new, \$1,500. x34202 or 559-2850.

'85 Honda Shadow 500, low mi., with windshield, ex. cond. x36462 or 996-1410.

Boats & Planes

24' Islander Bahama, sleeps 4. Rita, x36161, after 3 p.m.

22' Southcoast sailboat, retractable keel, depth meter, compass, auto helm, 4.5 hp Evinrude motor, trailer, ready to sail, \$3,000. 332-3107.

TRAC 16' Catamaran, great boat, one yr. old, extras incl., \$3,200. Randy, x35459 or 335-1577.

Audiovisual & Computers

Commodore 64, disk drive, printer, monitor, Modem, much software, incl. GEOS, timeworks series, and games, \$500, OBO. 332-3107.

Commodore 64 software, books and ISEPIC copy cartridge utility: 5.25 in. diskette boxes. Steve, x35272.

Atari 8 bit 48K, 400, 410, 1050 and printer, documentation and software, all for \$300. Mary, x34251 or 941-8622.

Household

Sofa and matching chair, tan w/flower print, ex. cond., \$100, OBO. Carl, x37095 or 332-1487.

Unused 23K/24K gold plated flatware, 70-piece service for twelve, finest chrome nickel steel, padded storage case, was \$1,200, now \$325. Cliff, x38166 or 486-8810.

Pioneer stereo cabinet, large, brand new, still in box, \$50, OBO. Lynn, x37159.

Bunk bed w/mattresses, rails, and ladder, ex. cond., can be used as twin beds, \$100. 946-6658.

Sofa, good cond., \$50. Linda, x32745 or 480-3187.

Mirrors, gold-veined, 45" x 91 1/2", two each, like new, \$200 for two or \$125 each, OBO. Doug, x32860 or 486-7412.

Chandelier, polished brass, Mediterranean style, ex. cond., BO. 480-0829 or 326-2995.

Set of new Wm. Rogers 1847 silverplate knives, forks, spoons, etc. service for 8 and extra pieces, (55 piece set) in lovely wooden case. 783-9164.

Whirlpool matching washer and elec. dryer,

1984 model, almond color, ex. cond., \$200/each or \$350 for the pair. Craig, 282-3731 or 485-5636.

Wanted

2 roommates (non-smokers), to live in my 3 BR/2 BA home in Friendswood, cable, W/D, microwave, VCR and all house hold privileges incl., no dep. or lease to sign, \$225/mo., all bills paid. Mike, x38169 or 482-8496.

Want drum set, good quality, for adult. C.W., 282-1871.

Need 12 people who would like to order a door size poster entitled "Astronaut Mickey", \$8 ea. Bill, x39210, (couple of weeks for delivery).

Need reliable person to carpool with from the Astrodomo area to JSC, 8:00 to 4:30 or 7:30 to 4:00, Mon.-Fri. Cherym, x38183.

Need riders for vanpool in the Missouri City/Sugarland area, along hwy. 6. Mike, x31693 or 499-07245.

Wanted by Frontier squares and beginner square dancers, class starting with a fun nite (no charge), 8 p.m., Sat, Jan. 7, 1989, CLC Rec. Center, 16511 Diana. more info? Contact Ed Lattier, x31452 or 486-4002.

Want mouse and associated circuit card for an Apple IIe microcomputer. Frank, x30882.

Want wheelchair, lightweight, portable. E. Rubenstein, x34807 or 326-2354.

New 1988 Dodge van needs riders, West Loop Park and Ride to NASA. Richard, x37557.

Want drafting table with a light box built in. 334-4894.

Want IBM Selectric II typewriter, sturdy wooden table, adjustable drafting stool. 334-4894.

Photographic

3X Telephoto converter and 75-260mm zoom Vivitar lenses, Cannon mount, BO. 280-4381 or 484-7834.

Konica lens, 28mm f/2.8 (Soligor), mint cond., \$40. x30577.

Burke & James 4x5 "Solar" photo enlarger, 75mm and 135mm lenses, 3 1/4 x 4 1/4 and 4x5 neg carriers., \$100. Terry White, 332-5177.

Konica TC camera w/case and 40mm f/1.8 lens, \$100. x30577.

Pets & Livestock

Pretty kittens need good homes, 1 female Siamese, 1 grey male, 1 B&W female plus 2 black. 783-9164.

Dickinson stalls and pasture for rent, 15 acres, trails avail., full board, \$85/mo.; partial board, \$55/mo.; pasture rent, \$45/mo. 534-2806 or 333-7098.

AKC Cocker pups, born 10/19, 1 red and 2 golden and white males, very cute and pretty marking pups. Pamela, x36159 or 480-8980.

Chow-Chow puppies, full-blood, wrinkled faces, M&F, black & reddish brown, \$125. x37815 or 475-2357.

Free to a good home, adorable female and male Cocker mixes, both blonde, shots, 1 yr. old, spayed, great health, housebroken and ex.

\$7 for students and young AIAA members. Reservations must be made by noon Jan. 23. For reservations or more information, call Judy at 282-3782 or Frankie at 333-6064.

Jan. 25

Phobos Mission discussion—The JSC Astronomy Seminar will host a discussion of the Soviet Phobos Mission at noon Jan. 25 in Rm. 193, Bldg. 31. For more information, call Al Jackson, x33709.

Feb. 23

Call for papers—The American Society of Quality Control (ASQC) is seeking innovative papers written on subjects such as applications in quality and productivity or the use of data systems for improving quality and productivity and competitiveness. The papers will be presented at the second annual South Texas Quality, Productivity and Data Systems Conference, Feb. 23-24 at the University of Houston's Hilton Conference Center. For consideration, and a brief abstract and biographical sketch, both less than 300 words each, a one page outline and a photograph to South Texas Q&P Conference, Attn. Eugene Berger, Box 890506, Houston, 77289. For more information, call Berger, 333-0967.

April 27

Space Flight Symposium—The Texas Bay Area Chapter of the Society of Hispanic Professional Engineers (SHPE) will cosponsor "The Challenge of Space Flight: A Space Symposium" to be held April 27-28 at JSC. The joint effort will be aimed at disseminating information to minority groups, educators, technical professionals and managers of EEO programs concerning current and future manned space activities and skills needed by JSC to meet 21st century demands.

with children. x37797 or 333-1293.

Musical Instruments

Sale/trade: Prof. bass guitar amp. Cerwin/Vega BG250, 250 watt head w/ 1 large speaker cabinet, 1-18" speaker & 1-12" speaker in folded horn enclosure, \$450, or trade for 4-track, etc. Mike, 559-2450.

Baldwin Spinnet piano, bench, humidifier, looks new, ex. cond., \$1,200. 482-1659.

Kimball Spinnet piano, 15 yrs. old, ex. cond., \$900, OBO. Rich, x34818 or 480-8335.

Lost & Found

Bicycle missing from Mission Control Center. J. Axford, x37671.

Miscellaneous

Home exercise system, DP 1000, \$75. Steve, x35272.

3/4 Stratavarius copy violin, \$250; mini-14 rifle w/extras, \$300; 2 40R 3 pc. suits, \$80; new 15" spare wheel and tire for Chevy, \$20. Jim, 280-2226 or 487-4552.

10 ton hydraulic log splitter, 1 yr. old, \$700. x36957 or 471-6304.

Men's Seiko quartz watch, rectangular, thin, gold w/stamped leather band, was \$135, now \$40. x38278 or 326-2995.

Through-the-wall electronic central air filter, removes particles down to 0.01 micron, incl. pollen, smoke, \$175. 480-0667.

Used carpet, bronze color, fair cond., approx. 230 sq. yd., \$300/sq. yd. 480-0667.

Carpet, aqua-grey, new, never used, 12' x 12' wall-to-wall, \$75, OBO. Edward, x36250.

New wedding gown, bridal orig., size 10, \$400, OBO. 486-1632.

New coffee maker, \$8; baby crib, \$50; baby mattress, \$10; crib bumper pad, \$5; J.C. Penney refrig., 3 cu. ft., \$45; intercom for baby, \$20; complete used wood garage door, very good cond., 16' x 7', w/all hardware, \$70, OBO. 480-2870 or 282-6616.

Ash rocking chair, \$54; 4 dining chairs, \$350; 1 sofa chair, new, \$110; 1 gas grill, \$50; 2 Sears prof. tool chests, \$320. x37192 or 996-9724.

B&D electric edger, \$25; weed eater, \$10; Royal portable elec. typewriter, \$50; Modem, \$10. 488-9257 or 488-4828.

Wedding gown, veil, size 5, silk chiffon and lace accented w/seed pearls, \$300. 332-2229.

Scuba equip., BC \$100, Octopus, \$150. 480-9810.

11 pc. copper pots, never used, \$125; portable VHS w/camera, \$450. 5' B&W portable TV, \$45. 480-9810.

Exercising/workout equip., half price, used 3 times, \$75. 280-8796.

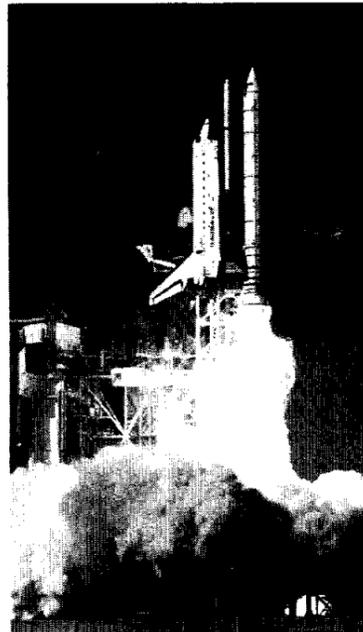
Beil helmet, size 7 3/8 model mag 4, ex. cond., dark blue, \$40, OBO. Pat, x39375.

Zenith Transoceanic SW. radio receiver, ex. cond., works well, \$100, OBO. Pat, x39375.

'65 3 spd. Corvair transmission, BO. 280-4381 or 484-7834.

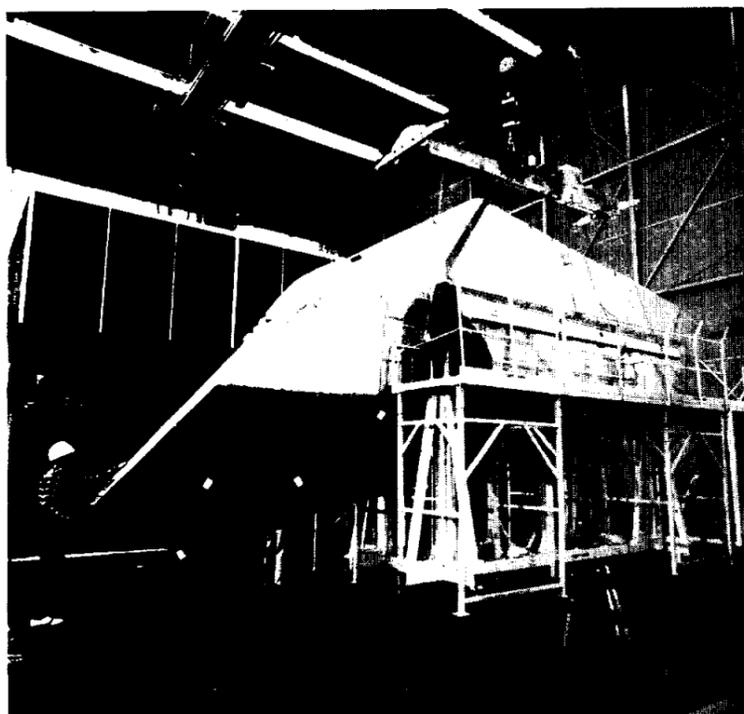
Volleyball, Mikasa, suede VB-2, new \$38, will sell \$16; bike, girl's or boy's, 4 to 9 yrs. old, 1 yr. old, ex. cond., \$15. 486-7831.

1988: A year of new beginnings



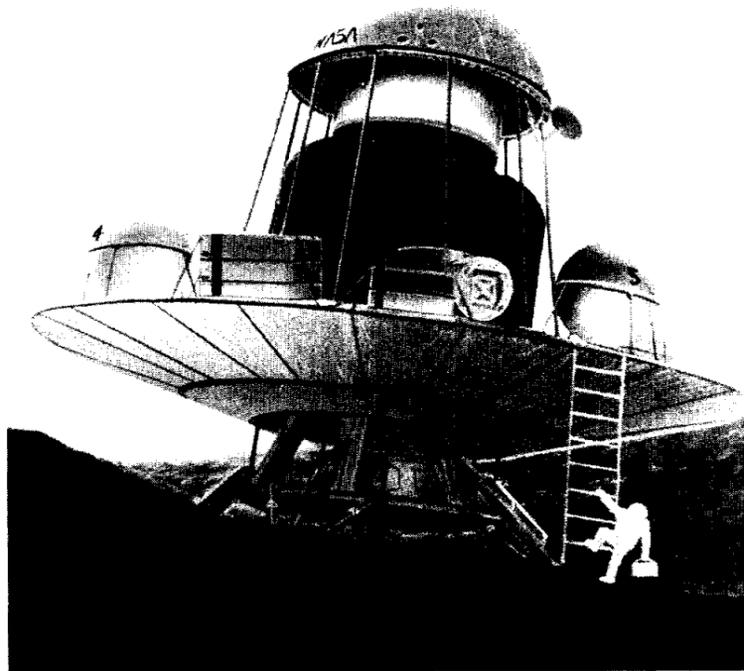
SEPTEMBER: More than two and a half years of painstaking efforts resulted in the return of Americans to space aboard *Discovery* on STS-26, launched Sept. 29 on a near perfect four-day flight. The crew, above, took time during the mission to honor flight controllers at JSC.

DECEMBER: *Atlantis* lifted off Dec. 2 on a mission dedicated to the Department of Defense, to signal the return of regular Shuttle flights. The crew, above, had two traditional preflight breakfasts as uncooperative weather caused officials to scrub launch on the first attempt.



JANUARY: Work continued at Rockwell's Palmdale, Calif., assembly facility on OV-105, the fifth Shuttle orbiter, as technicians prepared the tail and rudder for thermal protection installation.

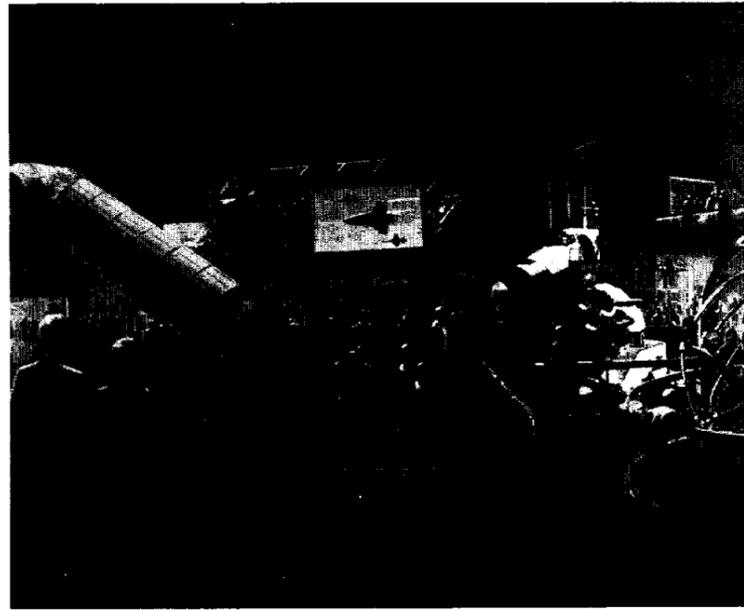
FEBRUARY: President Reagan announced a new "Space Policy and Commercial Space Initiative to Begin the Next Century" on Feb. 11. The policy established a long-range goal to expand human presence in the solar system and maintained a commitment to a U.S. space station. As a result, JSC formed a New Initiatives Office.



APRIL: EVA Retriever, a robot developed at JSC to assist spacewalking astronauts during work outside the space station by fetching dropped tools or performing other tasks, was demonstrated.



MARCH: The crew escape pole, developed and built at JSC, is tested by Navy parachutists.



MAY: Plans were announced for a spectacular new visitor's center to be built at JSC designed by Walt Disney Imagineering and called "Space Center Houston."

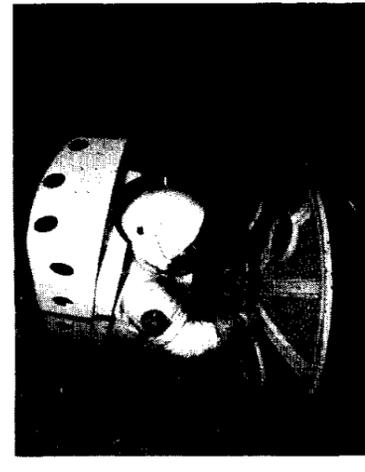


JUNE: An engineer is lowered inside one of the redesigned solid rocket boosters being stacked at KSC for STS-26.



JULY: *Discovery* was rolled out to Launch Pad 39B in a midnight ceremony on July 4.

AUGUST: Propulsion Test Section Chief Brian Morris displays a clamshell-like device used to repair a tiny leak in *Discovery's* Orbital Maneuvering System without moving the Shuttle from the pad.



NOVEMBER: Astronaut Greg Harbaugh tests a concept for a space station airlock hatch in the WETF. The airlock was first McDonnell-Douglas delivery to JSC.

Apollo splashdown parties to be held for 20th

(Continued from Page 1)

One of the events being planned is a re-creation of the Apollo splashdown parties. The party is being planned for Thursday, July 20, at the Gilruth Recreation Center to coincide with the anniversary of the day man first set foot on the Moon.

Kathy Lamb, the anniversary committee member in charge of planning the party, said all JSC employees, their families and the JSC contractor community will be invited to the party, which is expected to have some of the same flavor of the originals.

"It really is going to be such fun," she said. "Some people who were here for the splashdown parties have given me ideas on what really went on. Everyone's getting really excited about it, especially if we can get the crews here."

Lamb said tickets will be sold for the party, but will cost only a few dollars and include the cost of refreshments. The primary purpose of the

tickets will be to give planners an idea of how many people to expect. Tickets are expected to go on sale in June, Lamb said.

The Apollo 20th Anniversary Gala co-sponsored by JSC, the American Institute of Aeronautics and Astronautics and Spaceweek Inc., is scheduled for Friday night, July 21 at the Hyatt Regency Downtown in Houston. The black-tie affair will be similar to the 10th Apollo reunion, with a keynote speaker, dinner and dancing to an 18-piece orchestra, said Ava Lunsford, who is coordinating the gala. It will serve as the culmination of a week-long series of events in Houston.

All of the Apollo astronaut crews will be among the 1,200 invited guests. An as yet unspecified number of tickets will be available to civil service and contractor employees through the JSC Exchange Store. Neither the cost of the tickets, nor the date tickets will go on sale has been established.

A series of noon-time speakers is

being planned throughout the anniversary week in the Bldg. 2 Teague Auditorium, and the Space News Roundup is helping organizers solicit ideas for additional presentations.

Lectures, discussion panels and film clips will look at what scientists thought about the Moon before Apollo, what was learned during the program and how those lessons relate to future plans for human exploration of the Solar System.

Bill Phinney, one of the JSC planetary scientists instrumental in planning lunar missions and analyzing the data obtained, is coordinating the anniversary lecture series.

"The objective is that a lot of this has slipped from people's minds, or they have heard about it piecemeal," Phinney said. "It's an attempt to bring people back to an awareness of just what went on during that program."

Space News Roundup is planning an Apollo 20th Anniversary special issue to be published July 14. The

Roundup is seeking ideas for stories or photographs relating to the Apollo program, and will coordinate the information received with the organizers of the lecture series. Anyone who wants to submit an idea should send a one-page synopsis along with their name, mail code and phone number to: Space News Roundup Apollo Anniversary Issue, AP3.

Phinney said the lecture series organizers are particularly interested in hearing what subjects hold interest for people who were not here during Apollo. He encouraged anyone who has ideas about specific anecdotes, significant problems, key decisions and the people involved in the Apollo program to submit their ideas to the Roundup.

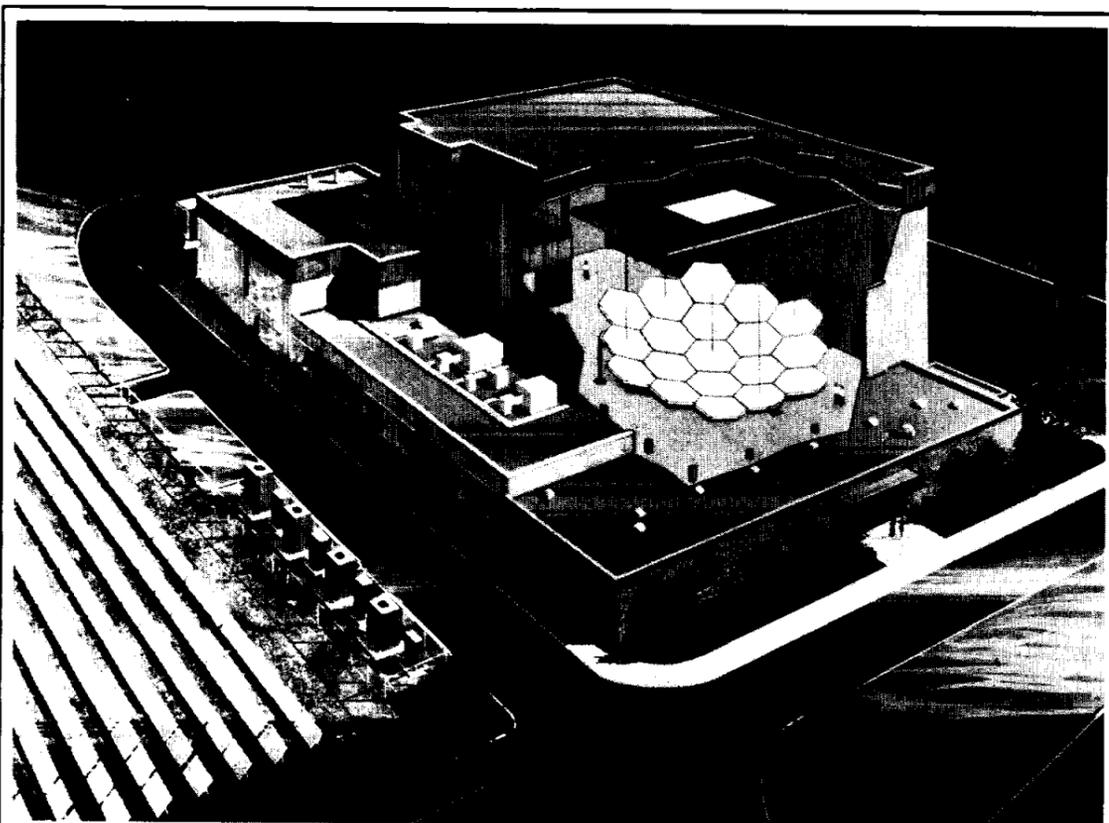
JSC also is planning to give visitors, employees and their families access to some buildings not normally open to the public, said Louis Parker, coordinator of the open house. Tentative dates for the extended open

house are July 22-23.

Facilities under consideration include Bldg. 7A, the Crew Systems Laboratory; Bldg. 9B, the Space Station Freedom mockup; Bldg. 14, the Antenna and Tracking Development Laboratory; Bldg. 29, the Weightless Environment Training Facility; and Bldg. 32, the Space Environment Simulation Laboratory. Other facilities may be added to the open house.

Discussions are under way on the possibility of having special displays on the JSC grounds, such as the Lunar Landing Training Vehicle (LLTV) in which Neil Armstrong trained, and a T-38 trainer used by astronauts to maintain flying proficiency, he said.

Parker said an attempt to re-create the Mission Control Center scene at the time of the Apollo 11 landing is being eyed, as well, and that special Apollo films will be shown throughout the week in Teague Auditorium.



NASA Photo

Lewis Research Center's new Power System Facility includes a 8,300-square-foot high bay area that can be used to test assembled solar dynamic power system components.

Lewis to open space station power system testing facility

Lewis Research Center will dedicate a new Power System Facility (PSF) built specifically to test Space Station Freedom power sources on Monday.

Lewis is responsible for developing the space station's electric power system (EPS), which includes power management, distribution hardware and on-orbit operations support.

The EPS will consist of two types of power sources—photovoltaic solar cells for the initial configuration, and solar dynamic power to be added in the growth configuration.

Lewis' new facility was built at a cost of \$6.2 million and will provide a wide range of electrical power

component and system testing. The PSF includes an 8,300-square-foot high bay main test area with a 55-foot clearance below its 10-ton crane. The test area can be operated as a class 100,000 clean room that is capable of removing 90 percent of airborne particles.

The Solar Concentrator Advanced Development (SCAD) concentrator needed for the growth configuration will be tested in the main test area. It consists of 19 graphite epoxy panels with each panel housing 24 triangular reflective facets. The overall diameter of the concentrator in its assembled form is about 60 feet.

Other space station hardware to

be tested in the new facility includes nickel-hydrogen batteries and power management and distribution (PMAD) system components. The batteries, which will provide power during nearly 6,000 sunlight/eclipse cycles a year, will be tested to demonstrate that the designs exceed the 5-year life and performance goals. The PMAD system will ensure that all of the components of the electrical power system work together.

The PSF engineering support center will monitor on-orbit power system performance, and have the capability to simulate any anomalies experienced in space for real-time analysis and resolution.

Tanner new leader for space station program

E. Ray Tanner was appointed director of the Space Station Freedom Program Office effective Jan. 3, according to James B. Odom, associate administrator for the space station program.

Tanner succeeds Thomas L. Moser, who was appointed deputy associate administrator for space station effective Dec. 1.

Tanner will direct the Space Station Freedom Program Office in Reston, Va., which is responsible for the overall technical direction and content of the space station, including systems engineering and analysis, configuration management,

budgeting and schedules.

The international space station complex, being developed by the United States, nine European countries, Japan and Canada, will permit establishment of a permanent human presence in Earth orbit and includes unmanned scientific platforms placed into polar orbits.

Tanner had been manager of the Space Station Projects Office at Marshall Space Flight Center since August 1988. Prior to that, he was deputy director for space systems in the Science and Engineering Directorate.

Report aims NASA at future

(Continued from Page 1) vehicles," explained Roberts. "But we know hardly anything about mining or about surface habitats or about a host of other things."

The case studies were simply tools used during the past year to determine what is and isn't possible plus what needs to be done today to accomplish any such objective, Craig said. They were chosen to define the spectrum of possibilities for exploration.

"The past year was very, very busy. We spent it trying to figure out what we should study, how we should study it and then studying it," he explained.

NASA has signed memoranda of understanding with other government agencies that have expertise the space agency can use, including the Corps of Engineers and the

Bureau of Mines. One outcome of last year's OEXP work has been a momentum boost to such agencies, heightening their interest as well as the interest of some private concerns, Roberts said.

"They see that the whole agency is studying this, and that it is really a national initiative," he said. "It's becoming more real."

"To most people, working on a tile, or a tire, or whatever on the Shuttle today, going back to the Moon or going to Mars seems a long way off," Craig said. "But it's in the works. We're not an advanced planning office looking 30 years down the road; we just have to find out how to make that first step. And the 1990s will be the preparatory decade, a decade of development, testing and precursor missions."

Space News Roundup

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Editor Kelly Humphries
 Assistant Editor James Hartsfield

1988 a successful, busy year for NASA and JSC

(Continued from Page 1)

The Hubble Space Telescope, a cooperative project with the European Space Agency (ESA) to be launched late this year, successfully completed extensive ground systems tests in June 1988.

Space Station Freedom got its name in 1988, and agreements were signed with U.S. international partners who will cooperate in the development, use and operation of the space station. Government-level agreements between the U.S., nine European nations, Japan and Canada, as well as memoranda of understanding between NASA and the European Space Agency and NASA and Canada were signed Sept. 29.

Negotiations of 10-year contracts with the four primary contractors to design and build Freedom's manned base and polar platform, Boeing Aerospace Co., McDonnell Douglas Astronautics Co., GE Astro-Space Div. and Rocketdyne, were completed in September.

A request for proposals for development of the Flight Telerobotic Servicer (FTS) went out from Goddard Space Center in November, and responses are due by Tuesday. Contractor selection is slated for June.

Prototype airlocks for the space station from McDonnell Douglas were delivered to JSC for testing in the WETF during 1988, and a prototype thermal management system was

installed in a JSC vacuum chamber.

A JSC crew training facility, Bldg. 9B, where astronauts will rehearse space station assembly flights and mission operations, was dedicated in November.

NASA's tracking and communications capabilities were bolstered in 1988 by further development of the Tracking and Data Relay Satellite System (TDRSS). Foremost was the successful launch and deployment of TDRS-3 as the primary payload of STS-26.

TDRSS now will provide communications with Earth-orbital spacecraft for about 85 percent of each orbit, contrasted with about 15 percent provided by NASA's worldwide

ground network. TDRSS also will facilitate a much higher information flow rate between spacecraft and the ground.

On Oct. 27, 1988, NASA selected General Electric Co. to provide communications hardware and software for a second TDRSS ground terminal to be constructed at White Sands.

NASA's Lewis Research Center, Cleveland and its industrial advanced turboprop team were the recipients in May of the 1987 Robert J. Collier Trophy. The trophy is awarded annually by the National Aeronautic Association for the greatest achievement in aeronautics or astronautics in America. NASA was selected for developing the technology for and

testing of advanced turboprop propulsion systems that offer dramatic reductions in fuel usage for future subsonic transport aircraft.

The world's fastest supercomputer, a Cray Y-MP, was installed in the Numerical Aerodynamic Simulation Facility at NASA's Ames Research Center, Mountain View, Calif. Capable of exceeding 1 billion computations per second in sustained operation, the computer's vast computational capabilities will permit solutions to aerodynamic problems far too complex to be handled by previous computers. The Cray Y-MP will replicate aircraft and spacecraft flight by virtually "flying" the craft inside the computer on a three dimensional grid.