

Lyndon B. Johnson Space Center Houston, Texas



Boat rocking JSC engineers are getting ready to float a full-scale mockup of the Crew Assured Return Vehicle. Story on Page 3.



Station-ery sim

Flight Control Room 2 was the site of the first bonafide paper simulation of Space Station Freedom. Photo on Page 4.

Space News Roundup March 27, 1992

JSC contributors can be sure of Combined Federal Campaign

the Combined Federal Campaign and therefore to the United Way of the Texas Gulf Coast - can be sure that the local organization is not mixed up in the controversy surrounding the national campaign.

CFC officials past and present said this week that the United Way of the Texas Gulf Coast is a separate, autonomous organization from the United Way of America, with its own board of directors made up of local community leaders.

United Way of America President

JSC employees who contribute to William Aramony resigned last month after revelations regarding improper salary and management

> In a letter to "friends of the CFC," Bill Schwanekamp, president of UWTGC, and Mary Koffend, 1991 CFC chair, said the local campaign took immediate action when the allegations concerning Aramony were brought to light. They expressed strong concerns to the national board and commended the board for its thorough investigation and timely action.

In the meantime, Schwanekamp and Koffend wrote, UWTGC is not paying any dues to United Way of America. The board and its volunteers will reassess their continued relationship with the national organization when the investigation's findings are reported back to

JSC Acting Director Paul J. Weitz said his experience as 1990 CFC chairman makes him confident that the CFC and UWTGC are running the local effort efficiently and effectively.

"I worked closely with the administrative staff of the United Way of the Texas Gulf Coast during my year as Combined Federal Campaign chairman," Weitz said. "Those people, and the thousands of volunteers who work with them, are extremely conscientious. They are doing the best they possibly can to put the hard-earned money you donate to good use for those less fortunate. I strongly urge everyone to continue to support the CFC this year."

UWTGC's record was substanti-

ated by an OPM-administered audit in 1991, Weitz added.

UWTGC plays two roles in the CFC, as administrator and as a participant. Each year, UWTGC must apply to run the CFC, and is selected by the Federal Executive Board Policy Committee. UWTGC also must apply for eligibility to participate with the FEB.

"First and foremost, federal employees should remember that the Combined Federal Campaign is a campaign run by and for federal

Please see CFC, Page 4

ATLANTIS

Americans favor strong space effort

By Brian Welch

Americans continue to support a strong civilian space program and list the space shuttle as one of the projects they most admire, according to the findings of a nationwide poll commissioned by Rockwell International Corp.

The poll found that over threequarters of the American public approve of the space program in general, and a record number-63 percent-would approve of spending "whatever is necessary" to maintain U.S. preeminence in space.

The survey, conducted for Rockwell by Yankelovich Clancy Shulman, is based on telephone interviews with 1,006 randomly selected voters. It has a margin of error of plus or minus 3 percent. This is the 15th such poll sponsored by Rockwell over the last 14 years.

"Americans believe that the space program provides meaningful benefits for the country," said Yankelovich Senior Vice President Elizabeth Ellers, "and support for U.S. leadership in space is at an all-time high."

Support for the Space Shuttle Program is widespread, with 92 percent agreeing that the shuttle "is a remarkable achievement and a source of pride for the United States." When asked if the space program should continue to emphasize a human presence in space, 80 percent said yes.

Please see AMERICANS, Page 4



STS-45 Commander Charlie Bolden and Mission Specialist Dave Leestma photograph the Kamchatka Peninsula in Asia from Atlantis' aft flight deck during their first day in orbit.

Atlantis crew 'oohing, aahing' over auroras

The STS-45 crew put on a cosmic light show that had everyone onboard Atlantis "oohing and aahing" as the Atmospheric Laboratory for Application and Science continued its studies of the Earth's atmosphere and its relationship to the Sun.

Ten minutes of black-and-white video showed flight controllers in the Mission Control Center at JSC and the Payload Operations Control Center at Marshall Space Flight Center the artificial aurora. The aurora

was created Wednesday when Mission Specialist Mike Foale fired a Space Experiments with Particle Accelerators electron beam into the Earth's atmosphere.

"Commander (Charlie) Bolden reports the phaser is working and in operation," added Mission Specialist Dave Leestma in a reference to one of the weapons used by the starship Enterprise in the television series Star Trek.

"We're seeing your beam, reported CAPCOM Jim Halsell. "We're all hiding under our consoles down here.'

Scientists on the ground measured the intensity of the artificial auroras and those of natural auroras with the Atmospheric Emissions Photometric Imaging instrument. By comparing the artificial and natural auroras, they hope to learn more about the complicated interaction of Earth's magnetic field and atmosphere with solar particles that produce the brilliant light displays.

"We've got everybody oohing and aahing," reported Payload Commander Kathy Sullivan as she and Payload Specialist Dirk Frimout observed the natural auroras Wednesday.

The aurora observations involved just two of the 14 experiments that make up the challenging mission to investigate the interactions of the Earth's atmosphere and the Sun.

Atlantis lifted off from Kennedy Space Center's Launch Pad 39B at 7:13 a.m. CST Tuesday, delayed one day by gaseous hydrogen and oxygen leaks that were detected during the initial attempt to fill the

JSC pre-integrated truss team earns station award

A JSC team that developed the concept of a pre-integrated truss has become the first group of civil servants to receive the Space Station Freedom Award of Merit.

Engineering's Structures and

Mechanics Division Space Station Freedom Pre-Integrated Truss Concept Development Team earned the award for its analysis of five alternatives to assembly of the space station framework in orbit. The effort came as the *Freedom* program searched for an assembly method that was less costly and complex, required fewer shuttle launches and space

The concept that rated highest and was adopted for the restructured space station program in 1990 - was a ground-assembled truss with preintegrated and ground-checked systems that could be berthed together in space over the nose of the orbiter. A simplified, rail-mounted mobile trans-

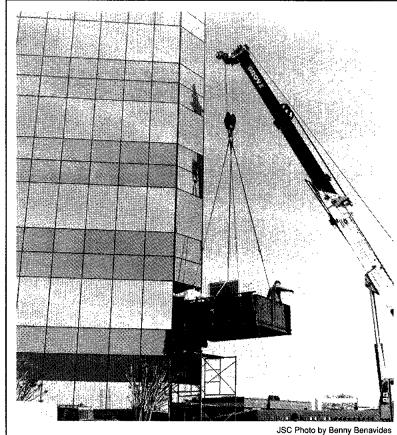
walks, and needed less maintenance.

porter system also was part of the concept.

Team members included Reginald B. Berka, Edgar O. Castro, Gregg A. Edeen, Allan D. Gist, David A. Hamilton, Jon B. Kahn, Kornel Nagy, Timothy E. Pelischek, Steven L. Rickman, Irene E. Verinder, Donald C. Wade and Clarence J. Wesselski.

The Award of Merit, administered by FREEDOM the Manned Flight Awareness Program, is designed to emphasize efforts that enhance the development and performance of Space Station Freedom such as improvements in design, services, productivity, error identification and correction, or preventive action.

The award consists of a special certificate, a letter of commendation and a Space Station Freedom pin, and is presented by an astronaut, the administrator for the Office of Space Flight or the director of the Space Station Program.



the computer will support the SSE, MODBM and the Flight Table Data System, which provide the tools, procedures and documentation the

uses 256 megabytes of main storage and 48 parallel channels to process more than 80 million instruc-

The SSE Project team includes

Powerful computer joins station team

Please see ATLANTIS, Page 4

A powerful new addition to the Space Station Freedom team moved into facilities near JSC last week.

Workmen moved a new IBM 9021 mainframe Model 580 computer that will serve as host for the Space Station Freedom Software Support **Environment and Master Object** Database Management System onto the second floor of the Lockheed SSE Facility at 1150 According to Frank Barnes,

Lockheed's SSE Program director,

space station work packages need to develop Freedom's software. The state-of-the-art mainframe

tions per second. Lockheed, PRC, Loral and SAIC.

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350. EAA Bluebonnet Trip (April 4 and 11, bus leaves from Bldg. 25 parking lot at 7:30

a.m., returns 5:30 p.m.): \$22 per person. EAA NASA Night at Astroworld (6 p.m.-midnight, April 24): first 5,000, \$8.50; rest

\$10.50. Limit 8.

EAA Astros vs. Atlanta Braves (7:35 p.m. April 7, Astrodome): \$8.

EAA 1992 Tour of World Figure Skating Champions (8 p.m. June 4, Summit): \$30. EAA Deep Sea Fishing (April 25, Galveston): \$45 to fish; \$20 to ride.

EAA Easter Egg Hunt (10 a.m. April 11, Gilruth): children, \$4; adults, \$2.

EAA Country Western Dance (7 p.m. April 18, Gilruth): \$12.50.

EAA Shrine Circus (5:30 p.m., April 12, Astroarena): \$4.

Sea World, \$18.90; Astroworld, \$16.95; Waterworld, \$9.50; and Six Flags, \$14.95. Movie discounts: General Cinema, \$4; AMC Theater, \$3.75; Loews Theater, \$4.

The following discount tickets will be available soon:

EAA Easter Egg Hunt, April 11.

Galveston Home Tours: May 2, 3, 9, 10.

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

Weight Safety - Required course for employees wishing to use the Gilruth weight room. The next classes will be from 8-9:30 p.m. March 31 and April 14. Cost

Defensive driving — Course is offered from 8 a.m.-5 p.m., April 18. and May 9. Cost is \$19.

Aerobic dance — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32.

Aikido — Martial arts class meets Tuesdays and Fridays. Cost is \$35 per month. Scuba — Scuba classes will meet at 6:30 p.m. Tuesdays and Thursdays beginning April 9. Cost is \$190 plus \$20 for the open water dive trip. Personal equipment costs about \$90.

Volleyball workshop — Eight-week program will meet Saturdays beginning March 21. Open beginner classes will meet from noon-2 p.m. Mixed advanced classes will meet from 2-4 p.m. Enrollment is limited to 24 students. Cost is \$25.

Softball tournament — Men's pre-season open "C" softball tournament will be April 4-5. Entry deadline is 7:30 p.m. April 2; cost is \$95 per team.

Intercenter run - Runners in the 10-kilometer or 2-mile races may turn in their times for the annual Intercenter Run at the Rec Center throughout April.

Fitness program — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Wier, x30301

JSC

Dates & Data

Today

Cafeteria menu — Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

Sunday

Showcase '92 — The University of Houston-Clear Lake will host its fifth annual spring open house, Showcase '92, from 1-4 p.m. March 29 in Atrium Il of the Bayou Bldg. Representatives from academic areas, admissions, financial aid and student organizations will be available. For more information, call 283-2500.

Monday

Cafeteria menu — Special: meatballs and spaghetti. Entrees: wieners and beans, round steak with hash browns. Soup: chicken noodle. Vegetables: okra and tomatoes, carrots, whipped potatoes.

Tuesday

National Space Symposium -The U.S. Space Foundation's Eighth National Space Symposium will be held March 31-April 3 at the Broadmoor Hotel in Colorado Springs. Nine U.S. astronauts and one French cosmonaut are scheduled to participate. For more information, call 799-550-

Cafeteria menu — Special: fried chicken. Entrees: beef stew, shrimp creole, sweet and sour pork chop with fried rice. Soup: beef and barley. Vegetables: stewed tomatoes, mixed vegetables, broccoli.

Wednesday

NCMA meets — The National Contract Management Association

will meet at 11:30 a.m. April 1 at the Gilruth Center. Darlene Druyun, NASA associate administrator for procurement, will speak. For tickets or information, call Lucy Yates, x31864.

Cafeteria menu — Special: Swiss steak. Entrees: fried perch, New England dinner. Soup: seafood gumbo. Vegetables: Italian green beans, cabbage, carrots.

Thursday

Cafeteria menu — Special: stuffed bell pepper. Entrees: turkey and dressing, enchiladas with chili, wieners and baked beans. Soup: cream of chicken. Vegetables: zucchini squash, English peas, rice.

April 3

Cafeteria menu — Special: Salisbury steak. Entrees: baked scrod, broiled chicken with peach half. Soup: seafood gumbo. Vegetables: cauliflower au gratin, mixed vegetables, buttered cabbage, whipped potatoes.

April 10

STI conference — JSC will host the 1992 NASA Scientific and Technical Information Conference April 29-May 1 at the Nassau Bay Hilton. Deadline for registration is April 10. The agencywide conference will focus on issues relating to the production, dissemination and retention of NASA scientific and technical information. For more information, call Patti Kanz, x31197.

April 11

Star party — The JSC Astronomical Society will sponsor a public star party from dusk until 10:30 p.m. April 11 at Challenger 7 park, if the sky is clear. Observations of the Moon, Jupiter and the Orion Nebula are planned. For more information, call Bill Williams, 339-1367.

PSI meets — The Clear Lake/ NASA Area Chapter of Professional Secretaries International will present its third annual seminar "Making the Most of You" at 8 a.m. April 11 at San Jacinto College, South Campus Student Center, 13735 Beamer Rd. Cost for members is \$30; guests \$35. Frankie P. Swenholt, a human resources development specialist, will discuss self esteem. For more information, call Elaine Kemp at x30556 or Bernice Woolsey at 334-5474.

April 14

ISSA meets — The Texas Gulf Coast Information System Security Association will meet at 11:15 a.m. April 14 at the Holiday Inn on NASA Road 1. Jack Garman, JSC Information Systems deputy director, will speak on the "Senior Management View of AIS Security." Coat is \$10 for members, \$12.50 for guests. For information or reservations, call Emily Lonsford, 333-09222.

April 17

UNIX meeting — The JSC UNIX Systems Administration Group will meet at 2 p.m. April 17 in Bldg. 12, Rm. 256. Dan Benbenek will discuss "Connecting to JESNET." For more information, call Mark Hutchison, x31141.

April 21

Picnic committee meets — The 1992 JSC Picnic Committee will meet at 4:30 p.m. April 21 at the Gilruth Center. For more information, call Ginger Gibson, x30596.

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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. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Lease: Webster/Ellington condo, lg 2 BR, W/D conn, \$475/mo. Dave, x38156 or Herb, x38161. Lease: TH, 2-2.5, garage, fans, \$850/mo. Dave,

x38156 or Eric, x38420. Sale: Friendswood, 2 lots, 0.95 ac., all util, \$26K/\$29K or \$39K/both. Ron, 996-9724.

Sale: Countryside, 3-2.5-2A, 2-story, lg corner lot, cov deck, all BRs up, int util rm, \$66.9K. 554-

Sale: University Place TH, 2-2.5, detach garage, 2-story, corner unit, custom drapes, blinds, fans, FPL, assum w/approval. 283-5894 or

Rent: Timeshare condo, \$600/wk anywhere in the world. 286-8417.

Sale: Baywind I condo. 2-1. new paint/carpet/tile, W/D, \$35.5K. 532-4628.

Sale/Lease: Nassau Bay TH, 4-2-2, over 2000 sq ft, master down, lg garage, 2-sty den, deck, atrium, new carpet, roof, tile, drapes, paint, no yard maint, no pets, 1 to 2 yr lease, \$119.9K or \$1250/mo. Jerry, x38922 or 488-5307.

Sale/Lease: Middlebrook, 3/2/2A, plus study, open plan, wet bar, garage opener, no pets, \$85K or \$875/mo. Michael, x37371 or 480-2152.

Sale: Egret Bay condo, 2-2, cov parking appli, blinds, fans, ex cond, \$46K. 283-0459 or

Rent: Barringer Way, 2-1, W/D conn. pool, stor area, no pets, ex cond, \$425/mo. 486-2048.

Sale: Friendswood, 3-2-2, 2 living areas, DR, Ig master, parquet entry, wood deck, \$63,5K, 482-

Sale: Scarsdale, 3-2-2A house, quiet, walk to elem schl, \$59.9K. Linda, 485-3037

Lease: Heritage Park, 3-2-2, cul-de-sac, new carpet, fence, FPL, Geno, 280-1505 or 992-2156. Rent: Lake Travis cabin, priv boat dock, C/AH, fully equip, accom 8, spring/summer, \$325/\$425/wkly, or \$80/\$85/dly. 474-4922.

Sale: Lake Livingston, 2 lots, 1/2 mile from water, \$5K. James, x36666 or 487-5730. Lease: Univ. Trace condo, 1BR plus study,

upstairs w/balc, W/D, alarm, appli, all elec, avail immed 282-4616 or 488-2946

Sale: League City lot off 646, 5 acre or more, investment opportunity. 286-4774. Rent: 5-Star condo, Cancun, Mexico, beachfront, avail anytime, \$450/wk OBO. Phong.

Rent: 5-Star condo. Cancun. Mexico. beachfront, avail anytime, \$450/wk. Katie, x33185.

Cars & Trucks

'78 Chevy Caprice Classic, totaled but eng/trans still good, eng has 67K mi. Joel, x35744

'90 300ZX, red, loaded, \$23K. Howard, x36650 or 471-1485. '79 XPlorer 228, Dodge chassis w/360 eng,

self-contained, A/C, bath, refrig, stove, good cond,

'83 Celica GT, 93K mi, good cond. 286-2270.

'78 Porsche 928, auto, brwn w/leather int, 75K mi, ex cond, \$8.9K. Bill, x39980.

'88 Mercury Cougar, no sunroof or keyless entry, 5.0 eng, leather int, loaded, ex cond, \$6.7K. John, x39357 or 486-5203.

AM/FM, clean, \$1.8K. 326-2307.

'86 Plymouth Voyager, new tires, eng, loaded, \$4.5K. Tom, x31252 or 482-2425. '88 Ford Taurus GL station wagon, new brakes, loaded, 71K mi, ex cond, \$4.5K. Bob, 488-9080

ext 3279. '68 Mustang, 289, West Coast no rust, auto, A/C, AM/FM/cass, new trans, int, tires, paint, radiator, brakes, fuel pump, rebuilt carb, \$3750

OBO. Kenny, x36566 or 777-1861. '76 Coup de Ville Cadillac, 2 dr, silver, 67K mi, \$850. (409) 938-4793.

'91 Pontiac Trans Sport SE minivan, wht, 3 yr new car warr, loaded, 4K mi, \$16.5. Alan, x30008

'92 Chev Cavalier, 4 dr, Maui blue metallic, auto, A/C, anti-lock brakes, P/L, AM/FM/cass, 5.9K mi, \$10K. x30258.

'87 Mustang GT, red, auto, A/C, sun roof, alarm, stereo tape, new tires, low mi, ex cond, \$7875. x36090 or 488-7427.

'74 Corvette Stingray, competition orange, saddle int, numbers match, good cond, BO. 474-

'74 Plymouth van, seats 8, BO. Ray, x30823 or '88 Ford Tempo GL, auto, 4-dr, A/C, cruise

control, AM/FM, P/S, P/B, 74K mi, ex cond, \$3.8K. x37990 or 996-1046. '85 Chevy Cavalier, 4 dr, 4 cyl 2.0L, auto, new

tires, brakes, 75K mi, ex cond, \$2.4K. 488-5522. '79 VW Rabbit, 4 dr, 4-spd, A/C, needs some work/dent in rear door, \$600. Sharon, x31754 or

'85 Toyota Tercel station wagon, 5-spd, 112K mi, ex cond, \$1.6K; 81 Toyota Corolla station wagon, 5 spd, 76K mi, good cond, \$1.2K. Mike, x34378 or 486-4983.

'80 Oldsmobile Cutlass, 4 dr, V-6, 125K mi/17K mi on rebuilt eng, good cond, \$2.5K; '82 Chevy Monte Carlo, 4K mi on rebuilt eng, good cond, \$2K. Mike, x34378 or 486-4983.

'85 Toyota, MR2, 5-spd, sun roof, 81K mi, \$3.7K. J. Craig, 283-5311 or 420-2936.

'88 Chrysler Le Baron, turbo, conv., auto, leather int, toaded, low mi, \$8.5K, 748-8739.

'87 Chevy minivan, V-6, rear A/C, 8 passenger, factory mags, tinted windows, loaded, records, GM repair manuals, \$7.5K, x38785 or (409) 945-

Boats & Planes

Hobie 16, multicolored sails, blk anodized alum frame, double trapeze, righting sys, galv trlr, spare tire, custom cat box, 2 harnesses, \$1.2K. Carla, x32959 or 992-4137.

'82 Citation 17' boat, 125hp Volvo I/O, new int. floor, newly painted trlr, boat in ex cond. \$4K OBO. Monte, 280-2532.

'83 Skilfish, 16', 115 0/B, trolling motor, depth finder, casting chairs, garage kept, \$3.9K. x31497 or 554-4215 75 Oachita 16' fiberglass bass boat w/85hp

Johnson, Holsclaw tilt trlr, depth finder, ex cond, \$1650. x34784 or 482-5190. Hobie 14' sailboat, trlr, trampoline and tequila

sunrise sail in ex cond, \$600 OBO. Chuck, 482-

'71 Columbia 22' sailboat, sails, anchor, Marine

batt, no motor, \$900, 334-2007.

'76 Hustler bass boat, rebuilt 50hp Evinrude, Dilly trlr, trolling motor, bilge pump, 2 batt/tanks, \$1K. 554-2845.

Windsurfing equip, '90 Obrien 9.2 epoxy lite shortboard, \$275 OBO; '88 Mistral 8.86 Hookipa '77 Ford F100 PU. V-6, short-bed, 3 spd, short- board, \$250 OBO. 486-5734.

Alumacraft 18' bass boat, 90hp Yamaha, ex cond, \$9K. Howard, x36650 or 471-1485. '89 Obrien excellerator windsurfer, 10' 4", 180 ltrs, ex cond, 5.4 Obrien sail, 2 Obrien mast

Longshaft O/B aux 6hp motor, ex cond. 485-

Audiovisual & Computers

bases, \$325, x38311 or 992-5832

IBM PS/2 model 25 computer, 286 IREM, monochrome display, ex cond. \$500 OBO. 482

Children's Socrates Educational Video System, preschool touch-pad, mouse palette, 5 SW

cartridges, \$100. 488-9080 ext 3627.

Apple IIc, 12" moni, ext dr, modem, mouse w/SW. \$425 OBO.

Panasonic Business Partner FX-1750 286 computer, 2 yrs old, 12' monochrome moni, 20 MB HD, 1.2 MB, 3.5-in, 640KB, 5.25" drives, 101 key enhanced kybd, 640KB RAM, 1 serial/parallel port, DOS 3.3, WP 5.1, Harvard Graphics, \$700

OBO. x38628. IBM PS1-286, HI-RES mono, 1 mg RAM, 1.44 mg FD, 30 mg HD, 2400 baud, int modem, MS works 2.0, comm SW, manuals, ex cond, \$625.

Tandy IBM PC 640K dual 5.25" dr, color moni, prtr, \$1K OBO. 332-3033.

Paradox 3.5 w/orig registr card, manuals, \$350. 280-1832 or 480-9620. Panasonic Business Partner EX600 IBM

compatible, monochrome moni, ext kybd, 30 MB HD, 640K RAM, manuals, DOS installed, 2 FD, modem, graphics card, \$700, 488-5564.

Photographic Sears SLR 35mm camera, case, bag, 135mm telephoto lens, 55mm lens. Ed, x31452 or 486-

Musical Instruments

Antique upright piano by John Spencer & Co, London, w/38" bench w/stor, good cond, \$600. 283-1834 or 332-4807.

Pets/Livestock

Mini-lop and American fuzzy-lop rabbits, all young, \$20-\$40/ea. Gailo, 554-6200. Free 3 yr old Vizsla. Mark, x38013 or 992-4132.

AKC reg Pomeranian stud svc, will take fee or pick of litter. Katie, x33185. Adult female stray cat. Vince, x31470 or 532-

AKC reg mini dachshund, 2 separate litters, reds/black and tans, born 2/3/92, males/females, shots, wormed, \$200/ea. 337-1896; AKC reg male dachshund, red, 2 yrs old, \$100. 337-1896.

Household

Four piece qn BR suite, \$350; matt set, \$40; chest, \$45; A/C unit, \$50; office desk/chair, \$35; bookcases, chairs, carpet. 286-4774. Amana Touchmatic microwave, model RR-9.

482-8820. Natuzzi blk leather sofa, chair, ottoman, 1.5 yrs old, ex cond, \$1.6K OBO, 283-8109 or 282-2040. Sears Homestead twin hdbd, ftbd, rails, maple

finish, \$60, 333-2830.

Refrigerator/freezer, brwn, \$175. Joel, x32569. Rattan LR furniture, couch, love seat, coffee table, end table, ex cond, \$375. Allan, 472-7526. Traditional camel back couch/matching chair,

navy blue, \$250/set. Lisa, 474-5609. Frigidaire refrig side-by-side, 23 cubic ft, almond, \$300; rattan desk/matching chair, ex

cond. \$100, 480-0527 Frigidaire full sz W/D, good cond, can deliver,

\$150. 482-3428. Dinette set, round oak w/leaf, 4 chairs, \$100; lg dresser w/2 mirrors, \$30; freezer, sm upright, \$35; rocking chair, \$20; elec dryer, \$100. 283-5514.

Rocker recliner, \$150, solid wood coffee/end tables, \$125; wicker room divider, \$50; video tape holder, \$5. x31279. GE sm elec dryer, ex cond, \$75, 333-9246. Sofa, love seat, 3 pc wall unit, \$125/all; men's

3-piece suit, gray pinstripe, ex cond, \$25; Tike Bike, \$2; red tricycle, \$8; kitchen table, 4' x 5', 4 chairs, \$70. Wayne, 282-4349 or 480-3157. Free blue couch and vinvl swivel chair.

green/brwn; weight bench, \$20. Bill, x30164

Lost/Found Found ladies bracelet, March 4, 1992, Wednesday, Bidg 1, conference rm, room 560.

x33937.

Wanted Want nonsmoking roommate to share home in CL, \$250/mo plus util. 286-5248.

Want computerized stair stepper, Stairmaster or Alpine. Richard, x30074 or 470-9994. Want child's bicycle trlr or seat. Steve, x36301

or 894-4323. Want male/female roommate to share 2-story 3-3 townhouse in Friendswood, \$300/mo plus 1/2

util, Janet, x35000 or 482-4358. Want sm trlr to haul 12' Quachita boat with O/B, fresh water usage preferred. x33611 or 337-7082. Want Bakelite plastic jewelry, circa '30-'50. Pat, 333-4609.

Want twin bed. frame/matt/box springs, good cond. Jeff, x333-7010.

Want male AKC reg cocker spaniel for breeding. 996-9415. Want good used encyclopedia. 867-8850.

Want to buy U2 tickets for Houston concert. John, x39357 or 486-5203. Want to buy U2 tickets, x33042. Want roommate to share 3-2 house in Friendswood, furn except for BR, maid svc

provided, \$250/mo plus 1/3 util. Jay, x35814 or

Miscellaneous

992-3149.

Regulation sz pool table, 4' x 8' disassembled, \$300 OBO. Bob, 488-5614.

Bay Area Aero Club for low-cost flying, FAA certified instructors, rent from 9-plane fleet, Earle, Men's 14K gold nugget ID 35g bracelet, was

\$1K, now \$495. Mike, x38169 or 482-8456. Four antique bentwood chairs, ex cond, \$100/all: sm barometer w/temp/humidity meters,

\$10; new men's watch w/sm diamond, interlock band, reproduction, \$60; mink stroller, 3/4 length, ex cond, \$950. 488-5564. Guitar, \$75; weight bench and weights, \$60; Technics turntable, \$25, Steve, x38867.

Obrien slalom ski, 167cm, ex cond, \$150; 1 pr Cut-N-Jump skis, \$75; 1 pr Connely skis, \$50; ski vest, \$35; 2 adult life preservers, vests, ski

harness, \$5/ea; 3 used BF Goodrich T/A radials. 255/60 SR15, 2 for \$15/ea, 1 for \$10. Keith, x35191 or 332-5170.

Rear bag mower w/mulching blade, ex cond, \$120. 333-6083 or 474-5272. Sears 5hp rear tine tiller, 17" wide path, 1 yr old,

\$400. Debra, x35245. Chain link dog kennel w/gate and roof, 6' x 6' x 6', ex cond, \$150; concrete blocks, 12" x 12" x 2",

\$1/ea. 489-9337. Roundtrip airline ticket, Continental Airlines, anywhere in the Continental U.S. \$200. x37432 or 286-6402.

Wet suit, 1/4" thick full med suit, ex cond, \$50 OBO. Monte, 280-2532. Free SPA, you remove and replace deck, cover

extra. 488-0217 Sears rowing exer, ex cond. Ed. x31452 or 486-

Craftsman lawnmower, 3.5hp, rear bag push, elec start, ex cond, \$95; gas edger, 1.5hp, 2 cycle, \$40. Alan, x30008 or 286-0234. Superlock serger, wht 208, ex cond, was \$700,

now \$500. Marilyn, 488-0059. Walther auto pistol, 32 cal, 9-shot, 2 clips, in box w/manual, \$265. John, x36965 or 332-1570. Kenmore dryer, \$100; elec H2O heater, BO;

Commodore 64 computer, BO; double stroller, \$75. Ray, x30823 or 554-5434. Shoei Britestripe, Hawk full-face motorcycle

helmet, med, wht, \$75. x39572 or 480-4780. Gold Figaro 14K bracelet, incl padded case. Two roundtrip tickets fm Ellington to Detroit,

5/22-5/25, 1 male/1 female, \$278/ea. 334-6220. President/First Lady Gold Charter membership, all inclusive, \$50/yr renewal, \$750 OBO. Allen, x30791 or 486-4558.

dues pd thru Nov '93, then \$6.30/mo, incl free babysitting and 2 day advance racquetball reservations, \$850, Richard, x30074 or 470-9994. Brass machine screws, #2 thru #5, sell or trade

President/First Lady Gold Charter membership,

for brass wood screws; also stainless steel screws and bolts, 283-5600. Signed 1st edition Arthur C. Clarke books, "The Promise of Space" and "The Coming of the Space

Age", \$50/ea OBO. 480-1024. Putter, Tommy Armour Zaap, \$55; irons, 2-PW, Palm Springs Top Club, \$160, Tim, x36324. Toys, bought and sold, Japanese tin

astronauts, robots, and space vehicles; also want tin autos from 50's and 60's. Todd, x30251. Pair Raichle RX860 ski boots, good cond, \$80 333-7444 or 480-7640.

Two country style cushions, \$4; la wht desk, \$40; 4-slice toaster, \$4; 2 framed Mickey Mouse posters, \$9/ea; World Book reading skills, \$15; 20 cups/saucers, \$15; punch bowl/cups, \$4; "Elvis is

Alive", book and tape, \$2. Wayne, 282-4349 or 480-3157. McCulloch 7.5hp boat motor, \$100; kg sz

waterbed w/side pads, \$100. 992-4628. Lange Zs ladies ski boots, sz 9, \$65; Casio MT-500 PCM kybd, 49 mid keys, drum pads, w/pwr pack, \$65; new 4" x 6" 3-way car speakers, \$20; Knox 40" project screen, \$5. 334-2612.

New R/C XCELL-60 helicopter w/Enya eng, assembled, \$650; wooden bar stool w/back, \$15.

Signet Centurion 10 spd men's bicycle, blk frame, ex cond, \$150; ivory and brass day bed, \$150, 282-4596 or 992-3861.

Pear-shaped diamond on 7mm flat gold band, 52 pt, VS1 clarity, G/H color, \$1K. 996-9415.

Rocking the BOAT

Homemade wave tank, models pave way for full-sized tests of Assured Crew Return Vehicle

The date is September 30, 1999. The space shuttle stands poised on the launch pad at Kennedy Space Center ready for the final baselined assembly mission for Space Station Freedom.

The cargo for this flight, known as Mission Build-17, is the key to making the orbiting laboratory truly self-sustaining.

Tucked in the payload bay is the Assured Crew Return Vehicle, which will be docked to the top of the station and allow up to eight people rapid escape from the facility in the event of an emergency.

The shuttle can undock and return to Earth leaving an international crew of four to man the orbiting outpost conducting experiments in life and materials sciences.

By Kyle Herring

he date is March 12, 1992. At JSC, a group has assembled to christen a BOAT. This BOAT won't set sail, as it were, until next month in the Weightless Environment Training Facility.

BOAT, which stands for Bouyant Overdesigned ACRV Testbed, is a test article for the space station rescue vehicle. It is designed for three phases of testing during the next several months ending with water testing at the Offshore Technology Research Center at Texas A&M University.

The test article was designed and built here by a large group of engineers and technicians from across the JSC family for a fraction of the cost of having it built outside.

"We figure it would have cost about \$50,000 for the design work and another \$150,000 to \$200,000 to have it built elsewhere," said Brian Kelly, ACRV Project Office lead on the BOAT test. The total cost of the in-house project was \$45,000.

The key to the success and low cost of the design and development was teamwork between NASA offices not particularly used to working together closely on one project, including assistance from the safety people who "saved us a lot of time and effort," said Bob Ess, principle investigator for the project from Engineering's Navigation, Control and Aeronautics Division's Aeroscience Branch.

In addition to the ACRV Project Office, employees from the Systems Engineering; Navigation and Control and Aeronautics; Structures and Mechanics; Man-Systems; Medical Sciences and Technical Services Divisions took part in designing and building the BOAT. Also, the Procurement Office

eased the process of working with Texas A&M for use of the OTRC.

"All of those offices were part of the team from the very beginning," Kelly said.

The full-scale, weight-representative test article will undergo three phases of egress and flotation testing during the next two months. Phase 1 begins immediately and consists of dry-ground evaluations of personnel validating egress procedures. Phase 2 will be divided into unmanned and manned testing in Bldg. 29's WETF. This phase is planned to begin later this month.

The final test phase is scheduled for late April and May at Texas A&M using a high-fidelity wave machine that was built to test platform design and stability for off-shore oil rigs. NASA will be one of the first big clients to use the OTRC, Kelly said, and will concentrate on open-water crew rescue simulations under a variety of sea-state conditions. The OTRC, which consists of 48 computer-controlled

hydraulic actuators that create and control the wave state, will allow the team to evaluate the ACRV testbed under controlled conditions.

"In the ocean we can't control the wave state and safety is a concern for the early testing," he said.

The BOAT was conceived during a meeting about a year ago when several people joked about using Waterworld's facility near Astroworld for such testing because its wave pool could generate "seastate" conditions.

Further analysis demonstrated that the device would come too close to the bottom of that pool, and the Waterworld idea was scrapped.

"Waterworld was agreeable, but our folks doing the analytical modeling said we would get within a foot or foot and a half of the bottom. That was too close," Kelly said.

It was about this time that Ess proposed a home-built wave tank and test article to at least demonstrate the concept could work.

Ess, along with then co-op Scott Tamblyn, built a wooden sub-scale wave tank in his driveway. The wave generation unit was built using an old washing machine motor. Four eight-inch-diameter BOAT test articles were built for use in the sub-scale tank by Paul

Romere who works in the same branch as ESS. Both cost a fraction of what a typical test article would have cost.

The wave tank cost less than \$1,000 and the BOAT sub-scale test article cost less than \$100. By comparison, the wave tank would have cost about \$30,000 and the test article about \$400 if produced commercially.

Ess said he began sketching a picture of the wave tank and bought a used transmission for a washing machine. The home wave tank was 24 feet long, four feet wide and two feet deep.

The people at the store where he bought the washing machine motor were skeptical when he told them what the unit was for. "They didn't think it would work as a wave machine," he said.

But the home unit did work and eventually Ess and his coworkers moved it to Bldg. 220 for further testing. Using the small wooden BOAT test articles, they developed restraining devices that would keep the unit

from contacting the side of the wave tank.

"This is a perfect example of these people using their own ingenuity for the benefit of the

overall project," Kelly said.

The sub-scale BOAT and wave tank testing enabled Lead Designer Stephen Munday, to arrive at the design of the full-scale testbed now undergoing testing.

"The Man Systems Division brought us in to help in the design to make sure the test article would be dynamically correct," Munday said.

The total quality management (TQM) aspect runs through this whole process, Kelly said

"This has involved people from across the center," he said, and would have cost more and taken longer had they not been involved.

As the chief designer, Munday also had responsibility for ensuring the BOAT could simulate three different types of ACRV.

By changing the skirt configuration and moving the center of gravity, the BOAT can simulate an Apollo-type spacecraft SCRAM (Station Crew Return Alternative Module) allowing water to cover the heat shield, and a SCRAM in which the heat shield is protected from the water.

Munday also has acted as the focal point

for coordinating the BOAT activities between the various divisions. "It has actually worked very well," he said.

Laurie Weaver, principle investigator on the BOAT project for the Man-Systems Division, said while there were "learning pains between the organizations" because of having different ways of doing things, "it has been extremely successful; it worked out better than I thought."

Following the early development came the design and requirements from other areas including Man-Systems.

Weaver was involved early on while flying test runs aboard NASA's zero-G aircraft, the KC-135.

"We flew aboard the KC-135 to demonstrate a crew's ability to get into the ACRV" during an emergency.

That proved "pretty negotiable," she said, so everyone began concentrating on getting out after splashdown or touchdown of the vehicle on Earth. "We realized we needed to concentrate on the design of the interior for egress," she said.

The word "overdesigned" in the Bouyant Overdesigned ACRV Testbed simply means the extra mass that was required in the design to better approximate real vehicle handling characteristics. The testbed weighs about 9,500 pounds.

"We have a two-pronged purpose to the testing," Kelly said. One is to create a database of vehicle handling characteristics to assess the vehicle's dynamics on the water. The second is to identify requirements for a water egress by a crew given such a landing, Kelly said.

Egress data gathered under various sea states will be used by the ACRV Project Office in helping determine whether a land or sea touchdown is the best course to take.

"The tests will help determine which landing mode is more feasible," he said. This will include the assessment of the type of parachute to use based on the G constraints on the human body.

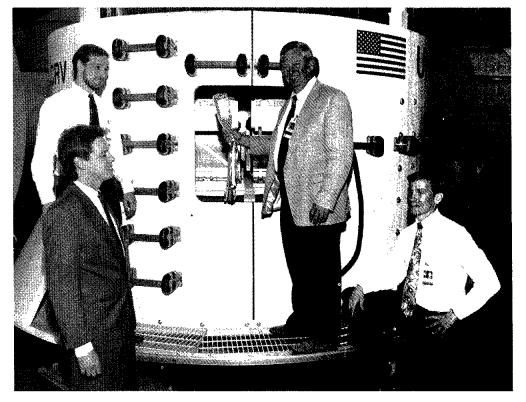
While the BOAT testing is under way, coworker Brian Ross is busy creating computer simulations of the hydrodynamic process for use in future programs that may require similar testing.

To demonstrate their faith in the workmanship, Ess, Munday and several others involved in the BOAT project will serve as the living test subjects for the egress tests in the WETF and at Texas A&M \square



JSC Photos by Robert Markowitz

Top: A small, wooden scale-model bobs in the wave machine constructed in Bob Ess' driveway. The grid behind the model measures the angle of the model's flotation. Above: Beth Grimaldi and a test dummy lie inside the full-sized BOAT as Jay Estes, left, and Ess look on. Right: A BOAT is christened; from left are Principal Investigator Bob Ess, Lead Designer Stephen Munday, New Initiatives Office Deputy Manager Jerry Craig and ACRV Project Office Lead Brian Kelly.



Rogers earn Woman of Year honors

JSC's Kitty Rogers has been elected Woman of the Year by the Clear Lake Area Chapter of the American Business Women's Association.

Rogers, manager of the Space Shuttle Program Administrative Office, was selected

on the basis of her work achievements, education, community activities and participation in the association.

She joined JSC in 1964 as a secretary for the

Landing and Recovery Division and was promoted to the administrative field in 1980. In 1988, she became a supervisor to manage the SSPAO.

Rogers has chaired several ABWA committees and was chapter president in 1990.

McHenry, Finney receive key station assignments

Elrich McHenry of the Space Station Projects Office and David Finney of the Flight Crew Operations Directorate recently

received two key space station-related assignments.

McHenry has been appointed manager of the Avionics Office within the Space Station Freedom Projects Office.

Finney has been appointed chief of the FCOD Space Station

Support Office. McHenry joined JSC in 1963 as an aerospace engineer in the Flight Operations Divi-

sion. Since then, he has received increasingly responsible positions, such as chief of the Spacecraft Software Division and deputy director of the Mission Support Directorate.

Most recently, he was Engineering's associate director for engineering development and test support to the Space Station Projects Office.

Finney, who joined JSC in 1987 in the Aircraft Operations Division, has been acting chief of the office since June 1991. He was named deputy chief of the office in



Rogers



McHenry







Stoltzfus

White Sands engineer earns testing society's merit award

Joel Stoltzfus of the White Sands Test Facility recently received the 1992 Award of Merit from the American Society for Testing and Materials.

Stoltzfus, projects director in the WSTF Laboratory Office, earned the society's highest honor for his work on a committee looking into Compatibility and Sensitivity of Materials in Oxygen Enriched Atmospheres, and for his coordination of symposia on the subject during the past two years.

Stoltzfus also is one of the primary instructors for a Standards Technical Training Course that is offered at JSC.

Cochennic top secretary

Michelle R. Cochennic, secretary for the Flight Training Branch in the Mission Operations Directorate's Training Division, recently received the Marilyn J. Bockting Award for Secretarial Excellence.

Cochennic earned the honor for leading the secretarial group that produces the instructional briefings, training manuals and workbooks for the branch, which is a hub of activity in the shuttle crew training process.

She was cited specifically for her ability to combine secretarial talent with negotiating skills to ensure that the office's tasks are accomplished on schedule, and for fostering a "can do" atmosphere in the office.

Mission Control viewing room hours adjusted

The Wednesday launch of STS-45 has changed some MCC viewing room hours for JSC and contractor badged employees and their families.

Based on the Tuesday launch, employees will be allowed to visit the MCC today, from 11:30 a.m.-2:30 p.m. and 5-7 p.m.; Saturday and Sunday, from 1-4 p.m.; Monday, from 11:30 a.m.-2:30 p.m. and 5-7 p.m.; and Tuesday, from 11:30 a.m.-2:30 p.m.

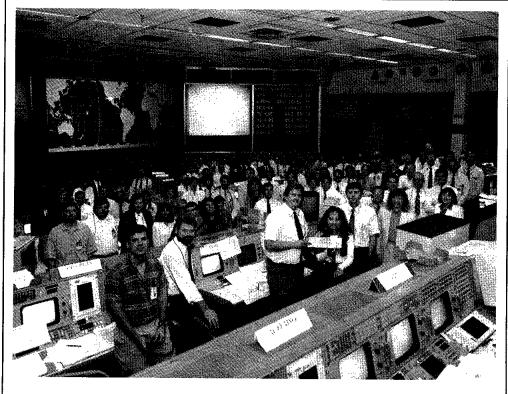
Employees must wear their badges and escort family members through the regular public entrance on the northeast side of Bldg. 30. Children under 5 will not be permitted. No flash photography or loud talking will be permitted at any time.

ISD wants to know how well it's doing

The Information Systems Directorate is seeking feedback from JSC computer users to help in its effort to continually improve service.

When an ISD technician visits a worksite, he or she leaves a customer satisfaction feedback card. Users are asked to complete the card rating areas such as overall service, quality of work, response time, personnel knowledge level and attitude. After completing the card the user can simply drop the card at any center mail pickup point. No envelope is necessary.

The response is entered into a database and recommendations are made allowing ISD to monitor trends and indentify potential problem areas.



STATION SIM—Space Station Freedom operations came one step closer to reality last Friday with the first all-day paper simulation in the Mission Control Center. Simulation Supervisor Jerry Swain said the exercise conducted by the Mission Operations Directorate's Space Station Training Division tested two full mission control teams with four cases. Operations Directors Andy Algate and Jenny Stein led their teams through malfunctions designed to test both individual systems and operations concepts, and served as a motivational opportunity for inexperienced controllers to work in an operations center. The next sim is planned for October.

NASA delivers Earth observer reform plans

NASA this week delivered to Congress its report on the restructuring of the Earth Observing System that will provide for a less costly, more flexible program able to gather scientific information on global climate

The Earth Observing System is the centerpiece of NASA's Mission to Planet Earth, a coordinated program to study the Earth's environment as a complete, global system. Under the new start approved by Congress in late 1990, EOS was to consist of two series of spacecraft to collect data over 15 years.

Following Congressional guidance, NASA began restructuring EOS in 1991. An external engineering review committee made recommendations and the EOS science team prioritized the science mission to refocus EOS on climate change. The restructured program increases EOS' resilience and flexibility by flying multiple, smaller platforms and reduces the cost of EOS from \$17 billion to \$11 billion through the year 2000.

"The restructured EOS program meets the concerns for a less costly, more flexible program while maintaining the science observations needed to support global change research," said Dr. Lennard A. Fisk, NASA's associate administrator for space science and applications. "In addition, under the restructured program, the launch of the first EOS spacecraft is moved forward six months, to June 1998," Fisk said.

The restructuring report outlines EOS' science priorities, spacecraft and instrument configurations and the role of the EOS Data and Information System.

Lace up your running shoes, its time for Intercenter Run

JSC employees and contractors are lacing up their running shoes once again for the NASA-wide Intercenter Run.

The agencywide competition is held twice a year during the months of April and October, with winning

honors going to the center with the highest percentage participation. JSC won the 10 km in Oc tober and Goddard Space Flight Center won

the two-mile. To participate, individuals run or walk a 10 km or two mile course and

report their times in the Gilruth Center Recreation Office. The course may be run as many times as desired, but the highest individual time should be reported. The race is scored in age groups by order of finish.

All participants receive a free Gilruth Center.

Intercenter run T-shirt. The competition is open only to NASA civil servants and NASA badged contractor employees.

Maps of the race route and additional information is available at the

Atlantis flight may be extended to gather more atmospheric data

shuttle's external tank Monday. Tuesday's launch was delayed 13 minutes when clouds encroached on return to launch site visibility.

Because of a particularly good load of the super cold hydrogen and oxygen that combine to make electricity and water for Atlantis operations, mission managers early on began discussing the possibility of extending the planned eight-day flight to nine days. Flight controllers told the crew Thursday that if power usage continues at its current level and Atlantis continues to operate nearly flawlessly, the shuttle would be in position to extend one day for added scientific observations.

The planned KSC landing time is at 5:25 a.m. CST Wednesday. A one-day extension would have Atlantis landing at 5:20 a.m. CST Thursday. A welcome home celebration for the crew is planned outside Ellington Field's Hangar 990 about 8 and a half hours after a landing at KSC, or 8 hours and 45 minutes after landing if it is shifted to Edwards Air Force Base in California.

(Continued from Page 1) Five unattended atmospheric science instruments in Atlantis' payload bay also were busy collecting data. The Atmospheric Lyman-Alpha Emissions instrument scanned celestial space with its mirror. The Atmospheric Trace Molecule Spectroscopy (ATMOS) took measurements of the Sun's infrared spectrum to identify and measure various trace molecules and determine their vertical distribution in the atmosphere. The Millimeter-Wave Atmospheric Sounder measured ozone, water vapor, chlorine monoxide, temperature and pressure in the middle atmosphere. And the Grille Spectrometer studied trace chemicals in the atmosphere at orbital sunrise and sunset. Solar physics instruments took

measurements of the Sun. The Active Cavity Radiometer and the Measurement of the Solar Constant instruments gauged the Sun's total irradiance, and the Solar Spectrum Measurements instrument gathered data to understand more about how solar energy is distributed among different wavelength regions.

Space News Roundup

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......Kelly Humphries Associate EditorKari Fluegel

CFC administrative costs among lowest in country

(Continued from Page 1)

employees, and is regulated by the Office of Personnel Management in Washington, D.C., and Congress," Koffend and Schwanekamp said. "Our CFC's administrative costs for 1991 were 5.6 percent of the total dollars raised. These costs are shared equally by all participating non-profit agencies and are monitored by the Federal Executive Board Policy

Committee." UWTGC administrative costs are among the lowest in the country, Koffend and Schwanekamp said, with more than 90 cents of every donated dollar being used locally to address our community's critical problems. Some 350 community volunteers decide which programs receive funding and carefully monitor the use of the

Americans give space program high marks

(Continued from Page 1)

In the wake of the Challenger accident, Americans seem to have a realistic view of the risks of space flight. "Americans seem to accept a certain level of risk inherent in manned space flights," Ellers said, "and, even if an accident should occur, would prefer to handle the problem rather than abandon the shuttle program altogether."

Among the new initiatives for the 1990s, missions to study the Earth's environment are the most popular

among Americans. Environmental monitoring drew strong support from 91 percent of the respondents. Joint space missions with other nations had the support of 77 percent, while the National Aerospace Plane program had a 70 percent favorable rating. Construction of a permanently manned space station had the support of 68 percent of the respondents, while human flights to Mars had 60 percent and a permanent lunar settlement had 49 percent.

When asked what goals or bene-

fits of the space program are most important, 92 percent said scientific and medical discoveries. Increased understanding of the Earth's climate and environment drew strong support from 88 percent of those surveyed. Even the goal that drew the least support, "putting the U.S. ahead in space exploration," drew 67 percent approval. "Nearly equal in importance, these goals have remained at consistently high levels since they began to be tracked," Ellers said.