

Space News Roundup

Vol. 21 No. 22

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National Aeronautics and Space Administration

'We deliver'

Fast and courteous, the Ace Moving Co. hauls its first load

If there is a single point at which one could say the Space Shuttle Program entered its operational phase, it may be found 160 nautical miles directly above the equator over the Pacific Ocean, or about 1,200 miles west of the Galapagos Islands at 109° west longitude.

It was at that location, during the sixth orbit of the Space Shuttle *Columbia* on her fifth trip into space, that a large cylindrical object belonging to Satellite Business Systems rose out of the payload bay and began the long journey to geosynchronous Earth orbit.

The object was, of course, SBS-3, a domestic communications satellite, and its majestic passage from the Shuttle into space elicited the proud boast from Mission Specialist Joe Allen which became the motto for flight five: "We deliver."

And deliver they did. Seven hours and 59 minutes after blasting off into a clear blue sky from the Kennedy Space Center Nov. 11, the first-ever four-man crew had circularized their orbit, chatted with the President of the United States, maneuvered *Columbia* to a deployment position and then had watched in triumph as SBS-3 rose from the payload bay right on schedule. Forty-five minutes later, they had moved *Columbia* off 20 miles behind and above the satellite in a posigrade maneuver designed, paradox-

ically, to increase the speed of the Orbiter and thus slow her down relative to the satellite.

At that point, the perigee-stage ignition motor on the McDonnell Douglas Payload Assist Module fired and sent SBS-3 into a 22,000-mile, 103-mile orbit. By Dec. 1, SBS-3 had circularized that orbit and was on station at 94° west longitude, working perfectly. The deployment was the first of its type from the world's first reusable spacecraft, and it set the stage for the almost identical deployment the next day of Telesat Canada's Anik C-3 satellite. During that exercise, the worlds of fiction and fact melted for a moment when music played by Allen accompanied Anik's rise into space. The music was "Also Sprach Zarathustra," better known as the theme to "2001: A Space Odyssey."

After the deployment, Allen said, "Houston, we're two for two. We deliver." Before the mission was over, a slide projected onto one of the side screens in Mission Control carried the same message.

Besides deploying the first two satellites of the Shuttle era, crewmembers Commander Vance Brand, Pilot Robert Overmyer and Mission Specialists William Lenoir and Allen broke new ground in other ways. They became the first humans to venture into outer space in what are essentially

street clothes, since the bulky pressure suits of the first four flights are no longer in use for operational missions. They also comprised the largest crew yet sent into orbit by any nation in a quarter century of space exploration. Allen became the first person to ride "steerage" in the Shuttle, occupying a fourth seat in the mid-deck during launch rather than being seated on the flight deck with the other three. Lenoir rode the middeck during reentry.

The one disappointment of the flight was the cancellation of a scheduled spacewalk on day five, when the spacesuits worn by Allen and Lenoir developed internet problems. The oxygen circulation fan in Allen's suit operated sporadically during preparations for the EVA, and finally forced mission controllers to scrub his part of the spacewalk. By that time, Lenoir was in the airlock beginning his 3.5 hour prebreathe protocol, and had been given a tentative okay to depressurize the airlock and at least crack the hatch. But about a half hour into the prebreathe, it became obvious that his suit pressure regulator was not working properly, and finally the entire exercise had to be scrubbed.

Immediately after landing, NASA set up a board of inquiry to determine what went wrong. The team is headed by Richard A. Colonna, Manager of the Program

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Photo by John W. Young

Bulletin Board

Family Affair Christmas Project underway

The annual JSC fund-raising campaign to assist needy families in the Houston area, the Family Affair Christmas Project, has begun and could use your help this week. This year's goal is to raise \$4,000 and provide food and toys to 135 families. The project has been a perennial success since 1971, thanks to the involvement of center employees. The fund drive ends Dec. 10, so act now. To make a contribution, contact Elmer Fridia at x3205 or Doris Roberts at x2761.

EAA Plans Christmas activities

JSC's Employees Activities Association will sponsor a dance and a Children's Christmas party this holiday season. The EAA Christmas Dance will be held beginning at 7 p.m. Dec. 10 and Dec. 11 at the Gilruth Center. Eric Carlson's Tophatters, featuring a big band sound, will play in the auditorium of the Rec Center, while the Texas Blue Water Band, a country/western and rock group, will play in the gym. The menu for the Friday dance is roast beef at \$12.50 per person. Saturday's menu is prime rib at \$17.50 per person. The social hour begins at 7 p.m., with dinner at 8 p.m. and dancing from 9 p.m. to 1 a.m. both nights. The EAA recommends cocktail attire and advises that each night's seating is limited to 450 persons. Tickets are on sale in the Bldg. 11 Exchange Store. The EAA will also sponsor a Children's Christmas Party, open to children of all ages, at 10 a.m. Dec. 18 in the Rec Center. Activities include cartoons, punch, cookies, pictures with Santa and much more for the admission of \$1.50. Tickets are on sale in the Bldg. 11 Exchange Store.

Two holiday concerts to be held on site

The Clear Lake Chamber Music Society will present two concerts for JSC employees during the Christmas and New Years seasons. The noon time concerts will be held in the Bldg. 2 Auditorium and are open to all employees. On Dec. 9, the performance will consist of various Christmas music selections and begins at 11:45 a.m. and concludes at 12:30 p.m. The other concert will be presented Jan. 13 at the same times, and will consist of selections from Mendelssohn's Trio in D Minor, Op. 49; Beethoven's Clarinet Trio in Eb Major, Op. 38; and Messiaen's Quartet for The End of Time. The concerts are being sponsored by the NASA Exchange.

M.D. Anderson Christmas cards available

In 1973, the M.D. Anderson Hospital began selling Christmas cards designed by children with cancer. Profits went exclusively to a special fund set up to help the children, and since then, the cards have become something of a Houston tradition. Last year, some 700,000 were sold. This year, cards are available locally at the Sakowitz mall on NASA Road One every Saturday until Christmas from 11 a.m. to 3:30 p.m. The cards are \$6 for each package of 20, one design per package. There is no sales tax and the purchases are tax deductible. If you would like to help sell the cards or desire more information, call Stella Keifer at 488-4080 or Betty Conklin at 486-4193.

Winterize your body with Clinic program

The December health education program by the JSC Clinic will focus on health problems which may be faced in the coming winter months. The presentation will be held beginning at 10 a.m. Dec. 7 in the Bldg. 30 Auditorium. The program will address health problems which may occur during the winter season and will discuss precautions which can be taken to minimize the effects.

Mothers Against Drunk Drivers on site Dec. 3

Every 23 minutes, an intoxicated person takes the life of another driver. Statistics like that are the prime reason behind the Mothers Against Drunk Drivers organization, which will be on site Dec. 3 from 1:30 to 2:30 p.m. in the Bldg. 2 Auditorium. MADD works to promote community awareness of the drunk driving problem in this country through public meetings, in school lectures and through the media. Marinelle Timmons, President of the Houston Chapter and Texas Director of MADD, is currently serving on the Governor's Traffic Safety Task Force, and urges involvement by all persons concerned about the problem. If you would like more information, attend the meeting in Bldg. 2, or call MADD at 641-3128.

Little Dribblers holding registration

The NASA Area Little Dribblers basketball group will hold registration for boys ages 9 to 14 (ages as of Aug. 31, 1983) on Dec. 11 from 9 a.m. to noon at the Clear Lake Recreation Center. For more information, call 488-2442 or 488-3722.

NASA soliciting ideas for celebration

Next October, the Space Agency will celebrate its 25th year of exploring the realms of air and space. NASA Administrator James M. Beggs has designated a senior 25th Anniversary Policy Group and a 25th Anniversary Task Force to assume day-by-day planning responsibilities for the observance. He has also invited each employee to help in the planning and to submit suggestions. "I would like it to be a NASA family affair as conceived by the NASA family itself," he said. Each employee is free to submit as many suggestions as come to mind. They should be sent to Mr. Azeezaly S. Jaffer, Code LF-6, Room 6025, NASA Headquarters, Washington, D.C. 20546. JSC employees might also pass suggestions along to Charles A. Biggs, Chief of the Public Services Branch here, who has been appointed to the task force representing the space-related centers in NASA.

Ace Moving Co.

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Operations Office here. At press time, findings were expected to be announced around the first week of December. NASA officials are considering the merits of an EVA on flight six in January or February.

On Nov. 16, the STS-5 crew came home. *Columbia* came down through a layer of clouds for a sunrise landing on the concrete runway at Edwards Air Force Base. The mission elapsed time was five days, two hours, 14 minutes and 25 seconds.

The Orbiter landed about 1,800 feet into the runway and rolled out about 9,000 feet. The crew left the vehicle after 35 minutes of post-flight activities and made a walkaround inspection of the venerable spaceship, now to be retired for the next three flights. *Columbia* will be returned to the Cape and modified for the STS-9 Spacelab 1 mission next fall. Her engines will be removed, new ones installed, and the old ones eventually will be used on *Atlantis*, the fourth Orbiter off the assembly line.

In other Shuttle developments, the first NASA Inertial Upper

Stage, built by Boeing, arrived at KSC during the STS-5 mission and began processing for the STS-6 mission in January. *Challenger*, the Orbiter which will carry that



SBS-3 against the limb of Earth.

upper stage and the first NASA Tracking and Data Relay Satellite, was mated to the external tank/solid rocket booster combination and rolled out of the Vehicle Assembly Bldg. Nov. 30. She now sits on Launch Pad 39A, awaiting the flight readiness firing later this month.

At the post-landing press conference at Edwards, NASA's Associate Administrator for the Space Transportation System, Lt. Gen. James Abrahamson, summed up the challenging schedule ahead for 1983: first use of main engines qualified for up to 109% thrust levels, first use of the new lightweight external tank, first use of the new high performance solid rocket boosters, first use of the adaptive first stage guidance system, first use of the heads up display, first proximity operations with a satellite, first flight of Spacelab, first night landing, first automatic landing, first dedicated Department of Defense mission, first demonstration of around-the-clock crew operations, and the deployment of two Tracking and Data Relay satellites and five additional commercial satellites.

STS-2 sensor results please remote sensing community

At least four ancient river systems known previously only to people of past ages were uncovered through remote sensing by an instrument flown on the second Space Shuttle mission in November 1981.

Another instrument flown on that mission provided the first orbital detection of clay and carbonate bearing minerals, scientists say, and both sets of results bode well for future remote sensing uses of the Space Shuttle.

Both the Shuttle Imaging Radar-A (SIR-A) and the multispectral infrared radiometer experiment which flew on that second flight are considered to have produced important results, even though the mission itself had to be shortened due to a fuel cell problem on the Orbiter *Columbia*.

The SIR-A instrument successfully penetrated the extremely dry expanse of the Selima Sand Sheet in the eastern Sahara Desert just north of the borders of Egypt, the Sudan and Chad to reveal unknown river channels, geologic structures and possible Stone Age occupation sites.

The SIR-A radar signal was able to penetrate the sand dunes, drift sand and alluvium-filled valleys of the Arabian Desert to reveal bedrock and gravel subsurface features. Some of those

features are nearly as broad as the Nile River Valley and could date to 50 million years ago. At least four river systems were discovered which predate the present Nile River, and some of the systems display drainage patterns which flow opposite to that of today.

The radar images also revealed a series of semi-rectangular features which are similar to sites found in the coastal desert regions of Peru, known to have been used for pastoral and agricultural purposes by pre-Hispanic peoples. Because of the similarity between the Egyptian sites and the Peruvian fields, this may represent the discovery of previously unrecognized pastoral or agricultural sites in southern Egypt, dating to the Stone Age.

The remote sensing community was also welcoming last week the results from the multispectral infrared radiometer experiment which flew on STS-2. For the first time, minerals other than limonite (a common suite of iron-bearing substances) was identified remotely from space. The instrument was able to identify limestone, kaolinite (a hydrous, aluminum silicate clay mineral) and possibly montmorillonite (another hydrous silicate of aluminum).

Before STS-2, this clay-mineral identification was possible only

through laboratory sampling techniques. The instrument used on STS-2 identifies substances on the basis of spectral reflectances in the infrared portion of the electromagnetic spectrum. It consists of 10 channels which range in wavelength from the visual red through the shortwave infrared, with the infrared bands being very narrow in bandwidth. The spectral resolution of this sensor was superior to all previous multispectral sensors flown in space. Skylab, Landsat and most aircraft sensors have broad spectral bandwidths which have not been able to detect the subtle reflectance differences which differentiate clays from each other.

The principal investigators for the multispectral infrared radiometer are Dr. Alexander Goetz, NASA Jet Propulsion Laboratory (JPL), and Dr. Lawrence Rowan, U.S. Geological Survey (USGS). The principal investigator for SIR-A is Dr. Charles Elachi of JPL. Principal work for the remote sensing geochronology was done by Jack McCauley, Gerald Shaber, Carol Breed and Maurice Golier of the USGS; C. Vance Haynes of the University of Arizona; Bahay Issawi of the Egyptian Geological Survey and Mining Authority; and Ronald Blom and Elachi of JPL.

Three more customers sign for Shuttle

The GTE Satellite Corp., the government of Australia and the Arab Satellite Organization have become the latest parties to notify NASA of their intent to launch satellites from the Space Shuttle.

The GTE Satellite Corp. of Stamford, Conn. will use the Shuttle to launch its GSTAR-C communications satellite in May 1985. The satellite will be used to provide common carrier communication services to the continental U.S., Alaska and Hawaii. GSTAR-C will be built by RCA Astro Electronics Corp. and launched with the McDonnell Douglas

Payload Assist Module. The PAM-D II to be used on that launch is an improved version of the original PAM.

Australia plans to use the Shuttle for the launching of two communications satellites in July and October of 1985. The two satellites of the AUSSAT system will be used for direct television broadcast and voice, data and telephone services to continental Australia and off-shore territories. The satellites will be built by the Hughes Aircraft Co. AUSSAT PTY Ltd. is the Australian corporation responsible for development of

the national satellite system.

The Arab Satellite Organization, ARABSAT, signed a launch services agreement Nov. 23 for a satellite which will serve 22 member countries and organizations. The ARABSAT-A spacecraft, built by Aerospatiale and Ford Aerospace, is scheduled for launch from the Shuttle in October 1984. A McDonnell Douglas PAM-D will be used to boost the satellite into geosynchronous orbit. The Arab consortium will operate a public satellite system for telecommunications for its member entities.

Griffin to address AIAA Dec. 15

Johnson Space Center Director Gerald D. Griffin will address the Houston Chapter of the American Institute of Aeronautics and Astronautics on "Challenges for JSC and NASA" during an after-work gathering at the Gilruth Center.

The reception begins in the Gilruth Recreation Center at 5 p.m.

Dec. 15, with the social and program running from 5:30 to 7 p.m.

"This after work reception is designed to capture the spirit of the approaching holiday season and we are delighted to have Mr. Griffin as the guest speaker," an AIAA spokesman said. During the reception, highlights from the

Space Shuttle program will be shown in a multiprojector slide presentation. The reservation deadline is Friday, Dec. 10 at noon. For reservations, call Pat, 333-1450; Joanne, 333-2030, Patty, 488-5660 or Nancy, 483-3995.

NASA
Lyndon B. Johnson Space Center

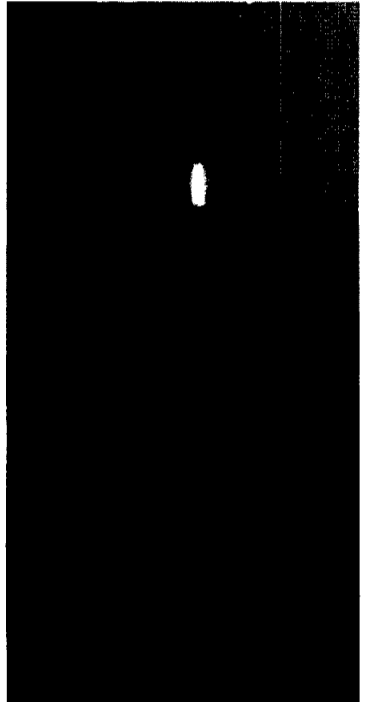
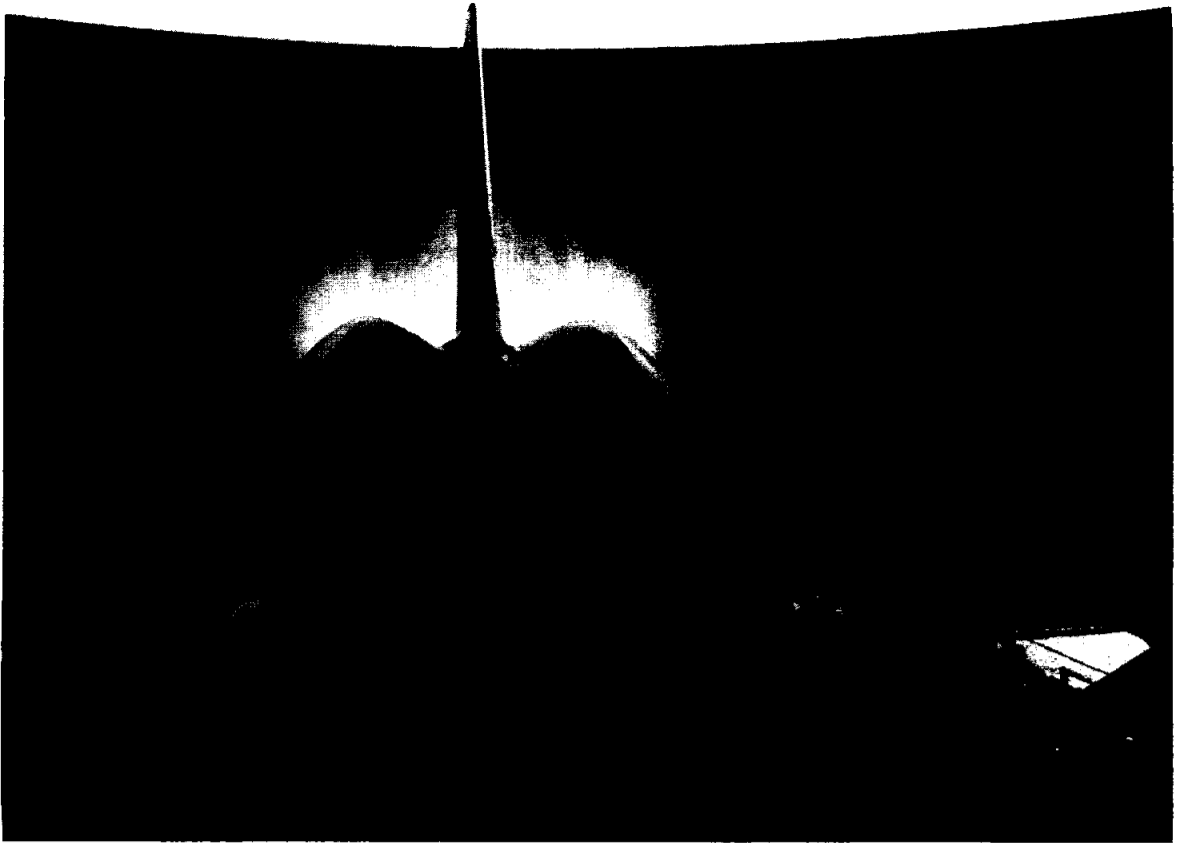
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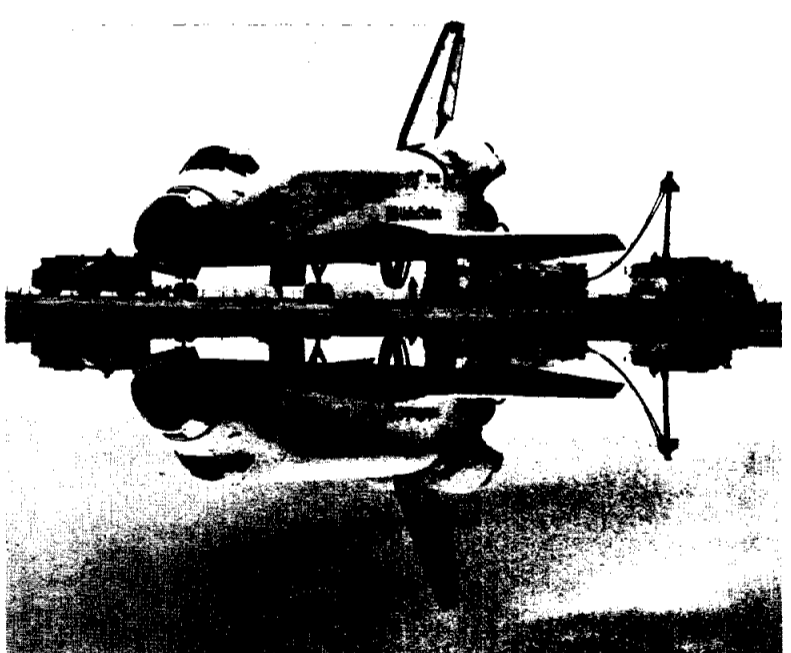
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Editor

Brian Welch



Scenés from STS-5 included, counterclockwise from upper left, mission specialists William Lenoir and Joe Allen waiting virtually in street clothes for the go ahead to enter Columbia and depart for space; the launch as seen from the ground and from the air; the deployment of SBS-3 on flight day one; the personnel of Ace Moving Co. posing on the middeck after two successful satellite deployments; the venerable spaceship Columbia under tow with her reflection in what is usually a dry lakebed; two members of a select club, former JSC Director Chris Kraft and present Director Gerald Griffin showing their feelings after a fifth successful landing; and at top right, perhaps the most technically and aesthetically excellent picture yet taken by a Shuttle astronaut: a view of an Orbital Maneuvering System burn captured by Joe Allen after 10 tries. For Allen, this 70mm frame was a triumph of patience and lighting. Three types of light — sunlight, Earthshine and the glow from the engines — are visible, and the streamers coming out of the OMS were caught exactly at the moment of ignition.



Gilruth Center News

Call X3944 for more information

Women's volleyball — If you are interested in playing USVBA-sanctioned volleyball for JSC, contact Helen Munk at the Rec Center, x3594.

Defensive driving — Learn to drive safely and qualify for a 10 percent reduction in your auto insurance for the next three years. The class meets from 8 a.m. to 5 p.m. Saturday, Dec. 18. The cost is \$18 per person and space is limited.

December race — Start practicing for our next race, which will be run with teams of four beginning at 9 a.m. Dec. 18. This team competition race is a 4 x 4 mile. Trophies will be awarded. Call the Rec Center for details.

Cookin' in the Cafeteria

Week of December 6 - 10, 1982

Week of December 13-17, 1982

Monday: Cream of Celery Soup; Braised Beef Ribs, Chicken a la King, Enchiladas w/chili, Italian Cutlet (Special); Navy Beans, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin, Selection of Salads, Sandwiches and Pies.

Tuesday: Beef & Barley Soup; Turkey, & Dressing, Country Style Steak, Beef Ravioli, Stuffed Cabbage (Special); Corn Cobbette, Okra & Tomatoes, French Beans.

Wednesday: Seafood Gumbo; Catfish w/Hush Puppies, Roast Pork w/Dressing, Chinese Pepper Steak (Special); Broccoli, Macaroni & Cheese, Stewed Tomatoes.

Thursday: Cream of Tomato Soup; Beef Tacos, BBQ Ham Slice, Hungarian Goulash, Chicken Fried Steak (Special); Spinach, Pinto Beans, Beets.

Friday: Seafood Gumbo; Liver & Onions, Deviled Crabs, Roast Beef w/Dressing, Tuna & Noodle Casserole (Special); Whipped Potatoes, Peas, Cauliflower.

Monday: French Onion Soup; Beef Chop Suey, Polish Sausage w/German Potato Salad, Breaded Veal Cutlet (Special); Okra & Tomatoes, Green Peas. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin, Selection of Salads, Sandwiches and Pies.

Tuesday: Split Pea Soup; Salisbury Steak, Shrimp Creole, Fried Chicken (Special); Mixed Vegetables, Beets, Whipped Potatoes.

Wednesday: Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Rib, BBQ Plate, Weiners & Beans, Shrimp Salad, Stuffed Bell Pepper (Special); Corn O'Brian, Rice, Italian Green Beans.

Thursday: Chicken Noodle Soup; Beef Stroganoff, Turkey & Dressing, BBQ Smoked Link (Special); Lima Beans, Buttered Squash, Spanish Rice.

Friday: Seafood Gumbo; Broiled Turbot, Liver & Onions, Fried Shrimp, Meat Sauce & Spaghetti (Special); Green Beans, Buttered Broccoli, Whipped Potatoes.



This recently unveiled view of the mission patch for STS-6 shows the first Tracking and Data Relay Satellite whizzing out of the hold of Challenger aboard an Inertial Upper Stage, with six stars in the background. The mission will be the first flight for Orbiter 099.

Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

For lease: Heritage Park 3-2-2, fireplace, ceiling fan, large kitchen, fenced, \$625/mo. Call Frank, x5303 or 482-6609.

For sale: Middlebrook 4-2-2, formal, paneled den, bookcases and fireplace, energy efficient, low equity, 9.5% VA loan, 2,150 sq. ft. Call Wheeler, x5276 or 486-5346.

For sale: Land near Center, Tx, 500 acres. Call (713) 598-8029.

For lease: 4-2-2-, large den, formal dining, large yard, \$450/mo. plus \$450 deposit, references, absolutely no indoor pets. Call 331-1136.

For lease: LC/Bayridge, 3-2-2A, den, DR, new paint, no pets, \$550 plus deposit. Call 488-1301.

For lease: CLC Baywind I 2-1 1/2 condo, WD, refrigerator, built-ins, game room, exercise room, sauna, pool. Call Al, x3005 or 334-1773.

For lease: Royal Aloha Tahoe condo, sleeps 6, completely furnished, 150 yards from ski lift, 4 miles from casinos, \$600/wk. Call 488-8682.

For rent: 1 week relaxed living at Walden on Lake Conroe, furnished condo sleeps 4, unlimited free tennis/golfing. Call 333-4379.

For sale: Gulf Fwy. near Scarsdale, 2-1.5-2 townhouse, \$43,900, assume 12.5%, \$440/mo., owner finance \$13,900 equity. Call Dennis, x3321 or 488-5262.

For rent: Lake Tahoe furnished condo sleeps 4, near ski areas/casinos, Feb. 19-26, \$400. Call Al, x4056 or 482-5515.

For sale/lease: Efficiency waterfront condo, The Landing in Seabrook, utilities paid, all amenities, luxurious, must see. Call 538-2087 evenings and weekends.

For rent: Friendswood 3-2-1, fireplace, drapes, fenced, very clean, \$475/mo, plus first and last plus deposit. Call 482-7546.

For rent: Hill Country by Lake Travis, condo, 2 BR, furnished, available by days (2 min.), week or month. Special winter rates through April 1st. Call Hoffman, 331-0817.

For sale: 1.39 acre lot in Friendswood, Cowards Creek, by owner, assume 10%, 39.9K total. Call Chambliss, x4451 or 486-1907.

For sale: League City, 3-1.5-2, \$55,900, assume old loan or refinance at \$2,800 down, 12.2%. See at 612 David. Call 554-6200.

For rent: Vail Village condo, fireplace, 2 baths, private sauna, completely furnished, 17-24 Dec. Call 488-5079.

For lease: Camino South 4-2-2, cul-de-sac, miniblinds/drapes, fireplace, covered patio, new carpet and paint, \$600/mo. Call 488-1532 evenings.

Cars & Trucks

1975 Mustang 2 dr., 4 cyl., new tires, AC, runs, needs engine overhaul. Call Metcalf, x5893 or 946-4860 after 5 p.m.

1977 Ford T-Bird, AM/FM/8 track, new tires, new battery, low mileage, excellent condition, \$3,000 cash. Call Frank, x3836 or 3837.

1969 Ford for parts only. Runs like new, owner unable to get title. Call Karen, x3931.

1978 Mazda station wagon, bucket seats, ski rack, 26K miles, \$2,800. Call Jan, 468-1039.

1966 Ford 4 dr., AC, PS, PB, stereo, 80K miles, good condition, \$525. Call 332-5065.

1979 Mercury Capri, 2.3 liter Turbo RS, 4-sp., AC, power steering, cruise, 34,500 miles, immaculate, \$4,495. Call Jimmy, 488-9005 or 488-4321.

1973 Ford Galaxy station wagon, AC, PB, PS, auto, \$745. Call Ted, x5865 or 482-8827.

1978 Ford LTD wagon, PS, PB, AC AM/FM/stereo cassette, excellent condition, 63K miles. Call Dick Johnson, 333-4150.

1981 Cutlas Supreme diesel, loaded, 30 mpg, \$7,200. Call Carolyn, x5378 or 480-2896.

1977 Winnebago motorhome, sleeps 6, new power plant, fully self-contained, \$9,500. Call Reeves, x2991 or 480-0296.

1977 Fiat X-19 convertible, AC, AM/FM/cassette, excellent condition, \$3,150. Call 486-8266 or 480-8325.

1975 Pontiac LeMans, single owner, CA registration, \$1,475. Call Larry Hamel, x5435 or 480-7917.

1978 Ford Courier, 5 spd., 2.3 liter, AC, radio, priced to sell. Call 488-2597.

1979 Camaro, excellent condition, auto, air, power, tilt, AM/FM, good tires, \$4,995. Call Renee, x2776 or 331-9263.

1979 Subaru FE coupe, 5 spd, AC, stereo, chrome luggage rack, very low miles, excellent, \$3,000. Call Bob, 488-0397 after 6 p.m.

Boats & Planes

Custom windsurfer, foam/fiberglass, 3 fin set-up, footstraps, very fast, \$600 or best offer. Call Lee, 332-2813 or 333-4291.

1977 Balboa 26, race rigged, swing keel, 110, 130, 150 Genoa, spinnaker and whisker pole. Call Steve, 470-1181 or Ron, 482-4935 evenings.

22' Wellcraft, 160 hp I/O engine, sleeps 2, head, telephone, tandem wheel trailer, \$4,500 or trade for car. Call Bill, x2030 or 488-2702 evenings.

16' Hobie Cat, tequila sunrise, w/trailer, excellent condition, equipped with double trapeze wires. Call 538-2288.

Piper Lance for rent, AC, club seats, \$75/hr wet. Call L. Damewood, 482-5572.

Skyhawk 1/4 interest, based at LaPorte, IFR, modern avionics, many extras, \$7,000, will finance 1/2. Call Pruett, x4491 or 487-3857.

Cycles

1981 Honda Express, under warranty, less than 300 miles, perfect shape, two for \$500, each for \$275. Call McChesney, x2393 or 333-2307.

1982 Harley, Superglide, FXE 80, black, Fat Bob tanks. Call 649-2465.

10 speed KIA bicycle, one year old, \$90. Call Lisa, x3406 or 480-5049 after 5 p.m.

1981 Sears minibike, nearly new, lists for \$349, asking \$175. Call Kimball, x6316 or 471-5736.

Yamahs, YZ80, excellent condition, \$350; 175cc Enduro, \$300. Call Travis, x4336 or 482-1582.

Child's starter bicycle, 16" wheels, red, \$15. Call Steve, x2447 or 529-8097.

1976 Honda XXL 175, excellent condition, low miles, w/helmet, \$450. Call Smith, x3987.

Suzuki GS1000E, 1980, loaded, \$3,200. Call Pritchett, x7484 or 991-3700 after 6 p.m.

1981 Suzuki GS250T, 4 stroke twin, 1,150 miles, \$900. Call Dan, x5348 or 333-4453.

Sidewalk bike with training wheels, excellent condition, boy or girl, \$40. Call 438-2951 evenings.

Household

Franciscan crystal, 8 tea stems, 5 wine stems, were \$14 each, will take \$5 each. Call Carla, x2623 or 538-1148 after 5 p.m.

Day bed corner unit with brown/gold covers, new mattresses, \$240; Kenmore washer for used parts, \$20. Call Brenda, x3836 or 996-9738 after 4 p.m.

Danish modern coffee table; carbine; sewing machine; antique RCA radio. Call Young, x4164.

Antique vanity table, needs a little work, \$75; gold vinyl reclining chair, \$75. Call Lee, x3459 or 488-1146 evenings.

Colonial sofa sleeper, earthtone colors, pulls to queensize bed, excellent condition, \$275. Call Lori, x2258 or 486-4160 after 5 p.m.

25" Zenith color console, dark Spanish oak design, excellent condition, \$200. Call Travis, x4336 or 482-1582.

Horizontal 6 drawer wood dresser, wood nightstand, wood bookshelf, metal file cabinet, prices negotiable. Call 480-7815.

Rich plan upright freezer, 22 cu. ft., one year old, \$365. Call Bev, x4950.

Persian carpet, 8.5' X 12.5', red and blue, floral sarough, must sell, \$4,500 or best offer. Call 339-2327.

Heavy gauge wrought iron round table, glass top, with 4 chairs, \$175. Call 488-8682.

Sears frost-free refrigerator, \$175; chair and ottoman, \$50; spice jar b/r hanging lamps, \$0. Call 488-6692 after 5 p.m.

Lady Kenmore electric dryer, gold, perfect condition, \$200. Call C.D. Haines, x3851 or 941-2495.

Morton Booth 8-gun solid walnut cabinet, excellent condition, \$175. Will hold til Christmas. Call 480-2724.

Plush brown carpet, 12 by 12 ft., excellent condition. Call Shannon, x4831 or 996-9038.

Wards deluxe upright freezer, 16.1 cu. ft., like new, \$325. Call Tim, x3105 or 488-6389 after 5 p.m.

Amana microwave oven, \$300; Whirlpool dishwasher, \$150; Hamster habitat cage, \$20. Call Clansy, x5666 or 438-5545.

One twin 79" foam rubber mattress and boxspring with frame, \$60; one twin 74" standard length mattress and box spring, \$50. Call Mike, 333-2335.

Lost

Camaro key tag with two sets of car keys and others, on parking lot near Palais Royal on NASA 1 around 10-18-82. If found, please call Opal, x3669.

Photography

Asahi Penta KX SLR 35mm camera including SMC Pentax 1:85/55mm, macro 1:4/50mm and 1:4200mm lens plus Hoya filters with Marsand accessory carrying case. Call 486-5020 after 5 p.m.

Eumig sound movie system, super 8 color camera and projector, \$350 firm. Call Kelly, x6268 or 482-5190 after 5 p.m.

Computers

TRS Mod 1, 48K cassette, RS-232 included plus documentation, \$860. Call Tony X Patino, x4891 or 944-5299 after 7 p.m.

Hazeltine 3000 computer terminal, \$250; Burrough L8000 office computer, \$500. Call 471-5209 after 5 p.m. ZX71 computer, 16K module and several books, all for \$100. Call Hendrix, x6204.

Sears router, Rockwell drill, Black and Decker drill, Victor torch. Call 480-7200.

Miscellaneous

Three passenger rear seat for Ford van, never used. Call Waite, x4241 or 333-2442.

Lafayette tube checker, with manuals, excellent condition \$15. Call 488-3966.

Realistic Model PRO-2001 programmable 16 channel scanner, any reasonable offer. Call Ken, x2907 or 665-2515.

Fresh from the garden mustard greens, \$2 per shopping bag. Call 559-2955.

Deer season special: 30/06 Springfield "03" spterized, bolt-action 5-shot with SX scope, leather sling. Call Alter, x5111.

Sears 8 inch table saw, complete, \$100. Call 944-8717.

Four tires, wheels and hub caps, \$50, size 15; 12 by 16 ft. brown carpet, new, \$80, will deliver. Call 986-6731 after 5 p.m.

Gray, Cerulian mink cape, mint condition, appraised at \$1,400. Call Paul Hobush, x2544.

Postage stamps below post office price, \$26 face value for \$25. Call Jeff, x7429.

Wanted

Need ride from Cedar in La Marque to NASA, 8:30 to 5 shift, will change if necessary. Call Karen, x3931.

Want usable card or similar folding table. Call Freda, x6301 or 486-0790.

Want used double mattress and boxspring in good condition. Call Sandy, x4111 or 480-1764.

Want fourth rider for car pool from Missouri City/Quail Valley to NASA. Call Bob Patil, x6484 or 488-9005.

Want female housemate to share 3-2-2 in Middlebrook area, no pets or children, \$250/mo. plus utilities. Call 946-7793 or 488-7891 after 5 p.m.

Need nonsmoker for carpool from Garden Villas/Glenbrook Valley, Hobby Airport area, for 7:30 or 8 to 4:30 shift. Call Bill, x5156.

Want female to share large furnished bedroom with same in condo near El Lago, all appliances, washer and dryer. Call Angie, x2581.

Want ski apparel, biv and jacket for small adult size, and goggles. Call Mike, 538-1793 after 3:30 p.m.

Want keyboard player for friendly group with goal of having fun and making a little money. Call Susan or Mark, x2948.

Need ride weekdays from and to Kings Park Apartments. Call Ben, x2191.

Want 1 person with car to join carpool from Bellaire/Buffalo Speedway area to NASA, 8 to 5 shift. Call Margaret or Peter, x4231.