

# Space News Roundup

Vol. 20 No. 12

June 19, 1981

National Aeronautics and Space Administration

## Shuttle Update

Turnaround of Orbiter 102, the Columbia, remains close to schedule despite two problems encountered last week.

On Thursday morning, during power-on testing of the vehicle, the elevons were being cycled to bleed air out of the hydraulic system. The left inboard elevon struck an access platform, damaging 18 tiles and superficially damaging the honeycomb structure.

The 18 damaged tiles were removed, as well as 10 others to facilitate analysis of the structural damage. As of the end of last week, there were 621 cavities and 130 tiles had been bonded to the orbiter.

Another problem was encountered Thursday morning when a technician discovered hydraulic fluid coming from a flash evaporator purge line. An investigation was conducted to determine the extent of the fluid contamination, which was found to be confined to the flash evaporator duct. The duct will be replaced.

*Continued on page 4*

## Centaur Studied as Shuttle Stage

NASA's Lewis Research Center, Cleveland, has awarded four letter contracts totaling \$7,483,000 for design and development of a modified Centaur launch vehicle and related components for use as an upper stage in the Space Shuttle.

Under a \$1,545,000 contract with Teledyne Industries Inc., Northridge, Calif., five digital computer units and nine remote multiplexer units will be designed and developed. The digital computer is the on-board computer which the Centaur vehicle utilizes during flight for control and operation without ground commands. The remote multiplexer units comprise the basic airborne data information system to supply in-flight data during launch. Work will be performed at the contractor's plant in Northridge.

Under a \$1,593,000 contract with Honeywell Inc., Avionics Division, St. Petersburg, Fla., three inertial measurement groups will be designed and developed. These are part of the self-contained automatic navigation and guidance system. Work will be performed at St. Petersburg.

Under a \$3,412,000 contract with General Dynamics Corporation, Convair Division, San Diego, two modified Centaur vehicles will be

designed and developed, with work to be performed at San Diego.

All work under these contracts was scheduled to begin June 1 and continue through Sept. 30.

Under a \$933,000 contract with United Technologies Corporation, Pratt & Whitney Aircraft Group, West Palm Beach, Fla., four RL10A-3-3A rocket engines will be built. Primary thrust for the Centaur is provided by two of these engines which develop 33,000 pounds total thrust. The engines are regeneratively cooled and turbopump fed. Work will be done at West Palm Beach and will begin on August 1 and will continue through Sept. 30.

All of these contracts are in support of the Galileo mission to Jupiter scheduled for launch in 1985 and the International Solar Polar Mission in 1986.

For use with these missions, the Centaur will be an adaptation of the vehicle that has flown as an upper stage for both the Atlas and the Titan boosters over the last 15 years on the Mariner missions to Mars and Venus, the Pioneer missions to Jupiter and Venus, the Viking and Voyager missions, and the cooperative Helios mission with West Germany. Centaur has also flown NASA low earth orbit missions.

## NASA Officials Honored For Success of STS-1

Awards to NASA personnel by President Ronald Reagan headed a list of honors bestowed upon agency officials as a result of STS-1.

At ceremonies at the White House, the President awarded the Presidential Citizen's Medal to Dr. Alan M. Lovelace, acting administrator. The award was established in November

1969, and Dr. Lovelace is the fourth recipient.

"For more than 25 years in the public service," the President said, "Alan M. Lovelace has exemplified the highest standards of responsibility in federal research and development programs. . . ."

In a separate ceremony, the President presented medals to STS-1 astronauts John Young and Bob Crippen. Young was presented with the Congressional Space Medal of Honor and the Distinguished Service Medal, NASA's highest award. Young was the seventh astronaut to receive the Congressional Space Medal of Honor, which is awarded for ". . . exceptionally meritorious efforts and contributions to the welfare of the nation and of mankind."

Crippen was also presented the NASA Distinguished Service Medal "for distinguished service as Pilot of the first orbital test flight of the reusable Space Shuttle — a new generation of spacecraft whose highly successful first flight promises continued U.S. preeminence in space."

Young and Crippen have also been singled out for recognition by the Aviation Hall of Fame. They have been selected to receive the Al J. Engle Award, named for an early aviation pioneer and presented in recognition of outstanding in-flight achievements.

The American Institute of Aeronautics and Astronautics (AIAA) also honored JSC personnel at its recent 50th Anniversary Honors Night Banquet in Long Beach, Calif.

Dr. Christopher C. Kraft, Jr., JSC director, was elected an Honorary Fellow of the AIAA for "achievements and exceptional leadership in astronautical engineering, especially in the area of manned spaceflight." The award is the highest honor the Institute can bestow on a member.

Donald K. (Deke) Slayton, manager of the Orbiter Flight Test Program at JSC, was elected an AIAA Fellow for his achievements as an astronaut and his leadership in space flight program management.

Retired JSC employee William H. Simmons was presented the AIAA distinguished Service Award for his contributions to the institute and to the Houston Section.

## Astronaut Al Bean Resigns June 26

Astronaut Alan Bean, fourth man to set foot on the moon, will resign from NASA effective June 26 to devote full time to his career as an artist.

Bean said his decision was based on the fact that, in his 18 years as an astronaut, he visited worlds and saw sights no artist's eye has ever viewed firsthand, and he hopes to express these experiences through the medium of art.

Bean was among the third group of astronauts selected by NASA in the fall of 1963. He was lunar module pilot on Apollo 12, man's second landing on the moon in November 1969. He and Pete Conrad explored the Ocean of Storms, while Dick Gordon circled in the command module.

From July to September 1973 he was commander of the second Skylab mission. On that 59-day, world-record-setting mission, Bean — with Jack Lousma and Owen Garriott — accomplished 150 percent of the pre-mission forecast goals. His next assignment was as backup spacecraft commander for the United States flight crew on the joint U.S.-Soviet Apollo-Soyuz Text Project in 1975.

Bean's 1,671 hours, 45 minutes in space rank him first among active American astronauts in total space flight time. He is fourth on the all-time list of U.S. astronauts in cumulative space flight time. During his career, Bean amassed 11 world records in space and astronautics. He is presently head of the Astronaut-Candidate Operations and Training Group.

Bean's interest in art is not new. He began his formal art training as a night school student while a test pilot in the Navy. His paintings are about what he knows best — the exploration of the moon. He feels that the beginning of man's exploration of space has been

the most historically-significant event of our time, and his purpose now is to make a contribution to art by capturing these events on canvas. He plans to pursue this goal in the Houston area.

With Bean's resignation, only one of the 12 Americans who have walked on the moon remains in the astronaut corps. He is John Young, chief of the Astronaut Office and commander of the first Space Shuttle flight.



An early demonstration of Al Bean's painting may be seen in the Bldg. 2 Visitors' Center. Artist Bob McCall who was commissioned to paint the mural, invited Astronaut Bean to paint the rendering of the astronauts' symbol included in the larger work. Bean has announced his resignation from NASA effective June 26. He will pursue a full-time art career.

# Many 'Spaceweek' Activities in JSC Area

A national event called Spaceweek, from July 13 to 20 will include many free public activities in and around the Johnson Space Center, designed to educate citizens about the benefits of space and what the future in space may hold.

"Space: America's New Wealth" is the theme of Spaceweek '81, according to Carolyn Conley, director of Spaceweek-Houston. "Culminating on the 12th anniversary of Neil Armstrong's first steps on the lunar soil," she said, "Spaceweek will celebrate America's past space achievements and will show how America will benefit from a continuing utilization and exploration of the resources of space."

Space supporters are organizing into groups across the country to lobby for a stronger space program. Although they say they are buoyed by the success of the Shuttle's first launch in April, they feel the country must now set a major goal for its space program. Advanced projects proposed by these groups include solar power stations, a permanent U.S. presence in earth orbit, mining the asteroids and the moon, and eventually even building large habitats in the sky, according to a Spaceweek spokesperson.

"Many of these concepts are economically feasible since

## JSC Exchange Store

(Store Hours 10:00 AM to 2:00 PM)

Plitt Theater tickets - \$2.10 each

General Cinema tickets - \$2.40 each

Astroworld/Six Flags tickets - \$9.50

Postage Stamps - 18 cents - Book \$3.60 Each

they can pay for themselves by relieving the energy, resource scarcity, and overcrowding problems we face here on earth," the spokesperson said. He added that space-related research and development expenditures have also always produced multitudes of useful spin-offs for people on earth.

Spaceweek will attempt to instill in the public the concern many feel for the future of civilization if locked here on earth. Celebrations this year are taking place in New York, Washington, D.C., Los Angeles, San Francisco, Houston, Salt Lake City, Omaha, Kansas City, Roanoke, Tucson, Baton Rouge, and many other large and small towns yet to be announced.

The Houston Spaceweek '81 celebrations will include a noon-time lecture series, a film festival, star parties, a model rocket demonstration, a poster contest, an amateur radio club QSL selection, a banquet, and even a fusion energy conference.

The lecture series, sponsored by the Houston Section of the American Institute of Aeronautics and Astronautics, is scheduled for July 13-17 and July 20 at 11:45 a.m., in the Visitors Center auditorium at the Johnson Space Center. Among the speakers will be Mr. Clarke Covington of NASA who will speak on the Space Operations Center — America's future space station, and Dr. Burton Edelson whose talk is entitled: "Satellite Communications: A Major Space Benefit."

On July 19 the NASA-Houston Section of the National Association of Rocketry will host a rocket demonstration, launching from behind the rocket park at the Johnson Space Center from 1-4 p.m.

A film festival is being sponsored

by the Lunar and Planetary Institute. The films will be shown over two evenings from 7 to 9 p.m., dates to be announced, in the Visitors Center auditorium at the Johnson Space Center. Films will highlight the recent planetary exploration of Voyager to Jupiter and Saturn. There will also be a new film of the space shuttle Columbia's first mission.

Following the film festival on both evenings, visitors will be able to do some planet and star gazing through telescopes provided by the JSC Astronomical Society. The star parties will last from 9 to 10 p.m.

Results of a student poster contest held by the Houston Section of the Association for Computing Machinery will be on display July 13-20. The theme of the contest was "The Space Age and Computers."

The JSC Amateur Radio Club is in regular contact with radio operators throughout the nation. On July 18 or 19 the club will present its collection of QSL cards, which are identification cards sent by in operators with whom they have made contact.

The Lunar Rendezvous Festival, as part of its annual

celebration, is hosting a banquet on July 20 at Jimmy Walker's in Kemah. Tickets can be purchased through the Lunar Rendezvous Festival and a speaker will be announced later.

The first event, leading up to Spaceweek '81, will be a conference on July 8 at the AstroDome Marriott Hotel sponsored by the Fusion Energy Foundation. The topic of this event is "The Promise of America in Space: Reviving a

National Commitment to Greatness." Featured speakers include Dr. Claude Nicollier, Swiss astronaut candidate, and Dr. Krafft A. Ehrlicke, author on space propulsion and industrialization. For reservations contact the Fusion Energy Foundation at 972-1714.

Organizations desiring to hold public events this summer as part of Spaceweek '81 are being asked to contact Carolyn Conley at 483-5871.

## New Medical Spinoff

Spacecraft technology developed at NASA's Goddard Space Flight Center, Greenbelt, Md., and proven over a decade (1962-1972) of space exploration has been transferred by Johns Hopkins scientists to medical applications that could revolutionize treatment of pain, involuntary motion and nervous disorder.

Utilizing miniaturized microcircuitry design criteria from the 181-kilogram (400-pound) Small Astronomy Spacecraft-C, third in a series of X-ray seeking surveyors exploring the celestial sphere above Earth's atmosphere,

engineers at the Johns Hopkins Applied Physics Laboratory, near Columbia, Md., in Howard County, reduced the spacecraft systems to deck-of-cards size which permits surgeons to implant the plastic encapsulated electronic device in patients suffering from neurological disorder or damage.

In the manner of spacecraft ground controllers sending radio commands to a satellite, neurosurgeons are able to address the implanted Tissue Stimulator with an electronic digital signal. These signals are the doctor's prescription in the form of pulses to the problem area for the desired stabilizing result.

The SAS spacecraft series (A, B and C) revealed the existence of such phenomena as quasars, pulsars and black holes, while carrying out their missions of seeking information in the gamma ray, ultraviolet, visible and infrared spectral regions both inside and outside our galaxy.

Because of the required compactness of onboard systems, Goddard spacecraft designers produced advanced state-of-the-art electrical power sources, telemetry uplink-downlink methodology and secure logic techniques not previously flown.

## JSC Golfer Scores Ace

For the fourth time, the JSC Golf Association played a wet tournament. Two through the rain, the third rained out after starting, and the fourth, at Chigger Creek (Friendswood), through standing water.

That didn't keep Bill Fullbright from having an outstanding day though. He not only won his flight, but also had a hole-in-one on the Par 3, 171-yard, number 12. Bill hit it straight to the pin with a five wood, and could see the ball

when he left the tee. About half way to green, they saw it disappear and thought it was resting against the flagstick. Playing with him were Max Engert, Bill Shropshire, and Joe Nick Villarreal.

Winners in the first flight were Fullbright (net 67), Shropshire (70), Jerry Shinkle (71), and Jake Klinar (71).

Winners in the Second Flight were Harry Kolkhorst (63), Cal Mitchell (64), Bob Sampson (68), and Al Ligrani (69).

Flight II plays Goose Creek (Baytown) tomorrow, and Flight I plays there June 27.

## Cookin' in the cafeteria

### WEEK OF June 22 - 26, 1981

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

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

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

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

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

**TUESDAY:** Beef Noodle Soup; Baked Meatloaf; Liver w/Onions; BBQ Spare Ribs; Turkey & Dressing (Special); Spanish Rice, Broccoli, Buttered Squash.

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

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

**FRIDAY: HOLIDAY**

\* Menu subject to change without notice

## Autograph Party For Author of 'Red Star in Orbit'

James Oberg, author of "Red Star in Orbit," will be at "Bookmaster" from 11 a.m. to 1 p.m. today and tomorrow to autograph copies of his book.

"Bookmaster" is located at the intersection of NASA Road 1 and El Camino Real.

"Red Star in Orbit" details the political and technological history of the Soviet space program.

Oberg is employed at JSC by McDonnell-Douglas Corp.



Weather information during the Space Shuttle era will be more critical than ever before since it now concerns primary and contingency landing sites, as well as the launch site. Accordingly, a new system has been introduced to provide more prompt and comprehensive weather data. Richard Siler, Chief of the Spacecraft Meteorology Branch, is shown here describing the system to Launch Team Flight Director Neil Hutchinson. The Automated Field Operations System (AFOS) interfaces directly with the National Meteorological Center, Washington, D.C., to provide decision-makers with the most complete possible picture of weather data.

### WEEK OF June 29 - July 3, 1981

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

## At the Gilruth Rec Center

Registration is being accepted in the following leisure time classes at the Gilruth Recreation Center:

**Aerobic Dance** - Part dance, part exercise - all fun. This class is offered on Monday and Wednesday mornings from 9-10 a.m. beginning June 22 and Tuesday and Thursday afternoons from 4:15-5:15 p.m. beginning June 23. Cost is

\$45.00 for this 8-week course. **Defensive Driving** - Learn to drive safely and qualify for a 10 percent reduction in your auto insurance for the next 3 years. Class meets on Saturday, July 18 from 8 a.m. to 5 p.m.. Cost is \$15 per person.

**Adult Tennis Lessons** - Sharpen up your game. Beginners class meets on Tuesdays from 5:15-6:45 p.m. beginning

June 23. Advanced beginners and intermediates meet at 5:15-6:45 p.m. on Thursdays beginning June 25. Cost is \$24 for each class.

**June Fun Run** - Mark June 27 on your calendar to run in our first annual Weight Handicap race. Race begins at 8 a.m.. Cost is \$2 per person for 5 Km and \$1 for the 2 mile race.

**Men's Basketball League** - Register now for the Men's Summer Basketball League. Play will be on Monday nights. Cost is \$100 for EAA teams and \$150 for non-EAA teams. League is restricted to first 11 teams.

**IMPORTANT NOTICE:** Phone Change At The Gym Office. The new phone number at the Gym Office is x3944. Call for information on all recreation programs. This is a temporary phone number change due to construction.

## 'Mets' Sweep Softball League

NASA 'A' League softball champion for the current season is the Mets, sponsored by Storer Cable Communications of Clear Lake City.

The Mets were undefeated in seven games, scoring 153 runs to a total of 33 by their opponents.

The team was paced by Ed Jeffrion with 10 home runs and a batting average of .846, and Jack Boykin with nine homers

and an .826 average. John Allen and Robby Hill were defensive standouts. Other team members included Bob Dickson, David Duttenhoser, Jim Smith, Richard Kruse, Mickey Donhahoo, Jim Powlowski, Al Morrey, Nat Hardy, Greg Blackburn, Wayne Whittington (who goes into semi-retirement after 15 years with the team) and manager Rich Holtje.

## Roundup Swap Shop

### Wanted

4x5 view camera in working order, w/lenses & accessories. Terry White, 332-5177.

18 or 20 cu.ft. refrigerator and electric dryer and washer (full size) all must be in good working condition. Paul x6437 480-2464.

**WANTED:** Portable Electric Typewriter with case in good working condition. Call Eileen 4407 or 487-0179 after 5:30.

### Household

Love seats (2), mediterranean, gold foam cushions, fruitwood arms and trim, like new, \$100 each. Call 482-8781 evenings.

For Sale: Baby crib \$45 and port-a-crib \$25. Good condition, firm price, no checks, call 488-3377 after 5.

### Property & Rentals

For Rent: Galveston By-The-Sea Condominium. Two bedroom furnished apartment for rent by day, week, or month. Clements 474-2622.

For Sale: Bolivar 2 bedrooms, 2 bath, central a/c & heat 482-7905.

Wanted to lease: 3 or 4 bedroom home in Seascape or El Jardin. Call Marla at 943-2830 or 334-6390.

Ten acres on NASA 1 near JSC. Seeking associates to develop health care facility. x5350 (Mr. Horton).

Jamaica Beach Cottage, \$220/wk. Make reservations now for summer season. Call 334-1640 after 6 p.m.

Forest Bend 3-3-1 for rent. Patio home, easy living maintenance free \$425 per month no pets please 480-5196.

League City/Ellis Landing 4-2-2 1/2 two story 2364 sq. ft. w/fireplace, wet bar 10 1/2 percent VA loan can be assumed by veteran 332-8323.

For Sale: CLC, by owner, 4-2 1/2-3, formals, den F.P. bonus room, other extras excellent 2800 sq. ft. low 90's 488-3385.

For rent: Lakehouse on Lake LBJ. Sleeps 8. Completely furnished except linens. Good fishing, swimming, boating. Daily/Weekly Rates. Steve x2001.

For Rent: League City 3-1 1/2-2, new interior, near schools with easy access to FM 270 bridge. \$450 per month 554-6200.

Rent: Sagemeadow, 2 years, 3-2-2, fenced, close to school and supermarket, M/W oven, G/D opener patio, grill \$575 484-1215 after 5 p.m.

For sale: Bay Pointe Townhouse-LaPorte, 2-11/2, patio, carport, pool, stove, refrig. available July 31, \$42,500 471-4209.

Rent, Lake Livingston, Cape Royale 3 br. waterfront cottage by marina. Tennis, pool, golf, boatramp. 3 day min. 488-3746.

### Boats & Planes

1978 Galaxy boat, 16 ft. w/walk thru windshield. 70 hp. Johnson Galvanized trailer. \$2995 488-5762 after 5.

12 foot blue and white fiberglass tri-gull boat, trailer and motor \$600. Free tryout Phone 488-0323.

Private pilot and/or instrument ground school for only \$10! Gr. Am. Tiger \$37.95 hr. wet instructor and 2 seat trainer available! For these and other benefits of the Gulf Coast Aero Club call Chuck Reynolds at 499-3124 (h) or 662-5782 (w).

### Lost & Found

Left-handed softball glove at Gilruth Center May 19th. If found please call Dave Walker x3856.

### Household

Beautiful carved solid pine spanish twin headboard, \$50. Seven room wood doll house, \$25. Ten sheets 1/2 inch c-d sheathing plywood, \$5.50 each John x4393 or 488-0559.

Solid maple round table (formica top) and 4 captain chairs; good condition, \$100. 488-0353 or 483-4416 (Gary).

For Sale: Early American sofa, 3 cushion, excellent condition, \$95.00. Refrigerator, 16 cu ft., white, excellent condition, \$100.00 Call 946-1869.

HEATHKIT 19" color TV (GR-273). Good working condition. Built-in test equipment will service manuals. \$100 Ernie x4171 or 485-2287.

Bernina 730 automatic sewing machine, free arm, w/all attachments. Judy x5803.

Three pairs of fixed louvered bi-fold doors 4 ft. wide with frames and hardware \$20/pair Shumilak 482-7723.

Double pecan head and footboard, Italian provincial, \$25. Pecan framed mirror \$20. Gold Spanish hanging lamp, \$20.

2 orange modern chairs, \$25. 2 red Spanish chairs, \$15. Black vinyl recliner, \$50. Maple child's rocking chair \$12. 482-2810.

### Cycles

For Sale: 1978 Honda 550-4 K, less than 4,000 miles. Adult owner, excellent condition, luggage rack, back rest, and Faring. \$1,650.000 946-9053.

## National Technical Assn. Establishes Local Chapter

Five JSC employees have been selected to head a newly-formed chapter of the National Technical Association in this area.

The association is a professional, non-profit technical society established in 1926. Its objectives are to provide for technical interchange among minorities, to disseminate career opportunity information to minorities, to motivate minority youth to consider technical careers, and to remove barriers to minorities entering and advancing in technical professions.

Association officials are Arrington H. Stewart, flight systems engineer, president-elect; Willie B. Williams, experimental facilities and equipment engineer, vice president of membership; Anngienetta R. Johnson, payroll officer flight

controller, vice president of programs; Howard L. Renfro, Technical engineering operations management, Vice president of operations; and Rae Chambers, contract specialist, treasurer.

Other JSC charter members include Eddie Burrell, Shirley Chevalier, Billy T. Herve, Curtis Hyman, Robert A. Ligons and Vernon Shields.

The first scheduled meeting of the local NTA chapter is set for September 1981. Applications for membership and other information may be obtained from any charter member.

**Take stock in America.**

Join the Payroll Savings Plan.



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.

**Wanted**  
4x5 view camera in working order, w/lenses & accessories. Terry White, 332-5177.  
18 or 20 cu.ft. refrigerator and electric dryer and washer (full size) all must be in good working condition. Paul x6437 480-2464.  
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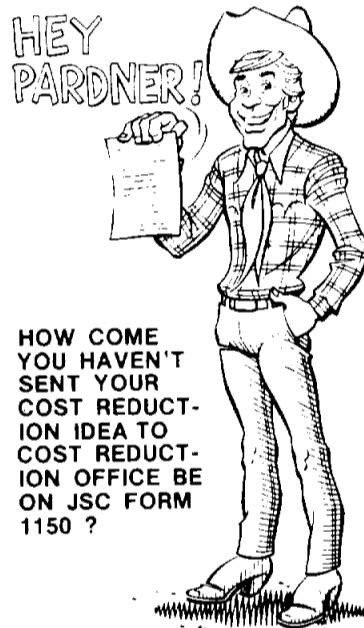
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Cartoon by Russ Byther

1974 Kawasaki 750cc European model H1 \$700.00 res. 946-6924 duty 483-7210.

CL-350 Honda low miles excellent condition \$425 x3213 or after 5 482-0370.

For Sale: 1978 Honda motorcycle 400cc Hawk with automatic transmission. 6000 miles \$850 ST. Leger x2626.

1973 Honda CB 350, 4 cylinder, low mileage, excellent condition. \$700 483-5107 ask for Dean, after 5 p.m. - 488-7032.

1974 HONDA, 450 gas-sipper, excellent condition with only 12,000 miles, luggage rack, back rest, safety bars. \$575 takes it. 488-8862 (after 8 p.m.).

### Pets

Registered Appaloosa mare 9 yrs. 15 hands, gentle, black/white blanket, due to foal in August wt. 1200 lbs \$1200 or best offer x5021, 453-6257.

AKC Reg. black male toy poodle, 4 yrs. old, \$75, x3576 or 944-7042.

**INSPECTOR GENERAL HOTLINE**

REGULATION & COMPLIANCE

- FRAUD
- WASTE
- ABUSE
- MISMANAGEMENT

AT JOHNSON SPACE CENTER CALL: 483-4773  
OR TOLL FREE: (800) 424-9183  
24 HOUR ANSWERING SERVICE

CALLER CAN BE ANONYMOUS

OR WRITE: NASA INSPECTOR GENERAL  
P. O. BOX 23089  
NASA L'ENFANT PLAZA STATION  
WASHINGTON, D.C. 20024

### Miscellaneous

Bernina 730 sewing machine; free arm; all attachments; excellent condition. Call Judy, x5803.

Huffy 10 sp bicycle, good condition \$10 Western competition slalom water ski, never used. \$50 485-5762.

Onan 4 KV generator, elect. st. 4-110v outlets, 1/2 gal/hr. tank, \$1100 645-1504.

Honey for sale: \$3 per quart call Garner at x6316 or Marilyn at x2688

Ping-pong table. Heavy-duty with 3/4 inch top Good condition \$30 J.B. Hammack 334-2986.

Beat-up old riding mower, gearbox shot, but 7 hpp engine ok \$50 to push it away. Samounce x4727.

Rheem/Rudd - "Hi Efficiency" 4 ton air conditioning compressor unit-almost new, half price Bill Whipkey 5827/482-7012

Sears 8 hp riding lawn mower, electric start, good condition 2 yr. old \$300 Bill Whipkey 4827/482-7012.

Sears exercise bicycle; like new (ridden only 75 miles). \$85. Call 487-5395 or 472-5243 after 6 p.m.

For Sale: seven sheets of 1/2" CDX plywood sheathing, \$47.25 Contact S. Gaudiano at 334-2186.

Romex compact refrigerator, approximately 2 cu. ft., white, \$55. Jack 483-6301.

Sears pinball machine - \$100. 16" glass sphere for aquarium or terrarium - \$10. 2 Life jackets - \$10 ea. Floor polishers-waxer - \$20. 482-2810.

Power saw, 7" circular, Sears-made, 1-3/4 hp with blade and attachments, metal housing, double insulation, barely used. Half original price, \$28. Call Dave x5111 or 488-8862 after 8 p.m.

For Sale: 4' chain link fence, 55' long, excellent condition, \$55. Call Eileen x4407 or 487-0149 after 5:30.

For Sale: Coleman double mantle lantern, \$14. Sears camping toilet with bags, \$3. Water ski jacket, \$12. Two brass india globes, \$10 each. Samsonite Starlite blue suit case, \$15. John x4393 or 488-0559.

### Cars & Trucks

1969 Camaro 6 cyl 3 ps, new paint & tires excellent condition. \$2195 485-5762.

4 Firestone tires size B78-14 \$40 or best offer call x3967, Mary ask for Dee.

1972 Pinto, good condition, runs well make offer. Jim Briley; x5523, 488-7901 after 5 p.m.

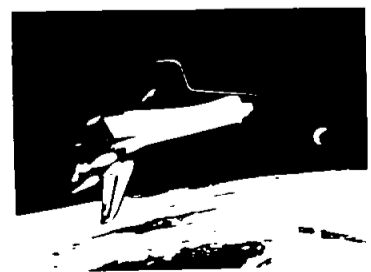
1977 Cadillac Cpe. DeVille, excellent condition, loaded, wire wheel discs, 8 track stereo, 3 way power seat, etc. call 333-3187.

1975 Omega Salon 4-D excellent condition. AT,AC,AM-FM stereo new radial tires \$1875. J.B. Hammack 334-2986.

78 Dodge Brougham 22.5' motor home. Onan roof/dash air, cruise, sleeps 7, am/fm, stereo tape, \$13,100. 479-6766 after 6 p.m.

For Sale: 1973 Gremlin. Needs radiator. \$150 call 483-1832 after 6 p.m.

Roundup deadline is the first Wednesday after publication.



The Roundup is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees.

**Payroll Savings.**  
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## NASA Displays Featured At Paris Air Show

"Imagination — the Essential Element" is the theme of the NASA exhibit in the U.S. Pavilion at the 1981 Paris Air Show. This theme reflects NASA's unique technological role in the support of aerospace products of the United States.

The show opened for the press June 4 and for the public June 5 to 14.

The U.S. exhibition, staged by the Department of Commerce's International Trade Administration, features the latest products and services of 112 American manufacturers of aerospace industry equipment and supplies.

The theme area of the U.S. Pavilion, with the NASA exhibit, is open to the general public. The commercial sales section, containing the manufacturers' displays, is open only to registered trade visitors and potential buyers.

The theme area display reflects the work of NASA in creating technology which ultimately becomes available for use in the products of the U.S. aerospace and transportation industries.

Highlights of the exhibit will include a Moon rock that can be touched, a full-scale mockup of the Space Shuttle Orbiter flight deck, a 1:20 scale model of a supersonic transport, 1:10 scale models of Galileo and Voyager spacecraft, a 1:10 scale model of Landsat-D satellite and a multi-image audio-visual presentation tracing and history of flight since the kite was invented in China some 2,400 years ago.

At the entrance to the pavilion is a two-minute multi-image audio-visual presentation.

In the adjoining aeronautics section are four films on energy efficiency, vertical and short takeoff and landing, general aviation, and high-speed aeronautical research. Models include the Lockheed L-1011, Bell XV-15, winglets and a general aviation private jet.

The next area is devoted to the Space Shuttle where the focal point

is a full-size mockup of the Shuttle Orbiter flight deck. The right side is a cutaway to reveal the couches, instruments and two mannequins in Shuttle flight suits. Above and to the left of the Shuttle mockup and suspended from the ceiling is a mannequin in an extravehicular activity simulated pressurized spacesuit with a manned maneuvering unit backpack. Also in this area is a small captioned display and a model of Spacelab.

The next area centers on the U.S. Space Transportation System with models of a full-stack Space Shuttle, and three expendable rockets — the Scout, Delta and Atlas Centaur. Backlit graphics depict the types of payloads that can be launched including the "getaway special" canisters.

In the Planetary and Space Science area, a backlit photographic mosaic about 18 meters (60 feet) long covers past, present and coming programs in words and pictures. In a large enclosed booth and latest color photographs of the recent Saturn encounter will be shown on a rear projection screen. In front of and to the right center of the mosaic wall is a Moon rock display. The rock is exposed so it may be touched.

Suspended above the photo mosaic will be 1:10 scale models of the Voyager and Galileo spacecraft.

Across from the Planetary Science area are large transparencies covering Landsat, materials processing in space and technology transfer. A smaller unit is on the NASA energy program.

Films on three rear projection screens will explain the Landsat, materials processing in space and technology transfer programs with some examples of how they work. A model of Landsat-D, 2.4 m (8 ft.) long, is suspended above this area.

Purpose of the displays is to show the potential of these disciplines to solve problems that are of direct day-to-day concern to people on Earth.

## Voyager Team Cited

NASA presented medals and awards to members of the Voyager project team at the Jet Propulsion Laboratory, Pasadena, Calif., June 2.

The awards recognize nearly 10 years of effort, including early project planning, mission and spacecraft design and development, launch, early flight operations and the highly

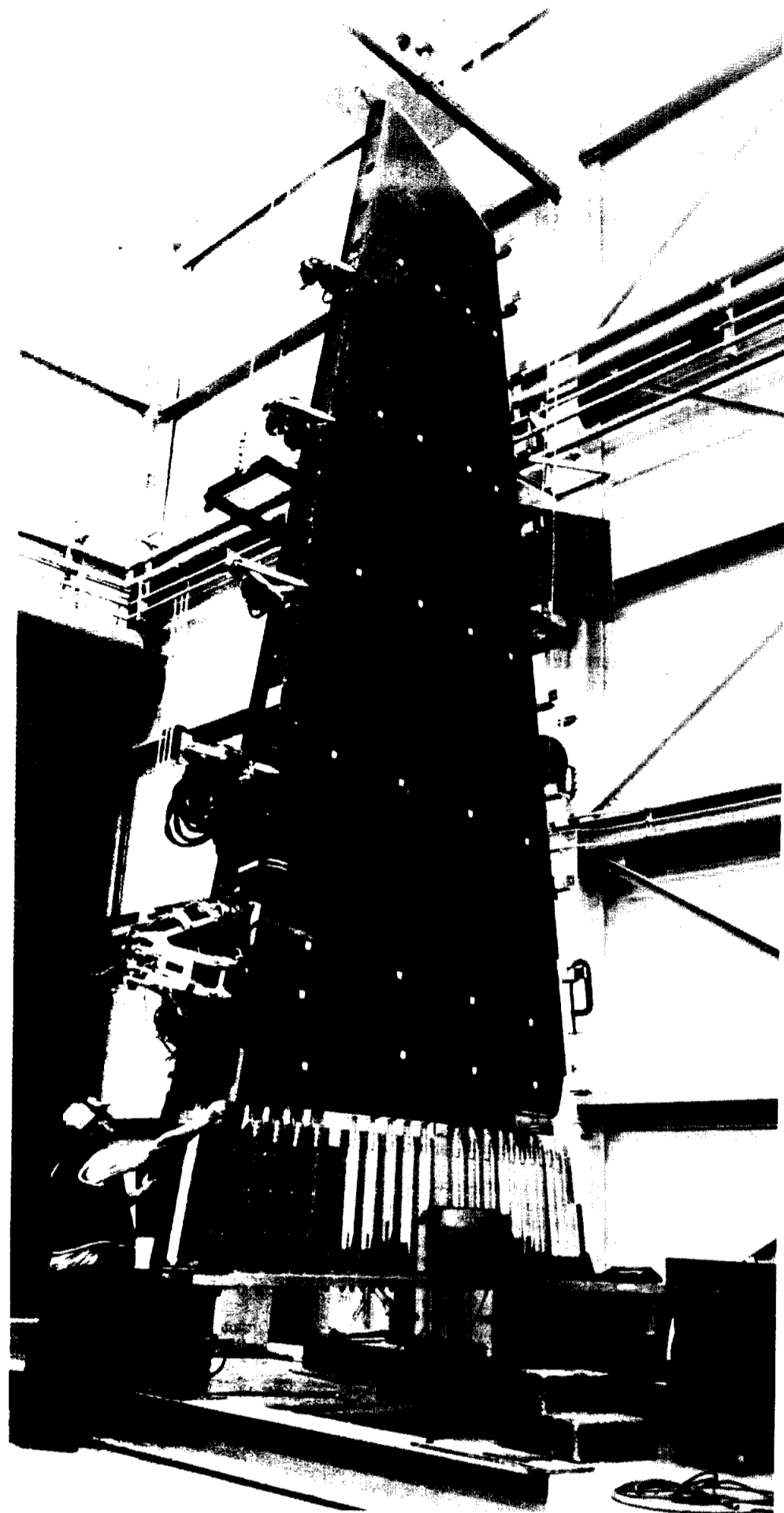
successful encounters with Jupiter in 1979 and the Voyager 1 Saturn encounter in 1980.

The Voyager project, managed for NASA by the Jet Propulsion Laboratory, launched two spacecraft to Jupiter and Saturn in 1977. Voyager 1 encountered Jupiter March 5, 1979. Voyager 2 encountered Jupiter July 9, 1979. Voyager 1 flew past Saturn Nov. 12, 1980. Voyager 2 will make its closest approach to Saturn Aug. 25, 1981, and then will head for Uranus and possibly Neptune.

The awards were presented to members of JPL and California Institute of Technology, as well as to individuals from other universities, private industry and other NASA centers. Among the awards presented to local individuals were four Distinguished Service Medals, 16 Outstanding Leadership Medals, seven Exceptional Scientific Achievement Medals, 65 Exceptional Service Medals and other awards representing exceptional group and individual achievement.

Receiving Distinguished Service Medals were: Dr. Bruce C. Murray, JPL director; Raymond L. Heacock, former project manager; Harris M. Schurmeier, former project manager; and Dr. Edward C. Stone, project scientist.

In addition, 14 Group Awards and 185 Certificates of Appreciation were presented.



**TESTING TALL TAIL** — Lockheed research technician Joe Robideaux examines a 26-foot tall advanced composite vertical fin now undergoing testing at the company's Rye Canyon, Calif., Research Laboratory. The developmental L-1011 TriStar tail section is constructed of carbon graphite fibers embedded in a resin matrix. Under a NASA contract, Lockheed is studying the durability of advanced composite fins, which could someday replace heavier aluminum tail sections aboard commercial aircraft. The lighter weight of the composite fin would help to conserve costly fuel.

## Voyager Brushes Jupiter Environs

NASA's Voyager 2 has returned to the environment of Jupiter, almost two years after it flew past the planet.

Heading for a rendezvous with Saturn in late August this year, Voyager 2 has encountered the magnetic tail of Jupiter extending almost

482 million kilometers (300 million miles) beyond the giant planet — and the end isn't yet in sight.

Dr. Frederick L. Scarf, a TRW Inc., Redondo Beach, Calif., scientist and principal investigator for Voyager's Plasma Wave instruments, and his

colleagues, Dr. Donald Gurnett and Dr. William Kurth of the University of Iowa, where the instrument was built, detected noises in plasma wave measurements obtained in February 1981 that were identical to those last heard in July and August 1979, when Voyager 2 was departing Jupiter but still in that planet's magnetosphere.

From this new information, they determined that Voyager 2 passed through a filament of the Jovian magnetotail a year and a half after leaving the planet.

As Voyager moves toward its meeting with Saturn, both Saturn and the spacecraft should cross into the Jovian magnetotail, or wake, about 628 million km (390 million mi.) beyond Jupiter. This alignment of Saturn in the expected region of Jupiter's tail happens only once every 13 years, and Voyager 2 will be in a nearly perfect position to investigate the phenomenon.

On the solid rocket boosters, joint closeout was more than 95 percent complete and installation of ablative material on the hold-down posts continued. Checkout of cables on the right hand booster was begun, while routing of cables on the left hand booster continued.

Closeout of external tank preparations, and mating of the tank with the solid rocket boosters is still planned for the first week of July.

## Update...

*Continued from page 1*

The leak was traced to a tiny hole in a bellows in the accumulator for hydraulic system No. 3. The actuator system acts like a shock absorber in the event of surges in the pressure maintained on the hydraulic system when in operation.

Preparations were underway to conduct an "all systems" test of the external tank, following completion of the liquid oxygen tank entry system, and retest of the ullage transducer.