

Space News Roundup

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National Aeronautics and Space Administration

Shuttle Update

A major test of the assembled Space Shuttle, the Shuttle Interface Test, began last week at Kennedy Space Center as preparations continue for STS-2.

On the seventh day of the nine-day test, prime and backup crews will participate in flying the shuttle through two simulated liftoffs and a single descent from orbit to landing.

The SIT is designed to check out the mechanical and electrical connections between the Orbiter, external tank and solid rocket boosters and the functioning of the onboard flight systems.

The test is broken down into three different sections. The first portion of the test lasts about 112 hours and the entire Space Shuttle vehicle is tested as a unit to determine its readiness for flight. The communications channels between the Orbiter and other Shuttle elements are verified, leak checks are made where gas, fluid and propellant lines are attached, and a complete checkout of the Range Safety System is performed.

The Orbiter's main engine nozzles, elevons, rudder and speed-brake and body flap are moved as they would be in flight and the solid rocket booster nozzles gimbaled during the first part of the exhaustive test.

Toward the end of the test, the prime and backup crews for the second Space Shuttle flight — astronauts Joe Engle and Richard Truly, and Thomas K. Mattingly and Henry Hartsfield — are to participate in three simulations: a normal ascent to orbit, a return-to-launch-site abort using the backup flight system, and a descent from orbit to a mock landing on the dry lake bed at Edwards Air Force Base, Calif. The simulated flights, which make up the second two parts of the test, will take about 55 hours to complete.

See Shuttle Update, page 4

Voyager 2 attempts to answer Saturn's mysteries

The Voyager 2 spacecraft reached Saturn August 25 with its closest approach occurring at 10:25 a.m. CDT. The robot explorer passed 63,000 miles above the planet's cloudtops.

Voyager 1 flew past Saturn last November 12 and is now moving out of our solar system searching for new evidence of the limits of solar wind.

Voyager 2, launched in August 1977 from Florida, is midway through its planned explorations. Future planetary explorations include planned encounters with Uranus in January 1986, and, using that planet for an additional gravitational slingshot, with Neptune in August 1989.

Based on the extensive list of discoveries made by Voyager 1, the Voyager 2's onboard computers were

almost entirely reprogrammed to enable scientists at NASA's Jet Propulsion Laboratory to capitalize on the second visit. The Voyager 2 encounter concentrated on studies of the planet's unique ring system, its satellites, and its cloud structure.

Because the ring system is composed of literally hundreds of discrete ringlets, Voyager 2 used an occultation technique to assist in the definition of the ring structure. The spacecraft's photopolarimeter — an extremely sensitive light meter — was aimed at the star Delta Scorpii 989 light years away on the other side of the rings as the spacecraft approached the planet. By measuring the successive dimming and brightening of the starlight, scientists expect to gain the best information

yet on the number of ringlets, their densities and widths as well as the gap size between them.

Using a similar technique, but with radio waves instead of light, the Voyager 2's radio signal was tracked as it receded behind the planet from the near-north equatorial region to the near-south equatorial region. By monitoring how the signal fades out and back as the spacecraft emerged from behind Saturn, scientists measured atmospheric components in the higher cloud layers.

Special photographic techniques were used to allow for computerized three-dimensional reconstruction of Saturn's strange braided F-ring. This is expected to provide sufficient information for determining whether this ring structure is actually braided — implying at least three components — or is twisted or twined — implying only two components.

Additional close-up photographs of Saturn moons, some only barely captured by the Voyager 1 visit, were taken to help better define what is now believed to be a new and important class of solar system moon — nearly all ice and of an intermediate size to those of Jupiter.

Because of the opaque nature of Titan's thick nitrogen atmosphere, surface photographs of the second largest moon in our solar system weren't taken. Titan was discovered to have an unbelievably thick nitrogen and methane atmosphere with a high hydrogen haze above it. The atmospheric pressure of Titan's surface is nearly two and a half times that here on Earth. Various speculation about surface conditions on Titan have included the possibilities of liquid nitrogen seas and falling methane snow or rain.

Voyager 2, along with Voyager 1 and Pioneers 10 and 11 are all on a trajectory taking them out of our solar system.

Final SIM planned for STS-2

The final long-duration simulation of STS-2, Columbia, will be conducted here at JSC, Monday through Wednesday, Aug. 31 - Sept. 2.

STS-2 is a planned five-day, six-hour mission with launch presently scheduled for Sept. 30. The simulation, however, will duplicate only the first 56 hours of the flight profile and timeline to be followed by Columbia.

The exercise begins 8 a.m. Monday with the countdown at T-9 minutes. Columbia astronauts Col. Joe H. Engle (USAF), mission commander, and Capt. Richard H. Truly (USN), pilot, will be situated in a Shuttle Mission Simulator. Three teams of flight controllers will alternate shifts on consoles in the Mission Operations Control Room.

Flight Directors Neil B. Hutchinson, Donald R. Puddy, and Charles R. Lewis, veterans of the first Columbia mission, will be joined by new Flight Directors Harold M. Draughon and

Tommy W. Holloway.

Purpose of the simulation is to give the astronauts and flight control teams realistic experience and training in preparation for the actual space flight. The Shuttle Mission Simulator in which the astronauts are positioned is a faithful duplicate of the Columbia flight deck, and is computerized to provide feedback identical to that which the crew would experience during a mission.

Imaginary problems are introduced, giving flight and ground crews experience in dealing with unexpected situations. The simulated problems are scripted and scheduled in advance, but are unknown to the participants.

This is the second long-duration simulation conducted in advance of STS-2. Dozens of short-duration simulations have been conducted in preparation for specific ascent, entry and on-orbit portions of the mission.

Astronaut candidates complete training

Nineteen NASA astronaut candidates and two ESA mission specialist candidates have completed the first phase of their training here at JSC.

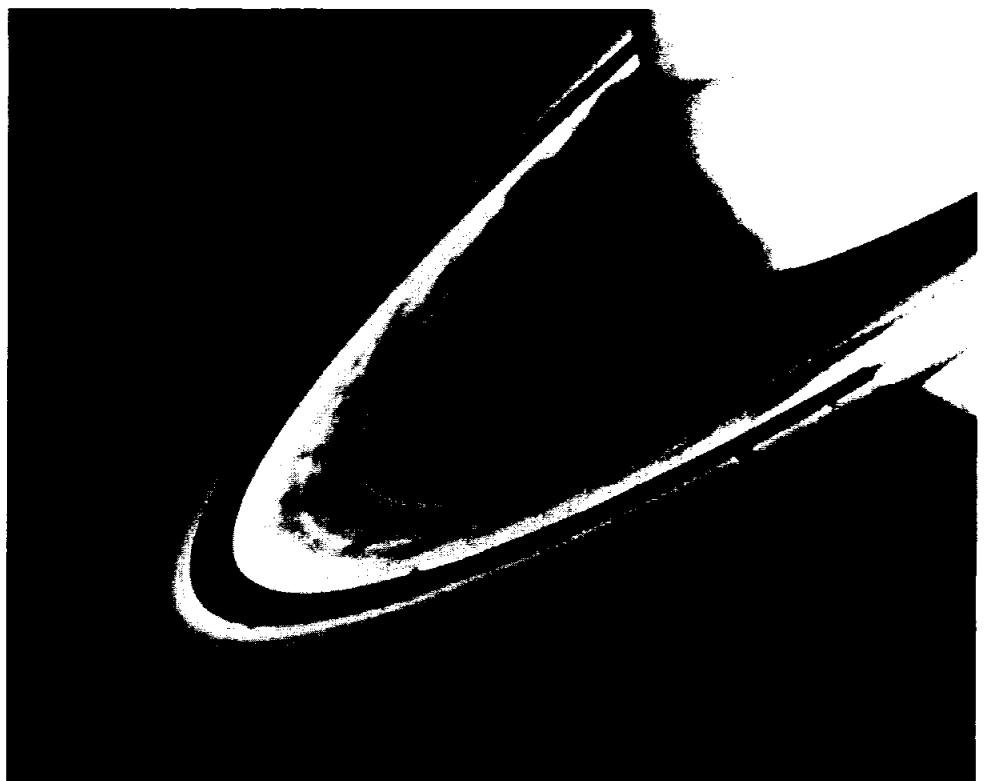
The 19 Americans become members of the U.S. astronaut corps, which now totals 79. Their training will continue toward qualifying them for duties as pilots or mission specialists on future flights of the space shuttle. They began training in July 1980.

The new American astronauts are: Dr. James P. Bagian, Lt. Col. John E. Blaha (USAF), Maj. Charles F. Bolden, Jr. (USMC), Lt. Col. Roy D. Bridges, Jr. (USAF), Dr. Franklin R. Chang, Dr. Mary L. Cleave, Bonnie J. Dunbar, Dr. William F. Fisher, Maj. Guy S. Gardner (USAF), Maj. Ronald J. Grabe (USAF), Capt. David C. Hilmers (USMC), Lt. Cdr. David C. Leestma (USN), John M. Lounge, Maj. Bryan D. O'Connor (USMC), Lt. Cdr. Richard N. Richards (USN), Capt. Jerry L. Ross (USAF), Lt. Cdr. Michael J. Smith (USN), Maj.

Sherwood C. Spring (USA), and Lt. Col. Robert C. Springer (USMC).

Last year NASA agreed to include two European scientists in the astronaut training program in recognition of the substantial contribution ESA is making to the Space Transportation System by funding development of Spacelab. ESA is reimbursing NASA for the costs of training the two Europeans.

ESA has indicated it will soon decide which of the two Europeans will transfer to the Marshall Space Flight Center, Huntsville, Ala., for payload specialist training in preparation for the first Spacelab flight. The other will continue training as an ESA astronaut at JSC for possible selection as a mission specialist for missions carrying European payloads aboard the shuttle. The two Europeans are Claude Nicollier of Switzerland and Dr. Wubbo Ockels of The Netherlands.



Still more to learn

Voyager 1's photographs revealed Saturn's strange twined and spoked rings with near perfect gaps between. This caused many scientists to theorize that the separation between rings was caused by small orbiting moonlets clearing paths like plows. But Voyager 2's photographs show no such moonlets. This has sent scientists "back to the drawing board" in an attempt to find the answer behind Saturn's mysterious rings.

Ross strives to be a more efficient secretary

Janet K. Ross' continuous demonstration of professionalism and flexibility as a receptionist, typist, chart maker, viewgraph designer, and property custodian make her the clear winner of August's Secretary of the Month.

As Secretary to the Assistant Director of Data Systems and Analysis and Directorate staff, Ross is constantly striving to increase her effectiveness and broaden her professional experience. She possesses outstanding initiative and willingly accepts new tasks as she strives to be a more efficient secretary.

Ross has been accepted in the Center's Increased Qualifications Program in her attempt to accrue college credits at a faster pace. She has also become very proficient in the use of the ATS terminal, Teleprinter, Hazeltine 4000-G, and function keyboards both in offline and online modes. She also learned



Janet K. Ross

how to use the Tektronix System and other computers and terminals in the office assigned to others.

"It would be very difficult to find a secretary who displays more initiative, who is more dedicated, or who is more outstanding than Janet Ross."



Shuttle art

This needlepoint was made by Angela K. Martin, cashier, Financial Management Division, for her husband's graduation from Auburn. This summer the picture has found a new office, Angela's, Bldg. 1, room 119, while her husband, Fred W. is participating in the Presidential Management Intern Program here at JSC.

Bulletin Board

Cycle for Suds

The JSC Bicycle Club is having a "Sun and Suds Sampler" ride Sunday, August 30. The club will meet at the San Jacinto Battleground Park (near the Battleship Texas) at 12 noon. Bikers will take the Lynchburg Ferry to the north side of Buffalo Bayou and ride to the Anheuser-Busch Brewery to sample their wares before returning to the park. Those interested in a longer ride (65 miles) will meet at Space Center and Bay Area Blvds. in Clear Lake City at 10 a.m. Visitors are always welcome. For further details call the starter, Chris O'Hearn at 484-1163 or Brian Morris at x5293.

Flu shots

Effective September 1, flu immunizations will be available at the JSC Clinic for badged NASA and on-site contractor personnel. Annual routine flu immunization is not recommended for healthy adults, but is recommended for persons who have chronic conditions like heart disease, respiratory ailments, diabetes mellitus or other chronic disorders. Inoculations will be available on a drop-in basis, beginning

Sept. 1, Monday through Friday from 10:00 - 11:30 a.m. and 2:30 - 4:30 p.m.

Project Mercury Reunion Picnic

On Saturday, October 24, at the Kars Park-Complex 99 at Kennedy Space Center participants from Project Mercury will be getting together for an afternoon of talking, eating, and beer drinking. The picnic is open to all people who worked on Project Mercury. For more information contact either Deke Slayton or Ron Kubicki, x 5931.

NARFE evening meeting

The Houston-NASA area Chapter No. 1321 of the National Association of Retired Federal Employees will meet in Clear Lake Park Building E on NASA Rd. 1 at 6:00 p.m. on Friday, Sept. 4. The La Porte Square Dance Group, Robin Hood Spin-in-wheels, will entertain. Members will serve a covered dish dinner. Active Federal employees who are 50 or over with five years of service, are eligible for membership. New members are always welcome. For more information, contact Bess Ross at 488-1965.

UH/CLC Orchestra Auditions

Auditions will be held Sept. 1, 1981 at the UH/CLC Bayou Bldg. Auditorium for those interested in joining the UH/CLC Community Orchestra. For more information call W.F. Meek, x4851 or 334-3092.

League of Women Voters

The League of Women Voters is having a series of "Get-acquainted with the League" events. Membership is open to everyone; Wednesday, Sept. 2, 10:00 - 11:30 a.m. 4127 Rolling Green, Clear Lake Forest, and Thursday, Sept. 10, 7:30 - 9:00 p.m., 1350 Nasa Rd. 1, Suite 100. For any additional information call M. Heselmeyer at 488-4610.

Learn better communications skills

Toastmasters International's Spaceland Club at JSC Cafeteria, Bldg. 3, has meetings on the first and third Wednesdays of each month. Look into Toastmasters if you are interested in an exciting, entertaining, and rewarding manner of improving your communications and leadership skills. For further information, contact Darrell Boyd at x3141, or Ann Sullivan at x2231.

Aero club is 15 and still going



Aero Club

J. D. Haptonstall, president of the Aero Club, readies the club's Piper Cherokee for flight. Besides this four seater, the club also owns a two seat Cessna 150.

The JSC Aero Club is the oldest active club on site. Since its beginning in 1966, the club has taught many members to earn their pilot's license and to rent its aircraft at a reduced rate. In its 15 year flying history, the club has enjoyed an accident-free record.

A \$200 equity payment makes every member a part-owner of the club. Equity may be sold or "flown-off" if a member quits the club. Fifteen dollars a month dues are also re-

quired. Besides cheaper airplane rental, the club also insures all its members; a benefit that would cost an individual \$750 a year alone.

The club's two airplanes, a two seat Cessna 150 and a four seat Piper Cherokee are kept at Houston Gulf Airport in League City.

The club is nine members under its 25 member limit. New members must have a third class medical physical as a part of obtaining a student

pilot's license. Right now, the club has two certified instructors. For any further information on the Aero Club contact J.D. Haptonstall, x5285.

Cookin' in the cafeteria

Week of August 31 - September 4, 1981

Monday: Chicken Noodle Soup; Round Steak w/Hash Browns; Weiners & Beans; Meatballs & Spaghetti (Special); Okra & Tomatoes, Carrots, 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; Beef Stew; Shrimp Creole; Fried Chicken (Special); Stewed Tomatoes, Mixed Vegetables, Broccoli.

Wednesday: Seafood Gumbo; Fried Perch; New England Dinner; Swiss Steak (Special); Italian Green Beans, Cabbage, Carrots.

Thursday: Cream of Chicken Soup; Turkey & Dressing; Enchiladas w/Chili; Weiners & Macaroni; Stuffed Bell Pepper (Special) Zucchini Squash, English Peas, Rice.

Friday: Seafood Gumbo; Baked Flounder; 1/4 Broiled Chicken w/Peach Half; Salisbury Steak (Special); Cauliflower au Gratin, Mixed Vegetables, whipped Potatoes, Buttered Cabbage.

Week of September 7 - 11, 1981

Monday: HOLIDAY

Tuesday: Tomato Soup; Potato Baked Chicken; BBQ Spare Ribs; Mexican Dinner (Special); Squash, Ranch Beans, Spanish Rice, Broccoli.

Wednesday: Seafood Gumbo; Baked Turbot; Liver & Onions; BBQ Ham Steak; Baked Meatloaf w/Creole Sauce (Special); Beets, Brussels Sprouts, Green Beans, Whipped Potatoes.

Thursday: Beef & Barley Soup; Chicken & Dumplings; Corned Beef w/Cabbage; Smothered Steak w/Cornbread Dressing (Special); Spinach, Cabbage, Cauliflower au Gratin, Parsley Potatoes.

Friday: Seafood Gumbo; Pork Chop w/Yam Rosette; Creole Baked Cod; Tuna & Salmon Croquette (Special); Brussels Sprouts, Green Beans, Buttered Corn, Whipped Potatoes.

**Menu subject to change without notice.

Northrop donates for life

Northrop Worldwide Aircraft Services is not only well known for keeping NASA/JSC aircraft in tip top shape, but for its generosity in blood donations as well.

Thirty two Ellington based Northrop employees make up the largest number of The Methodist Hospital's gallon donors in the Houston metropolitan area.

JSC has been involved in the Methodist Hospital's blood program since 1974. Since that time, Northrop employees at Ellington have donated a total

of 904 units (113 gallons).

Members of the Gallon Club are Winston Beckham, Joseph Bezner, Daniel Cass, John Cowley, Oren Cox, Bobby Dupree, Bobby Erickson, Richard Goody, Joe Johnson, James Johnston, Jackie Lankford, Glenn Livingston, Linda Maddox, Roy Mayfield, Ronnie Meshell, Johnnie Mims, Edgar Neely, Gregory Parker, Charles Peavey, Nathan Ragan, Earl Simpson, William Simpson, William Smith, Paul Trout, Michael Vasek, James Whitmore, Randal Wood.



People Helping People
The United Way

Service pin



Ernest Boyd — 35 years

At Gilruth Rec Center

Aerobic Dance - Part dance, part exercise, all fun, this course is designed to get you in shape and keep you that way. Daytime classes meet from 9:00-10:00 a.m. on Mondays and Wednesdays beginning on Sept. 14. Afternoon classes from 4:15-5:15 p.m. on Tuesdays and Thursdays will be beginning Sept. 15. These sessions will last 12 weeks and cost \$54.00.

Basic Automotive Mechanics - Learn to perform your own preventative maintenance and beat inflation. Class meets on Thursdays beginning Sept. 17, 7:30-9:30 p.m. for 3 weeks. Savings in labor alone pays for the cost of this course. Fee \$16.75.

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, Sept. 19 from 8:00 a.m. to 5:00 p.m. Cost is \$15.00 per person.

Country-Western Dance - Learn the popular country and western dance steps. This class begins Sept. 14, every

Monday beginning from 7:15-8:45 p.m. Another Session will go from 8:45-10:15 p.m. Cost will be \$20.00 per couple. Course last 6 weeks.

Adult Beginning Tennis - Sharpen up your game. Beginners class meets on Tuesdays from 5:15-6:45 p.m. beginning Sept. 22. An intermediate class meets at 5:15-6:45 on Thursdays beginning Sept. 24. This course will last 8 weeks and cost \$24.00 for each class.

Predict Your Own Time Race - It's not too early to start warming up for a race which is won by the person who can predict to the nearest second the amount of time it will take them to run 5 KM. The race is August 29 at 8:00 a.m. Cost for the race is \$5.00 per person, which includes a T-shirt. Call x3944 for entry blanks.

Ballroom Dance - Learn the fine art of ballroom dance steps, class begins Sept. 16 for a 12 week period, on Wednesdays. There will be two classes offered. Introduction classes and high intermediate start at 7:15 p.m. while intermediate and advanced classes

start at 8:45 p.m. Cost will be \$60.00 per couple with the deadline for registration Sept. 9.

NAUT Advanced Diving Course - This is a 6 week course which will begin Sept. 15, with the last 2 weekends dedicated to open water work. Course cost is \$75.00 and students will provide their own equipment. Register at the Rec Center.

Texas Garage Sale - Bring all your useful, not so useful and useless items. \$2.00 per table, September 19, 9:00 a.m. to 3:00 p.m., Gilruth Center Parking lot.

Men's Open and Women's Open Softball Tournament - Sign your team up for the last tournament of the softball season. September 11-13. \$65.00 entry fee. Limited to the first 24 men's teams and first 12 women's teams. Trophies will be awarded.

Children's Movie - Walt Disney's "Freaky Friday", September 12, 10:00 a.m. to Noon. Admission \$1.00 including popcorn and coke. Tickets available at Building 11.

1981 RACE SCHEDULE

HERE IS THE RACE SCHEDULE FOR THE REMAINDER OF 1981. ALL RACES ARE HELD AT THE GILRUTH RECREATION CENTER ON THE JOHNSON SPACE CENTER.

Date	Time	Name	Distance(s)	Entry fee
Sept. 12	9:00 am	Combat Medic Memorial Mini-Marathon	10 km & 1/2 marathon	7.00/7.00 (late)
Oct. 17	9:00 am	12th Intercenter	2 mile & 10 km	free
Oct. 30	7:00 pm	Halloween Fun Run	5 km	5:00
Nov. 21	9:00 am	Team Competition	1/ marathon	5:00
Dec. 19	9:00 am	Fun Run	20 km	2.00

RACES ARE JOINTLY SPONSORED BY THE GILRUTH RECREATION CENTER, NASA EMPLOYEES ACTIVITY ASSOCIATION AND THE BAY AREA RUNNING CLUB.

Leger receives largest JSC invention award



Dr. L. J. Leger

The largest JSC invention award, \$7,500, has been granted to Dr. L.J. Leger, Head, Nonmetallic Materials Section, Structures and Mechanics Division, for his concept for the strain isolation pad (SIP). The SIP is a thin layer of material between the orbiter's skin and the thermal protection system's ceramic tiles which isolates the tiles from structurally induced stresses.

The successful bonding of the ceramic tiles to the aluminum body of the orbiter was a major challenge for thermal protection system engineers. Tiles could not be bonded directly to the skin of the orbiter due to stress and flexing of the vehicle — causing the brittle tiles to crack.

Leger's patent, recorded in 1978, replaced the formerly proposed SIP of elastomeric foam. The foam was suitable for withstanding higher temperatures in the vacuum of space.

With this new challenge, Dr. Leger developed his concept of a SIP constructed from a special felt made with Nomex

fibers. Nomex fibers bonded to the orbiter's aluminum surface closely resemble the felt on a tennis ball. A specially coated version is used as primary thermal protection over a significant area of the orbiter's skin.

Leger's invention proved to have substantial savings in weight, cost, and schedule time.

The award was recommended by the Inventions and Contributions Board, NASA Headquarters.

JSC Golf Assoc. results

The JSC Golf Association played its fifth competitive tournament at Brock Park on August 8. Winners in Flight I were Gil Bowse (net 67), Joe Nick Villarreal (69), Bob Ross (71), and Mike Gremillion (72). Winners in Flight II were Bill Miller (69), Larry Keyser (71), Craig Thompson (73), and Al Ligrani (73). The next tournament is at Newport on August 29.

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.

Editor: Eddy Wittry

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.

Cars & Trucks

Two chevy eng. one 350-rebuildable, \$75; one (seized) good head: \$35; C. Pace, 5321/337-1436.

One Mustang six (200 in.) rebuildable, \$100; one Mustang auto trans cu. in., \$70; C. Pace, 5321/337-1436.

For Sale: 1978 Ford Super Van. Call Warren, 453-8666.

Ford Station wagon '73 air, auto, transmission, pwr. brakes and steering, radio, htr. good condition \$1495, 488-5564.

For Sale: '77 Rockwood 24 ft. travel trailer, fully self contained, ac/heat, bath/shower, stove, ref. sleeps six excellent condition \$5000. 488-0658.

'73 Pontiac Grand Am; 2-door, A/C, AM/FM radio; very good engine, body, and interior; \$950. 480-6095.

Pickup camper shell for 8 foot bed, as is \$40. Call 488-8436 after 5:30 or weekend.

Sacrifice 1980 XR7. Loaded. \$7000 or best offer. Top condition. 868-1793 after 5 or 795-3672 days.

'74 Olds Omega, 2 dr., 6 cyl., A/C, P/S, extra clean, \$1495 Jacobs x2386/538-1075 after 5 p.m.

Auto A/C compr., off 2970 chev., good cond., \$40.50 x4468 A.F. Smith. 1972 Datsun 240Z engine, brakes recently overhauled, body reconditioned, new paint, A/C, radio. Asking \$4,000. Call 482-7961.

4 Crager mags like new, 14 in., includes lugs and adapter, \$150, Kochner, x6364, 488-2390.

400 cfm Holley double pumper four barrel carb. and Wieland manifold that fits Ford 289, \$125, Kochner, x6364, 488-2390.

1965 Mustang restored to original condition, 289, 3-speed, original A/C. 3,000 firm, Kochner x6363/488-2390.

'74 Pontiac Lemans, excellent cond., 50,000 mi., \$1650. 333-3279 after 5 p.m.

For Sale: 1970 Buick Wildcat, loaded, 4 dr. runs good, restorable, call Bob, x3051/438-2266.

1975 Blue Camaro, AC,PS, Mag Wheels, \$2575. 474-3559 after 6 p.m.

For Sale: Front end part for 1974 Datsun 260. Call for details 482-7961.

1979 Mustang "Giha" V6, full power, tilt wheel, cruise control, TRX suspension package, AM/FM/Tape, white leather interior low mileage, well maintained \$5475. 488-1326 after 5 p.m.

1974 Javelin, \$1125 Kramer x2796.

Wanted
12 or 20 gauge shotgun, automatic, vent rib preferred, any Huntley x5858/472-3244.

Miscellaneous

J.C. Penney/Toro 21" push mower, engine ok, needs throttle assembly. \$35. 488-3966.

Super-high eff (12.1) a/c condenser. New, under warranty. Some scratches & dents. 1/2 wholesale, \$800. John P. Mitchell, x3695.

1 would like to request a vehicle pass for the STS-2 launch. I have a standard size vehicle. James McBride x2541.

For Sale: One six pack unopened Billies Beer, \$9,250.00, contact Bob Bryant AFGE office x4276.

Sperti sun lamp, with timer & stand used little, new \$75 sell for \$40 x4468, A. F. Smith.

1970 edition encyclopedia Britannica w/yearbooks, \$150, C. Pace 5321/337-1436.

Wheel covers, 13" factory, spotless \$25 x6241/643-8170.

Doghouse, good condition, suitable for large dog or small husband, \$35. 482-0935.

Lawnmower-22" cut, 3.5 hp, push mower, very good condition-\$50 call after 5 pm 486-0677.

Six interment spaces in Forest Park Cemetery. Priced at \$2995. Sell for \$2395. 488-1028.

Two 20 in. bicycles, conv. (boys or girls) orig. \$75-sell \$40 ea. 488-1028.

Household

Free, rebuilt transmission for Montgomery Ward washer. 334-2294.

4 pc (14' seating) Sectional couch exc. cond. avocado; matched swag lamp. \$375 474-5610/x3747.

Singer "Touch and sew" sewing machine with desk type fruitwood cabinet. Excellent condition \$300 Gail x4952.

Cycles

1980 Honda 750 F 4000 miles excellent condition, must sell-bought a car \$2250. 460-0236 after 6.

1978 Honda 750 F, 6300 miles, excellent condition, \$1900. 331-5724 after 5.

Honda 1973 CB350 motorcycle. Call 482-7042 after 5 pm or weekends.

Pets

Boxers, AKC reg. puppies and adults, exceptional quality, guaranteed 337-2855.

For sale, 1 dwarf Netherlands rabbit, silver gray, with cage and food. Child's house pet; family moving. x3912/488-5446.

Property & Rentals

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

Rent: 3-2-2 Friendswood, formal areas, large fenced yard, fireplace, no flooding, \$475/mo. plus deposit. 482-1127.

Rent, Lake Livingston Cape Royale 3 bdrm waterfront cottage by marina tennis, pool, golf, boat ramp. By week 488-3746.

Lease: Heritage Park, 3-2-2 new section, 11 months new, custom drapes, formal dining rm. country kitchen, wood fenced, ref. w/icemaker (new) avial Oct. 1 \$585 plus deposit call 482-6609 after 5.

For sale: Cleveland area, 30 acres w/two bedroom house, fireplace, wooded, fenced, live creek very pretty 488-4915.

Lot for sale, Lakeview Hills Development, South end of Lake Livingston. Jim V. x4571/488-8143.

Lease: 1 br. Pebblebrook Condo, fpl, washer/dryer, tennis, pool, next to woods \$325 plus utilities no pets. x4171/538-1780 Harbaugh.

For Sale: Lot in Sportsman's retreat, Lake Livingston, Large trees. \$3200, 331-0608.

Musical

For Sale: Drum set excellent condition, bass drum, snaredrum, cymbals. x4111/480-7281 after 4. Ask for Ruth.

1 B flat clarinet (Bundy) good condition, 486-0939.

For Sale: Flute, Signet, silver, closed holes, like new w/case. Call 554-2448 after 5 pm.

For Sale: King Cornet & case-good condition. Mary x3116/486-4229 after 5.

Trumpet, Yamaha, good condition with carrying case. \$100 488-4069.

For Sale: Bundy-Selmer B-flat clarinet. Excellent condition new pads. \$175. George Guthrie 946-7848/x2938.

Schreiber Bassoon, quality instrument, excellent condition, reasonably priced. Jim x4571/488-8143.

Gemeinhardt flute, open hole. Excellent condition, new pads. Reasonably priced. Jim x4571/488-8143.

Armstrong Flute, closed hole, \$200; Yamaha coronet with mute, \$125 Billie x4591/538-1681 after 5 pm.

King Trombone w/case, good condition. Excellent instrument \$125. 471-3119.

B-flat Normandy clarinet w/case. Vito mouthpiece. Very good condition. \$125 471-3119.

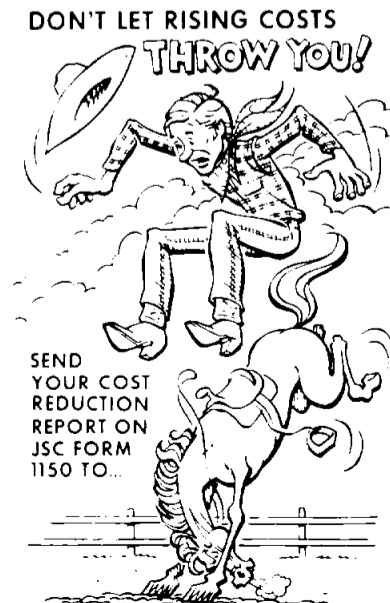
Stereos & Cameras

GE portable stereo with detachable speakers, \$45.00 GE organ with bench, \$55.00-Both in excellent condition. Berkline rocker-recliner \$50 485-3028, Jackie.

Klipshorn speakers, unfinished cabinets Mac/nzosh Z75 power amp & Dynaco preamp. Good condition, Mike M. x3522/488-3102.

Carpools

Form a vanpool from Missouri City to JSC 7:30-4:00 or 8:00-4:30 Bob x3051.



BE-3 COST REDUCTION OFFICE
Cartoon by Russ Byther

NASA testing new techniques in weather research with special airborne laser

Researchers at NASA are testing a new technique to measure which way the wind blows. The data collected from a special airborne laser should help scientists better understand storms, understand air pollution and harness wind energy.

As part of NASA's Severe Storms and Local Weather Research Program, a team of researchers spent this summer flying in Oklahoma, Montana, Colorado and California. On-board with the researchers was a Doppler Lidar System, a special laser system built by Raytheon for NASA's Marshall Space Flight Center, Huntsville, Ala. The aircraft, a Convair 990, is a four-engine jet transport known as the Galileo II flying research laboratory. The aircraft was provided by NASA's Ames Research Center in Mountain View, Calif.

"Very little is known about what goes on in the clear air around a storm," said Jim Bilbro, the project manager from Marshall Space Flight Center. "We don't know why some die out and others grow. We would like to measure the wind field around the storm to see what is happening."

The Doppler Lidar System is a whole new concept, a whole new measurement technique, according to Bilbro. The current program is an attempt to establish the credibility of the new system, he added.

"Preliminary findings indicate that the system should be a very powerful tool for meteorological research," said George Alger, a mission manager from NASA's Ames Research Center.

The Lidar system was used this summer in conjunction with the National Severe Storms Laboratory in Oklahoma and the Cooperative Convective Precipitation Experiment

(CCOPE), based in Montana. The precipitation experiment, supported by a number of universities and government agencies, is designed to study how clouds produce rain, a question particularly important to drought-prone areas such as the High Plains in the West.

Data collected from the summer tests will be compared to data collected from other measurement systems, such as ground radar, towers and balloons, in order to test the accuracy of the new lidar technique. The project scientists, headed by Dr. George Fichtl from Marshall Space Flight Center, plan to combine data from all available sources to provide meteorologists with a more complete picture of what happens before and during storms.

If the new technique is accurate, it will greatly enhance traditional measurement systems.

"You have to guess what happens in between measurement towers," Bilbro said. "It's easy to miss gusts of wind."

And, in many areas, including the Central Valley in California, there are few stationary towers. With the airborne system, in a couple of hours the computer provides an overview of the wind pattern for the entire valley.

Wind speed and direction also are important to meteorologists studying air pollution. The aircraft recently flew past various mountain passes in California to determine what happens to polluted air that is created in the San Francisco Bay area and Los Angeles regions.

"Air pollution is a severe problem in the Los Angeles area," said Charles Unger, state air pollution research specialist. "We need to know what happens to the pollutants

— what are the sources, where do they go, how concentrated are they, whom they impact. We need to know if the air is going to stagnate or move."

The Convair 990 flies at various altitudes near the edge of a storm. The lidar measures the velocity of minute aerosols (pollen and dust). Because these particles are so light, they travel at the same velocity as the wind. The lidar samples aerosol back-scatter frequency variations with range and looks forward and back every 1 1/2 seconds. The interactions in space of the lidar beams create a grid pattern that is analyzed by a computer onboard the aircraft. The computer can calculate wind vectors based on the original frequency of the beam, the reflected frequency, the speed of the aircraft and other factors. These vectors give the direction and speed of the wind at each point of the grid in a horizontal plane, next to the aircraft.

Onboard the aircraft, the computer gives an instant picture of the wind by plotting vector fields on a graphic display.

Thus researchers can get a picture of the changes in the speed and direction of the wind in a horizontal slice of the atmosphere ranging from 300 meters (985 feet) to 20 kilometers (12 miles) from the plane, depending on the amount of aerosols in the air.

"The laser pulse looks like a pencil that is 300 m (985 ft.) long and 0.25 m (10 inches) in diameter," Bilbro said.

The laser beam poses no danger to anyone on the ground or in other aircraft. "This laser system emits energy at levels of 10 to 100 times lower than the established eye safe level," Alger said. The eye safe level,

as established by the American Conference of Environmental Industrial Hygienists, is the amount of radiation an eye can be exposed to without injury.

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The prime crew is expected to fly the ascent and descent, while the backup crew is scheduled to conduct the return-to-launch-site simulation.

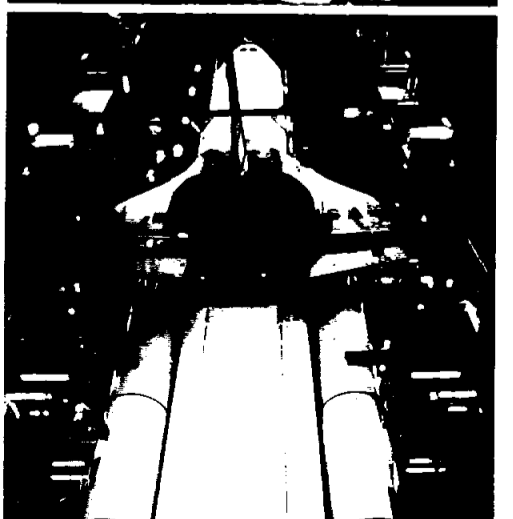
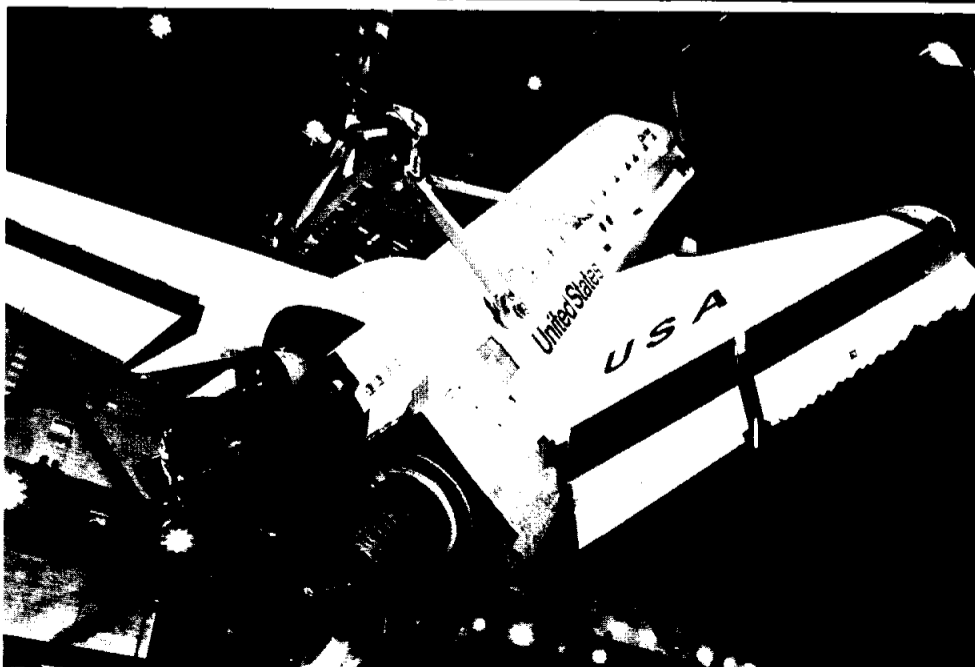
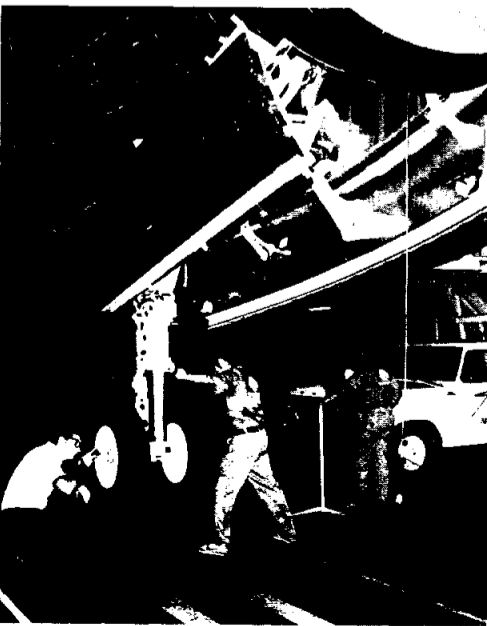
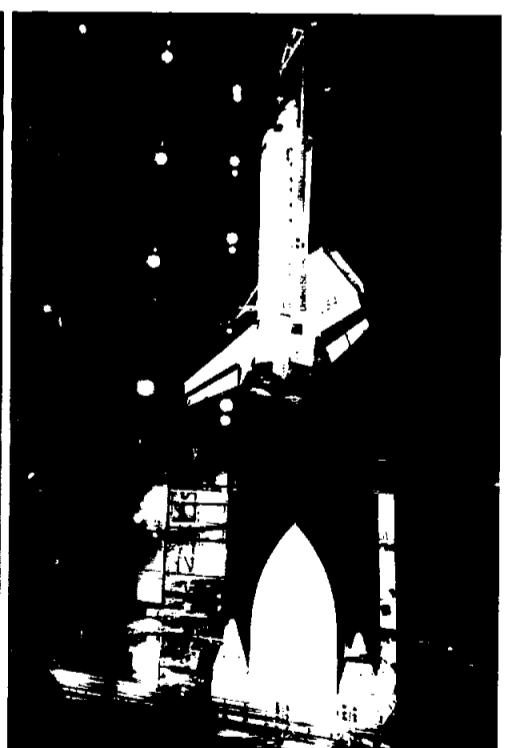
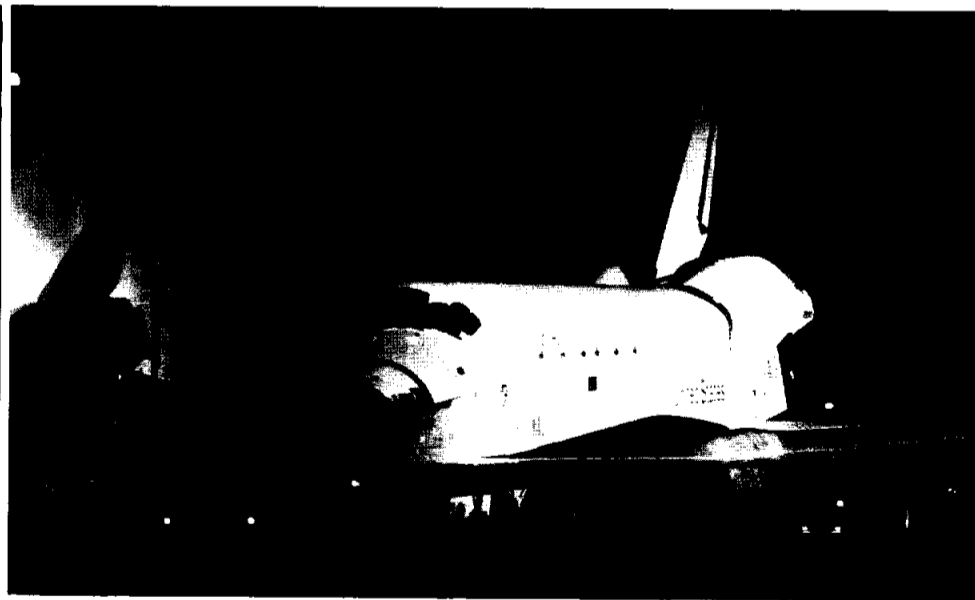
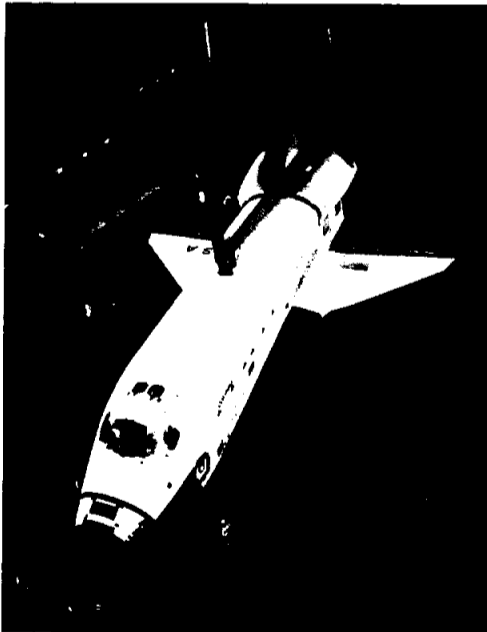
With a series of minor delays during the preparation of the Orbiter vehicle in the OPF and some problems during the mating of the Columbia with the External Tank and Solid Rocket Boosters, rollout to the launch pad is running behind schedule. Rollout is now set for Monday, having been moved from its original date of Aug. 24.

Additionally Operation Graysteak, the modifications to the launch platform being made to compensate for the STS-1 overpressure problem, are running behind. Crews are working around the clock, seven days a week to make platform changes which will involve the use of a deflector plate and water-filled troughs to absorb some of the force of the SRB thrust which rebounds up through the main engine flame hole at liftoff.

Officials are assessing the potential impact these delays will have on the officially scheduled September 30 launch date.

Meanwhile, in Houston, flight controllers and astronauts participate Monday through Wednesday in a 56-hour simulation in preparation for Columbia's five-day flight. (See story on Page one.)

Preparations for launch nearly completed



Getting ready for launch

The orbiter Columbia was rolled out of the Orbiter Processing Facility (OPF) earlier this month and moved the Vehicle Assembly Building (VAB) for mating with the external tank and solid rocket boosters. Once inside the VAB, a special sling is used to grasp it at forward and aft attach points. The orbiter was first raised six inches off the

ground to retract landing gear before its 190 foot hoist over the transfer aisle and moved into High Bay 3 where it was lowered into place alongside the SRBs and ET. After this process was completed on August 12. The Shuttle Integration Test (SIT) began. After completion of SIT, August 26, Columbia will be readied for rollout to 39's pad A for launch September 30.