

Space News Roundup

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National Aeronautics and Space Administration

Shuttle Update

Preparations of the Space Shuttle Orbiter Columbia and the other main elements of the Shuttle system continue on or close to schedule at the Kennedy Space Center as the target launch date for STS-2 of September 30 approaches.

The Orbiter's three fuel cells have been replaced and fuel pumps on the three main engines have been removed, inspected and replaced.

Tile removal, replacement and densification continues. As many as 765 tiles could be removed for densification, about one-fourth of those on the OMS pods.

Stacking of the two Solid Rocket Boosters on top of the mobile launch platform has been completed, setting the stage for mating with the External Tank scheduled for the week of July 6.

A final inspection of the launch pad was scheduled earlier this week following painting and sandblasting operations and normal work at the pad was to resume late this week.

Rollout of the Orbiter from the Orbiter Processing Facility to the Vehicle Assembly Building is set for the week of August 3 with mating of the vehicle to the rest of the stack also planned for the same week. Rollout of the complete stack to the pad is planned for the week of August 24.

Students Develop STS Payloads Space Shuttle Involvement Project Winners

Ten high school students from across the country have been selected as winners in the first National Space Shuttle Student Involvement Project.

The project, co-sponsored by NASA and the National Science Teachers Association, is designed to stimulate science and technology studies in grades 9 through 12 by conducting a competition to develop experiments suitable for flight aboard the Space Shuttle.

Winners were chosen from over 1,500 entries and judged by a panel of representatives from NASA, the NSTA, National Science Foundation, National Institutes of Health, Department of Education, American Association for the Advancement of Science and several universities and consulting firms.

The 10 national winners and their teacher-advisors will attend a special Space Shuttle conference in August at NASA's Kennedy Space Center, Fla.

The students will receive instructions and advice on how to prepare their experiments for payload assignment and review the procedures for integrating their experiments into a specific Space Shuttle mission. Students and teachers will tour the Kennedy Space Center facility and will view the Shuttle Columbia in preparation for its second flight in September.

Finalists, science teacher advisors and winning entrants' schools will

receive special medallions. All entrants in the competition have received a certificate of participation.

To broaden participation in the program, NASA is encouraging U.S. industrial firms and other groups to sponsor student winners and assist them in transforming winning proposals into experiments. Industries or other organizations interested in serving as a sponsor should write to Glen P. Wilson, Acting Director, Academic Affairs Division, NASA Headquarters, Mail Code LC-16, Washington, D.C. 20546.

The sponsor should be prepared to assign a company scientist to work with the student, as well as provide necessary funding for student travel, hardware development and other costs related to pre- and post-flight analysis and reporting. Student experiments will receive a thorough pre-flight review and safety analysis by NASA in a procedure similar to the review and analysis given to operational payloads.

In some cases, where a sponsor cannot be found or where the student proposal closely parallels a professional experiment already planned for a Space Shuttle mission, NASA may arrange for the student to work with a Principal Investigator as part of an existing research team.

In other cases, minor modifications of professional experiment operations, or the collection of special data from existing instruments, may be

made to accommodate the student proposals. In all cases, NASA will make every effort to see that the student receives sufficient information to write a final report.

Winning national Space Shuttle Student Involvement Project experiments will be assigned to specific Shuttle flights as the experiments are ready, as space is available and as future Shuttle flights are confirmed.

Student experiments will be placed in storage lockers in the mid-deck section of the orbiter and not in the cargo bay areas as for operational payloads. The mid-deck placement will allow for easy astronaut access to the student experiments and as much as one hour of an astronaut's time during the flight may be allocated to work on the project.

Assisted by the sponsor and/or a NASA advisor, the student will analyze the data returned from the experiment and prepare a final report. All scientific data from the student experiments will be in the public domain and made available from the National Space Science Data Center at NASA's Goddard Space Flight Center, Greenbelt, Md.

A second Space Shuttle Student Involvement Project contest will open in September with regional conferences to be held in March 1982 and student winners selected in May 1982. NASA plans to increase the number of student winners for this competition from 10 to 20 finalists.

Robert F. Thompson

Space Shuttle Program Manager Leaves JSC



Shuttle Program Manager Bob Thompson

The man who headed up the Space Shuttle Program from drawing board to launch is leaving the Johnson Space Center and government service after a long career in aerospace and aeronautical research.

Robert F. Thompson, manager of the Space Shuttle Program Office since February of 1970, has his last official day on the job today. A reception in his honor was held Thursday at the Gilruth Recreation Center.

Thompson moves into a new career in the homebuilding industry in the Kingwood area.

His career in public service started as a U.S. Navy line officer from 1944 to 1946. In 1947 he began his career as an aeronautical engineer with the National Advisory Committee for Aeronautics (NACA, the predecessor agency to NASA) at Langley Field, Virginia.

From 1947 to 1948 he was assigned progressively more responsible positions in the Stability Research Division at Langley where he specialized in research investigations of high-speed subsonic, transonic and supersonic aircraft.

While at NACA, Thompson co-authored and authored numerous papers on aircraft stability and control. In January, 1959, he was

selected as one of the early members of the Space Task Group which became the nucleus of the present Johnson Space Center.

He served as chief of the Landing and Recovery Division for over six years. In this position he had responsibility for the development of manned spacecraft landing and recovery systems and for planning and directing the activities of the worldwide NASA/DOD recovery operations during the Mercury, Gemini and early phases of the Apollo programs. In 1966, Thompson became manager of the Apollo Applications Program (later called Skylab). He was named in February 1970 to head the Space Shuttle Program Office, responsible for management and integration of all elements of the program.

A native of Bluefield, Virginia, he is married to the former Dorothy Pritchett.

Among his special honors are the NASA Medal for Outstanding Leadership, 1966; NASA Exceptional Service Medal, 1969; NASA Distinguished Service Medal, 1974; Fellow, American Astronautical Society, 1975, and Fellow of the American Institute of Aeronautics and Astronautics, 1978.

Bulletin Board

Toastmasters Club

At the District 56 Toastmasters Conference held at the Nassau Bay Inn May 1-2, the Spaceland Toastmasters Club won several club and individual honors. Spaceland was awarded a President's select and Governor's Distinguished Ribbon for outstanding accomplishments in membership and achievement of club goals.

Individual honors went to Angie Johnson for second place in the District 56 Club Bulletin Contest and to Emmitt Fisher who finished second in the District 56 Speech Contest.

The Spaceland Toastmasters Club meets at 11:30 a.m. on the first and third Wednesdays at the JSC Building 3 cafeteria. Contact the Administrative Vice President at 483-3561 for information.

JSC Exchange Store

(Store Hours 10:00 a.m. to 2:00 p.m.)
Plitt Theater tickets - \$2.10 each
General Cinema tickets - \$2.40 each
Astroworld/Six Flags tickets - \$9.50 each
Postage Stamps - 18 cents each - \$4.35 book

L-5 Society Meets

Dr. Dennis R. Morrison of JSC will speak to the June 12 meeting of the L-5 Society to be held at 8 p.m. in the Pacific Room of the University Center on the University of Houston Central Campus.

Morrison's work concerns electrophoresis, the use of electrostatic forces to isolate certain types of living cells which may be used to produce medically valuable substances.

Bay Area Texas Exes Fun Run

The Bay Area Chapter of the University of Texas Alumni Association will hold a fun run at the Gilruth Recreation Center June 13. Registration begins at 7:00 a.m. Pre-registration may be made by contacting any club officer. For information, call Peggy Adams at 482-1361.

STS Ops Study

The Johnson Space Center has recently accepted the final report of a study performed by McKinsey and Company, Inc., of the organization and plans for the operation of the Space Transportation System at JSC.

The final report, entitled "Organizing for Effective Operation of the Space Transportation System" is available for inspection by all JSC and contractor employees at the JSC Technical Library.

Shuttle Facts

The Space Shuttle main engine operates at greater temperature extremes than any mechanical system in common use today. The fuel, liquified hydrogen at -423°F, is the second coldest liquid on earth. When the liquid hydrogen and liquid oxygen are combusted, the temperature in the main combustion chamber is 6000°F, higher than the boiling point of iron. Source — Rockwell International.

Astronomy Seminar

The JSC Astronomy Brown Bag Seminar meets every Wednesday from noon to 1 p.m. in Room 193 of Building 31. Upcoming programs include: June 10, films "Universe," and "HEAO," about the High Energy Astrophysics Observatory; June 17, Mike Martin speaking on the size of the Milky Way, and June 24, Andrew Secord, speaking on numerical studies of galactic structure and evolution.

Houston Symphony Orchestra

The Houston Symphony concludes its series of free summer concerts with three

programs at 8 p.m. at the Miller Theater in Hermann Park. They include: July 1, A Night of Romantic Music; July 2, A Salute to America — Texas Style, and July 3, Tchaikovsky Night (featuring the 1812 Overture).

On July 5 at 8 p.m. in Jones Hall, the celebrated dancer Mikhail Baryshnikov performs in a benefit for the Houston Symphony and the Society for the Performing Arts. Also appearing are American Ballet Theater soloist Cynthia Harvey, the Louisville Ballet and the Houston Symphony Orchestra. Tickets by mail only. For more information call 227-1111.



Guess Who's Coming to Dinner

This frisky little critter routinely helps himself to a meal at the expense of the regular patrons who frequent the bird feeder in the backyard of JSC photographer Pat Patnesky. Not being a flying squirrel, he has to resort to the old-fashioned method of climbing the pole.

Class Registration Starts

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 9:00 - 10:00 a.m. beginning June 22 and Tuesday and Thursday afternoons from 4:15 - 5:15 beginning June 23. Cost is \$45.00 for this 8-week course.

Scuba Class - The JSC Scuba Club will offer a 7-week class leading to NAUI certification beginning June 9. Classes meet at the Rec Center on Tuesdays from 6:30 - 9:00 p.m. and at the pool on Thursdays from 7:00 - 10:00 p.m.. Cost is \$100.00.

Defensive Driving - Learn to drive safely and qualify for a 10% reduction in your auto insurance for the next 3 years. Class meets on Saturday, July 18 from 8:00 a.m. to 5:00 p.m.. Cost is \$15.00 person.

Children's Drama Class - Vacancies still exist in the children's drama class which meets from 10:30 - 12:00 on Mondays and Wednesdays beginning June 8. Class is 4 weeks long and ends with par-

ticipants performing in a play. Cost is \$10.00 per child.

Children's Tennis Lessons - Tournament tennis lessons taught by the former coach at the University of Houston. Intermediate Juniors - Monday & Wednesday - 3-5 p.m. beginning June 15. Cost is \$64.00. Advanced Juniors - Tuesdays and Thursdays 3-5 p.m. beginning June 16. Cost is \$64.00. Beginning Juniors - from 9:00-10:30 on Saturday mornings beginning June 20. Cost is \$24.00. Class duration for each course is 4 weeks.

Adult Tennis Lessons - Sharpen up your game. Beginners class meets on Tuesdays from 5:15-6:45 beginning June 23rd. Advanced beginners and Intermediates meet at 5:15-6:45 on Thursdays beginning June 25. Cost is \$24.00 for each class.

Other programs of interest include:

Adult Dinner Theatre - Tickets are on sale until June 10th for the EAA Dinner Theatre Production of "Dirty Works at the Crossroads" - a Gay Nineties melodrama. Performances are Friday, June 12 and Saturday June 13. Program features a social hour at 7:00 p.m., a roast beef dinner at 8:00 p.m. and the play at 9:00 p.m.. Cost is \$10.00 per person. Get your tickets at Bldg. 11.

Children's Movie - First summer presentation of the Children's Saturday at the Movies will be the Muppet Movie on June 20 from 10:00-12:00 noon. Program features the movie, cartoons and popcorn and coke. Cost is \$1.00. Get your tickets at Bldg. 11.

Mixed Softball Tourney - Sign up now to enter your mixed team in a tournament on June 19, 20 and 21 at the Gilruth Recreation Center. Cost is \$65.00 and trophies will be awarded.



Cost Savings Award

NASA Downey employee Hector Rodriguez is presented the Golden Eagle Cost Reduction Award by Downey Shuttle Program Office Manager William B. Wilson for his weight saving suggestion. Rodriguez, project engineer for electrical fabrication of wiring harnesses used in the Shuttle, won the award for suggesting changes in the way wiring harnesses are fabricated. An El Paso native, Rodriguez has been with NASA since 1960.

Cookin' in the cafeteria

WEEK OF June 8-12, 1981

MONDAY: Beef & Barley Soup; Beef Chop Suey; Breaded Veal Cutlet w/Cream Gravy; Grilled Ham Steak; Weiners w/Baked Beans (Special); Whipped Potatoes, Brussels Sprouts, Buttered Rice. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

TUESDAY: Celery Soup; Fried Shrimp; Turkey a la King; Pork Chop w/Applesauce; Chinese Pepper Steak (Special); Au Gratin Potatoes, Breaded Squash, Buttered Spinach.

WEDNESDAY: Seafood Gumbo; Fried Catfish w/Hush Puppies; Braised Beef Ribs; Mexican Dinner (Special); Spanish Rice, Ranch Beans, Buttered Peas.

THURSDAY: Green Split Pea Soup; Corned Beef w/Cabbage & New Potatoes; Chicken & Dumplings; Tamales w/Chili; Hamburger Steak w/Onion Gravy (Special); Navy Beans, Buttered Cabbage, Green Beans.

FRIDAY: Seafood Gumbo; Deviled Crabs; Broiled Halibut; Liver & Onions; BBQ Link (Special); Buttered Corn, Green Beans, New Potatoes.

WEEK OF June 15-19, 1981

MONDAY: French Onion Soup; BBQ Sliced Beef; Parmesan Steak; Spare Rib w/Kraut; Chili & Macaroni (Special); Ranch Style Beans, English Peas, Mustard Greens. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

TUESDAY: Split Pea Soup; Meatballs & Spaghetti; Liver & Onions; Baked Ham w/Sauce; Corned Beef Hash (Special); Buttered Cabbage, Cream Style Corn, Whipped Potatoes.

WEDNESDAY: Seafood Gumbo; Cheese Enchiladas; Roast Pork w/Dressing; BBQ Link (Special); Pinto Beans, Spanish Rice, Turnip Greens.

THURSDAY: Beef & Barley Soup; Roast Beef w/Dressing; Fried Perch; Lasagne w/Meat; Chopped Sirloin; Chicken Fried Steak (Special); Whipped Potatoes, Peas & Carrots, Buttered Squash.

FRIDAY: Seafood Gumbo; Fried Shrimp; Baked Fish; Beef Stroganoff; Fried Chicken (Special); Okra & Tomatoes, Buttered Broccoli, Carrots in Cream Sauce.

***Menu subject to change without notice.**

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.

Hurricane Season Opening Prompts Action Reminders

Since JSC and the surrounding residential communities occupy an area highly susceptible to hurricane damage, we present these hurricane preparedness reminders from the Center Operations Directorate Management Services Division.

The hurricane season for the upper Texas coast begins June 1 and extends through November 30. Hurricane Allen and our experience with flooding in recent years graphically reflect the Bay Area's vulnerability to severe weather.

Recommended Actions Prior to Hurricane Season or Before a Watch...

1. Know the elevation above MSL of your home or place of business.
2. Familiarize yourself with past flooding in your area. Is your home subject to tidal flooding

3. Have your route picked out or planned, if it becomes necessary to relocate to a place of safety or higher ground.
4. If you live in a Mobile Home, pre-arrange for safe shelter.
5. Know the locations of storm shelters in your area.
6. Check your insurance coverage.

Hurricane Watch

Does not mean that hurricane conditions are imminent but there is a real possibility that the hurricane will threaten this area within 24 hours.

RECOMMENDED ACTIONS WHEN A WATCH IS ISSUED FOR THIS AREA . . . and SOME SUPPLIES YOU SHOULD ARRANGE FOR . . .

1. Fresh batteries for your radio and flashlights.
2. Candles, lamps and matches.
3. Non-perishable foods, canned goods and drinking water containers.

4. Materials for boarding up windows & other glass openings such as boards, lumber & tape.
5. Gas-up your automobile.
6. Prepare to moor your boat or move it to safer shelter.
7. Monitor progress of storm via radio or TV.

Hurricane Warning

When a warning is issued, it means that hurricane conditions are expected within 24 hours. High tides, winds in excess of 74 MPH, heavy rains and flooding and the possibility of tornadoes. Take the following actions immediately. . .

1. If in mobile home, check tie-downs and leave. Never remain in mobile home if hurricane winds are expected.
2. If home is subject to flooding, prepare to leave for higher ground.
 - a. Board-up large windows and other exposed glass.
 - b. All outside loose objects should be placed inside.

- a. Move your most valuable possessions that you cannot take with you to higher points within your home.
3. If you remain at home. . .
 - a. Stay indoors, on leeward or downwind side of house and away from windows or glass doors.
 - b. Beware of the Eye of the Hurricane. Do not be fooled by a lull in the wind, it could be that you are in the eye; if so, extremely high winds, above hurricane force, will rise rapidly from the opposite direction in a matter of minutes.

There are many other actions that can be taken prior and during a storm. Conditions will vary considerably, depending on the strength of the storm, your particular location, type of building construction, and the ever-changing road building and elevations due to the land subsidence.

After the Storm

Frequently, persons who have weathered or survived a storm venture outside and are electrocuted by blown down power lines.

1. Do not touch or go near fallen utility lines.
2. Make sure you see where you are walking. If it's dark stay inside or if water remains, take no chances in wading unless absolutely necessary.
3. Drive with extreme caution, especially where roads are still under water.
4. Poisonous snakes and insects are always a threat in this area during the post-storm clean-up.
5. Guard against spoiled food, contaminated water and fires.

Hurricane Terms That Are Commonly Used

Tropical Disturbance - An area of disturbed weather in the tropics that has the potential of storm development.

Tropical Depression - A closed low pressure circulation at the surface in the tropics with winds up to 39 MPH.

Tropical Storm - A closed low pressure circulation at the surface in the tropics with winds 39 to 73 MPH.

Hurricane - A closed low pressure circulation in the tropics with winds in excess of 74 MPH.

Small Craft Advisory - When issued in conjunction with possible hurricane conditions for this

area, advises small craft operators to take precautions and not to venture into the open Gulf.

Gale Warnings - When winds of 38 to 55 MPH are expected.

Storm Warning - When winds of 55 to 74 MPH expected. Normally, not used in the Gulf or this area, usually hurricane warnings follow gale warnings.

Hurricane Watch - Hurricane may threaten this area within 24 hours.

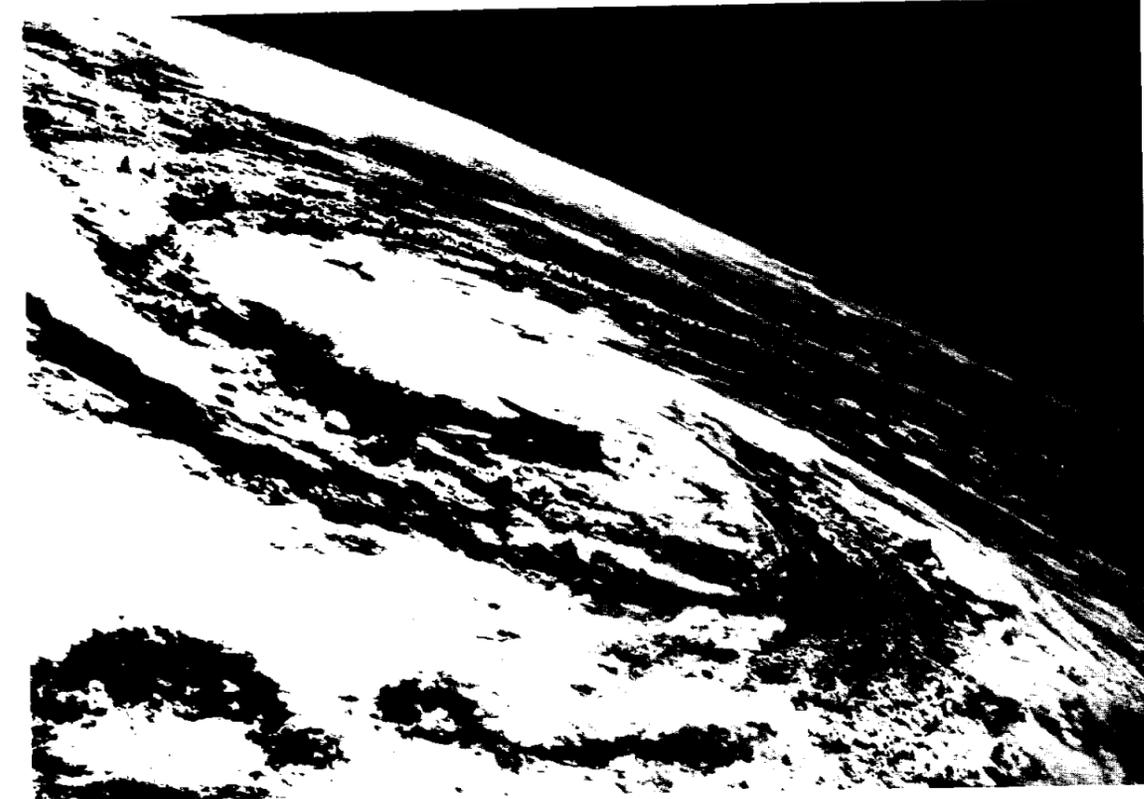
Hurricane Warning - Hurricane force winds or high tides and seas are expected to strike this area within 24 hours.

When a Hurricane Threatens the Texas Coast

An Emergency Hurricane Information Center is established at the National Weather Service in Galveston to disseminate hurricane warnings to persons along the Upper Texas Coast. The long range radar, tide stations and other meteorological sensors along with the NWS vast communications network affords the news media up-to-date information on the storms progress and its potential effects to this area. In addition to providing the latest storm information to the media, frequent hurricane briefings are conducted for Community Preparedness Officials for this area.

Sources For The Public to Obtain the Latest Hurricane Information

1. Virtually all commercial radio and TV stations have a direct teletype line to the National Weather Service Offices and broadcasts are made soon as received.
2. Radio Station KGBC, 1540 KHz, Galveston, in addition to their teletype connections, has a direct radio link between the Weather Office and the station, both on emergency power. All other commercial stations are encouraged to rebroadcast KGBC's messages, if land lines are disrupted from Galveston Island.
3. The NOAA National Weather Service Radio Stations; 162.55 MHz at Galveston and 162.40 at Houston broadcast the latest information on a continuous basis.
4. Law enforcement Agencies, Civil Defense, Red Cross and other local Community Officials are kept abreast of the storms progress and are continually disseminating storm related information.



Hurricane!

Viewed from space, a hurricane seems almost peaceful, a graceful array of spiral clouds stretching over hundreds of miles of water and land. This photo, taken from Apollo Seven October 17, 1968, shows the beauty of cloud formations in Hurricane Gladys as it spins in the Gulf of Mexico. Down on the ground and in open water under one of these fierce storms the view is quite different. One of Nature's most destructive forms of expression, hurricanes have lifetimes of up to several weeks and may cover thousands of miles.

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

Baywind I condo for lease: 2-2, washer, dryer, refrigerator; \$400/mo. plus deposit 486-9770 or 474-5267 ask for Charlotte.

Lease - LaPorte/Pasasena 4-2-2 in Brookglen next to San Jacinto College. Fireplace, drapes and fenced yard. \$495. Call Glen at x6249 or 486-0462 available July 1.

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

Austin Lake House, 4-2, 4 yrs. old. Dock privileges, view, beautifully remodeled. Must sell, \$59,900 low equity and assumable 488-5010.

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

Cars & Trucks

1970 Chevrolet 1/2 ton pickup 250-6 cyl, standard, runs good, looks good, new tires. \$900.00 477-8640.

Sharp 2977 Chev. Chevette hatchback. Jim x4947 or 480-2927. 69 Impala, 327 engine, 4 dr., auto, \$300. Trebes x6313.

Set of 2 - 11x15 dishpan mags, mounted with 10x15 a/t B.F. Goodrich tires, over half tread left. \$200. 333-3426 or x2569 Dean.

1973 Cheyenne P/U, 8 ft side bed, camper cover - lots of other extras -

reasonable 333-3426 or x2569 Dean. 1974 T-Bird where is as is \$600 460 ci/60,000 miles, cruise control, electric windows and door locks, am-fm 8 track stereo good mechanically. x2131 days 472-6910, after 6 947-9900.

1977 Chevy Malibu Classic Landau, ac, auto, has many power options. Very clean car. Sacrifice, college student must sell 488-4069.

For Sale '67 Camaro classic, 327, p.s., new brakes, am/fm/8 track, runs good. \$1500/negotiable, Cliff 488-1366.

For Sale: '76 Ford Courier Pickup, air, am/fm, tool box, mag wheels, undercoated, 46,000 miles, excellent condition, Stan Faber 482-7877.

'77 light duty truck (Chevrolet 10-35) service manual, unit repair manual, (overhaul) include cars, wiring diagrams, owners & driver's manual, \$8.00. Schnell 337-2402/488-9005.

1979 Fiat, like new, 5 spd, am/fm/cassette, ps, pb, excellent mpg, handles like sports car. Best offer over \$4000. x3035/534-3891.

Boats & Planes

Marine engine, 1599 cc, 4 cyl., complete engine, Chrysler 80, 80hp, includes closed water systems, mcw, x4105, 643-8944.

Easy Rider Bi-Wing hang glider, 12 h.p. McCulloch 101, Tricycle landing gear, seat & Harness, A.S.I., 200 lbs.

capacity, \$1500.00 481-8731.

Sailboat: 23' Erickson model 1977, fixed keel, 6 hp outboard, marine head, bimini, call after 6 229-1498.

3-hp Seagull outboard motor 11 yrs. old, used very little, \$225. Smith x2626, 946-1895.

Household Articles

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.

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

Musical Instruments

Piano, good condition \$200. Call after 4:30 p.m. 339-1793.

Sears best electric guitar with phase, echo, wah, whirlwind and fuzz effects and Sears LA 25 amplifier. Brand new condition. Best offer, call 337-3182.

Antique player piano 1929 Baldwin electric motor, antiques, great condition and sound, \$1000 or best offer. x3035/534-3891.

Stereos & Cameras

Polaroid SX-Sonar Land Camera, and Polaroid Polatronic Flash x2350. Both still in original cartons. Never used. \$200.00.

AM/FM/Stereo, car radio, \$30; metronome, \$10; humidifier, \$10 x6161 or 333-5883.

Craig cassette system, includes cassette recorder, telephone recorder, dictation, handunit, \$45 Wright x4105.

Cannon 35mm FT QI, lens 35mm, 50mm, 50mm macro, 85mm, 200mm, 2x extender, \$400. Also Soligar 30-220mm Zoom, new \$225. Dave Moore x2886/485-1705.

Miscellaneous

Bostitch roofing stapler used for one roof. Call 482-1769 after 6 p.m.

Sears power edger, engine excellent, needs tuneup. Runs \$35 488-3966.

Cycles

1978 Honda 550-4 K, less than 4,000 miles. Adult owner, excellent condition, luggage rack, back rest, and Faring. \$1,650.00 946-9053.

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.

Wanted

Wanted: Trick skis, good condition, x4105 or 643-8944 evenings.

Wanted: Apple II or TRS-80 computer. Phil, x4801 or 333-2476 after 5. Want to rent - compact pop-up

camper cheap. April 23-27 John x4231.

Large old ship Anchor rope, 4", use to decorate yard, fence, pool, buildings, etc. Wright x4105 643-8944.

Computer Peripheral RS232 Dot Matrix Printer Heath H14 \$300. Heath 16k Mem Board \$125. Two 8K's \$40 ea. 334-5931 after 4:30

Three shelf horizontal entertainment stand, 70x14x36, \$40.00. Can be assembled. 334-5931 aft. 4:30.

Ninety percent Chlorine 1-inch tablets, 25 lb. plastic pails. Francis Smith x5421 or 479-8141 after 6 p.m.

Electric typewriter w/backspace correction feature, power repeat keys and half-space function - carrying case included - Sandra 333-7540 after 5 938-4893.

Six foot tall brass metal sculpture, cattails, \$65. National Geographic collection 1962 to 1980 with index, make offer. 27-inch Samsonite Starlite molded suitcase, \$15. John x4393 or 488-0559.

UVA plumes, beige and brown, 60 cents each. Free airplane plants. John x4393 or 488-0559.

Basketball backboard and goal in good condition, Fullerton x2321.

Small Raleigh girls bike. Excellent beginners bike. \$30. John Erickson 488-1901 or x3431.

Tent - large 10' x 12' Sears deluxe family camping tent. Large screened windows - great ventilation \$40 - 488-0266.

Instrument Being Prepared

Telescope Will Expand View of Universe

MARSHALL SPACE FLIGHT CENTER, Ala. — Shaping and polishing of the 94-inch-diameter (2.4-meter) primary mirror for NASA's Space Telescope has been completed at the Danbury, Conn., facility of the Perkin-Elmer Corp.

The mirror surface has been completed to a perfection that deviates, at any point on the surface, less than one-millionth of an inch from an ideally perfect surface.

The primary mirror is the major optical component of the Optical Telescope Assembly (OTA), a major element of the Space Telescope. The Space Project is managed by the Marshall Space Flight Center, Huntsville, Ala. Perkin-Elmer is prime contractor for the OTA.

The 10-ton unmanned telescope will be placed in Earth orbit in early 1985 by the Space Shuttle and will have a mean orbital distance of 310 miles (500 kilometers), putting it well above the interfering haze of Earth's atmosphere. It will enable man to gaze seven times further into space than now possible — as much as 14 billion light-years — and to observe some 350 times more volume of space.

To take full advantage of this undistorted view of space, the telescope optics had to be polished to a much higher accuracy than those used in Earth-bound telescopes. Space Telescope's primary mirror was polished to specifications finer than for any previous telescope mirror its size, according to Perkin-Elmer.

The Space Telescope is of an optical design known as Ritchey-Cretien, a folded system with a secondary mirror in front of the primary mirror and the image plane behind the primary mirror.

Every photon striking the primary mirror's eight-foot clear aperture will be reflected onto the secondary mirror, then focused at a point no bigger than one-quarter the diameter of a human hair. What this surface fineness means to astronomers is that they will see stars and galaxies 1/50th as bright as can be observed from Earth's surface.

Manufacture of the primary mirror

blank began at Corning Glass Works, Corning, N.Y., in October 1977. The blank was delivered to Perkin-Elmer a little over a year later, in December 1978. Optical fabrication began with rough grinding of the front and back surfaces and of the inside and outside edges of the mirror shape. This was

followed by fine polishing of the mirror front surface, using a specially developed computer controlled polisher and extensive data reduction computer software, which began in August 1980.

In the next stage of fabrication, the primary mirror will have two ex-

tremely thin, yet uniform, coatings applied to its polished surface. First, a reflective layer of pure aluminum .00002 inches thick will be applied and then a protective layer of magnesium fluoride .000006 inches thick which will prevent oxidation of the aluminum.



SPACE TELESCOPE PRIMARY MIRROR INSPECTED

MARSHALL SPACE FLIGHT CENTER, Ala.— The primary mirror for NASA's Space Telescope undergoes final inspection by technicians following completion of shaping and polishing at the Danbury, Conn., facility of the Perkin-Elmer Corp. The 94-inch-diameter (2.4-meter) mirror will become a principal component of the 10-ton unmanned observatory scheduled to be launched into Earth orbit in early 1985 by the Space Shuttle.

Handicapped Exempt from Vehicle Taxes

Senate Bill 366 became effective August 29, 1977. This Legislation exempts individuals with orthopedically handicapping conditions from motor vehicle sales and use tax.

A person who is orthopedically handicapped is an individual who has limited movement to his extremities and physical functions. The physical impairment must be such that the person is unable to operate a motor vehi-

cle which has not been specially modified.

The motor vehicle (a) must be driven primarily by a person who is orthopedically handicapped, (b) must be privately owned, and (c) must be modified for operation by the orthopedically handicapped person.

This exemption does not apply to the sales and use of a motor vehicle owned or operated by a corporation,

partnership, limited partnership, or association.

The motor vehicle must be specifically modified by altering one or more of the following areas to facilitate an orthopedically handicapped person: (a) conventional foot brakes, (b) accelerator pedal, or (c) steering wheel.

The person claiming the exemption must present a restricted Texas Driver's License which indicates a modification restriction on the vehicle to the County Tax Assessor-Collector.

The license must verify that the person claiming the exemption is so physically impaired that he is unable to operate a motor vehicle which has not been specifically modified.

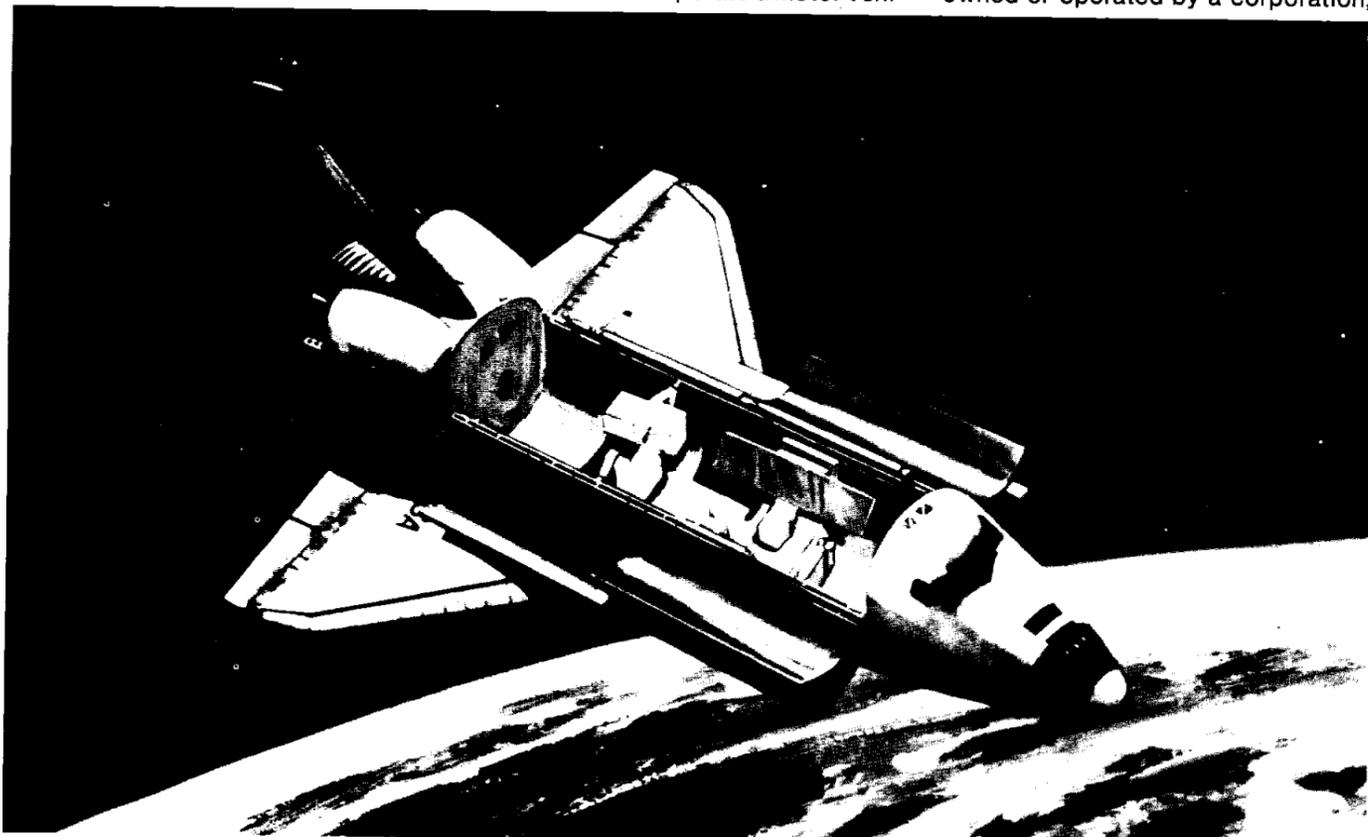
If you have purchased a vehicle since September 1, 1977 and if you paid the sales tax, and you have an orthopedically handicapping condition you may claim a refund of those taxes from the State Comptroller.

Your claim for a refund of vehicle sales taxes must be in writing with a copy of your Driver's License, both sides, (showing that you require a modified vehicle) attached.

Send claim to: State Comptroller
Motor Vehicle
Division
Capital Station
Austin, Texas 78774

If you have any question, contact the Motor Vehicle Sales Tax Division or call toll free 1-800-252-5555.

The Space Shuttle main engine fuel turbopump develops as much torque as 18 V-8 automobile engines. Source — Rockwell International.



Second Flight Payload

This is an artist's concept of the Space Shuttle on orbit with its STS-2 payload. In addition to the Development Flight Instrumentation package (shown in the aft section of the bay) which is carried on all four Orbital Test flights, the OTA-1 is a collection of scientific instruments which will perform experiment in ocean color sensing, geographic feature determination and lighting sensing, among others.