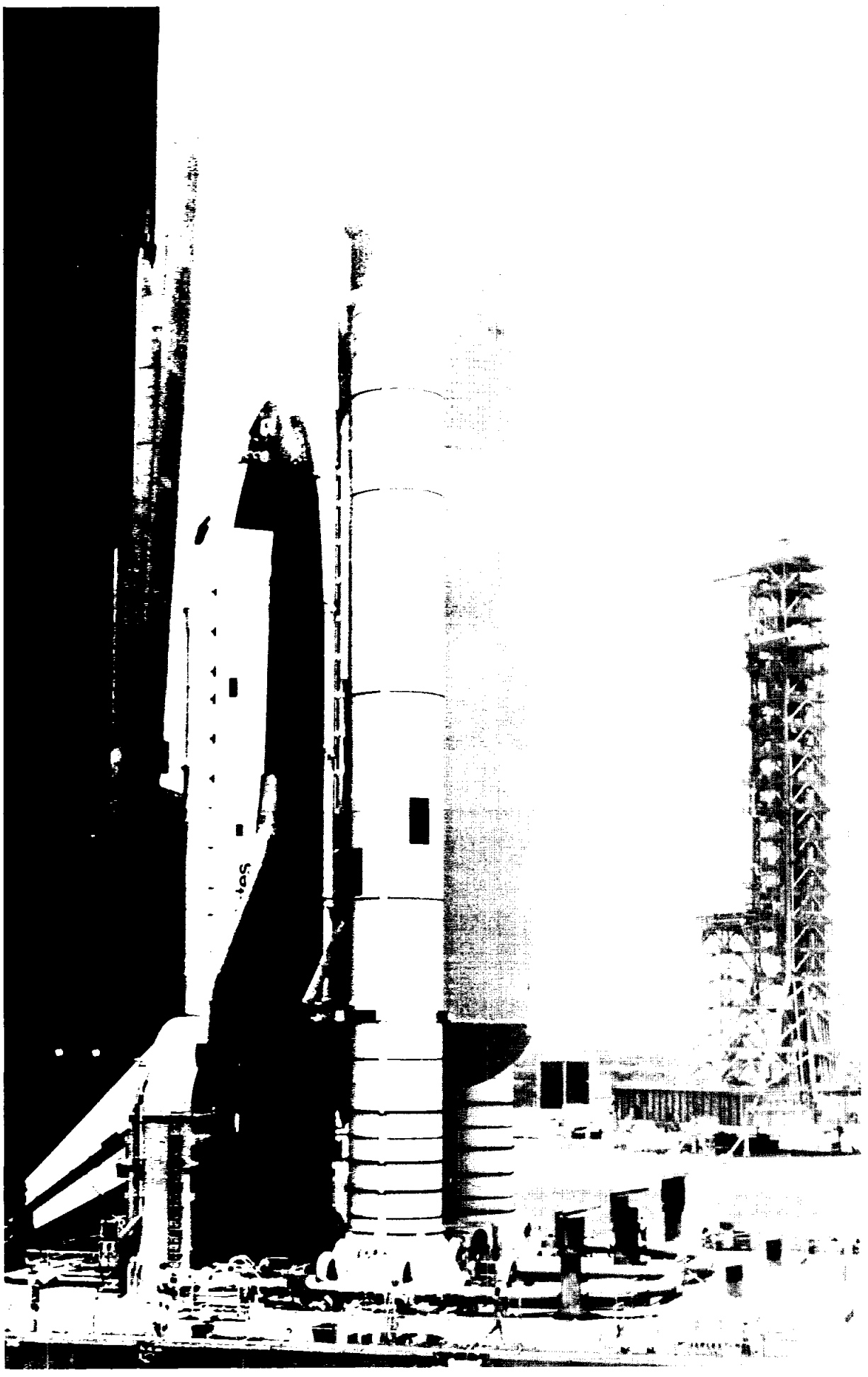
NASA
Lyndon B. Johnson Space Center

Space News Roundup

Vol. 22 No. 11 June 10, 1983 National Aeronautics and Space Administration



Rollout of the Space Shuttle Orbiter *Challenger* and its solid rocket boosters and external tank for STS-7 began at 12:32 p.m. May 26. The move ended with a hard down at Launch Pad 39A at 8:17 p.m. The 3.5 mile crawl to the pad was a major milestone for the mission, now set for June 18 launch.

TDRS deleted from manifest

The second in a series of Tracking and Data Relay Satellites (TDRS) that was scheduled for launch aboard STS-8 has been officially deleted from the flight cargo list.

The decision by NASA program managers to remove TDRS-B from the STS-8 cargo was based on the failure of the Inertial Upper Stage (IUS) solid rocket booster to propel the first TDRS to geosynchronous orbit after deployment from *Challenger* on STS-6. Reasons for the IUS anomaly and final corrective actions are under continuing investigation by a joint U.S. Air Force and NASA Anomaly Investigation Board.

Meanwhile, TDRS-A is nearing its planned orbit after a month-long series of successful thruster firings, sent through the TDRS ground station at White Sands, New Mexico. Gradually, through burns lasting from several minutes to as much as three hours, the apogee had been raised to 22,189 miles and the perigee to 22,012 statute miles as of late last week. At that time, the orbital period was 21 hours and 58 minutes. The NASA, TRW and Spacecom engineers are aiming at a 22,234 statute mile circular orbit. No firm target date for reaching that orbit has been set, although officials said it could be later this month.

The replacement payload for TDRS-B will be the Payload Deployment and Retrieval System Test Article, originally planned to be carried aboard *Challenger* on STS-11. The test article is a 15×16-foot, 8,500 lb. aluminum and stainless steel structure fitted with four remote manipulator arm grapple fixtures.

The test article simulates a large-mass payload and will be used to conduct dynamic tests of the robot arm. The tests will evaluate elbow, wrist and shoulder joint reaction to higher loads and to gain crew experience in operating the 50-

(Continued on page 4)

W5LFL to broadcast from orbit on STS-9

While Spacelab orbits the Earth this fall on its first mission, there will be more than one communications network in touch with its crew.

Dr. Owen Garriott, an STS-9 mission specialist and amateur radio operator, will use a hand-held radio during part of his off-duty time to communicate with some of the thousands of "ham" radio operators around the world. Garriott's call sign is W5LFL.

Original proposals to place an amateur radio transceiver aboard an orbiting U.S. spacecraft surfaced when NASA was about to launch Skylab in the early 70s. NASA rejected the plan, then dubbed SKYLARC (for Skylab Amateur Radio Communications) because it came too late in the development of the program.

Space Shuttle flights presented another opportunity. The American Radio Relay League (ARRL) and the Amateur Radio Satellite Corporation (AMSAT) jointly requested that NASA supply a small transceiver to be carried by Garriott, a ham operator since his teens.

NASA accepted the proposal with the stipulation that the plan would not interfere with mission activities and that safety requirements were met.

Crew members aboard the Spacelab 1 flight will work on a 12-hour-on, 12-hour-off schedule. Use of the transceiver will be limited to one hour a day.

All "ham" radio operations for STS-9 will be in the two-meter band. Transmissions will be in the range 145.51 to 45.770 MHz FM. Reception will be in the range 144.910 to 145.470 MHz FM. Twenty kilohertz steps will be used to both transmit and receive.

The radio will be operated from the aft flight deck of the Space Shuttle Orbiter *Columbia*, which is carrying the Spacelab in its cargo bay.

The transceiver itself will be a battery-powered unit capable of five watts of output. The printed-circuit antenna will be placed in the upper crew compartment window on the aft flight deck.

Garriott will wear the standard in-flight headset when operating

(Continued on page 4)

NASA stressing productivity gains

NASA, long seen as a model for the government in fiscal and personnel management, is now pushing as one of eight major goals to become a government leader in productivity enhancement, management practices and the application of advanced technologies.

The effort will include bringing more employees into the decision-making process, setting up employee teams similar to quality circles in the private sector, promoting more office automation and providing a creative environment for employees.

The Productivity Improvement and Quality Enhancement (PIQE) Program grew out of the Agency decision to include productivity enhancement as one of its eight major goals. The PIQE Program calls for a voluntary and largely decentralized effort on the part of management and employees at each of the NASA centers.

At JSC, a Productivity Committee consisting of representatives from all staff offices, program and project offices and directorates, met for the first time May 17 for a briefing on the Agency program. Members of the committee were asked to consider where elements of the program might fit into their areas.

In the next few months, the Center hopes to have a pilot program of from four to six NASA Employee Teams, or NETs, in operation. The NETs will be voluntary, and are seen as a NASA version of the quality circles which have been gaining popularity in many private businesses.

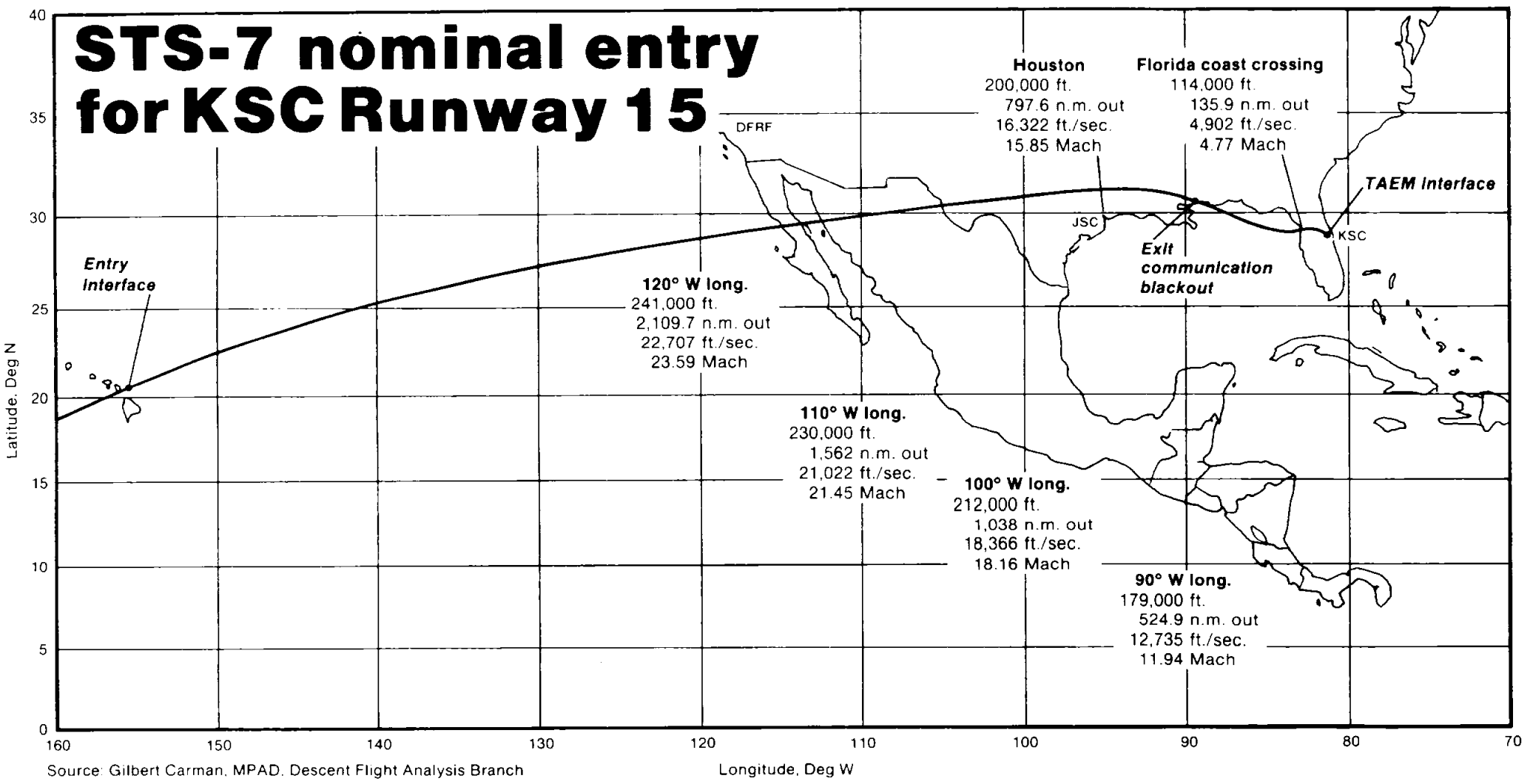
The philosophy is that employees know their job as well or better than anyone, and are in the best position to make suggestions and decisions which can improve productivity, quality and the overall conduct of the job.

Westinghouse has been an industry leader in quality circles, and American automakers have adopted the concept with measureable success over the past few years. Locally, Rockwell and Northrup are two examples of contracting organizations which have already adopted the philosophy.

The Center will also continue to emphasize the Productivity Improvement Awards Program (formerly the Cost Reduction Program), which is seen as a way to bring all employees into the effort. The award program provides recognition for acts or ideas which save time or money, reduce funding or staffing necessary for a particular project or which improve the effectiveness of a particular activity.

Other major NASA goals adopted in March include:

- Making the Space Transportation System fully operational and providing routine and low cost access to space;
- Establishing a permanent presence in space;
- Conducting an aeronautics program which contributes materially to the preeminence of U.S. civil and military aviation;
- Conducting a space science program which expands human knowledge of the Earth, its environment, the solar system, and the universe.
- Conducting an effective and productive space applications program which enhances U.S. technology leadership and security;
- Expand opportunities for private sector investment in space-related activities.
- Provide a creative environment and the best of facilities to NASA employees to enhance their performance in NASA's research, development and operational responsibilities.



Source: Gilbert Carman, MPAD, Descent Flight Analysis Branch

Space News Briefs

IRAS sights yet another comet

The international Infrared Astronomical Satellite, IRAS, has sighted a second comet now on its way out of the solar system. It is the second comet to be sighted by IRAS in two weeks and the third sighted in the solar system since May. Comet IRAS (1983F) was discovered by the orbiting telescope May 13 and was confirmed by ground observations on May 19. The comet is one million times fainter than Comet IRAS-Araki-Alcock, which made a close approach to Earth on May 11. The newest comet came within about 130 million miles of the Sun last January 20, and is now visible only with powerful telescopes. Another comet, named Sugano-Saigusa-Fujikawa, was sighted by Japanese astronomers two weeks ago and will make a close approach to Earth on June 12 and 13. IRAS astronomers say many faint comets may pass the inner solar system without being noticed. The infrared telescope on IRAS, however, is proving to be very sensitive to the dust that trails even faint comets. Astronomers think IRAS may sight a number of comets during its year-long survey of the sky in infrared wavelengths.

Direct broadcast service planned

The Satellite Television Corp., a wholly owned subsidiary of COMSAT, has given RCA the go-ahead to produce six satellites which are expected to provide direct-to-the-home pay television service across the United States. The $100 million contract calls for the production of four operating and two on-orbit spare satellites with a first launch planned for 1986. The four primary satellites will broadcast pay TV to areas roughly coincident with the four U.S. time zones. The satellite at 105° W longitude will cover the Eastern Time Zone, while others at 130°, 155° and 175° W longitude will cover the Central, Mountain and Pacific Time Zones, respectively. Programming will be transmitted to the satellites in the 17.3 to 17.8 gHz band from a ground site in Las Vegas. The satellite transponders will retransmit to Earth in the 12.2 to 12.7 gHz band. Each satellite will weigh approximately 2,750 lbs. The satellites are capable of being launched either on the Space Shuttle or the European Ariane rocket.

Star's companion raises eyebrows

A gaseous companion to a young star some 450 light years from Earth may be the first planet ever observed outside our solar system, a University of California astronomer says. The object is 7.5 billion miles from its star, T Tauri, and is known by the acronym "TIRC" for T Tauri Infrared Companion. TIRC is from five to 20 times larger than Jupiter. Douglas Lin, one of three UC astronomers working on the observations, said TIRC, if it is a planet forming, could help astronomers test models for the formation of our own solar system. The other school of thought in the astronomical community is that TIRC is a small sun and that both objects could be a binary system. Radio, optical and infrared telescopes revealed the object in the past year.

EXOSAT now on station

The European Space Agency's X-Ray Observatory Satellite, EXOSAT, was successfully launched from Vandenberg Air Force Base on an American Delta 3914 May 26 and is now on station in a highly elliptical orbit. EXOSAT will study cosmic X-ray sources in the energy range from 0.04 keV to 80 keV. It has six mission objectives, which include mapping, broad-band spectroscopy and high-resolution spectroscopy undertaken in conjunction with imaging telescopes aboard. The satellite is in a 119,300 × 210-mile orbit inclined 72° to the equator.

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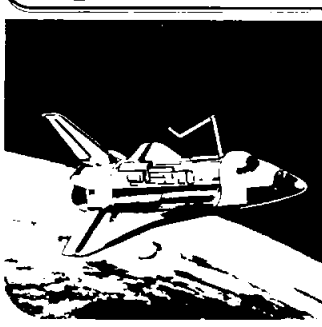


The ***Roundup*** is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. ***Roundup*** deadline is the first Wednesday after publication.

Editor Brian Welch

Shuttle conference to cover fundamentals

As many as 1,500 scientists, engineers and technical experts connected with the Space Shuttle Program are expected to gather at JSC June 28 to 30 for a conference seen as the definitive review of America's latest space flight project.

A total of 84 papers ranging across 15 fundamental disciplines associated with the Shuttle development program will be presented. Lt. Gen. James A. Abrahamson, NASA Associate Administrator for Space Flight, will present the keynote address during the opening session.

"The Space Shuttle Program: From Challenge to Achievement," is the conference theme, and papers will address the advances in such areas as avionics design and development; aerodynamic challenges faced during launch and entry; guidance, navigation and control; Shuttle structural design; life support, environmental control and crew equipment; ground operations; propulsion and power; communications and tracking; mechanical systems; and thermal environments associated with the Orbiter's flight regime.

The General Chairman for the conference is Aaron Cohen, Director of Research and Engineering. JSC Director Gerald Griffin will deliver the welcoming remarks at the opening session.

Abrahamson's keynote address will focus on the challenges faced during the design, development and testing that led to the operational Shuttle system. His speech will be followed by a plenary session with the key Space Shuttle development managers led by former JSC Director of Engineering and Development Dr. Maxime A. Faget.

The afternoon of the first day and the two subsequent days will feature three parallel technical sessions running in three buildings on the central campus of the space center.

From 6 to 9 p.m. June 28, attendees will gather for a dinner at the Gilruth Center with Dr. Glynn Lunney, Manager of the National Space Transportation Systems Program, as the featured speaker.

From 11:30 a.m. to 12:30 p.m. June 29, a luncheon will be held at the Gilruth Center with Donald K. "Deke" Slayton, former astronaut and Shuttle Orbital Flight Test Manager, as the featured speaker. Cost for the dinner is $15, and the luncheon cost is $8. Reservations should be made before June 23 by calling x3995.

A summary of the conference sessions follows.

Space Shuttle Program Technical Conference
"From Challenge to Achievement"

The Challenge

TUESDAY, JUNE 28, 1983 — BUILDING 2 AUDITORIUM

9:00 a.m.	Opening Remarks	Mr. Aaron Cohen
9:10	Welcome	Mr. Gerald D. Griffin
9:20	Keynote Address	Lt. Gen. James A. Abrahamson
9:45	"The Challenge"	Dr. Maxime A. Faget and Panel

The Achievement

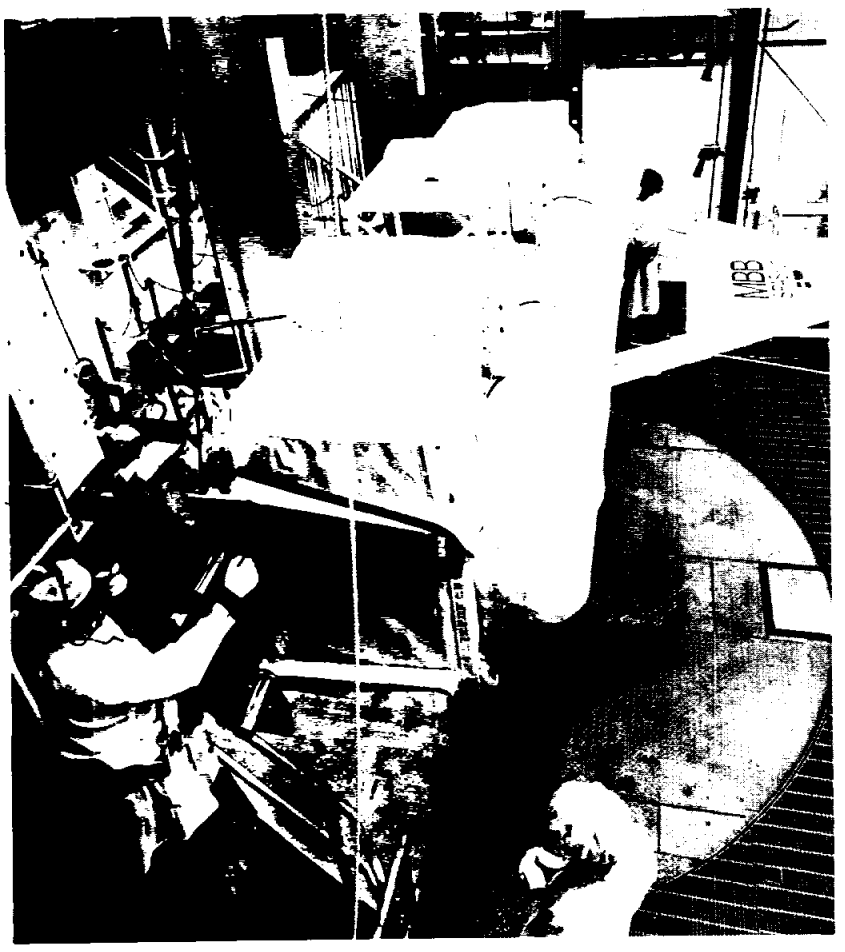
Date/Time	*Building 2 Auditorium*	*Building 30 Auditorium*	*Building 7 Auditorium*
Tuesday 6/28/83 1:00-4:00 p.m.	Aerodynamics #1	Ground Operations #1	Life Support, Environmental Control and Crew Station
Wednesday 6/29/83 8:30-11:30 a.m.	Integrated Avionics #1	Propulsion & Power #1	Communications & Tracking
Wednesday 6/29/83 1:30-4:30 p.m.	Mechanical Systems #1	Aerodynamics #2	Ground Operations #2
Thursday 6/30/83 8:30-11:30 a.m.	Structures	Integrated Avionics #2	Propulsion & Power #2
Thursday 6/30/83 1:00-4:00 p.m.	Thermal, Contamination Environments, Protection Systems	Guidance, Navigation & Control	Mechanical Systems #2

Social and Dinner, Tuesday, June 28 (Speaker, Dr. Glynn Lunney)
$15 — 6 p.m. — Gilruth Center
Luncheon, Wednesday, June 29 (Speaker, Dr. Donald K. Slayton)
$8 — 12 noon — Gilruth Center

For reservations, please call Norm Chaffee's office, EP, x3995, by noon June 23, 1983.

The summer heats up

A quick look at the next three Space Shuttle flights

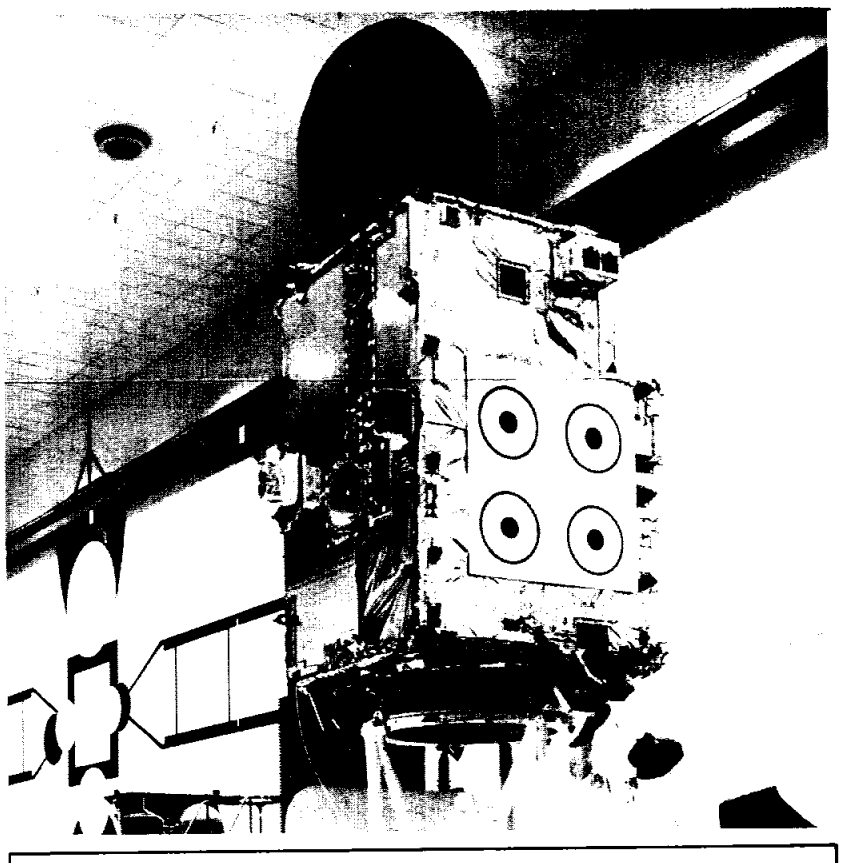


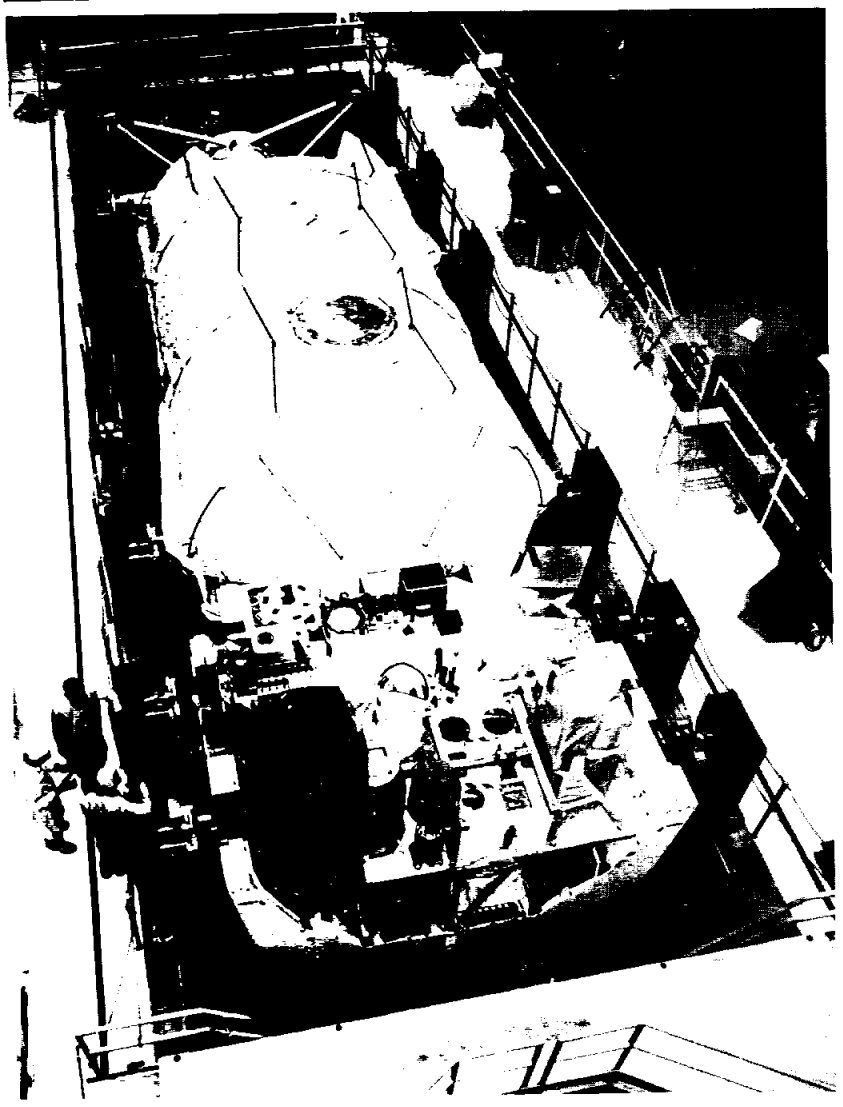
STS-7

The Orbiter is now at the pad and pre-launch activities are picking up as preparations continue for the June 18 launch of STS-7. Shown at right is the *Challenger* from a bug's eye view during the rollover into the Vehicle Assembly Bldg. at KSC. At left, technicians prepare the first Shuttle Pallet Satellite, SPAS-01, for final inspection and checkout last month. The SPAS will carry television, still and motion picture cameras, and proximity operations with the satellite promise never before seen views of the full Orbiter against the backdrop of Earth. Two communications satellite launches, two different materials processing experiments and the SPAS proximity ops highlight the mission. NASA plans to conclude the flight with the first KSC landing.

STS-8

Mid-August is the target date for the launch of STS-8, NASA's first night launch since Apollo 17. At left is the crew patch for the mission, and at right is a view of INSAT 1-B, a communications satellite to be deployed for the Government of India. INSAT will provide telecommunications, television broadcasting and meteorological services to India in a unique three-in-one system. STS-8 will also feature the Shuttle program's first night landing, scheduled for Edwards Air Force Base.





STS-9

The triumphant return of the Orbiter *Columbia* will come on STS-9, when she carries Spacelab, one of the most ambitious payloads ever flown. The flight article of the space laboratory is shown at left in the Operations and Checkout Bldg. at KSC. Installation in the *Columbia* is scheduled for mid-August. At right is the crew patch for STS-9, unveiled this week. At six people, the mission will be carrying the largest number of people into space ever. Launch is now scheduled for Sept. 30.

Gilruth Center News

Call x3594 for more information

Race — Sign up to run in our weight handicap race, which begins at 8 a.m. June 25. The cost is $2 per person.

Ladies exercise — Come stretch with the gang for only $12 in this continuing class at the Rec Center.

Children's movie — The next movie will be "Snoopy Come Home," to be shown from 10 a.m. to noon June 25. The cost of $1 per person includes popcorn and cokes. Tickets are on sale in the Bldg. 11 Exchange Store.

Aerobic dancing — Dance away those extra inches with Jacki Sorensen's dance class, held Mondays and Wednesdays from 9 to 10 a.m. and Tuesdays and Thurdsays from 4:15 to 5:15 p.m. Cost for the 8-week session is $40. Starting dates are July 11 and 12.

Defensive driving — Learn to drive safely and qualify for a 10% reduction in your insurance rates for the next three years. The class is held from 8 a.m. to 5 p.m. July 23. The cost is $20.

Dancercise — This class will gradually get you into shape over an 8-week session which begins June 20 and will meet on Mondays, Tuesdays and Thursdays from 5:30 to 6:30 p.m. The cost is $30 per person.

Ladies self defense — Learn the basic skills of self defense by signing up for this 13-week course which begins July 5. The class meets on Tuesdays and Thursdays from 5:15 to 6:15 p.m. and the cost is $30.

Aikido — This form of non-agressive defensive techniques stresses mind and body cooperation and uses the principles of controlled movement and balance. The class will be held from 6:30 to 8:30 p.m. on Tuesdays and Thursdays. The cost for the course is $20 per person and begins June 14.

Tennis — Beginning tennis teaches the fundamentals, including backhand, forehand, service, footwork and body movement. The class begins July 11 and runs for 8 weeks. Intermediate tennis, which begins July 13, will teach you spins and spin service and improve your net. The cost for these classes is $26 per person. Call the Rec Center for details.

Ladies weight training — Shape up your body in just the right places and gain endurance in this basic course. You won't get bulging muscles, and you can learn about effective and fun exercise in your life. The class meets Mondays and Wednesdays from 7 to 8 p.m. and begins June 20 for six weeks.

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Twenty-fifth Anniversary
1958-1983

TDRS

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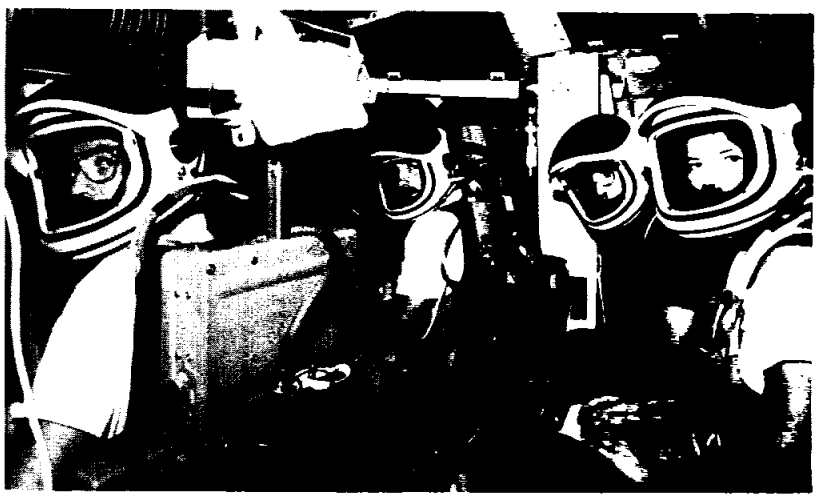
foot long Canadian-built mechanical arm.

Unaffected by STS-8 cargo changes is the Indian National Satellite, INSAT-1, a communication and meteorological geosynchronous satellite being carried by *Challenger* for the Indian Department of Space. INSAT-1 will be boosted from *Challenger's* 174-nautical mile orbit to geosynchronous altitude by a Payload Assist Module-D, the type which successfully launched two communications satellites on STS-5 and will be used again on STS-7.



Four of the five crew members for STS-7, Commander Robert Crippen, Pilot Fred Hauck and Mission Specialists Dr. Sally Ride and John Fabian, are shown here in the Shuttle Mission Simulator in the positions they will occupy during launch June 18.

W5LFL to broadcast

(Continued from page 1)

the radio.

Most of the Earth's land mass will be within line-of-sight transmission of the spacecraft during a typical day. The Spacelab 1 mission will have an orbital inclination of 57 degrees. The times when Garriott will communicate with "ham" operators will be announced later.

"Amateur radio is a valuable national, even international, asset and it is certainly appropriate that Spacelab be used to demonstrate this capability," said Garriott, who will operate Spacelab 1 systems and conduct many of its experiments during the mission. "I look forward with great enthusiasm to brief conversations with as many of my fellow hams around the world as our work schedule will permit."

Cookin' in the Cafeteria

Week of June 13-17, 1983

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.

Week of June 20-24, 1983

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 & 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.

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 AP 3 *Roundup*, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

For rent: Galveston By-The-Sea condo, 2 BR, furnished apartment for rent by day (2 minimum), weeks or month. Call Clements, 474-2622.

For sale or lease: Nassau Bay 2-2.5-2 townhouse, $59,900. Call 333-3833 or 334-4184.

For lease: Webster/Sterling Knoll, Wescon 3-2-2, fenced, clean, $650/mo. plus deposit, no pets, avail. now. Call Bo, 486-5621 or 488-4052.

For sale: College Station 3-2 mobile home, 2 miles from campus on Texas Ave., fenced, landscaped, available June 15, $14,900. Call 474-3839 after 5 p.m.

For sale: League City/Pecan Forest 3-2-2, fireplace, spacious living room, low cost financing available, priced in the $70s. Call 554-6200.

For lease: Friendswood 3-2-1 house, White Hall, landscaped, fenced, 1,800 sq. ft. Call Law, x3566 or 482-6816.

For lease: Two story townhouse, 2-2.5-2, fireplace, atrium, fenced patio, balcony, garage opener, pool, 1,500 sq. ft., NASA area, $590/mo. Call 452-3361 evenings.

For lease: Meadow Bend 4-2-2, fireplace, fenced, cathedral ceiling, refrigerator, W/D, 10 minutes from NASA, $650/mo. Call 334-6210.

For rent: Walden at Lake Conroe, 2-2 condo, sleeps 6, available June 18-25. Call 474-3839 after 5 p.m.

For lease: Heritage Park 3-2-2, near Baybrook Mall, fireplace, fenced, $495/mo. plus deposit. Call 486-9562.

For sale or rent: League City 3-1, privacy fence, central air and heat, new carpet, 1,054 sq. ft., assumable, $400/mo. or $39,900. Call Charlie, x3421 or 480-3260.

For rent: Galveston Gulf front condo, 1 BR, completely equipped, introductory rates, pool and tennis, reserve now for summer. Call Nussman, 721-2459.

For sale: Bayou Vista area 2-1-1, on canal, furnished, boat storage, concrete boat ramp, 16' tri-hull boat w/115 HP Evenrude and trailer, $25,500 takes all. Call Ford, x5511 or 473-6840.

For rent: Jamaica Beach cottage, $230/wk., make reservations now for summer season. Call 480-0220 after 6 p.m.

For sale: Large lot on golf course at Sam Rayburn, well below market, utilities, available now, paving in next year. Call Poindexter, x4241 or 474-7769.

For lease: 10 acres, Alvin area, fenced, on paved road, good for horses or cattle. Call Damewood, 482-5572.

For sale: Baywind II condo, 2-2-2, split plan, fireplace, walk in closets, W/D connection, refrigerator, large living room, low 40s. Call Hiram, x2651 or 488-1683.

For sale or lease: Countryside 4-2-2, fenced, fireplace, near elementary school, assumable VA. Call 486-8130 evenings.

For lease: League City, Countryside, 4-2-2, brand new, ready on 7/1, large cul-de-sac lot. $595/mo. Call Tim, x2276 or 488-6167.

Cars & Trucks

1980 Plymouth Horizon TC3, 2 dr. hatchback, 4 spd. transmission, AM/FM, power steering, AC, new tires and battery, shaded back glass, 34K miles, $3,895. Call 946-4752.

1980 Chevy Diesel pickup, tilt steering, camper cover, new tires, A-1 condition. Call Cotton, x2211 or 471-9564.

1980 Ford Fairmont, 4 dr., 4 cyl., AM/FM, AC, PS, PB, 17,600 miles, $3,800. all McKinney, x6287 or 337-5106.

1977 Chrysler Cordoba, AM/FM, AC, power windows, new tires, new tune-up, tilt, cruise, $2,095 neg. Call Lonnie, x5888 or 482-0547.

1978 Chevette, 2 dr. hatchback, 4-spd., AM/FM, AC, one owner, deluxe interior, 57K miles, $2,350. Call B. Craig, x4031 or 1-420-2936.

1975 Catalina, one owner, best running moose ever, excellent tires, high miles, tacky anti-rust body, best offer. Call 486-8810.

1981 Mercury Cougar, 2 dr. sedan, PS, PB, AC, radio, mint condition, 28K miles, $4,500. Call 921-2793 or 921-7212.

1977 Camaro, sharp, 6 cyl., 3 spd., mag wheels, new tires, $2,395. Call 486-9406.

1973 Satellite Sebring, 318, auto, AC, PS, PB, new brakes, shocks, good tires, AM/FM stereo, $1,275. Call 474-4535 after 5 p.m.

1981 Chevy Chevette, excellent condition, manual trans., 32K miles, $4,200. Call Linda, x4319 or 480-8339.

1979 Honda Civic, good condition, 30MPG, $2,200 or best offer. Call 554-6733.

Recreational

1965 Motorhome, 4 spd., runs well, stove, refrigerator, sink, bath with shower, sleeps 4, well taken care of, $1,800. Call 944-4526.

Fiber glass, cab-high camper shell for Fleet Side LWB half-ton pickup, $150. Call Lonnie, X2051 or 334-2305.

1975 Prowler travel trailer, 19.5', dual axle, air, awning, self-contained, excellent condition, $3,150. Call Harris, x5281 or 488-0026.

Camper shell for small pickup, vinyl exterior, four windows, bubble, $100. Call 481-0780 after 5 p.m.

Boats & Planes

Piper Warrior PA-28-151 for rent, $33/hr. wet; Cessna 150, $25/hr. wet. Based Houston Gulf, avail. weekends, instruction available. Call 946-1750.

Hobie Cat, 14', with trailer, excellent condition, $1,650. Call 471-1369 after 6 p.m.

15' open bow fiberglass boat, new 40 HP Mercury, galvanized tilt trailer, excellent condition, ready to go, $3,100. Call 946-1965.

Lido-14 sailboat, excellent family craft, active fleet Clear Lake & Lake Houston, boat, sails and trailer like new, $2,950. Call 334-2392.

Piper Lance for rent, 6 place, 160 knots, full IFR, club seating, $85/hr. wet. Call L. Damewood, 471-1675.

Cycles

1977 Yamaha RD 400, new rear tire, 4,300 miles, good condition, $850. Call Haynes, x6337 or 338-2390 after 6 p.m.

New motorcycle parts: Jardone mufflers for Suzuki GS550, $70; full coverage Plexifairing II windshield, $75; Ga-Zee-Bo cover for full dress MC, $30. Call 488-7899 after 5 p.m.

Audiovisual & Computers

Byte Magazine, all issues, 9/75 to 6/83, $100; Heathkit SB-401 Xmtr, $75. Call Ken Goodwin, x2881.

Magnavox stereo/TV home entertainment center, phono, tape, AM/FM tuner, power amp, large speakers (no TV), sliding doors, beautiful finish, best offer over $100. Call Samouce, x4727.

Atari 2600, all controllers, 3 cartridges, excellent condition, $100; Sears two-seater go cart, excellent condition, $100. Call Martin, 485-7362.

New HP-41CV pocket computer, card readers, extnd. function/mem. modules, 2 extnd. mem. modules, extra batteries, manual, $350. Call Tom Clark, x7445.

Household

JC Penny microwave with clock, big capacity, used less than 1 year, $250. Call Bo, 486-5621.

Zenith stereo in cabinet w/8 track and AM/FM, $275; queen size mattress and box springs, $100 for set; used black vinyl couch and two matching chairs, $150 for set. Call 480-4208, days.

Red vinyl platform rocker, $45; wooden rocker, $30; white rectangular coffee table, $20; lamp, $8; two shelves plus brackets, $14. Call Marianne, x5871 or 486-4747 after 5 p.m.

Dining room table, six chairs, matching china cabinet, $400. Call 474-3839 after 5 p.m.

Bedroom suite, good condition, double bed, dresser with mirror, end table and lamp, $400. Call Joe, x4451 or 486-1907.

Hexagon shaped 50 gal. aquarium w/stand, salt water equipment & accessories, cost $450, make offer. Call Mark, 280-6637 days or 998-8034 evenings.

Double window ovens, stove top and vent hood, electric, coppertone, $150. Call Marie, 482-5197.

1930s Deco dresser, chest and bed, w/mattress, $350. Call 485-0076 after 6 p.m.

Oak desk, 36"×66", $150; 6' Queen Anne sofa, $100; studio couch, single bed, $40 each. Call Rodriguez, x4708 or 946-5849 evenings.

Wanted

Seeking stud for AKC female Pekingese, 18 mo. old, biscuit color, will be in heat late June/early July. Call Frank, x2048/2049 or 480-8473.

Need car pool partner(s) between Rice University area and NASA. Call Sophie, x2555 or 523-0589 after 6 p.m.

Want to join or form carpool from Hwy. 6 Bear Creek Park area to NASA, 8 to 4:30 shift. Call George, x4927 or 463-6704.

Need queen size mattress only, local NASA area please. Call Karen, x2495.

Musical Instruments

McPhail spinet piano, 25 years old, in good shape, needs tuning, has tufted gold velvet piano bench, $400. Call 485-2949.

Bundy clarinet with case and stand, excellent condition, used 4 mo., $245. Call Marie, x3606 or 488-2870 after 5 p.m.

Pets

Good home wanted for family dog, two years old, very good with children, part Labrador. Call Ritz, x4973 or 333-3352.

Calico kittens, black and white, free, mother is good mouser. Call 482-3989.

Miscellaneous

Emergency tire and rim for '79 Monte Carlo, 15", new $85; TV game with tennis, paddleball, western, $25. Call 332-5830 after 6 p.m.

Set of four wheels and tires, G78-15, for Datsun pickup, tires in fair condition, $150. Call 473-7745.

New Book of Knowledge children's encyclopedia, 1980 edition, plus 10 vol. of children's stories, classics, etc., excellent condition, $550 new, best offer over $300. Call 333-5331 between 7 and 10 p.m.

Seiko watch, gift never worn, digital with leather band, sells for $120, asking half that. Call Ted, x3314 or 486-4747 after 5 p.m.

Six inch reflecting telescope, equatorial mount, pier, eyepieces, accessories, $165. Call 480-1347.

Are you having a problem controlling your eating? If you're interested in helping yourself, we're interested in helping you. Call Overeaters Anonymous, no dues or fees. Call Connie, x6130 or 5350.

Stamp album, copyright 1949, World Wide album, collector's item, good condition, 2,200 stamps mounted within, $50. Call Doc, x4372 or 280-8029.

Factory engine and chassis manuals for 1978 Buick; E-Z lift trailer hitch for Chevy/GMC pickup. Call Handley, x6196 or 482-7041.

Boat trailer, 17', frame needs work, $50. Call Jon, x4006 or 334-1087.