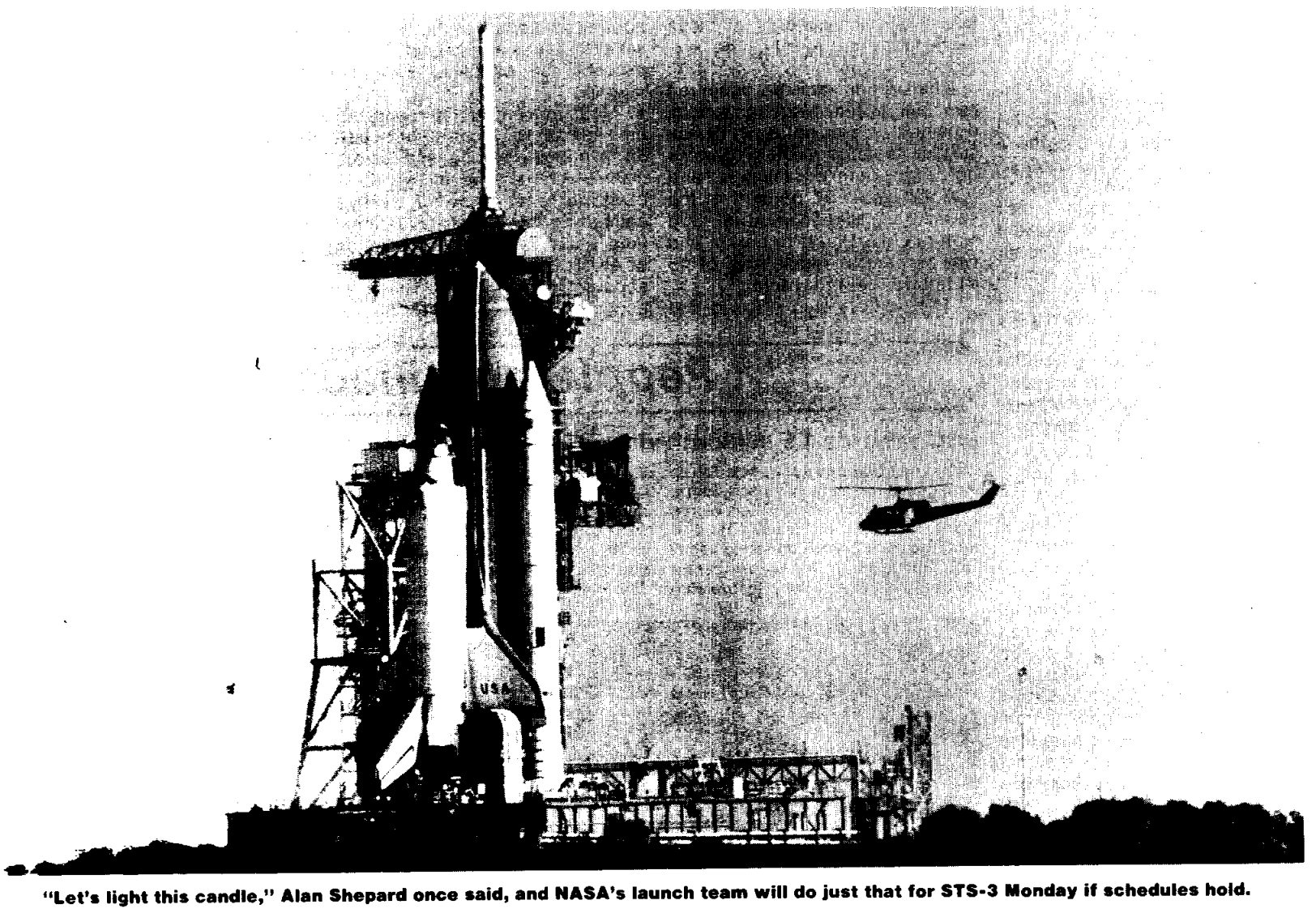
NASA
Lyndon B. Johnson Space Center

Space News Roundup

Vol. 21 No. 6 March 19, 1982 National Aeronautics and Space Administration

Teams on station, countdown underway



"Let's light this candle," Alan Shepard once said, and NASA's launch team will do just that for STS-3 Monday if schedules hold.

Launch teams are now on station at the Kennedy Space Center, and mission support teams here are scheduled to go on duty Saturday at T-41 hours. At press time, the terminal countdown was anticipated to proceed toward a 9 a.m. CST launch of STS-3 on March 22.

A thousand or more news people are expected at JSC by the second day of the mission, and information on the flight will be made available in various ways on a worldwide basis.

The Public Affairs Office is broadcasting mission status reports locally from a transmitter atop Bldg. 1 at a frequency of 171.15 MHz. Those reports will consist of live press briefings, mission audio (selected air to ground and PAO commentary) and code-a-phone updates. The reports will in turn be patched into the JSC Amateur Radio Club facilities and ultimately broadcast worldwide via shortwave radio.

There will also be a 900 number available in the United States and Western Europe for news people to call in and listen, for a charge, to conversations between *Columbia* and JSC. That number, 900-410-6272, received over 15,000 calls during STS-2. The charge is 50 cents for the first minute and 35 cents each minute thereafter up to 2.5 hours.

On-site callers can also dial x6111 for a code-a-phone reports.

Cosmic dust now available for study

Cosmic dust particles, thought to originate from comets, are now a third source of extraterrestrial material available for study from the Planetary Materials Curatorial Branch at JSC.

These tiny solid particles, usually from 1 to 50 microns in size, can travel as fast as 70 kilometers per second, and leave miniscule "zap pits," or craters, when they strike objects in space. The surfaces of U.S. spacecraft in the Gemini, Apollo and Skylab programs have been studied for information on this cratering caused by cosmic dust particles.

The particles can also enter Earth's atmosphere and filter through its various levels until being deposited on the surface. In the 1970s, science discovered that these particles can be retrieved, if painstakingly, from the stratosphere.

The first collection of cosmic dust was accomplished by Dr. Don Brownlee of the University of Washington in Seattle in the early 1970s. His method for retrieving particles from the stratosphere was expanded on by JSC, and the collection has grown to the point where systematic cataloging has begun, and samples are available for research.

James Gooding, Associate Curator, said the device used to collect the particles is relatively simple. A thin surface of lucite, called a flag, is mounted to the wings of research aircraft, either a WB-57F or a U-2, with a thin coat of silicon oil applied to help the particles stick. The flags have an area of about 30 square centimeters.

The aircraft collect the particles at altitudes of around 60,000 feet. Any higher and the particles are out of reach of most aircraft, and very much lower they become contaminated by terrestrial pollutants, Gooding said.

The flags are then returned to a Class 100 clean room in Bldg. 31. That classification means that for every cubic foot of space in the room, there are no more than 100 particles of 0.4 microns or greater present. (A micron is 1/1000 of a milimeter. A human hair is about 70 microns thick.) This makes the room about 100 times cleaner than the Lunar Processing Lab by comparison.

The particles are initially given a preliminary examination by a core of experienced Northrup Services sample processors. These people, Betty Gabel, Claire Dardano, Jack Warren and Judy Allton, are the first to inspect the flags and send promising specimens on for further study.

Those specimens are studied under a scanning electron microscope, from which a great deal can be determined. Researchers also use an energy dispersive x-ray analyzer tied into the electron microscope to study the particles in depth. Materials bombarded with electrons respond in various ways, and one way is to emit characteristic x-rays. By looking at the abundance and energy of the emitted x-rays, researchers can often identify the

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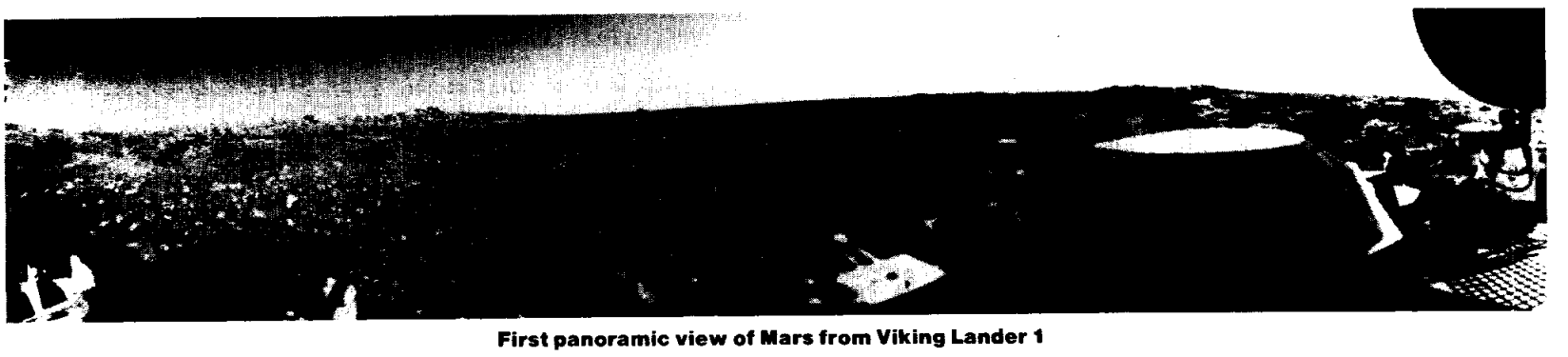
Viking update

Extended mission ends, 'eternal' mission begins

NASA has closed the Viking Project Office, but the mission still lives in the form of Viking Lander 1, sending back weather information and photographs every eight days from Mutch Station, Chryse Planitia, Mars.

Since 1978, the mission has been referred to as in its extended phase, with periodic reports from the Red Planet monitored by the Viking Project Office and the Jet Propulsion Laboratory. Before that, Viking was in its primary mission, wherein the tantalizing but inconclusive biochemical experiments on surface samples were made.

Program considerations have now prompted NASA to close the Project Office and issue the summary mission review which is required of all such ventures. Almost six years after their arrival at Mars, that review now lists the extended mission of Vikings 1 and 2 as a complete success.



First panoramic view of Mars from Viking Lander 1

Four Viking spacecraft, two orbiters and two landers, arrived at Mars in the summer of 1976. All four spacecraft returned a massive amount of data — it has been said that Mars is better mapped than the Moon — and performed far longer than called for in original mission plans. Both orbiters and the Viking 2 lander have since been shut down, but Viking 1 continues to send back data, including photographs.

The long-lived lander now enters a new phase of exploration — it's "eternal" mission, some are calling it — from the site at Mutch Station (named for former NASA Director of Planetary Programs Dr. Thomas Mutch, who was killed in a mountain accident in 1980). It is now configured for a continuous but low activity program to return images, meteorology, radio science and engineering data on eight-day cycles from now through 1994.

During the extended mission, the Viking spacecraft provided nearly continuous monitoring of weather at the landing sites. While the weather in the Martian midsummer was found to be repetitious, in other seasons it was variable with cyclic changes in weather patterns.

One surprise was the generally small magnitude of wind speeds. Neither lander recorded a gust of over 120 kilometers (74 miles) an hour, and average velocities were

(Continued on page 2)

Space News Briefs

Pioneer 10 completes first decade in space

Pioneer 10, the first spacecraft to visit Jupiter and the first man made object to approach the edge of the solar system, completed 10 years in space on March 2. Since launch in 1972, Pioneer 10 has traversed the asteroid belt, survived Jupiter's intense radiation belts and operated almost flawlessly across 6.6 billion kilometers (3.27 billion miles) of space. In that time, Pioneer has received more than 40,000 commands from Earth, and returned more than 125 billion bits of scientific data. The spacecraft is now more than halfway between the orbits of Uranus and Neptune, and in October 1986 will officially be considered to have left the solar system and entered true interstellar space. Scientists are now using Pioneer to explore the outer regions of the Sun's atmosphere, the magnetic bubble which contains the Sun and the planets. This bubble, known as the heliosphere, is enormous, far larger than predicted, and is expected to extend from between 5 and 10 billion miles away from the Sun. Scientists hope Pioneer will be able to provide information on the extent of the heliosphere as it speeds out of the solar system.

NASA requests SRB modification proposals

NASA plans to make a change in the Space Shuttle's solid rocket boosters that could reduce their weight substantially and provide a 2,720 kilogram (6,000 pound) increase in the spacecraft's payload capacity. Pending approval for reprogramming of funds, NASA plans to replace eight of the 11 metal segments of the current booster motor case with four segments made from lightweight composite filament material. Other motor components, including the metal forward and aft domes and the external tank attachment segment, would remain unchanged. The modification is seen as necessary for best results on high performance launches into near-polar orbit from Vandenberg Air Force Base. The lightened motor case will help compensate for reduced lift when launches from the West Coast cannot take advantage of the added velocity provided by the Earth's rotation. The filament-wound case can also be used to boost extra heavy payloads from the Kennedy Space Center. First use of the modified SRBs would be in 1985.

Bulletin Board

Rocket club schedules several launchings

An STS-3 "Fun Fly" March 21 is but one of several launchings scheduled this spring by the JSC Rocket Club. The club's launch site is approximately 1/4 mile behind the Saturn V on Avenue E, and the public is invited to all launches. The STS-3 Fun Fly will be held a day before the scheduled launch of the real thing, on Sunday, March 21 from 12:30 to 4 p.m. The April business meeting and Fun Fly will be held April 18 from 12:30 to 4 p.m. The May business meeting and Fun Fly will be held May 16 from 12:30 to 4 p.m. JSC will also be the site for the Texas-Regional '82 Contest, on May 29 and 30 from 9 a.m. to 4 p.m. each day. For more information, call Frank Bittinger at 481-5541 or x6141.

NARFE plans April meeting

NASA Area Chapter 1321 of the National Association of Retired Federal Employees will meet at 1 p.m. April 6 in the Clear Lake Park Bldg. on NASA Road One. George Meador, Galveston County Extension Agent, will speak on spring care of lawns, flowers, shrubs and trees. Federal employees who are 50 years of age or over, with five years of service, are eligible for membership in NARFE. Active and retired Federal employees are invited to visit and join the local chapter. Refreshments are served at the social hour. Call Burney Goodwin at 334-2494 for more information.

ASME Annual Symposium to feature Shuttle

The Annual Symposium of the American Society of Mechanical Engineers, to be held near Scottsdale, Arizona on May 15, will emphasize the Space Shuttle this year, and several JSC speakers will be on hand to participate. Topics during the one-day session will cover several different aspects of the Space Transportation System, including hardware, software and research. The symposium will be held in Rawhide, an authentic 1880s Arizona town near Scottsdale. For costs and registration information, call Gary Boyd at (602) 267-2696, or call Barney Roberts at x4701.

1982 blood drive information listed

The next on-site blood drive, sponsored by Lockheed, will be held March 25 in the Gilruth Center. Various other blood drives are scheduled throughout the year, with JSC, Lockheed, Rockwell, McDonnell Douglas, General Electric and Ford Aerospace sponsoring at least two each. JSC's blood drives will be held April 8, Aug. 26 and Dec. 2 in the Gilruth Center. For more information, call Helon Crawford, x5238, Bob Jones, x6364, or Jim McBride, x6226. After its March 25 effort, Lockheed will sponsor blood drives on June 24, Sept. 23 and Dec. 9, all in the Gilruth Center. For more information, call Janell Bennet or Bob Bose at 333-5411. Rockwell will sponsor blood drives on May 6 and Oct. 7, also at the Gilruth Center. Frances Mussman has more information at 333-2030, x124. The McDonnell Douglas blood drives, also in the Gilruth Center, will be held July 6 and Nov. 23. Call Ralph Patterson at 488-5660, x212. The General Electric blood drives will be held June 11 and Sept. 16 in the Gilruth Center. Call Ima Lee Ross or Linda Pratt at 332-4511, x400. Ford Aerospace blood drives will be held Aug. 5 and Nov. 11 in the Ford Bldg. 1 auditorium. Call Ed Barela at 486-6231, x230 for more information.

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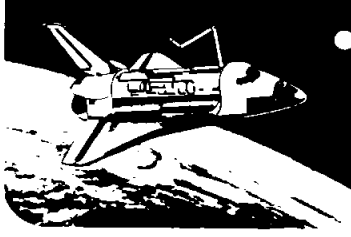


The *Roundup* is an official publication of the National Aeronautics and Space Administration, Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for all space center employees. *Roundup* deadline is the first Wednesday after publication.

Editor Brian Welch

Viking Update

(Continued from page 1)

much lower. But Martian weather is not tame by any means. The orbiter instruments observed more than a dozen small dust storms and two global dust storms. Both global storms obscured the Sun at the landing sites and hid most of the planet from orbiter cameras.

Photos returned from the orbiters and the landers surpassed expectations in quantity and quality. The total number of pictures exceeded 4,500 from the landers and 51,500 from the orbiters, and the majority of those were obtained during the extended mission.

The orbiter cameras observed new and often puzzling terrain, provided clearer detail on known surface features, produced some color and stereo images, and mapped about 97 percent of the surface at a resolution of 300 meters (1,000 feet) or better, and two percent at resolutions of 25 meters (82 feet) or better.

The orbiters also showed that the residual north polar ice cap, which survives the summer, is composed of water ice.

Other significant discoveries from the Viking extended mission include the following:

- Changes in the Martian surface occur very slowly, at least at the landing sites. Only two very small changes were observed in four years.
- The greatest concentration of water vapor in the atmosphere is near the edge of the north polar cap in midsummer, and near the equator in the fall. In the southern summer, the entire planet is dry, probably an effect of the dust storms.
- Measurements of the round-trip time of radio signals between Earth and the Viking spacecraft, made near the time of two solar conjunctions, showed delays caused by the Sun's gravitational field which confirm the prediction of Albert Einstein to an estimated accuracy of 0.1 percent. That is an accuracy 20 times greater than in any previous test.
- Mars is seismically much less active than Earth.
- The permanent north polar cap is water ice; the south polar cap probably retains some carbon dioxide throughout the summer.
- Water vapor is relatively abundant only in the far north during the summer. Subsurface water, however, is abundant in the form of permafrost, which covers much if not the majority of the planet.
- The northern and southern hemispheres are drastically different climatically because of the effect of global dust storms, which originate in the south during the summer.
- The surface of Phobos, the largest Martian moon, has features which indicate it was once nearly broken apart by some massive impact. These features are two families of parallel striations, and are probably fractures in the crust. Observations of the other moon, Deimos, showed no such striations.

People and Places

JSC records 15 millionth visitor

The day had been set aside for an educational trip to the Johnson Space Center for the Paul family of Fort Worth, Texas. The Paul's two children, Heidi, 8 and Thad, 6-1/2, were on spring vacation, and visiting the space center seemed like a good way to broaden their horizons. By the afternoon of March 9, the whole family's horizons had been broadened more than any of them could have expected.

At 9 a.m. that day, Elaine Paul stepped up to the information counter in the JSC Visitor Center to ask a question, and became the 15 millionth visitor recorded at the center since it opened in 1964.

The family containing the 15 millionth visitor to JSC, the Pauls of Forth Worth, is presented a montage of images from STS-1 by Astronaut Robert Crippen. Mrs. Paul, center, asked Crippen to convince son Thad, lower left, that there really are female astronauts.

She and her husband, Dr. Gordon Paul, and Heidi and Thad were escorted to a nearby office, where they were introduced to STS-1 Pilot Robert Crippen. Thad and Heidi were wide-eyed. Dr. and Mrs. Paul were somewhat stunned, and the whole family was almost speechless.

The children were given VIP information packets, and the family was presented a large color montage of the STS-1 flight by Crippen. Later in the day, the family was given a special VIP tour of the space center and left that afternoon trailing cloud nine behind them.

Dr. Paul, a pediatric neurologist, moved his family to Fort Worth two years ago. Mrs. Paul said her children have already been exposed to concepts of spaceflight and space exploration in school, and that the trip to the space center would be a memory that will stay with them for a long time to come.

JSC has averaged at least one million visitors each year for the last five years. In 1981, 1.5 million visitors were recorded, the highest total ever.

The JSC Visitor Center is open every day except Christmas from 9 a.m. to 4 p.m. Briefings are available in the Mission Control Center for tourists, as well as self-guided tours of various training facilities around the center.

A. Thomas Young, Director of the Goddard Space Flight Center, will leave NASA March 20 to take the position of vice president for research and engineering with Martin Marietta Aerospace, Bethesda, MD. Young began his NASA career at the Langley Research Center in 1961, working on Project Vector, an aerospace controls program for Lunar Orbiter. In 1968 he was assigned to the development of Mars mission objectives for the Advanced Space Projects Office, and in 1975 was named Mission Director for Project Viking. From 1976 to 1979, he served as director of the Planetary Program in NASA's Office of Space Science. Young became Deputy Director of Ames Research Center in 1979, and Director of Goddard in 1980.

Dr. John F. McCarthy, Jr., Director of the Lewis Research Center, is also leaving NASA, effective July 1, to return to the Massachusetts Institute of Technology as professor of aeronautics and astronautics. Before coming to Lewis in 1978, McCarthy was director of MIT's Center for Space Research. From 1962 to 1971, he held various positions with North American Rockwell, including vice president of research and engineering for the Space Division and assistant chief engineer for Apollo. In 1973 he was awarded the Meritorious Civilian Service Award by the Air Force for his work on the C-5a transport.

Forty-two JSC employees were recognized recently with 25, 30 and 35-year length of service certificates at award ceremonies in Bldg. 1. JSC Director Dr. Christopher C. Kraft, Jr. made the presentations. Following is a list of those recognized and their length of service: Joseph A. Hehn, 30 years; Marion E. Wheeler, 30 years; Emmit E. Fisher, 25 years; Walter Scott, Jr., 25 years; John H. Allen, Sr., 30 years; Kenneth D. Easley, 30 years; Roman Z. Petrowski, 30 years; Walter M. Surrency, 25 years; Jerry A. Jones, Jr., 30 years; Dominic J. Fillippa, 25 years; Allen Williams, 30 years; Thomas L. Barrow, 25 years; Lawrence M. Magers, 25 years; Robert O. Piland, 35 years; Alan M. Rochford, 25 years; James R. Moore, 35 years; John R. Cowan, 30 years; Harold R. Largent, 25 years; Bernard J. McGee, 30 years; Henry O. Pohl, 25 years; James A. Wiltz, 25 years; Michael S. Brzezinski, Jr., 25 years; Rex B. Cline, 25 years; James S. Arthur, 30 years; John C. Welch, 25 years; Raymond C. Heiskala, 25 years; Wayne E. Koons, 25 years; Thomas M. Matuszewski, 30 years; Stanley LaPine, 25 years; Ralph E. Keyes, 25 years; Lawrence G. Williams, 30 years; William J. Frome, 30 years; Eugene E. Horton, Jr., 25 years; Donovan L. Teegarden, Jr., 25 years; Daryl W. Chilcutt, 25 years; James H. Richburg, Jr., 30 years; Alma S. Martin, 25 years; Robert G. Bryan, 30 years; E. Alan Troeger, 25 years; Thomas F. Gallagher, 25 years; Robert C. Stults, 25 years; and Joseph S. Algranti, 35 years.

Some picnics may just happen, but not "The Best Little Picnic in Texas," the 1982 version of the JSC Employees Activities Association picnic. Pictured above are about half of the people who have been meeting and planning since early January to make sure the May 1 picnic at Camp Manison runs smoothly and has something for everyone.

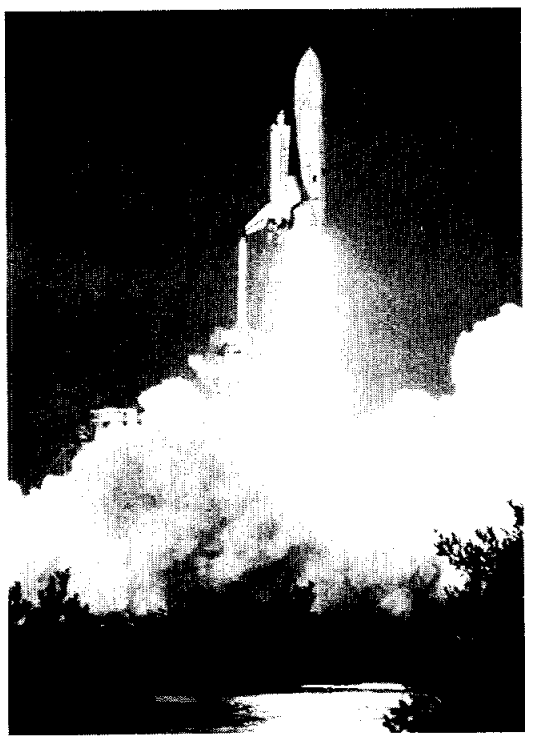
A guide to STS-3

Countdown Milestones

The March 22 launch window for STS-3 extends from 10 a.m. until 1:16 p.m. EST for a launch opportunity of three hours and 16 minutes. The lateness of the window opening will result in a later landing at Edwards Air Force Base, and increases the probability for a crosswind landing, as well as providing optimum lighting conditions for launch photography and safe landing at any of the designated landing sites. STS-3 will be launched into a 241 km (130 nm) orbit with an inclination to the equator of 38 degrees.

Count time	Event
T-73 hrs.	Call to stations
T-61 hrs.	Pressurize orbital maneuvering and reaction control system tanks
T-58 hrs.	Purge fuel cells with gaseous hydrogen and oxygen reactants
T-50 hrs.	Mass memory unit patch and compare
T-35 hrs.	8-hour built-in hold commences
T-32 hrs.	Load fuel cell liquid oxygen and liquid hydrogen tanks
T-27 hrs.	8-hour built-in hold
T-20 hrs.	Retract rotating service structure
T-19 hrs.	Interface test with Mission Control at Houston and tracking station at Merritt Island
T-10 hrs.	Fill sound-suppression water tank and load launch cameras
T-8 hrs.	12-hour 10-minute built-in hold; final equipment stowage begins
T-7 hrs.	Clear blast danger area and switch Orbiter air to gaseous nitrogen
T-5 hrs.	Start of terminal count. Start slow conditioning of ground lines and external tank for cryogenic loading
T-4 hrs. 50 min.	Liquid hydrogen slow fill begins and continues until external tank is 2 percent full
T-4 hrs. 30 min.	Liquid oxygen slow fill begins and continues until external tank is 2 percent full
T-4 hrs. 20 min.	Liquid oxygen and liquid hydrogen slow fill completed. Fast fill of both fuels begins and continues until external tank is 98 percent full
T-3 hrs. 30 min.	Wake flight crew for breakfast and suiting
T-2 hrs. 15 min.	External tank 98 percent full; begin topping off
T-2 hrs. 10 min.	Flight crew begins suiting
T-2 hrs. 5 min.	1-hour 40-minute built-in hold
T-1 hr. 50 min.	Crew enters *Columbia*
T-1 hr.	Inertial measurement unit pre-flight alignment
T-20 min.	10-minute built-in hold. Orbiter computers transition to launch configuration
T-9 min.	10-minute built-in hold
T-9 min.	Launch director gives "go" for launch. Ground launch sequencer starts
T-7 min.	Orbiter access arm retracts
T-5 min.	Orbiter auxiliary power units start; external tank and solid rocket booster ignition and range safety systems armed
T-3 min. 30 sec.	Orbiter transfers to internal power
T-2 min. 55 sec.	Liquid oxygen tank pressurization begins, gaseous oxygen vent hood retracted
T-2 min. 35 sec.	Transfer to on-board fuel cell reactants
T-1 min. 57 sec.	Liquid hydrogen tank pressurization begins
T-28 sec.	Ground launch sequencer gives Orbiter primary flight computers "go" to take over vehicle control of terminal count; start solid rocket booster hydraulic power units
T-6.8 sec.	Main engine start
T-3 sec.	Main engines at 90 percent thrust
T-0	Solid rocket booster ignition and liftoff

A prototype for manufacturing drugs in space, the first student experiment on the Shuttle, the first Get-Away Special verification payload, a number of space physics experiments and the most ambitious flight plan yet — all will be a part of STS-3.



Principal events to watch for during the seven-day flight include:

- *further engineering shakedowns:* the orbiter will be put through an exacting thermal response test, with 10 hours of payload bay toward Sun, 30 hours of tail to Sun, 80 hours of nose to sun and another 25 hours of payload bay to Sun while holding an inertial attitude. Another test of orbiter systems will be a "cold start" of an orbital maneuvering system engine after a prolonged cold-soak in orbit.
- *first grapple of the RMS:* the remote manipulator system (RMS) will be given its second workout, and for the first time is scheduled to grapple a payload in orbit.
- *insect reactions to micro gravity:* how will honeybee drones and velvetbean caterpillar moths react to micro gravity? Todd Nelson, an 18-year-old high school student from Minnesota, along with Honeywell and NASA, hopes to find out in this first student experiment to fly on the Space Shuttle.
- *verification of the Get-Away Special:* the first Get-Away Special canister — without a payload — will be flown on STS-3 to verify its suitability as a container for low-cost scientific and research experiments. NASA has received requests for approval to fly over 325 of the GAS canisters.
- *OSS-1 operations:* the diverse set of experiments on the Office of Space Science-1 payload will, among other things, conduct active experiments with a beam of electrons in space, study the interactions of the orbiter with the Earth's atmosphere, measure the buildup of electrical charge on the orbiter's insulating tile, precisely measure the Sun's ultraviolet radiation, and study the effect of near weightlessness on the production of lignin in plants.
- *aerodynamic tests on entry:* more aerodynamic response tests will be run on STS-3 as the orbiter is pushed closer and closer to its operational limits. A series of response tests will be run in all speed regimes from hypersonic to subsonic to evaluate orbiter stability and control system effectiveness.

On-orbit highlights

STS-3 television promises to be spectacular

STS-3 television, accessible through NASA Select, JSC's closed circuit television network, promises to be spectacular as it highlights the mission's on-orbit activities.

From 10 monitors and one 30-inch screen in the Bldg. 2 Visitor Center, and another 30-inch screen in the Bldg. 30 auditorium, viewers will be able to watch live and pre-recorded feeds from *Columbia* on each flight day except the last, when the crew will be busy buttoning up for landing.

One of the most visually stunning sequences should come on Day 4, when the remote manipulator arm takes live images of the orbiter from overhead with the Earth as a backdrop. This particular sequence, with 120-degree views from the elbow camera, will be the highest and widest shots yet taken of the orbiter in space. Viewers should be able to see the full reach of both wings in the wide angle color views, and the forward areas of *Columbia* should be visible in other scenes as well. Plans call for Pilot Gordon Fullerton to then direct the camera to peer down into the aft flight deck through the overhead observation windows. If schedules hold, these scenes will be on NASA Select at 3 days, 3 hours and 57 minutes Mission Elapsed Time (MET), or about 12:57 p.m. CST Thursday, assuming a 9 a.m. CST launch on March 22.

Because delays — such as a late launch — could change the TV air times, use the Mission Elapsed Time as a yardstick in this guide to STS-3 TV:

Launch Day: Ground controlled views of the payload bay at 00/01:35 MET, or about 10:35 a.m. CST.

Day 2: Live views of Electrophoresis Equipment Verification Test operations at 01/04:24 MET, or about 1:24 p.m. CST; live views of the Induced Environment Contamination Monitor (IECM) deploy at 01/23:36 MET, or about 8:36 a.m. CST.

Day 3: Tape recorded views from the payload bay of the IECM berthing at 02/01:11 MET, or about 10:11 a.m. CST; live views of the Payload Diagnostic Package electron beam search at 02/04:01 MET, or about 1:01 p.m. CST.

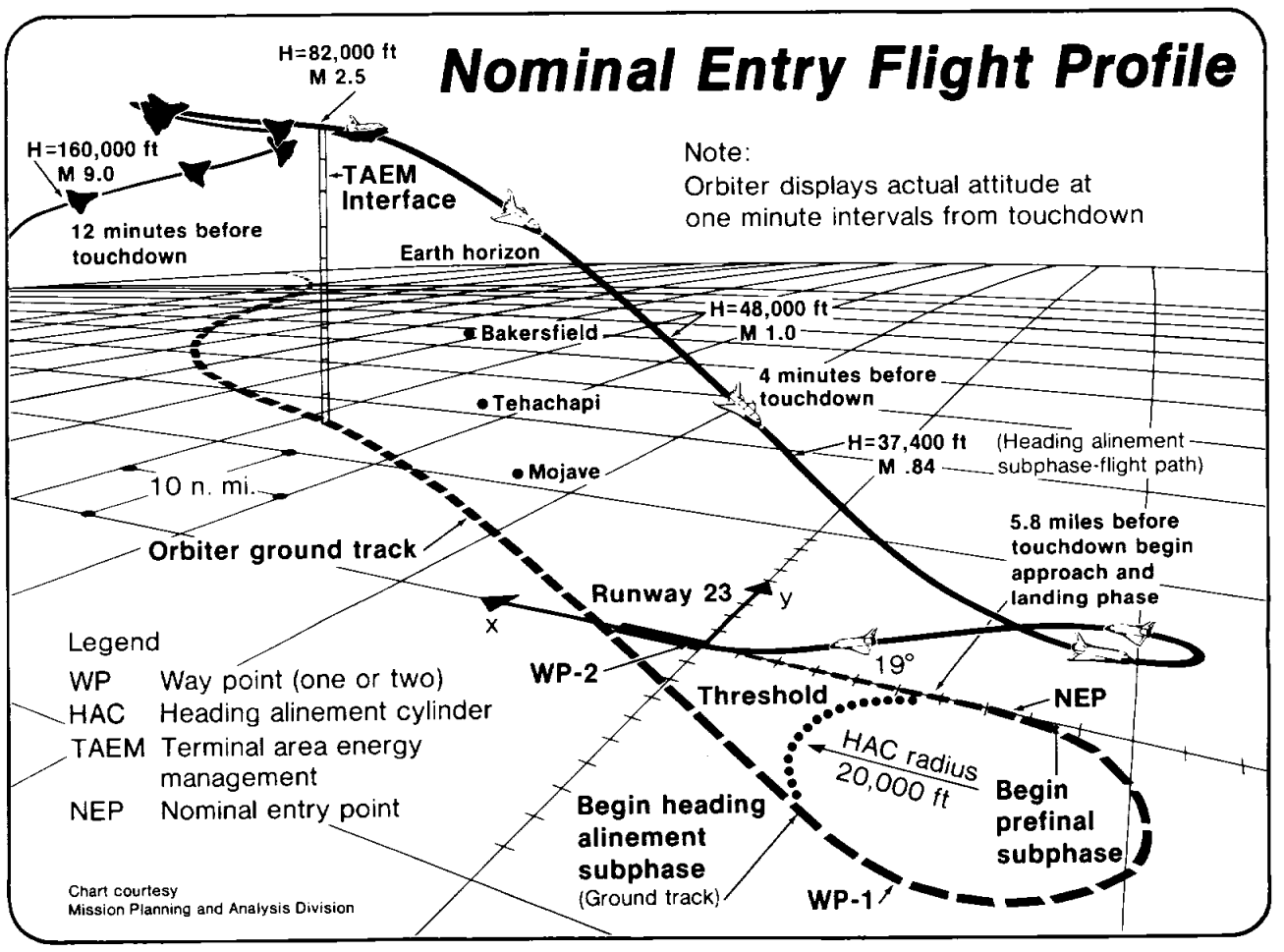
Day 4: Live 25-degree views from the remote manipulator system (RMS) elbow camera at 03/00:50 MET, or about 9:50 a.m. CST; live 120-degree views from the RMS elbow camera at 03/03:57 MET, or about 12:57 p.m. CST; live views of the insect motion study in the "bug box," the student's experiment in the mid-deck area at 03/07:05 MET, or about 4:05 p.m. CST; live views of the Payload Diagnostic Package deploy at 03/23:07 MET, or about 8:07 a.m. CST.

Day 5: Tape recorded views of forward flight deck activities at 04:08:19 MET, or about 5:19 p.m. CST.

Day 6: Live theodolite operations at 05/05:06 MET, or about 2:06 p.m. CST.

Day 7: Waste management operations at 06/00:21 MET, or about 9:21 a.m. CST; tape recorded views of personal hygiene at 06/01:36, or about 10:36 a.m. CST.

STS-3 TV is subject to change. Updates and alterations in the schedule will be played on NASA Select prior to each downlink.



Cosmic Dust

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composition of the particles with an elemental analysis.

Some 24 collectors have been returned so far, each with about 50 to 75 particles which meet the criteria. Both Gooding and Dr. Uel S. Clanton are working to establish the Cosmic Dust Program as a continuing effort which both collects new particles and makes those already obtained available for study.

"This will be the first widespread availability of this material," Gooding said. The branch hopes to publish catalogs about every two months, with each edition devoted to samples from a particular flag.

This new availability could open another line of study into the nature of extraterrestrial materials. Lunar samples have enabled scientists to unravel much of the history of the Moon, and some information about events which occurred early in the history of the solar system. Meteorites were apparently once a part of asteroids or comets, and provide evidence for events which occurred as or even before the solar system began to form. Many cosmic dust particles are probably grains from comets, and thus could provide another window to the history of the solar system.

In preparation for the real thing, STS-3 Flight Crew Commander Jack Lousma and Pilot Gordon Fullerton leave the Operations and Checkout Bldg. at KSC on the way to Launch Pad 39A for a simulated countdown and liftoff recently. The test was one of the last major events before initiation of the countdown, and was judged a complete success.

Gilruth Center News

Call x3594 for more information

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

Basic auto mechanics — Begins March 25 and meets from 7:30 to 9:30 p.m. Cost is $17 per person.

Aerobic dancing — Meets from 9 to 10 a.m. March 29 and from 4:15 to 5:15 p.m. March 30, for 12 weeks. Cost is $54 per person.

Ballroom dance — Classes begin April 1. Intermediate classes meet from 7 to 8 p.m. and beginners from 8 to 9 p.m. for eight weeks. Cost is $50 per couple.

Basic drawing — Begins April 14 from 7:15 to 9:15 p.m. for four weeks. Cost is $30 per person.

Creative stained glass — Classes meet from 7 to 9 p.m. for six weeks beginning March 23. Cost is $30 per person.

Square dancing — Classes meet from 7:30 to 9 p.m. for 10 weeks beginning April 1. Cost is $12.50 per person.

Ladies self defense — Begins March 23 and 8 to 9 p.m. Cost is $25 per person.

Defensive driving — Class meets from 8 a.m. to 5 p.m. April 24. Cost is $18 per person.

2nd Annual Space Shuttle half & quarter marathon — Trophies to 1st male and female, medals to top three in each age group and ribbons to all participants. T-shirts to first 400 entrants - Cost is $5 now, $6 day of race.

March arts & crafts sale — A chance to get your spring shopping done. Sale is from 11 a.m. to 5 p.m. March 28. A limited number of tables are still available

Children's Easter egg hunt — Tickets are now on sale at Bldg. 11 for this April 3 event. Cost is $2 and includes egg hunt, Easter goodies, the movie "Dumbo" and refreshments. Seating is limited.

Softball registration — Registration is now in full swing. If you have not received information, call x3594. Deadline for registration is March 29.

Phone number change — The number to call for more information on **ALL** Rec Center activities has been changed from x3944 to *x3594*. Please do not call the *Roundup* office for information.

Cookin' in the Cafeteria

Week of March 22-26, 1982

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 March 29 - April 2, 1982

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 AP3 *Roundup*, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

For rent: Galveston Jamaica Beach, central AC, furnished 3 BR, boat mooring, by day, week or month. Call Darrell Smith, 337-3970.

For rent: Pearland, Dixie Hollow, 3-2-2, formal dining, fireplace, utility room, fence, $575/mo. plus deposit. Call 482-6609.

For rent: Galveston West Beach, 3 BR, AC, Gulf side, $250/wk. Call 481-5943.

For rent: Hawaii condo, 1 BR, waterfront, Makaha area of Oahu, $175/wk. Call 481-5943.

For rent: Baywind I condo, 2-1 1/2-2, all appliances, W/D, upstairs w/balcony, assume 9-5/8% loan, $41,900. Call 488-5969 after 4:30 p.m.

Cars & Trucks

1981 Toyota pickup, long bed, 5 spd., AM/FM, AC, PS, camper shell, 9,200 miles, $6,600. Call Kathy, 877-6078 or 337-4643 after 5 p.m.

1974 Dodge Dart, gold, 4 door, hitch, auto, PB, PS, good condition, $1,250. Call 474-3507.

1974 Chevy Vega, good body condition, engine completely overhauled, $700. Call 333-1790.

1981 Camaro, V8, T-top, AC, PS, PB, EW, TS, cruise, spoiler, fin, alarm, Monroe shocks, excellent condition. Call David, 488-2269.

1979 Ford Thunderbird, deluxe model, AC, AM/FM, tape deck, excellent condition, $5,400. Call Cheryl Berry, x2786.

1980 Chevy Monza, 4 cyl., 2 dr. Hatchback, AM/FM stereo, P/P/A, 24,000 miles, very clean, must sell, $4,000, negotiable. Call Sandy, 765-1644 between 8 a.m. and 5 p.m.

1979 GMC pickup, AC, AT, PB, PS, dual tanks, $3,995. Call 488-8036.

1976 Oldsmobile Cutlass Supreme Brougham, super clean, excellent mechanical condition. Call Holland, 334-2461.

1976 TR 6, white, 39,000 miles, good condition, new top, exhaust, fogs, brakes, etc., $5,500. Call Kevin, x2941 or 486-4782 after 5 p.m.

1976 Datsun 280Z 2 plus 2, good mechanical condition, $5,500, negotiable. Call 483-4231, x21 or 480-2222 after 6 p.m.

1979 Toyota Celica GT liftback, 5 spd., mags, AC, sunroof, excellent condition, $5,800. Call David, x4721.

1981 Mazda GLC Sport, 5 spd., AM/FM/cassette, three year warranty, $5,695. Call R. Needham, x3458 or 554-2044 after 5 p.m.

1977 Dodge Aspen station wagon SE, 33,000 miles, excellent, must see, $2,750. Call R. Needham, x3458 or 554-2044 after 5 p.m.

1978 Toyota Corolla liftback, excellent condition, AC, auto, new tires, $3,995. Call 488-4915.

Cycles

1978 Honda XR-75, looks great, $400. Call 488-0284 after 5 p.m.

1980 Yamaha MX100 dirt bike. Call 486-4034 after 5 p.m.

Boy's 20-inch bike, racing type, spare parts, $45. Call 554-6673 after 5 p.m.

Boats & Planes

One man Bass Hunter boat, swivel seat, trolling motor, battery, other extras, like new, $320. Call R. Sanders, x3458 or 481-6928.

One fourth share in Cal 2-30, 30-foot sailboat, Seabrook shipward dockage, many sails, excellent NASA partners, bottom just refinished, tillermaster. Call Charlie at x3441 or 474-3914.

16-foot catamaran, prindle, with galv. trailer, $1,800, negotiable. Call 486-8847, evenings.

Video & Audio

23" Heathkit GR-295 color TV. Solid maple cabinet, extra tubes for trouble shooting, works great, $225. Call Joe, x3576 or 944-7042.

RCA 19" black and white TV, old but still works, best offer. Call Lou, 488-5660, x434.

Household

Kingsize bedroom set, bed and dresser—$275; solid state portable color TV—$135. Call 488-5564.

Two maple twin beds, reversable light blue and navy blue comforters, dust ruffles and pillow shams to match, $75 for all. Call Billie, x3941 or 538-1681.

Green and black plaid sofa, 8 feet long, $100; matching black tweed chair and ottoman, $35. Call 488-8048.

Three cushion contemporary sofa, Herculon cover, excellent condition, $150. Call 483-3856 or 334-1659.

Double sleeper sofa, contemporary style, wheat and brown colors, 9 months old and in good condition, $75. Call 471-8556.

Antique brass Russian samovar. Large complete samovar, great condition, $90. Call 471-8556.

Wanted

Want to buy 1972 Pontiac Grand Prix, must have good body, engine and transmission, will pay $800. Call 486-5795 after 5 p.m.

Want to buy space memorabilia: stamps, coins, autographs, covers, photos, unusual and rare items. Call Frank, x3836 or x 3837.

Interested in babysitting on weekends and at night, age 21, very responsible. Call Sheryl, 488-1424 after 4 p.m.

Want to share ride from Nassau Bay to Clear Lake High School. Call Sandra, x3995 or 333-4379 after 3 p.m.

Want responsible adult to share home in Heritage Park, non-smoker, no pets. Call 554-7439 after 6 p.m.

Want to buy recordings by Larry Clinton/Bea Wain for Deep Purple and Freddie Martin for Cumana. Call Helen Statz, x5326 or 334-6067.

Female wishes to share apartment with same, 2-2 in Nassau Bay area. Call x3991.

Starting in May, need to share ride with person from Eldorado View Apts. Hours 7:30 a.m. to 4 p.m. Name your price. Call Debra, x5595.

Found

Imported Briarwood adjustomatic pipe found about March 6 in Bldg. 30 parking lot. Call Fred W., x5557.

Pets

German Shepherd puppies, shots and wormed, $75. Call x5416 or 998-0290 after 5 p.m.

Three year old spayed Siamese cat, all shots, affectionate, healthy, free to good home. Call Owens, x5894 or 482-4158 after 5 p.m.

Computers

TRS-80 computer system, 48K, disk drive, RS 232, software and documentation, $1,500. Call x2781or 333-5470 after 6 p.m.

Miscellaneous

Two Pan Am 2 for-1 coupons, $50 each. Call 481-1469 after 6 p.m.

Vivitar 135 mm telephoto lens, screw type mount, never been used, best offer. Call Lou, 488-5660, x434.

Regulation size ping pong table, 5' X 9', 3/4" plywood w/frame, painted green, $25. Call Joe, x3576 or 944-7042.

Biofeedback monitor, Alpha, Theta waves, self test, proportional and threshold control, literature, nearly new, best offer over $150. Call 488-0284 after 5 p.m.

Free—extra wide 60 series raised letter 13" tire. Good condition. Call Thompson, x4823.

Mean Joe Greene NFLPA jersey, $20; basketball goal, $7; new cooler, $8; electronic basketball game in box, $12. Call 482-8827.

Panasonic stereo cassette deck, operating manual and cables, $45; TI-55 programable calculator, adapter/charger, case, instruction manuals, $29. Call Paul Vincent, x3801 or 538-1281 after 5 p.m.

Free—monkey grass, you dig it. Call 941-5563 after 6 p.m.

Conrac 17" video monitor, w/documentation, ideal for computer use, working, $40; Hitachi AM/FM car radio from Datsun Z car, $35; EICO 5" oscilloscope w/documentation, works fine, $40. Call Speier, 333-2263.

Insulated camper shell, 8 feet, cabinets, storage and electric AC, $200. Call x5271 or 332-4750 after 6 p.m.

Neolife water dome purifier, triple cartridge removes heavy metals, bacteria and 106 different chemicals. Call Helen Statz, 334-6067 after 6 p.m.

Plant sale: 200 10" hanging baskets, 500 potted plants, March 29-April 1. Call Wood, x2267 or 333-2373 after 5 p.m.

Exercise cycle with load control, RPM and timer, $35. Call 333-3254.

Pan AM 2-for-1 coupon valid for a round trip anywhere on pan Am before June 15, 1982, $50. Call Ankur, 333-5020 or 480-4757.

Pan Am 2-for-1 coupons good until May 31, $75 or 2 for $100, or trade for weight set with bench. Call 481-1469.

Eight track tapes, 58 of them, variety of music, 2 storage cases, cleaning units. Call Verby, 946-3907.

Miscellaneous

Electronic game set, hockey, tennis, target, 1-2 people, $20; air hockey table, approx. 2' X 4', $10; rabbit hutch, $5. Call A. F. Smith, x4468.

Wanted

Want exercise bicycle in good condition. Call 333-2395.