# Space News Roundup 

## Fletcher says Moon, not Mars, may be better first step

NASA Administrator James C Fletcher says the Moon, rather than Mars, may be the best initial des tination for possible United State Soviet Union manned missions. "Going to the Moon together would give the two leading spacefaring nations in the world an opportunity to build a stable base for further cooperation, which could, one day, lead to a cooper ative mission to Mars." Fletcher told participants at the National Space Symposium in Colorado Springs.

Fletcher stressed that any coop preceded by a program of cooprative unmanned activities.
"Flying out to Mars together before building such a foundation could, for several reasons, be less practical," Fletcher said in his April 14 address. In the last several months, a number of parties have advocated a U.S./USSR manned mission to Mars. Fletcher cited three crucial factors favoring the Moon for an initial cooperative

## Solid rocket motor firing tests O-rings

The full-duration firing of Qualification Motor-6 (QM-6) on Wednesday appears to have been a success, according to initial test results.
The third in a series of five tests of the redesigned Space Shuttle solid rocket motor at Morton Thiokol's Wasatch Facility near Brigham City, Utah, went off without a hitch at noon CDT. The firing lasted two minutes.
The test included two intentional flaws. A "wave defect" was inserted in the surface of the center field joint's bonded insulation J -seal to test the capture feature $O$-ring, and a small blowhole was created in the polysulfide adhesive of the redesigned case-to-nozzle joint to test the new wiper O-ring
Test officials said they would continue to analyze the test results, and prepare for the two tests remaining before STS-26, QM-7 and Production Verification Motor-

In a related development, NASA announced plans April 18 to issue a request for proposals in June or July for an Advanced Solid Rocket Motor (ASRM) that would make the Space Shuttle capable of lifting 12,000 more payload pounds and eliminate the need to throttle the main engines during ascent.
Design, construction and operation of a government-owned test and production facility are part of the request for proposals (RFP). A Site Evaluation Board has been formed to recommend a tentative government site for inclusion in the RFP as a common basis.

The ASRM acquisition plan submitted to Congress contains NASA's strategy for a full and open competition to introduce an ASRM into the Shuttle system. This is expected to substantially improve flight safety design margins, reliability and performance

The RFP-for ASRM design, development, test and evaluation (DDT\&E)-is being scheduled to achieve an earliest launch opportunity in fiscal 1994. The RFP release is compatible with the stipulations of the NASA Authorization Act of 1988 and the requirements for initiation of the necessary redesigned solid rocket motor follow-on procurements.

NASA plans to proceed with a segmented motor design that incorporates substantive design changes to improve the reliability and the design safety margins. In addition, the ASRM ballistic design precludes the necessity for throttling the Space Shuttle main engines during the period of maximum dynamic pressure, which reduces or eliminates about 175 criticality $1 / 1$ R failure modes for the Shuttle system

The ASRM's design goal to provide a 12,000 pound payload increase will equate to an additional 2.4 equivalent Shuttle missions per year (at a rate of 14 missions a year) and will support Space Station deployment and other critical missions.

To achieve the level of process high and automation needed for (Continued on page 2)


The ultimate opportunity to have your name up in lights-well, at least one you've chosen-has arrived. NASA and contractor employees have been invited to help name the Space Station. For details, see Page 2.
Related story, Page 3
manned mission:
$\star$ Timing $-A$ joint mission to
the Moon would involve a relatively
short timetable, while a Mars mis-
sion "would probably encompass
four or five presidential administra-
tions," Fletcher said. He said rela-
tions between the U.S. and the
USSR have yet to demonstrate that
degree of stability.
$\star$ Cooperative experience - A
year ago, the U.S. and the USSR signed a space science agreement groups in five areas. The working groups in five areas. The efforts of these groups "could lay the groundwork for a strong bridge of mutual cooperation and mutual trust," he said.
$\star$ Technical readiness - Both realize there are "many technical unknowns involved in a manned Mars mission," Fletcher said. Issues such as the effects of prolonged weightlessness on humans
must be considered before Mars mission pacts can be made.
In a more general vein, Fletcher labeled 1988 "perhaps the most critical year in the history of the U.S. civil space program," and he criticized those who say American leadership is a thing of the past.
"It's ironic that these doom-and gloom-sayers have emerged this year, just when the United States is poised to launch itself into a new era of development and exploration of space," he said.


Interested faces watch as one of several motivational speakers addresses a large crowd of Manned Flight Awareness honorees and dignitaries in JSC's Bldg. 2 auditorium April 13.

## Locals accept awareness honors

The first Manned Flight Awareness Honoree Program ever held at JSC honored 215 people NASA-wide this month, including six from local contractor operations.
Honorees came from all of the NASA centers, Vandenberg Air Force Base and the U.S. Air Force Space Division, and from as far a way as Guam.
They received certificates and an all-expense paid trip to Houston, where they toured the city and the center, and attended a program and reception with top NASA management, astronauts and other dignitaries.
"We tried to provide an awareness of the full extent of what is taking place at JSC," said Hank Williams, who represents JSC on the Manned Flight Awareness national panel.
Houston Mayor Kathy Whitmire, Houston Chamber of Commerce President Gerry Griffin and JSC Director Aaron Cohen met with the honorees at a get-acquainted social at the Houston Museum of Natural Science on April 12. Motivational talks, featuring NASA Associate Administrator Dale Myers, and Rear Adm. Richard

Truly, associate administrator for space fight Arnold Aldrich, director of the National Space Transportation System, and JSC Director Aaron Cohen were made April 13 in JSC's Bldg. 2 auditorium. Twenty-eight astronauts attended a reception at Brady's Landing following the presentation.
Local honorees were John F. Gladu and Edward F. Lednicky of Boeing Aerospace Operations Glenn Norman and Gary Smith of IBM Corp., and Cullen Wright and Lee Olson of Lockheed Engineering and Management Services Co.
Lois Walker, who assisted Williams in coordinating the program at JSC, said it honors individual government and contractor employees who have exhibited outstanding performance and is one of the most coveted awards for work on the government/industry space team.
Manned Flight Awareness programs in the past have been held at Kennedy Space Center in association with launches. During the standdown the programs are being rotated among NASA centers.

## Budget crunch to delay Station

## Man-tended capability achievable by 1995

Budget constraints will postpone stones," Fletcher wrote launch of the first Space Station element by a year, according to NASA Administrator James C. Fletcher, but man-tended capabil ity can be achieved by late 1995

Fletcher reported the findings of a "Space Station Program Response to the Fiscal Year 19881989 Revised Budgets" on April 12 in letters to leaders of congressional appropriations committees that had mandated the rescoping and rescheduling plan.
"The only sensible way to accommodate the Space Station funding profile inherent in the FY 1988 and 1989 budget reductions is to slip the major program mile-
"I believe that the current Station onfiguration is the correct one, and that descoping the design would be extremely thise.... balance between development costs, operations costs and satisaction of user requirements in safe Station.
Fletcher said that to achieve earliest possible man-tended cap ability, the baseline assembly sequence will be changed to provide launch of the pressurized laboratory module on the fourth assembly flight of the Space Shuttle in the last three months of 1995. Such a capability can be provided
with minimal cost impacts, and will not delay the permanently manned capability
The laboratory will be launched with useful capability but will no be fully outfitted until the sixth assembly flight, he said. Use outfitting could be quadrupled if he Advanced Solid Rocket Motor vere available for lab module launch, he added.
Before the laboratory can be accommodated, he said, the Station truss structure and basic power, propulsion, guidance and control, and Shuttle docking sys ems must be placed in orbit on the first three assembly flights (Continued on page 2)

## Space News Briefs

## Ames develops perspective display system

A computer-generated display system, to aid close-in spacecraft maneuvers, has been developed at NASA's Ames Research Center The display can precisely depict a spacecraft's position relative to other vehicles and objects, allowing rapid, accurate monitoring and response. Developed by Stephen R. Ellis and his colleagues, the system can be placed aboard spacecraft such as the planned U.S. Space Station. It would help in conducting and monitoring maneuvers within one mile of the Station

## Bulletin Board

## U.S. Savings Bond Campaign is April 25-May 6

JSC kicks off its 1988 U.S. Savings Bond Campaign on April 25. The campaign, designed to encourage employees to join the Payroll Savings Plan and invest in five-year bonds earning market-based interest, runs through May 6. Canvassers may call on you during the campaign and ask you to sign up or increase the amount you set aside from each paycheck. For more information, call x38970.
Secretarial video teleconference is April 27
The Human Resouces Development Branch and the Equal Opportunity Programs Office will participate in the "First Annual Secretaries Briefing" video teleconference from 1:30 to 4 p.m. April 27 in the Bldg. 2 auditorium. The program, sponsored by the American Management Association and Professional Secretaries International, is open to all JSC and contractor employees. For more information, call Joann Walgamuth, x33077.

## Commodore users to meet April 28

NASACOMM, a Commodore users group, will conduct its next meeting at 7:30 p.m. April 28 at the Harris County Park Bldg., 5001 NASA Road 1. For more information, call Bill Moore at $335-6251$ or $\times 53462$.
Semiconductor lasers topic of May 4 video conference "Semiconductor Lasers and Light Emitting Diodes for Telecommunications," an IEEE Education Committee-sponsored video conference, will be downlinked to the Gilruth Recreation Center at 11 a.m. May 4. It will cover laser operations, technology, characteristics, telecom applications and future trends. For more information, call Nancy

## Marshall, x30174.

## Galveston historical homes tours begin May 7

Tickets are on sale for the 14th annual Historic Homes Tours on
Galveston Island, sponsored by the Employee Activities Association. Tours will be conduchsored by the Employee Activities Association. Saturdays and noon to 6 p.m. Sundays. Admission costs $\$ 9$, and covers tours of seven private homes and admission to two informative talks. For more information, call x35350.

## 'Back to the Future' JSC picnic set for May 7

A "Back to the Future" JSC picnic is planned from 11 a.m. to 5 p.m. May 7 at the Gilruth Center. Barbecue dinner will be served between noon and 3 p.m. Tickets may be purchased through May 4 at the JSC Exchange

## Skylab 15th anniversary conference May 11

"Skylab Revisit," a conference recognizing Skylab's 15th anniversary, is planned for May 11 at the Von Braun Civic Center in Huntsville, Ala. An
evening reception is planned at the Alabama Space and Rocket Center evening reception is planned at the Alabama Space and Rocket Center.
Cost is $\$ 65$, and includes lunch, evening reception and all panel sessions. A $\$ 25$ fee is available to retirees and full-time students to attend only panel sessions. For more information call Karen Mack, 205-895-6372.

## Symphony presents 'Romantic Evening' May 14

The Bay Area Symphony League of the Houston Symphony Orchestra will present a "Romantic Evening" featuring music from variations of Romeo and Juliet at 8 p.m. May 14 at the University of Houston-Clear Lake Atrium. Guest conductor will be Niklaus Wyss. For ticket information, call 488-1284.
Olympic and world ice skating exhibition is May 19 The next JSC-EAA night at the Summit will feature a "Tour of Olympic
and World Skating Champions" at 7:30 p.m. April 18 . Medalists from the and World Skating Champions" at $7: 30$ p.m. April 18. Medalists from the
1988 Winter Olympic Games, including Debi Thomas, will perform. A limited number of tickets are on sale at the BIdg. 11 Exchange Store for $\$ 18$ each. For more information, call $\times 35350$.

## NACA Reunion IV coming up in September

Planning is complete for NACA Reunion IV, a reunion of former employees of the National Advisory Committee for Aeronautics. The reunion will be Sept. 30-Oct. 2, 1988, at the Red Lion Inn, San Jose, Calif. Activques wind include a Friday night Western buffet, a Saturday nigh banquet and a farewell champagne brunch on Sunday. All former
employees and military detailees and their spouses are invited. For more employees and military detailees and their spouses are invited. For more committee at P.O. Box 6-1988, Mountain View, Calif., 94042.

## Gilruth Center News

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## JSC hiring freeze eases slightly

JSC is thawing, but the freeze emains officially in effect.
Human Resources Director Jack Lister said JSC was granted limited relief this month to begin refilling high priority positions. However, the center will be However, he center will be allitical areas, and must phase it
critical areas, and must phase its uate coops in May and June and of 3,403 civil servants, he said. "I'm pleased that we have the opportunity to meet our most said.
"We also have permission within these guidelines to hire our grad-
m pleased about that, he said. Lister said 38 graduating coops hired permanently during those two months. The hiring freeze was instituted Nov. 23, 1987, due to a sequestration of fiscal year 1988 funds under the Gramm-Rudman Hollings deficit reduction act.

## Seniors to see JSC managers in action <br> interpersonal and leadership skills,

teered to host 24 seniors and fou teachers from local high schools for a "Management Experience Day" on April 27
Each student and teacher will be assigned to accompany a manager or supervisor through his or her afternoon activities. The observers will be matched with managers working in their fields of interest working in their fields of interest, during every business task.
during every business task.
The experience is being sponsored by the JSC Chapter of the
National Management Association,
program an annual event
"We hope that by bringing seniors into the program we can provide some exposure to what constitutes management within a government agency, and possibly influence their choice of futur nducation and training " Daniel A Nand training, said Daniel A. Nebrig, executive assist The students from Conen Clear Creek Pearland and Friends Clear Creek, Pearland and Friends wood High Schools, were recom mended by educators at thei schools. They were chosen for their
interest in learning about NASA leadership, and intent to attend college. Faculty members were chosen from each school for their leadership skills, interest in practical application of management tical application of management theory and ability to share the experience with other faculty and students.
The experience day will begin at 8:30 a.m. with a welcome briefing and tour of JSC. After lunch, observers and managers will be paired from 1 to 4 p.m. A debriefing will be conducted at 4 p.m


WALLS GO UP- Workers are putting up the exterior walls of Bldg. 9B this month. The building addition is 75 percent complete, said Mary O'Hearn, construction manager, and it is hoped that it can be occupied by Aug. 1.

## Budget crunch limits contractor hiring

(Continued from page 1)

## payloads until the sixth and sev

 enth assembly flights.The full report notes that NASA has directed its four Work Package contractors (Boeing Aerospace, Electric and Rocketdyne)-now operating under letter contractsto constrain hiring of personnel
and subcontracting efforts so that

## Employees may

The ultimate opportunity to have your name up in lights - well, at least one you've chosen - has arrived. NASA and contractor employees have been invited to help name the Space Station.
Suggestions must reach Mark Hess, public affairs officer, at Headquarters by the close of business, May 9. A JSC announcement with detailed instructions of how and where to send suggestions is being distributed.
"As the Space Station program prepares to enter its development phase, I believe it is an appropriate
time to begin the process for selecting a name," James B. Odom, NASA Associate Administrator for Space Station, wrote in a recent Space
letter.

Odom has assembled a Space Station Name Committee chaired
they may retain key personnel and add only the staff necessary to accomplish a Program Require ments Review.
Similar constraints have been placed on hiring to support programwide engineering and integration analyses through the Program Support Contract with Grumman Aerospace and the Technical and Management Information System and Software Support Environment
suggest Space
by Dr. Franklin Martin, Deputy Associate Administrator for Space Station, which will make its selec tion in accordance with the NASA Management Instruction (7620.1C) on "Official Names for Major NASA Projects.'
The international partners also will be involved in the process. The resulting assessment and recommendations will be presented to the NASA Administrator James C. Fletcher, who will make the final selection.
The committee has established criteria that must be satisfied by any suggestion: names must be simple and easily pronounced; names must not duplicate or be so similar to other NASA or nonNASA names that they create confusion; acronyms are to be avoided; names must be translat
contracts with Boeing Compute Services and Lockheed Missile and Space Co., the report states. "This program represents a crit ical element in the Nation's efforts to reinvigorate leadership in manned civil space endeavors," Fletcher wrote. "The realization of the full scientific, technological and commercial potential of space requires the attention of men and women living and working in orbit."

## Station names

able and must not have ambiguous or offensive meanings in the languages of NASA's internationa partners; names of living people will not be accepted; and rationale or names must accompany suggestions.
Although NASA does not plan to publicize the process or solicit uggestions from the general pub ic, voluntary suggestions from the public will be accepted, provided they meet the above criteria
A suggestion form, and a list of already suggested names to which the committee is requesting reac tions, will accompany the JSC announcement
Comments and suggestions should be sent to Mark Hess, Public Affairs Officer (Code S), NASA Headquarters, Washington, DC 20546.

## Advanced solid rocket motor request out

(Continued from page 1) NASA has concluded that a substantially new facility is required.

In keeping with the President's new space policy encouraging commercial initiatives in space, companies responding to the RFP will be required to propose a private-financing option for the new ASRM facility on a tentative
government site. NASA also will equipment, plus $\$ 200-300$ million solicit optional proposals for a for construction of facilities. privately owned facility.
All approaches must be structured to allow timely and economical recompetition of the SRM contract by the government.
The overall ASRM DDT\&E cost is estimated at just under $\$ 1$ billion, including modern tooling and

The planned ASRM development is critical to NASA and will provide substantive improvements in flight safety design margins and reliabil ity, achieve full Shuttle payload capability, optimize program cost encourage commercial initiatives and promote industry competition.


Oxygen propellant derived from lunar raw materials could help reduce the amount of mass launched into low Earth orbit to support a lunar base, and thus cut costs. At left is a pilot plan producing liquid oxygen from ilmenite. Below, crew member shut down a Lunar lander's flight systems for layover. The pressurized vehicle in the foreground is waiting to take the crew to the lunar base, while other equipment supports the lander


# MOON BASE: 

 Lunar base symposium was'a parade waiting to happen'

## By Kelly Humphries

"We've come a long way, baby," said Wendell Mendell, Iong-time champion of a lunar base, as he looked at the new NASA Headquarters telephone book.
The new phone book, featuring a Moon base concept cover illustration, arrived about the same time as a statement by NASA Administrator James C.Fletcher supporting the Moon, rather than Mars, as the best initial destination for possible U.S./USSR manned missions.
The statement is highly consistent with the stand $I$ and my colleagues have been taking over the last five years," said Mendell, a JSC planetary scientist who has been talking lunar base since Apollo. "I think it's right on target. I think the President's space policy is an excellent basis on which to build a strong civil space program, and that strolly civi's space program, and that
Sally Ride's report plus Dr. Fletcher's Sally Ride's report plus Dr. Fletcher's
statement start to set down specifics of statement start to set do."
what needs to be done."
The Fletcher statement also came on the heels of a successful second symposium on Lunar Bases and Space Activities of the 21st Century. Three things about the symposium stand out, according to organizers Mendell and Barney Roberts.
First, the number of people who attended the April 5-7 event at the Westin Galleria Hotel in Houston was unexpected, as were the amount of interest and enthusiasm they displayed.
"To our surprise between 550 and 600 people showed up," said Roberts, manager of JSC's Exploration Studies Office, who served as the symposium's administrative chairman.
"It was right at the limits of our most optimistic projections," said Mendell, technical program chairman. "We ran out of supplies because we hadn't a lot of comments on the general level
of energy and enthusiasm. People were can Society of Civil Engineers and the just amazed that so much was going American Geophysical Union the on. They had anticipated a much sponsored the symposium
smaller gathering.
Second, the make-up of the participants was different from that of the first symposium.
"When we held the first meeting in 1984, out of 100 papers presented there were probably fewer than five tha represented funded work," Mendel said. "This meeting had a substantial NASA component. There were people from all the NASA centers here giving papers on work that they were doing that's related to future initiatives efforts.
Speakers included NASA Deputy Administrator Dale Myers; JSC Director Aaron Cohen; Mark Craig manager of the Lunar and Mars Exploration Office at JSC. Gerry Griffin president of the Houston Chamber of Cosmmerce the former JSC diretor: Harrisince and Apmer JS director, Harrison Schmitt, Apollo 17 astronaut, former NASA deputy ad H Kolle Dr. Hans Mark and D. H.H. Koelle, chairman of the International Academy of Aeronautics committee on international lunar base This wa
This was also the first large meeting where the new Office of Exploration, its structure and plans were featured, he added. John Aaron, NASA assistant administrator for the Office of Exploration, spent all three days at the conference.

The Office of Exploration is actually now funding studies and getting organized," Mendell said. "The management at the various NASA centers has a sense that something might be happening and they want to send people to learn more about it and are more willing to send people to give papers."
In addition, people from outside the aerospace community and the country attended and contributed. The Ameri-


#### Abstract

American Geophysical


"You really got a sense that this was a parade waiting to happen," said Alan Ladwig, director of program support and special projects for the Office of Exploration.
The question now, he said, is "how do we now make sure that we can sustain the interest and enthusiasm they have shown for this? How do we get beyond the study stage into the doing stage?"
The broader mixture of participants added a dimension to the discussions that isn't usually present at a technical symposium, they said
The people who are farthes removed from NASA tend to have the more visionary conceptions of what a Moon base might be like. People who are closest to NASA tend to have perceptions that are highly functional and limited and represent to som extent a Space Station on the some Mendell said.
"You get a cross-section of what people think a lunar base might be. Both sides temper one another and their sets of ideas. It was intended to be a conference of engineers, scientists, designers, students, professors bureaucrats and managers all thrown together and talking to one another.
Third, although the organizers hope o have another conference in two years, this year's was the last to focus exclusively on the idea of a lunar base.
"This was the last lunar bases meet ng," Roberts said. "The next meeting will be just Space Activities of the 21 st Century. The purpose is to get away from the discussions of going to a place and keep in front of us a discussion and keep in frint these things and let the why re doing these things-and le why determine the
Mendell said that while he stil
believes a lunar base is the best place to begin human expansion into the Solar System, there are many similarities in the living conditions, objectives and technologies associated with either a Moon or a Mars base. He said he's confident the Moon base will win out on the merits of its proximity to Earth and its known resources, such as ilmenite from which oxygen should be able to be extracted.

We've always talked about the lunar base as being much more of an evolutionary follow-on to the Space Station and the whole space transportation capability.'

Mendell said his lunar base studies assume that a manned Martian base will be developed next
"People cannot exist on the surface of Mars without space suits. Your space suit for operating on Mars will not be a lot different than the space suits for operating on the Moon. People cannot work on the surface of Mars for long periods of time without accumulating a radiation dose which is hazardous, so you have the same kind of philosophy of trying to operate machines and automation as much as possible, saving actual physical human labor for special conditions. You are going to want to live under the surface on Mars just like you'll live under the surface just the Moon so construction techniques will Moon, so const be very similar
"My claim is that it's much easier to learn how to do those things on the Moon. I see the Moon as the kindergarten for learning to live and work in space."
Mendell said he's happy with the current direction of the debate.
"I'd much rather be debating whether we go next to the Moon or Mars rather than debating whether we ever leave the Space Station," he said.


A deep drill team obtains cores for petrological stu dies of the young Aristar chus crater's floor. The peak is a few kilometers to the south of the drill rig. The crater floor shows prominent slump terrace of the crater walls and solidified impact melt rivulets that flowed down the steep inner wall immediately after the crater was formed.

# Roundup Swap Shop 

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadine for submitting ads is 5 p.m. the first Wednescay after the date o publication. Send ads to Roundup, AP3, or deliver them to the Newsroom, Bldg. 2 Annex, Room 147. No phone in ads will be taken.

Property \& Rentals
Sale: Clear Lake, 1-1/2 story, 4-2-2, near schools, park, large yard. 282
3479 or $532-1112$. 15 or 532-112
mile to NASA 3-2 Place townhouse 1 mile to NASA, 3-2.5-1, refrig., micro
wave, W/D, FPL, ceiling fans, miniblinds, $\$ 650 / \mathrm{mo}$. David, x32791 or 488-9768. Lease: Nassau Bay townhouse, ${ }^{2-}$ ool, avail. May 1, \$550/mo., deposit $\times 32864$ or 335-1695.
Lease: Galveston, restored Victorian, 3-1-1.5, 2 car garage, two-story, \$775 o. Carodyne Holliday, 409-763-8030 Sale: Near Tyler and Henderson, 13.5 acres, gently rolling wooded East Texas land, fronts county blacktop, assum McLeaish, 480-7445.
Sale: Lake Livingston lot, $160^{\prime} \times 50^{\prime}$ Il utilities avail., Impala Woods in Onalaska, $\$ 1,800$. Doug, $\times 39376$ o 337-3704.
Sale or lease: Pasadena, 3-1-1, den, large kitchen, carpet, fenced yard, vinyl siding, ex. cond., close to schools $\$ 31,900$. Assume $8-1 / 2 \%$ VA loan at 240/mo. Equity \$14,400. 941-5908. Sale: Grapeland, TX, mobile home,
3-2, dining, utility room, air/heat, par-$3-2$, dining, utility room, air/heat, par tially furnished, appliances, 5 acres, ex cond., \$19,500 OBO. 214-729-6885 or
214-764-2183. 4-764-2183
Lease: Houston, Brentwood Subdivi sion, 3-2-2, many extras. 15 min . from Johnson, x37194 or 438-0201
Lease: Pensacola, FL, beachfront Lease. Pensacola, $F L$, beachfron equipped kitchen, balcony overlooking gulf, pools, sauna, exercise room, acuzzi. Weekly and weekend rates Dean, x34132 or 486-5331.
Lease: Clear Lake condo, 1-1, studio, LR, all appliances, water view, $\$ 385 / \mathrm{mo}$. utilities. 481-5747.
Lease: Piper's Meadow, 3-2-2, nice $\$ 575 / \mathrm{mo}$. plus deposit. 480-6516.
FPL, 2 children maximum, $\$ 450 / \mathrm{mo}$. NASA. 331-1136.
NASA. 331-1136.
Sale: University Trace townhouse, 2-2.5-2 CP, all appliances, FPL, security, assume loan. 333-4044.
Sale: East Huntsville, Acorn Hill Estates, 10 acres, $\$ 3,000 /$ acre, assume 8-1/2\% note. 333-4044.
Lease. Friendswood, 3-2-2, formal dining, large kitchen, FPL,
Sale: Clear Lake, Oakbrook West, 4 2.5-2D, contemporary, large living dining, W/D, FPL, professionally deco rated, landscaped, security, garage doo pener. 482-6609
Lease: Clear Lake condo, vaulted eiling, 2 BR, FPL, balcony, W/D con\$350/mo. 486-0315.
Sale: Kirkwood South (near Dobie H.S.), large custom 2 -story, 4-2.5-2, both formals, family room, FPL, intercom, walk-in closets, new 4 -ton AC, 488-5210.
Sale: Lake Livingston, Highway frontage lot, wooded, located in Paradise Acres, on FM356. Roger, x 30093 o
$472-5650$. Lease: Bacliff, mobile hom
mo. $\$ 50$ deposit. 488-1758.
Sale or lease: Kirkmont Subdivision -2-2, Assume $7-3 / 4 \%, \$ 49,500$ or $\$ 475 / \mathrm{mo}$ 481-6158.
Lease: Camino South, 3-2-2, family
, $18^{\prime} \times 16^{\prime}$, ining room, garage door opener, trash compactor, $\$ 600 / \mathrm{mo}$. Richard, x34266 280-0689.
Sale:League City, Newport, 3-2, ranch style, new carpet, new appliances, fenced, trees, ex
Fred, 585-5946.
Fred, 585-5946.
Sale or lease: Friendswood condo, 2-2-2, large loft, new carpet, swimming,
tennis, wooded area, $\times 32744$ or 326 1835.

Lease: Piper's Meadow, nearly new, drapes, fenced yard, gas outside grill, drapes, fenced yard, gas, o
$\$ 590 / \mathrm{mo}$. Walter, 332-1609.
Lease: El Dorado Trace condo, 2-2, W/D, FPL, fans, wetbar, security, tennis courts, pool, sauna, avail. June 1
$\$ 395 / \mathrm{mo}$. Pete, $\times 36228$ or $480-4525$. Sale: Friendswood, Sun Meadow Estates, wooded lot, cul-de-sac, bordered by stream, golf course, $210^{\prime}$ deep,
gas/elect on site. Doug, $\times 32860$ or $486-$ 7412
Lease: University Trace condo, 1 BD, tudy, W/D, disposal, fans, exercise 480-1746.
Lease: Camino South, 3-2-2, fenced FPL, deposit, references, no pets
Sale: Angleton, town of Holiday Lakes,
$70 \times 100$ corner lot, unimproved, $\$ 700$ Brenda, $\times 37752$ or $996-9738$.
Sale: Center timber 120 pasture land one-half mineral rights. 482-4365 or 1-409-254 miner
3462.
Sal
Sale: 4 Crystal Beach lots on Bolivar,

## Cars and Trucks

' 84 Ford Escort L, AC, 4-dr, 30K miles, gets approximately $30-35 \mathrm{mpg}$, like new, $\$ 3,500$ firm, OBO. Rick, x33036 488-4261.
'78 Camaro, for parts only, 350 engine, wheels, back windshield, e
Bonnie, x34248 or 489-9007.
' 81 Ford Escort GL Hatchback, ex cond, auto AC new radiator hoses, ex seals, heater, $\$ 1,595$. Kathy, $\times 34776$ or 482-7874.
' 73 Grand Am, auto, AC, console, 400 good cond., \$1 800. 337-3690.
' 75 GMC, $1 / 2$ ton, 6 cycle, 87 K miles,
some rust, good mech. cond., campe
top, $\$ 900$. Larry, $\times 35437$ or $482-8578$.
76 280Z, 4 spd., sunroof, AC, 108 K
i., blue, needs paint, body work. $\$ 2,000$ OBO. 479-2654
' 67 Mustang, 3 spd., 289-V8, new paint, AM/FM, good tires, airshocks, Mike, x38169 or 482-8496.
' 84 Jeep Wagoneer Ltd, all power leather interior tan wood grain panels, low miles, good cond, $\$ 8,300$ negoti able. 470-0105.
' 71 turbo 350 auto, works fine, $\$ 75$ OBO. Randy, x 34540 or 997-1558. ' 67 Mustang Convertible, 6 cyl., new Mary Lee Meider, x $\mathbf{x} 4386$.
' 76 Ford Mustang II, white and red, 2 DR, 2300cc, 4 spd., AM/FM, cold AC $94 \mathrm{~K}, \$ 950$. Brad, 282-3570.
74 Chevy Cheyenne Pickup, auto air, PS, PB, AM/FM/Tape, glass campe cover, original owner, 50 K mi., $\$ 2,000$

## '82 Toy

' 82 Toyota Celica GT, 5 spd., manual will fit on 20R and 22R Toyota engines $\$ 300 \mathrm{OBO}$. Tony, x 3440 or 334-2365.
68 Porsche 911 rebuilt engine, ex
ond., \$5,800. 326-1278.
'85 Honda Civic DX, AM/FM/Cassette 5 spd., AC, 32,000 mi., ex. Cond., $\$ 5,200$ Ruben, 280-1229 or 947-0697.
' 84 Nissan Sentra, SR5, 2 DR, AC, PB AM/FM/Cassette, new tires, BRN, like ew, \$3,600 OBO. Ramesh, 484-3683. '81 Datsun 280-ZX, T-tops, auto, AC $\times 34266$ or 280-0689.

74 Datsun $260 \mathrm{Z}, 4$ spd., blue, louvers, alpine stereo, needs engine wor
$\$ 1,600$. Victor, $x 35983$ or $538-1658$. ' 74 Chevy Luv pickup, 4 spd., ne wrecked, running, $\$ 400$. 471-5161. '83 Honda Accord, gray, 4 DR, 5 spd ' 74 Camaro, orig. owner, PS, PB, auto, AC, AM/FM, good cond., needs engine $\$ 1,200$. Sharon, $\times 35452$ or $480-2313$. ' 79 VW Rabbit, PS, PB, 5 spd., AC AM, good cond., needs new head $\$ 1,200$. Sharon, x 35452 or $480-2313$.
' 84 Honda LX, 4 DR, 5 spd., PW 84 Honda LX, 4 DR, 5 spd., PW,
ocks, cruise, ex. cond., $\$ 6,500 . \times 30092$

## 481-3637.

' 85 Mallard 35 ' motor home, loaded ow miles, \$37,000. 337-4051.
rown, 96 K Corolla, 5 spd ., 2 DR, AC brown, $96 \mathrm{~K} \mathrm{mi.}$,good
$\times 31429$ or $482-1909$.
' 76 Toyota Corolla needs work good
ires, AM/FM, AC, \$375 OBO. 486-4229 ' 86 CRX-Si, black, fuel injection, stere cassette, electric sun roof, alloy wheels 88,000 . David, 480-5132 or 644-0861.
' 86 RX-7, sports model, white/maroon AM/FM/cassette, 24 K mi., ex. cond
$\$ 11,995$. Jeff, $\times 31470$ or $996-7097$. ' 77 Ford Granada Ghia, 4 DR, 6 cyl., spd., PS, AC, AM/FM, 100 K mi., good Allen, $x 35538$ or $486-5740$
' 85 Custom Ram 250 Dodge Van, V8 all power, 4 capt. chairs, rear bench new tires, $\$ 10,800$. 996-1863.

## Cycles

' 83 Honda GL650 Silverwing, 4,800
miles, $\$ 1,800$ OBO. Jim, 335-8539 o 61-0273.
82 Honda 110 3-wheeler, 482-1602. ' 83 Honda Shadow, ex. cond., tinted windshield, helmet, cover, low miles , 85 Suzuki GS700E 2500 mi ' 85 Suzuki GS700E, $2,500 \mathrm{mi}$., ex 1186. $\$ 1,850$. John, $\times 36484$ or 486

## Boats \& Planes

$822^{\prime}$ U.S. Yacht, 3 sails and 9.9 OB Ready to sail, \$12,000. 282-3029 or 326
'83 16' Hobie catamaran, ex. cond. railer, $\$ 2300$. Karl, x 35067 or 333-3544 18 Mahogany boat with trailer. No 282-4519 or 486-5732.
$15^{\prime}$ Chrysler Mutineer Daysailor, good cond., ready to sail, trailer, $\$ 950$. $333-$ 6356 or 480-6340.
16.5' Sidewinder ski boat, 75 Hp Johnson, tow bar, pwr tilt, new paint seats, carpet, AM/FM, gaiv. trailer, skis $\$ 3,400$. Ben, $\times 31588$ or $488-1326$
$18^{\prime}$ Catamaran AMF trac sailboat with double trapeze, cat tilt trailer, extras new cond., \$3, $100.333-3056$.
82 to adult orig. owner, stored in shed, galv. 282-1871 or 280-8796.

## 26' Pearson

26 Pearson sailboat, OB, m
$\$ 8,000$ OBO. Tom, $332-7048$
15' Chrysler Mutineer sailboat, trailer carries 4 adults, $\$ 995$. Steve, x 38651 or 480-9715.

## Household

Wicker desk/dressing table, $\$ 50$ rattan loveseat $\$ 85$; wood desk, $\$ 45$ soloflex exercise machine, $\$ 375$. 474-
3181 .
Baby furniture, Simmons crib, mat ress; Strolee playpen, make offer. 870 Fren.
French provincial canopy bed. 996
Large 6 drawer metal desk, chair good cond., $\$ 50$, desk alone $\$ 45$. LaVon $\times 31129$ or 486-1187.
Oversized contemporary couch, loveeat, white/taupe, exc. cond., $\$ 250$ each or $\$ 450$ for both. 488-7572.
5 -piece formal Broyhill dining se w/matching lighted china cabinet, wa
$\$ 1,800$; now $\$ 1,200$ OBO. 339-2306. 1,800; now \$1,200 OBO. 339-2306. Solid oak bunkbeds, mattresses bunkie boards, ex. cond. $\$ 395$. Kim 34824 or 554-2030
Sleeper sofa, striped earth tones $\$ 75$; drafting chair, $\$ 50$; twin bed frame 480-7111.
$m$ loveseat, sofa, contemporary good cond., \$250; coffee table, Lane walnut, $\$ 50 ;$ J.C. Penney microwave 487-0640.
2 piece L-shaped sofas, beige, good cond., $\$ 500$ OBO, will sell separately. Kari, x35111 or 488-8919.
Men's small chest, ho
Antique, \$30. 488-0946.
oot stool $\$ 10$ desk, $\$ 30$; saddle sea \$45: large painting wood highchair 445; ange painting by Lee Reynolds, fluorescent desk light $\$ 1250$. two straight matching chairs, \$20 488-5564 Antique mantle clock 1879 Gilber 175; table lamp 4' tall \$25.488-5564 King-sized motionless waterbed, solid wood frame, pedestal, heater, liner startup kit, $\$ 200.996-6929$. Executive desk, $\$ 150 ; 5^{\prime} 3^{\prime \prime}$ freezer \$60. Richard, 538-1854.
Washer, 2 yrs. old, dryer, good cond electric, BO, will sell separately or as set. Marianne, 335-1668.
Bunkbeds, study oak, mattresses $\$ 300$. Billie, $\times 38334$ or 482-4365. Breakfast table, 4 chairs, $\$ 75$ OBO.
$282-3494$ or $484-3683$.

## Audiovisual \& Computer

Apple scribe, thermo, 4-color printer, \$75; AM/FM/Cassette, 8 track player recorder, phono, pecan cabinet. 996

Amiga 1000, 512 K , color monitor mouse, NEC printer, software, word processor, graphics, misc. games $\$ 1,200$ OBO. Ron, 779-4128.
Commodore 128, NEC color monitor 1571 disk drive, joystick, assorted pro grams, $\$ 600$ OBO, 338-2620
Microcomputer with 8086 chip, 256K RAM, full page CRT, dual $8^{\prime \prime}$ floppies, power supply needs repair, $\$ 20$. Jim

## Wanted

Need help with a CORVUS flat cable re-OMNIDRIVE. If you or someone 7678.

Want $35-55$ HP Chrysler OB moto
for parts. Jerry, x 39287 or 554-6093.
Want live-in sitter to care for children, reliable, nonsmoker, must love children, mornings free for part-tim student,
532-2128.
Want roommate to share 3-2-2 house in League City, Meadowbend, non smoker, $\$ 300 / \mathrm{mo}$., plus half utilities at, $\times 38456$ or 334-3703.
10 . Elaine, $\times 31082$ or $337-3239$
Want Astronomy magazine, Mar. 84
to Apr. 85 , June 85 to Dec. 85 , Aug. 86
to Jan 87. Will trade for issues of

Aerospace America, 1983 to present, or Aviation Week
Want roommate for 3-2-2 with poo \$225/mo., plus half utilities, non smoke only. 488-8029.

## Judy, 538-1854.

Want 35 to 45 Hp tractor with disc
and brush hog, must be in good working cond. Jim Cooper, 484-0775.
Want body work on a 1979 Camaro. Bonnie, $\times 34248$ or 489-9007
Want to join car pool, will share driving or pay for ride. Live in Bellaire 4:30 p.m. Roy, $\times 37185$
Want to buy electric trains, Don
x37832 or 996-1425.

## Musical Instruments

 396-1482Aria Guitar, \$80. Paul, x39218
Five-piece black Tama drum set with ight cymbal (camber) and high hat, ex ond., \$500 OBO. 482-8088
Banjo, 5 string, includes case, book
Gteve x38651 or 480-9715.
Gulbransen elect. organ, double ke
board, bench, $\$ 700$ OBO. 280-0958.

## Photographic

Pentax KX camera, manual, Sigma high-speed, $80-200 \mathrm{~mm}$ telezoom lens, F/3.5, Velboa triped, electronic flash 250. Phil, x33035.
Minolta XG-1 camera, Minolta MD Rokkor-X 45 mm lens, Minolta auto 118 flash, MC auto zoom CPC Phase 2 CC Macro $75-200 \mathrm{~mm}$ lens, carrying \& trave case, $\$ 375$. Jana, x 31653 or 532-3008 Olympus OM2S program 50 mm 1. zukio, auto winder $1,200 \mathrm{~mm}$ F4 tele photo 35 mm 3.5
Telephoto lens, 2 lenses for spotting cope, 1044 camera, $\$ 200$. $\times 38497$ or 488

## Pets \& Livestock

Free kittens, 8 wk . old, yearling black cat, house broken, Joyce, x30829 480-3535
Fre, mixed breed medium sized 5 y old dog, blond, good watchdog Marianne, 335-1668
2 yr. old AKC red Cocker Spaniel Ball, 282-4686.

## Lost \& Found

Lost, NASA 25 yr. service pin, meatball design, blue enameled, goldplated, lot, Bldg 1 and Bidg Bidg. 2 parking $\times 31347$ or 944-4687.

## Miscellaneous

Popup camping trailer, sleeps 6-8 sink, 3 burner stove, ice box, piopane tank, canopy, 1650 ibs can be tow \$750. David 282-4519 or 486-5732. ' 85 Wilderness Travel Trailer, 25 ,


[^0]:    EAA badges-Dependents and spouses may apply for photo I.D. badges between $6: 30$ and $8: 30$ p.m. April 26 or May 3 .
    Defensive driving-Course is offered May 21 from 8 a.m. to 5 p.m. and costs \$20.
    Weight safety-This is a required course for those employees wishing to use the Rec Center weight room. The class will be on May 4 or 19. The use the Re
    Softball tournament-Men's Open C \& Mixed softball tournament will be May 14 and 15 . Entry fee is $\$ 95$; entry deadline is May 11 .
    Physical fitness-Next session will be July 5-Sept. 23. Classes meet at 6:30 a.m. Mondays, Wednesdays and Fridays.
    5K Fun Run-AIAA-sponsored run will begin at 8 a.m. May 14 at the Rec Center. Prizes for first, second and third place in each men's and women's age category. Entry fee is $\$ 8$ before May 3 or $\$ 10$ race day. For more information, call Scott Satterwhite, 282-7756
    Almost Anything Goes-Six coed teams are needed Saturday, May 7 at the JSC employees picnic. Teams consist of three men and three women. Entry fee is $\$ 10$; entry deadline is April 29 . Every team member will receive a $T$-shirt.

