

Space News Roundup

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National Aeronautics and Space Administration

Final Spacelab parts arrive at Cape

The final elements of the first flight set of Spacelab hardware have arrived in the U.S. as technicians at the Kennedy Space Center prepare for powerup and final checkout of the experiments in Spacelab 1, scheduled to fly about a year from now.

The elements, which arrived at KSC from the European Space Agency's (ESA) prime contractor plant in West Germany, include three Spacelab pallets, an igloo and ground support equipment, all shipped aboard two jumbo jet aircraft. The hardware will be kept at the Cape and used to Support Spacelab 2 and future Spacelab missions.

At the same time as those components were arriving, experiment installation on the Spacelab 1 laboratory was completed. Installation of a platform carrying 12 ESA experiments completed the process, and the next step is to now power up the unit and perform a functional checkout of each experiment.

The first set of flight hardware for Spacelab was provided to the United States at no charge by the ten participating nations in ESA's Spacelab program. NASA will purchase a second Spacelab flight hardware set, for approximately \$300 million.

ESA's prime contractor in the development of Spacelab is the West German firm ERNO Raumfahrttechnik GmbH. Some 50 firms in the ten European nations funnel parts to ERNO in Bremen, West Germany, for assembly and integration. McDonnell Douglas Technical Services Corporation is the integration contractor for both the Marshall and Kennedy Space Centers.

Spacelab 1 will first fly on STS-9, now scheduled for October 1983. Mission Commander for the flight will be Astronaut Office Chief John W. Young. Pilot will be Maj. Brewster Shaw and the Mission Specialists will be Dr. Owen K. Garriott and Dr. Robert A. Parker. Two Payload Specialists will also be named, one from the ESA and one from NASA, at a later date, bringing the crew complement to six — the largest so far in the Shuttle era and on any American spaceflight.

The Orbiter used during the mission will be *Columbia*, fresh from major modifications for operational duties. The first Spacelab mission is designed to carry out experiments in stratospheric and upper Earth atmosphere plasma physics, biology, medicine, astronomy, solar physics, thermodynamics and lubrication.

Double take



Photo by Charles Ciendaniel

One of the gentlemen pictured above is the new Center Director, Gerald D. Griffin. The other is his twin brother, Col. Larry Griffin, who works in the Space Shuttle Program Office on detail from the U.S. Air Force. If you are wondering which is which, turn to page 3, where a Roundup interview unravels the mystery.

Comet Austin visible in northwest sky

A newly discovered comet, called Austin-1982G, should be visible to skywatchers late this month, according to astronomers at NASA's Goddard Space Flight Center.

The comet either will be entering the inner reaches of our solar system for the first time, or is one that passes by earth only once every million years or more.

The brightest comet visible since 1979, Comet Austin should be discernible to the naked eye shortly after the middle of August

and into September. Observers can expect to see the comet by looking to the northwest just after sunset, just above and to the right of where the sun disappears over the horizon. The comet will be the first visible to the naked eye from the Northern Hemisphere since 1976 and should appear six times as bright as the faintest star.

Comet Austin passed closest to the earth on Aug. 10. It passed closest to the sun on Aug. 24, after which time it was expected to develop a tail. Long before these

dates, however, astronomers at Goddard were taking its picture from a satellite orbiting between some 25,000 and 45,000 kilometers (15,500 and 28,000 miles) from the earth.

The satellite, called the International Ultraviolet Explorer (IUE), took images of the comet in the ultraviolet spectra, expected to reveal details such as the comet's composition. At the same time, the scientists viewed the comet in false colors on a television-like screen in the satellite's ground

control room at Goddard.

Astronomers using the satellite, including Drs. Michael A'Hearn, University of Maryland, and Paul Feldman, Johns Hopkins University, hope to ascertain the composition of this comet and compare it with the composition of short period comets previously observed by the satellite. They will also compare it to Comet Halley which will be observed by many astronomers in 1985 and 1986.

According to Dr. A'Hearn, Com-

et Austin may come from an enormous cloud of comets, a comet storage space, in effect, that surrounds the Solar System and in which comets orbit the sun at very large distances, possibly one third the distance to the nearest star, Alpha Centauri. Alpha Centauri is about four light years from the earth. A'Hearn said Comet Austin may have been disturbed slightly by the interaction of a neighboring star, slightly changing its orbit so that it was pulled by the sun's gravity into the inner Solar System.

Lunar rover technology aids handicapped drivers

Operating a joystick controller that looks like part of a video game, a handicapped person can drive a van or other vehicle with a system derived from NASA "moon buggy" technology.

This week in Houston, engineers from Nelson and Johnson Engineering, a Colorado firm under contract with NASA, were showing off the latest development phase of the system which allows even severely handicapped individuals to smoothly operate a vehicle.

The system is based on the hand controller used on NASA's lunar rover "moon buggy" which NASA astronauts drove around the surface of the moon. When fully developed, it will be a compact electronics unit which fits into virtually any vehicle without extensive modification and allows non-handicapped drivers to return to standard controls at the flip of a switch.

The van being demonstrated during the week in conjunction

with a convention of engineers who design equipment for the handicapped is a partially developed prototype, but one in which no permanent modification is required.

All the equipment fits neatly under the dash or alongside the driver's seat with no changes needed under the hood. A switch on the dash determines whether the vehicle is controlled by the electronics or the usual steering wheel and pedals.

A joystick controller mounted on the end of an arm rest by the driver's side sends electronic signals to servo motors on the steering column, or to the brake pedal or accelerator whenever the controller is moved.

A forward push on the stick depresses the accelerator while pulling back applies the brakes. Left or right movements steer the vehicle which can be done simultaneously with braking or accelerating.

The controller can be used by

an individual as severely handicapped as classification C-5, that is, paralyzed from the chest down. For those unable to grasp the joystick, a special device is used.

The project to adapt lunar rover technology to more Earthly vehicles began with an agreement between NASA and the Veterans Administration. The VA was interested in improving equipment used to help handicapped veterans lead more normal lives and NASA was seeking to expand the uses of its technology.

In 1981, NASA signed a contract with Nelson and Johnson Engineering of Boulder, Colorado, for phase one of a three-part development effort. The first part, to prove the usefulness of the concept, was funded by the VA while NASA managed the contract.

The van in Houston this week is further along than earlier models and future stages will have reduced-size electronics packages and other refinements.



This is the official mission patch for the upcoming STS-5 flight, now scheduled for November launch. The five points of the star signify the mission number, and the two satellites blasting off from the cargo bay represent Telesat E and SBS-C, the first spacecraft to be orbited from the Space Shuttle. The patch is predominantly light blue, dark blue, red and yellow.

Bulletin Board

Hispanic Heritage Day to be held

The Johnson Space Center will host Hispanic Heritage Day Sept. 11, initiating observances of Hispanic Heritage week in conjunction with the Fiestas Patrias activities. A program is planned to begin at 1:30 p.m. in the Teague Bldg. 2 auditorium. Astronaut Dr. Franklin Ramon Chang-Diaz and Jose R. Perez, Deputy Chief of the Equal Opportunity Programs Office, will be among the participants. There will also be entertainment and a brunch in the lobby of the auditorium, as well as tours of the facilities accompanied by JSC Hispanic employees. For more information, call x4831.

Spaceweek seeks interested volunteers

Spaceweek National Headquarters in Houston consists of a hard-working team of volunteers, mostly from the JSC community, concerned about the nation's future in space who are doing something about it, according to Spaceweek President Dennis Stone. They are the national coordinators of the July 16-24 Spaceweek celebrations which this year were held in 50 cities and were supported by proclamations from every state governor in the country. Staff meetings are held from noon to 1 p.m. on the first Tuesday of every month at the Lunar and Planetary Institute's McGetchin Hall conference room. Any persons in the JSC community interested in working on projects related to Spaceweek '83 are invited to attend the next meeting Sept. 7. For more information, call Dennis Stone at 333-8246.

Correct opera offerings listed

Due to an editing error, the information on the Houston Grand Opera and Light Opera offerings for the upcoming season as listed in the last edition was incorrect. Here is the right information: Luciano Pavarotti will highlight the 1982-83 season with a one-night performance at the Summit. The Houston Grand Opera is offering a 20% discount to JSC personnel on season tickets. The 20% discount is an introductory offer, directed at first time subscribers only. Grand Opera offerings are: Puccini's "Turandot," Berg's "Wozzeck," Leoncavallo's "I Pagliacci" on a double bill with Busoni's "Arlecchino," Verdi's "Rigoletto," and Leonard Bernstein's new one-act opera, "A Quiet Place," to be performed on the same bill as his earlier "Trouble in Tahiti." Bonus options to the Grand Opera include the "Pavarotti Extravaganza," Lehar's "The Merry Widow," the "Prima Donna Series" with concerts by Kiri Te Kanawa and Leontyne Price, and "Sugar Babies" with Mickey Rooney and Ann Miller. The deadline for ordering season tickets through the Corporate Discount Program at the special 20% rate is Oct. 1. For more information, pick up an order form at the Bldg. 11 Exchange Store, or call Keith Gates at 227-0091.

Rec Center lists group offerings

The Gilruth Recreation Center is available for group luncheons, dinners, receptions and picnics, according to Manager Ted MacDonald. A minimum of 35 persons is required for use of the facility by NASA and NASA contractor groups, as well as a few days notice, MacDonald said. Meal specials through September include: breaded veal cutlet from Sept. 6 to 10, Chinese pepper steak from Sept. 13 to 17, German sausage from Sept. 20 to 24 and baked ham from Sept. 27 to Oct. 1. All meals include salad, vegetables, dessert and beverage at a price of \$2.99 per person. For more information on the specials, call the Rec Center at x4921.

Credit available for Toastmasters members

Officials of the Spaceland Toastmasters wonder if you would like to meet new people, receive two extra hours for lunch per month, improve your communications ability and receive official government training for your efforts. If so, all you have to do is fill out a Standard Form 75 and join the Toastmasters Club. Toastmasters meet at 11:30 a.m. every first and third Wednesday of the month at the JSC Bldg. 3 cafeteria. For more information, call Pat Bahr at x5031 or 538-1516, or Herbert Coleman at 333-3133, x243.

Clear Lake Symphony tickets on sale

Season tickets for five concerts of the Clear Lake Symphony at the University of Houston/Clear Lake City are now on sale. The general admission price is \$12, and student/senior citizen tickets are \$4. For information on the concert schedule and how to obtain tickets, call W.F. Meek at x4851 or 334-3092.

JSC Aero Club accepting applications

The JSC Aero Club is now accepting new membership applications for flying at club rates. Members may rent a Cessna 150 for \$20 an hour (wet) or a four-place Piper Archer II with auto pilot, air conditioning and full IFR panel for \$30 an hour (wet). Member dues are \$25 per month. The planes are based at Houston Gulf Airport in League City. Two club members are certified flight instructors available for beginning lessons or advanced flight instruction. Membership is open to JSC employees and contractors. Experienced pilots are desired, but non-pilots may join and learn to fly. For more information or membership application forms, call J.D. Haptonstall at x5285, Dennis Morrison at x5281 or B. Mercantel at x2314.

NARFE dinner meeting scheduled

Chapter 1321 of the National Association of Retired Federal Employees (NARFE) will meet at 6 p.m. Sept. 7 in the Clear Lake Park Bldg. on East NASA Road One. Retired and active federal employees are invited to attend. Employees or former employees over the age of 50 with at least five years of service are eligible for membership in NARFE. Bring a covered dish to the meeting and share an evening with other NARFE members. For more information, call Burney Goodwin at 334-2494.



The newest addition to the astronaut world, Paul Seddon Gibson, is shown here with his proud parents Astronaut Pilot Robert L. Gibson and Astronaut Mission Specialist Rhea Seddon during an appearance recently on the ABC program "Good Morning America." Young Paul was born July 26. His parents both came aboard at JSC as astronaut trainees in 1978 as part of the 35-member Astronaut Group 8.

Several JSC employees were honored recently for their suggestions, tech briefs and inventions. Those honored included: **Richard J. Williams**, for a tech brief which described systems for measuring and controlling the rate and extent of oxygen reactions with materials at high temperatures; **Thomas J. Dunn**, for an invention for better means of attaching Space Shuttle Orbiter thermal protection tiles; **Donald C. Wade**, for an invention which when adopted will eliminate water soak-up by tiles on Shuttle Orbiters; **Joseph A. Chandler**, for two tech briefs and one invention. Chandler's tech briefs related to a new type of gear using magnetic poles and a pipe thread vacuum seal which both saves space and reduces cost. His invention was a remotely controlled space vehicle docking system. Other award winners for suggestions included **Harry M. Porter**, who said shipping and storage costs might be saved by reducing the size of the Orbiter glider souvenir kit sold in the Exchange Store; **Barbara A. Beasley**, whose suggestion for automobile safety around Bldg. 1 will result in improved traffic flow; **Robert N. Prince**, who suggested a way to refurbish and reuse lithium hydroxide cartridges used in Orbiter environmental systems; **Daniel T. Lockard**, for a suggestion which will improve traffic flow into JSC from NASA Road One; **Ruth A. Hollen**, for a suggestion to streamline the JSC distribution lists; **Carolynn Lee Conley**, for a recommendation that JSC Speakers Bureau participants be formally recognized for their efforts; **N. L. Dawn Brittingham**, for a procedure she suggested which will improve the typing flow system in the Management

People

Services Division; **Kent D. Castle**, for a suggestion which should improve traffic safety around the Bldg. 17 area; and **J. Anthony Bouchard**, for suggesting that performance appraisals of employees in the technical intern program be discontinued.



Several members of the Flight Operation Directorate's famous "Roo Team," comprised of payload operations flight controllers and friends, conquered the rapids of the Guadalupe River during the Employees Activities Association rafting trip recently. A total of 42 Roo's participated in the fun, some of whom are shown here.

Several JSC employees were honored recently with 25, 30, 35 and 40-year length of service certificates. Those honored were: **Richard A. Kuhn**, 30 years; **Martin L. Hooper**, 40 years; **Roy H. Field**, 35 years; **William W. Grimes Jr.**, 25 years; **Larry G. Damewood**, 30 years; **Billy W. Pratt**, 25 years; **Stanley J. Buinski**, 40 years; **Lawrence D. Blackshear**, 30 years; **Paul T. Keim**, 25 years; **Dean F. Grimm**, 25 years; **Albert B. McIntyre**, 25 years; **Jackson D. Harris**, 25 years; **Joe D. Gamble**, 25 years; **Marlowe D. Cassetti**, 25 years; **Ben F. McCreary**, 25 years; **Gus R. Babb Jr.**, 25 years; **Victor R. Bond**, 25 years; **Donald J. Jezewski**, 25 years; **Richard P. Campbell**, 30 years; **Dolores F. Rodriguez**, 30 years; **Hershel C. Larue**, 30 years; **David B. Mullins**, 30 years; **Robert H. Allmond**, 25 years; **Sammie L. Wilkins**, 35 years; **Bernard A. Marlow Jr.**, 25 years; **Lester A. Stewart**, 35 years; **Augustine A. Verrengia**, 30 years; **Gerald P. Kenney**, 25 years; **Cheever H. Lambert Jr.**, 25 years; **Martin L. Raines**, 40 years; **Andrew E. Potter Jr.**, 30 years; and **Robert F. Fletcher**, 30 years.

Hoyt McBryar, who retired from Federal service Aug. 20, was honored recently with a Superior Achievement Award for his career contribution to fuel cell technology. McBryar, a chemist by profession, joined NASA in 1959 at the Langley Research Center and transferred to JSC in 1962. He is especially known for his contribution to the Space Shuttle fuel cell powerplant through his invention of a key element, a reconstituted fueled asbestos matrix electrolyte holder.

Robert E. Bobla has been appointed Manager of the Orbiter Engineering Office in the Engineering and Development Directorate. Bobla joined the Johnson Space Center as part of the Space Task Group in June 1962 and has held key positions in E & D and in the Apollo Spacecraft Program Office.

Houston Police Chief Lee P. Brown was the guest speaker at the annual Summer Employees Banquet Aug. 12 and told the group of over 190 summer employees that "...their experience at the Johnson Space Center has placed them on the launch pad of their careers." The banquet is held to present awards to those students who have performed in a noteworthy manner during their tour at JSC. The recipients of this year's awards were as follows: Outstanding Awards in the Office Education Program went to Madglean Bush, BN3; Gayle Kelley, NB; Sharon Lactson, EL; Gwendolyn Miller, BZ; and LaJuanda Moore, AH6. Honorable Mention Awards in the Office Education Program went to Cheryl Babineaux, WT3; Cynthia Davis, BB12; Beverly Jackson, SN; Yvonne Simon, SD24; and Jacqueline Wilson, AJ. Outstanding Awards in the Summer Aid Program went to Cheryl Bass, EE; Cynthia Hughes, EE; Ta'Wanda Kelly, BC46; Angela Miller, BC2; Lisa Moore, WB; and Amy Powell, JF9. Honorable Mention Awards in the Summer Aid Program went to Joanne Horn, AH3; Angela Jenkins, SD4; Regina Roberson, JJ; Dottie Smith, ED; and Pamela Spigner, FD.



Outstanding Award winners, Office Education Program



Honorable Mention Award winners, Office Education Program



Outstanding Award winners, Summer Aid Program



Honorable Mention Award winners, Summer Aid Program

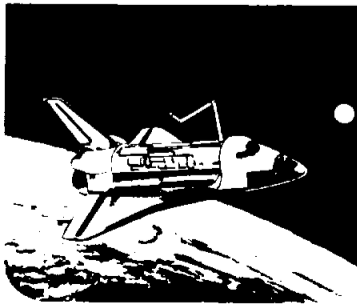
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Lyndon B. Johnson Space Center

Space News Roundup

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Editor

Brian Welch



Interview

Gerald D. Griffin

Sleeves rolled up, the new Director gets ready for operations

These are busy days for the new JSC Director, Gerald D. Griffin, who assumed the post Aug. 8.

No stranger to JSC, he has been in the space business for 20 years, and with sleeves rolled up and an air of bustle in his office even one late Friday afternoon recently, he is quickly coming up to speed for the tasks ahead. He knows the system, relishes the challenge and seems clearly excited by the prospects of the new job.

In keeping with the general atmosphere of coming home, Griffin was preceded here by his twin brother, Col. Larry Griffin — the oldest by five minutes — who was detailed here by the U.S. Air Force last December. Both Griffins are now working in Bldg. 1, and during a photo session and interview in the Director's office last week, the **Roundup** had the opportunity to question and photograph them both at the same time:

Roundup: Welcome back to JSC.
Griffin: Well thanks. I tell you, it's a lot like coming home. Of course I lived here for almost ten years. I've spent more time in Houston than I have in any other single place in my life. So as you can imagine, it's really like coming home. Not only work-wise, but community-wise, it's like going back to your home town. So it's nice, nice to be back in Texas.

Roundup: This is an often-asked question lately: how are we going to tell you and your twin brother Larry apart?

Griffin: Well, I wish I could say I was just a lot prettier than he is, but I can't get away with that. (At that moment, Col. Larry Griffin enters the room and the Director makes the introductions. Col. Griffin seats himself at the conference table, and side by side, the brothers are fairly distinguishable from one another.)

Gerald Griffin: But actually, there is one key. Larry parts his hair on the left side.

Roundup: Who is the oldest?
Gerald Griffin: He is, by five minutes.

Larry Griffin: Five big ones.
Gerald Griffin: Five big ones.
Larry Griffin: And don't you forget it.

Gerald Griffin: And he reminds me of that every once in awhile. But people are going to be confused, because our voices are a lot alike and our mannerisms are similar. They probably in time will grow used to us when they see us together. It's when they catch us apart that they'll have to think. If they will remember that Larry goes with the left hand part, Larry and left...

Larry Griffin: Most people who are around us for any period of time can generally tell the difference, after a few years. (Both laugh.)

Gerald Griffin: Yeah, it takes awhile.

Larry Griffin: And when we are together, people can do it pretty quickly.

Gerald Griffin: Of course. Larry will be the Chief of Staff of the Air Force by then. (Both chortle and exchange bemused glances.)

Roundup: Did Security have any problems with two people who both look like the Center Director?

Gerald Griffin: No, as a matter of fact. They've reacted well.

Roundup: Col. Griffin, are you here on a special tour of duty?

Larry Griffin: Oh no, it's a three-year tour starting last December with an option for a one-year extension.

Gerald Griffin: In Larry's case, it's



The photos above capture some expressions of the third man to hold the post of Director at JSC. Below, all three of the Center's Directors are shown in this photo from 1970 in Mission Control, as controllers celebrate what was perhaps their finest hour — the safe return of Apollo 13. In the background at left, Christopher C. Kraft Jr. lights a cigar for Robert Gilruth as Gerald Griffin gives the universal gesture of triumph at center.

Photos by Charles Clendane



a four year tour if we're satisfied with his performance. (Both laugh again.)

Roundup: To be determined.
Gerald Griffin: Yes, to be determined. (At this point, the photographer is finished and Col. Griffin leaves the room.)

Roundup: You gentlemen seem to have a good working relationship.
Griffin: Yeah, always have.

Roundup: Have you been undergoing an intensive series of briefings in the last week or so?

Griffin: Yes, I've started them. The plan here for the next several weeks is to really give me an intense course in a whole myriad of special topics, things that need to be addressed quickly, and laid right in with that is a series of briefings on each organization in the center by that organization and actually going out and seeing their facilities and talking with their key people and that sort of thing. So there's kind of a laid out pattern of standard stuff, and associated with that we're sprinkling in topical subjects which fit those areas. It's mainly a question of getting reacquainted with what the Center's up to. In the time that I've been gone, of course I haven't been all that far away, so it's not like I've been completely out of touch with what's going on at JSC. By and large, almost all the key people I've known for 20 years now, and I've worked with them in other capacities in NASA. So it's not like I don't know what's going on at all. But my cup runneth over, I can tell you that, and it will be a very intense period. I might add too that the response of everyone has just been outstanding, super.

Griffin: Since I've been here? No. Of course, you've got to put that in the proper context. I was here only half days last week and I've been here one full week now. But there's no doubt that the day I got here was an immediate work day, a decision day. In fact, I started acting in the Center Director role immediately. But most of it has been fairly routine technical and programmatic issues or institutional issues. We are already preparing what you might call some major

policy positions. And of course, one of the first things I had to face right away was this furlough thing, for instance, which doesn't get you started off with a bang, to say the least.

Roundup: Has it given you pause in the last week or two to sit back and realize that decisions being made now are ones we will live with for the next 20 years?

Griffin: Yes...it has. The answer to the question is yes. The reason I hesitated a little bit is that to do a job like this one takes years of preparation, and my preparation really started about 20 years ago when I first got here. I had other jobs, but the beautiful thing about the space program 20 years ago is that people at a very young age and low experience level were thrust into positions of tremendous responsibility. It's only natural that as the Agency has matured, we've lost some of the ability to do that. It's something I think about. I think Chris Kraft was a master at delegating responsibility and the authority to go along with it. And he has probably developed more people to do very important jobs than anyone I know in industry or government. And I want to take a page out of his book and remember that. You must delegate responsibility and let people run and make mistakes and let them learn. That's the way he did with us years ago. I really think I'm well prepared to do this job, and I say that just as a fact.

Roundup: Well, we could tick off the list: you worked on high performance jet aircraft as a navigator and radar intercept officer, you've worked on hardware as an engineer, you've worked as a flight controller, a flight director and you worked in center management at the places where the Shuttle is now launched and controlled, and where it lands. You've worked with legislators and with external affairs at Headquarters...

Griffin: But even having said that, you ask if I feel the gravity of the situation and so forth, and the answer to that is yes. I also am happy and very proud that we've got such a strong staff here at the

Center, and such an able set of contractors who really know their business, so you're not trying to do it alone. It's comforting to know that you've got the kind of support we've got here.

Roundup: A two-fold question: Are there any areas of technology you think this country should push forward in — such as artificial intelligence, self-replicating machinery, improved computer systems and the like — and along with that, what areas of technology would you think JSC most likely should or will get into in the next decade?

Griffin: Well, I can answer that in a number of ways. First of all, there are a number of areas of technology that I think the country should put a fair amount of push into. Some of that NASA has responsibility for, and some it doesn't. There are areas that specifically relate to space. I am in firm agreement that the next logical step in this whole process is a space station. And I'm not saying that we are through working out all the wrinkles with the Space Shuttle. But the next step is a space station. The Shuttle allows us to do that, Shuttle is the tool that will make it possible. Now, the technologies associated with that aren't all in hand yet. There are some questions of control of very large structures, of the assembly of very large structures, and there are obviously questions of habitability and things like that which we've more or less taken for granted. But if we're going to operate this system on an essentially permanent basis, even the habitability question needs a great deal of addressing. There are some technology breakthroughs there which are going to be required. Some of those are things like noise levels and cleanliness and general creature comforts. We have not paid just a whole vast amount of attention to that. It's not been completely disregarded, but trying to get people to the Moon in a very cramped spaceship and then trying to fly in Earth orbit in a vehicle like Shuttle, you don't have the ability to optimize the

habitability like you would in a permanent house in space, if you will. I think we're gonna learn a lot there. Now, our people are aware of that, but we just haven't had that driver yet. So I believe that if we get a space station start in the not too distant future, we will drive some technologies out that we don't even count right now as being a prerequisite to building a station. You mention things like higher density computers or different forms of chips and things like that. I think we'll do those as a result of trying to package things in the station. You've got to remember that Shuttle is primarily 1960s and early 1970s technology. It's ten years old. I've said this before and it's true in everything where R & D is involved, which is that we have pretty well eaten up our research and technology development that's been done and put on the shelf, so to speak. There's not much left. We need a rebirth of emphasis in R & D. The country is in a pretty tough economic state, but I believe even the key people in the Administration now recognize the need.

Roundup: Remember in the last decade when a pocket calculator cost about \$200?

Griffin: And now the same one is \$13.95.

Roundup: Exactly. There was a real infusion of Apollo technology in the 1970s. Can we look forward in the '80s and '90s to a similar infusion of Shuttle technology?

Griffin: There will be an infusion of technology through the space effort. I doubt that we will ever see quite that scope again, however, primarily because other people are involved in technology that are making things happen. You stop and think about it. In Apollo, for instance, and even in Shuttle, we didn't have many other people in the world involved in space technology at all. The Americans and the Russians of course were doing things, but now we've got many of the Western European nations, Japan and others that are now recognizing the value of space. So it's not just what we do anymore driving the technology. It's what the world's doing in space. And that's good. I don't see that as a problem. It just means that the competition to the Americans is much more marked than it was then. So yes, I think we'll see Shuttle-derived technology, I think we will get space station-derived technology that we will see reflected in our everyday life, like the calculator you mentioned. But I don't think we'll ever see the scope again, the rapid push that we saw in the late '60s and early '70s. The country needs to take advantage of the technology drivers.

Roundup: Can NASA make the case that with the impetus for a space station, we can also contribute to economic growth and recovery?

Griffin: I think you can make that point, but it's a hard one to prove. The problem is, and I've spent some time on the Hill in Washington trying to make that point, that to the layman, they think of this as something which has happened in the past. If you say, it's going to happen again, they tend to say, 'Ahh, I'm not so sure of that.' They're just not convinced. The only thing you can prove is what's happened in the past. And it's very difficult, very tough to sell programs that are funded at the kinds of levels that we talk about, several million or hundreds of millions of dollars on the basis that they are going to help the man in

(Continued on page 4)

Gilruth Center News

Call x3594 for more information

Yoga — These classic yoga exercises are designed for those who desire to gain inner peace, awareness and control of their bodies. Yoga promotes health and a sense of aliveness in everyday life. Class runs from 7 to 8:30 p.m. beginning Sept. 8. The cost is \$20 per person.

Country-Western dance — The next six-week C&W dance class begins Sept. 13 with intermediates from 7:15 to 8:45 p.m. and beginners from 8:45 to 10:15 p.m. The cost is \$20 per couple, limited to 15 couples.

Aerobic dance — This 12-week session begins Sept. 13 and 14 with classes on Monday and Wednesday from 9 to 10 a.m. and on Tuesday and Thursday from 4:15 to 5:15 p.m. The cost is \$65.

Tennis lessons — These eight-week classes begin Sept. 7 for beginners and Sept. 8 for intermediates. Classes run from 5:15 to 6:45 p.m. each night at a cost of \$20 per couple. Space is limited.

Ballroom dance — This eight-week session runs from 7 to 8:15 p.m. for intermediates and 8:15 to 9:30 p.m. for beginners starting Sept. 2. Cost is \$50 per couple.

Dancercise — This course meets from 5:30 to 6:30 p.m. Tuesdays and Thursdays beginning Sept. 7. The class lasts for six weeks and costs \$20 per person.

Square dancing — This class begins Sept. 9 and runs for ten weeks. Intermediates meet from 7 to 8:30 p.m. and beginners from 8:30 to 9:45 p.m. Cost of the course is \$24 per couple.

Beginning oil painting — Learn the relaxing art of oil painting. Class is for beginners and meets Tuesdays from 7 to 9 p.m. beginning Sept. 15 and running for eight weeks. Cost is \$30.

Basic auto mechanics — This class stresses the fundamentals of automobile repair. The course features lectures on three successive Thursdays from 7:30 to 9:30 p.m. beginning Sept. 16 with a Saturday morning laboratory also. The cost is \$17 per person. Call x3594 for more details.

Intro to symphony — This relaxing class begins Sept. 8 and provides an overview of symphony music. The course lasts for six weeks and meets from 7 to 8 p.m. at a cost of \$6 per person.

Creative stain glass — This class meets from 7 to 9 p.m. Tuesdays beginning Sept. 6. Cost for the six-week session is \$35 with a limited number of spaces available.

Softball tourney — Our fall classic tourney is divided into male and female teams and will be held Sept. 10, 11 and 12 with an entry fee of \$65 per team.

Fall volleyball — Registrations for autumnal mixed volleyball is now being held. Leagues will play Friday evenings and Saturday and Sunday afternoons. Fees range from \$25 to \$100. Deadline for entries is Sept. 14. Play begins Sept. 17.

Fall basketball — Register now for fall men's and ladies basketball. Cost is from \$50 to \$200, with the entry deadline at Sept. 15. League play begins Sept. 20.

Basic watercolor — Class meets on Tuesdays from 7 to 9 p.m. and lessons begin Oct. 5. Cost for the six-week course is \$40 per person.

Winter softball — Male, female and mixed teams will be accepted soon in the first of two winter softball leagues. One league will play from October to December, the second will play from January to March. Cost for the eight-week seasons will be approximately 80% off the regular summer cost. Watch this space for more details.

Griffin

(Continued from page 3)

the street in Cleveland.

Roundup: And some might say, nor should you try to sell a space station on that basis.

Griffin: I don't think you should. And I think we are beyond that point anyway. The success of space will be proven when people start making money with it. That is to say, when the entrepreneur can make an investment and expect a return at profit, then we will be getting into it. In fact, at that point it is Katie bar the door, because American know how and the World-wide know how will rush to take advantage of it. The same thing happened with the airplane. When people figured out it wasn't a toy, that there was a way to make money with it, the whole field of aviation went bananas. That's what we're going to see in space.

Roundup: In the coming years when we are engaged in an operational program, with a flight rate never before sustained by NASA, is there the danger that we may reduce the effectiveness of the R & D side of the house at JSC just when we need it most, assuming that we get a space station start in

the next few years?

Griffin: That's a good question, because, yeah, it is a worry that all of NASA space R & D, not only at JSC, but at other space centers as well, has concern about. Right now, it is not a problem, because we are still facing some developmental issues in Shuttle, we are still building new Orbiters, all of which are a little different than what we've got now. So our space transportation and space living skills are still required. There will be a day in Shuttle when that requirement will be smaller, although it will never go to zero. That's why I'm hoping we don't have a serious gap, so that those skills can be maintained. There are other areas, and there are other ways we need to be looking at maintaining those skills. We have got a very long program in Shuttle, a very long running kind of thing. There will be a need for sustaining engineering to support that operation for a long time. Obviously the development contractors that built this machinery have a role in that, but so does the government. And as you said, we have never had a long running operational program like this before, particularly with hardware like the Orbiters. We are starting to wrestle with the problem of how to support this thing with sustaining engineering for the rest of its

life, which could be anywhere from 10 to 20 years or more. And that's a new ballgame. Obviously, if we have a new space station start, many of the skilled persons working on Shuttle will have to be used for a space station. On the other hand, we don't have to make the switch quite so fast. But that's going to be one of my big management challenges, maintaining our own base of expertise. The people who really think about that are the ones who have been with NASA a long time and even have careers that go clear back to the NACA. They have seen and I have seen in the last 20 years an almost miraculous capability evolve, and it can be called on, and when it is called on it is there and functions well. There are a lot of people in this country who don't recognize that unique capability in NASA. I'm not talking about JSC, I'm talking about NASA as a whole, aeronautics and space. There is a capability there unique in the world. We must maintain the institutional base and the capability. It's very important for the country. I am convinced it is a very important national capability, and we have got to think about that over the next several years and make sure we do our best to maintain that core R & D talent. We owe it to the country.

Cookin' in the Cafeteria

Week of August 30 - Sept 3, 1982

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

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

Wednesday: Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised

Beef Ribs, Mexican Dinner (Special); Spanish Rice, Ranch Beans, Buttered Peas.

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

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

Week of September 6 - 10, 1982

Monday: HOLIDAY

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.

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 sale: Lease house in League City, Glen Cove, 3-2-2A, VA assumption, leased thru 6/83. Call Bill, 488-1410.

For sale: Countryside 3-2-2, assume 11 1/4% FHA loan, \$18K equity, no approval, new carpet, newly redecorated, ceiling fan and landscaping, many extras, must see. Call 332-0187.

For sale: 22 acres, Hill country, deer, scenic views, meadows, trees, \$1,100/acre, \$500 down, balance at 11% for 20 years. Call Nickerson, 481-5943.

For lease: 1 BR condo, all kitchen appliances, fireplace, private patio, spacious, all recreational facilities, \$350/mo., no pets. Call 333-2340 after 4 p.m. weekdays.

For sale: Lot at Waterwood, Lake Livingston near Coldspring, sized for weekend home, near golf, tennis, stables, etc. Call Bill, 488-1410.

For sale: by owner, Galveston beach condo, furnished, good location, like new, storm shutters, leasing services available, \$10K equity and assume. Call 488-3377.

For rent: Galveston By-The-Sea condo, 2 BR, furnished apartment for rent by days (two minimum), week or month. Call Clements, 474-2662.

For lease: 1 BR condo, W/D, covered parking, fireplace, clubhouse, pool, tennis courts, icemaker. Call Mark, x4436 or 554-2538.

For lease: House on Loop 610 south, 3-2, central air and heat, gourmet kitchen, hardwood/ceramic floors, fenced yard, trees, \$600/mo. Call Harry St. John, x5835.

For sale: 3-2-2 in Seabrook, Miramar, new roof, tile, inside and outside paint, VA assumption. Call Bill, 488-1410.

For sale: condo on beach, 2 BR time-sharing in Galveston, \$400 assume, \$2,600 balance. Call Ruben, x3171 or 554-2210.

For rent: Co-op special, furnished bedroom in private home, share bath w/other co-op, free cable TV, 10 minutes to NASA, \$140/mo. Call Jim Young, x5071.

Cars & Trucks

1976 Dodge Royal Monaco 2 dr hardtop, power, 20K miles, new 60K-mile tires, Firestone exchange. Call 334-1925.

1972 Pontiac Firebird 350, new transmission, \$1,000. Call R.T., x2525.

1980 Datsun longbed pickup, AC, 5 spd., camper shell, excellent condition, \$6,000. Call Debie, x6393.

1978 Camaro, excellent condition, auto, AC, PS, PB, super stereo cassette, low miles, \$4,800. Call A.F. Smith, x4468.

1975 Plymouth Valiant Brougham, V-8, 4 dr., auto AC, AM/FM/tape, clean, low miles, \$1,495 or best offer. Call 488-0491 after 5 p.m.

1973 Olds Delta 88, auto, PS/PB, AC, \$995. Call 480-6321 after 5 p.m.

1968 Buick La Sabre, 2 dr., runs well and in good shape, new AC compressor but needs evaporator. Call 486-0785 after 5 p.m.

1974 Cutlass Supreme, 76K miles, body in good condition, engine needs repair, \$800. Call Dwayne, x6393 or 476-1673.

1980 Olds Cutlass Classic, AC, AM/FM/Cassette Stereo, 24K mi., extras, must sell, \$6,900 or best offer. Call Beverly, x5760 or 332-3130.

1974 Opel Manta, rebuilt engine, needs work, \$850. Call 334-3019 after 6 p.m.

1976 Olds Omega, 4 dr., auto, AC, AM/FM stereo, PS, PB, see to appreciate. Call Leona, x3338.

1975 Chevy Monte Carlo landau, 350 engine, auto, AC, PS, PB, AM/FM, 84K miles, good condition, \$2,000. Call 554-6685 after 5 p.m.

1978 Ford F150, 4WD, AC, auto, AM/FM/tape, PS, custom wheels, book value \$5,200, will sell for \$3,495. Call Doug, x3561 or 334-2179.

1978 Olds Delta 88 Royale, auto, PS, PB, AC, AM/FM/tape, 4 dr., pwr. locks, 50K miles, 350 V-8, \$4,200. Call Jan, 486-4800, or 333-2129.

1975 Chevy 1/2 ton pickup, auto, PS, PB, AC, fiberglass cover, 65K miles, excellent condition, \$2,700. Call 482-7546.

1974 Dodge van, 3/4 ton, long wheel base, PS, PB, AC, 318/auto, cap-

tains chair, mags, \$1,495. Call 482-8457.

1976 Corvette, auto, AC, PS, PB, T-top, leather interior, yellow, \$6,500. Call Lynn, x4384 or 487-2862.

1976 Datsun B210, orange w/black interior, four new tires, rebuilt transmission, still under warranty, \$1,000. Call Verna, 483-3911.

Cycles

1976 Honda XL175, low miles, good condition, one helmet, \$550. Call A.F. Smith, x4468.

1978 Honda 750K, burgundy, runs well, looks good, carb. gauges, cover, \$1,200 firm. Call Allen, 477-4482.

Motorcycle tires, tubes, chains, oil filters, tuneup kits, batteries, rainsuits, 2 stroke oil, low prices. Call 488-7899 after 5 p.m.

1981 Kawasaki GPZ 550, low miles, accessories, must see, negotiable. Call J.B., x2805 or 480-2308 after 4 p.m.

Lady's bike, 3 spd., \$10; boy's bike, \$5. Call Jim Weldon, x4971 or 482-1461 after 5:30 p.m.

Boats & Planes

1975 Bayliner, 25 feet, full galley seats six, inboard/outboard, good shape, \$9,500 w/trailer. Call 481-1695, evenings.

1979 AMF Puffer, 2 sails, w/trailer, extras, \$1,600. Call R.T., x2525.

Piper Lance for rent, AC, club seating, \$65/hr., wet. Call L. Damewood, 482-5572.

Pearson Ensign sailboat, 22.5 feet, 6.5 hp Seagull outboard, new rigging and sails, slip optional, \$5,800. Call 644-0726.

1964 Chris Craft express cruiser, excellent condition, insurable, Marine survey, plywood hull. Call 488-6441 after 6 p.m.

Audio & Video

Infrared remote control to fit any TV, cost \$120 new, best offer. Call 488-3354 after 6 p.m.

Intelelevision with five cartridges, perfect condition, \$250. Call 333-4614 or 337-3401, evenings.

Computers

Northstar Horizon computer, 32K, 1DD drive, H19 terminal, \$1,700 for both. Call Phil, 488-5660, x308.

ZX80 microcomputer, 1K

RAM/integer BASIC, includes manuals, game book, and past issues of SYNC magazine, \$70. Call Steve, x5185.

HP41-CV, \$200. Call K. Hopping, 538-1758.

Wanted

Want used bassinet in good condition for infant. Call Debbie, x6393.

Want female roommate, non-smoker, to share 3-2-2 house in Friendwood, \$250 plus 1/2 utilities. Call Mary, x4546 or 996-1482.

Want ride from Red Bluff/Burke area, 8:30 a.m. to 5 p.m. shift. Call Shirley, x4258.

Want small 13" bike with or without training wheels, reasonably priced. Call 488-3377 after 4:30 p.m.

Want female to share 3 BR home in Bayview. Call Sandy, x6151 or 339-2252.

Want non-smoker to share 3 BR dome home. Call Ron, 486-2172 or 489-1059.

Want female roommate to share 2 BR apartment, private bath, \$175 plus 1/2 utilities. Call 280-9377.

Want female roommate to share 4 BR house with 2 others, \$230 plus 1/3 utilities. Call Lydia after 5:30 p.m. 488-7235.

Household

Twin bed with mattress and box spring, \$50; fireplace screen with glass doors, \$50. Call Jim Weldon, x4971 or 482-1461 after 5:30 p.m.

14.4 cu. ft. upright freezer, very good condition, 1.5 years old, \$275. Call 482-8457.

Large sofa and matching chair, earthtone colors, excellent condition; 12' X 15' green rug. Call 482-7546.

Portable sewing machine, \$125; exercbike, \$100; portable 9" BW TV. Call Cheryl, x2786.

Custom made bunk beds, extra sturdy, will not separate or tip over, mattress sets in plastic covers, \$175. Call 482-2810.

Red shag rug, good condition, \$25. Call 488-5967 after 5:30 p.m.

Two twin bed sets, mattresses, box springs, frames, \$150; full size frame, \$20; dinette table, \$25. Call 487-3795.

Two single garage doors w/ all hardware, locks and keys, good condi-

tion, \$60 each or \$100 for both; Victorian fainting couch, carved wood, new velvet upholstery, \$365; Edison four-minute cylinder player, Radiola 18 radio, works, and other antiques. Call Terry Slezak, x2662 or 481-5659 evenings.

Baby bed that converts to youth bed, dark brown, very good condition. Call Fred or Birdie, 944-0493.

Sears built-in dishwasher, \$40; floor polisher/scrubber, \$30. Call 482-7073.

Two contemporary chairs, blue/oyster color pattern. Call Bill, x6444 or 488-6465 after 5 p.m.

King-size hide-a-bed sofa, green & brown, \$90; twin-size bookcase headboard, wagon wheel footboard w/frame, \$20; two 9 X 12 rugs, avocado shag and purple shag, \$15 each. Call Foster, 487-0155.

Sears Kenmore large capacity heavy duty washer/dryer combo, \$500. Call 534-2467 or 480-8335.

Animals

Palomino mare and tack. Call Jim Weldon, x4971 or 482-1461 after 5:30 p.m.

Boston terriers, AKC, black and white, whelped 7-5-82, four males, two females, available after Aug. 13th, \$200 each. Call 334-1628 after 4 p.m.

Male Cockatiel, finger trained, talkative, cage included, \$65. Call 480-4766 after 4:30 p.m.

Fluffy dark brown male kitten with tiger markings needs a good home, approx. 8-9 weeks old, fully housebroken, healthy and loves attention. Call Laurie, x2426.

Rare pure bred Afghan puppies, 9 wks. old, blue, silver, white, and tan. Male and female. Call Mitch, 559-2237.

Poodle stud service in exchange for pick of litter. Need beautiful, silver toy, AKC registered female. Call 333-2717 evenings.

Musical Instruments

Accordian, 120 bass, three shift, student model w/case, \$75. Call 485-6423.

Fluife in excellent condition, \$100. Call 488-3354 after 6 p.m.

Ludwig beginner drum kit w/drum pad, stand, bells and stick in black case, \$100. Call Patti, x4841.