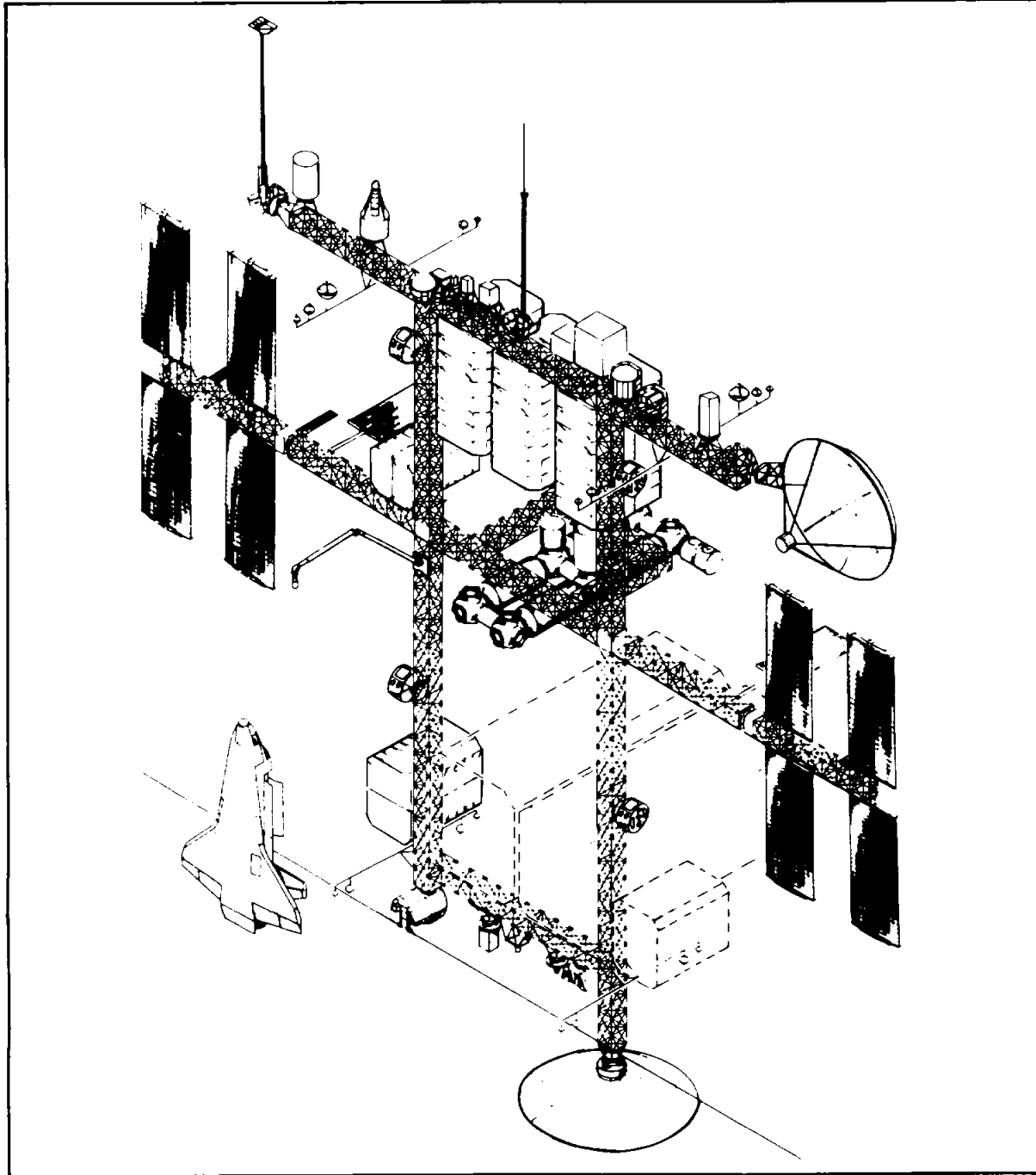


Space News Roundup

Station design continues to evolve



Dual Keel adopted

In the lexicon of the Space Station Program, "Power Tower" is being eclipsed by "Dual Keel."

The design of the Station has undergone the first major configuration change since the Power Tower was selected as the baseline station reference configuration prior to the start of Phase B.

From the beginning, the Power Tower was seen as a starting point, and program officials have predicted all along that it was likely to change.

The updated design, known as the Dual Keel, retains many of the basic elements of the Power Tower, but now has two vertical booms, rather than one, that provide a framework for attachment of other structures.

Another major change relocates the pressurized modules from the lower area of the Station to the center of the configuration, at the structure's center of gravity. This was done to meet the needs of future station customers for the best micro-gravity environment attainable.

"There were many other technical considerations for that change," said Space Station Program Deputy Manager John W. Aaron, "but the most fundamental reason was to meet the

micro-gravity needs of our customers."

Aaron said additional refinements are expected as the program moves toward two major milestones after the first of the year. Designers are studying, for example, the use of larger pressurized modules, with as few as two attached to the Station in the early years of its operation. The exact placement of satellite servicing hangars and servicing bays is also to be determined, Aaron said.

Change board meetings over the next month will determine several other refinements in the geometry of the Station. Program officials hope to have the major configuration design completed by the Interface Requirements Review in January.

After that, the design will undergo validations leading to a second major upcoming milestone for the program, the Systems Requirements Review (SSR) March 17th. The SSR will essentially bring to a close the first half of Phase B. The second half will consist of a preliminary design of the Station and its subsystems, setting the stage for the combined C/D Phase.

Phase C/D — which includes manufacture and launch of the Station elements — is scheduled to get underway in May 1987.

Although not precise in its portrayal of certain elements of the Space Station, the illustration at left shows generally what shape the dual keel design will take. The pressurized modules are located at the structure's center of gravity, and the framework provides many areas for attachment of servicing hangars, payload arrays, communications gear and other equipment. More refinements are expected in the design as the program works toward the Systems Requirements Review in March.

NASA satellite aids in Mexico quake

The chaos following Mexico City's devastating earthquake could have been far worse without the services of a communications satellite developed 18 years ago by the National Aeronautics and Space Administration.

NASA's ATS-3 communications satellite, located at 105 degrees west longitude, through its control center at Malabar, Fla., is providing critical communications support for the international rescue and relief efforts of the American Red Cross and the Pan American World Health Organization.

The voice communications link with the outside world was crucial since the earthquake disrupted all other forms of communications in Mexico City. The Mexican capital was effectively "cut off," except for the communications capability of the ATS-3 satellite.

In a direct radio communication from Mexico City, George Manno, director of media relations for the Red Cross, said, "the ATS-3 satellite is providing us with the most critical communications link to the rest of the world. The ham radio operators have been doing

a swell job but, at present, they are serving as our backup communications system, while we rely primarily on the ATS as our main communications vehicle."

According to Dr. Claude DeVille, of the Pan American World Health Organization, "the ATS-3 satellite is extremely useful in any emergency situation such as the disaster that took place in Mexico."

As soon as the disaster struck, the ATS emergency preemption plan was implemented. Within 24 hours, ATS-3 was on the air and

giving priority to satellite communications traffic involving the emergency rescue operations.

In addition to the American Red Cross and the Pan American World Health Organization, the CBS network also used the ATS-3 satellite for communications between its U.S. operations center and reporters on the scene.

The ATS-3 satellite was developed by NASA's Office of Space Science and Applications, Washington, D.C. Dominick Santarpia of the Communications Division, Office of Space Science and

Applications, Washington, D.C., is coordinating and monitoring the emergency communications effort.

James Lewis, a communications specialist at the General Electric Corporate Research and Development center, Schenectady, N.Y., is assisting in the operation of the emergency communications network.

The ATS control center at Malabar is managed by Paul Eden, and is operated by the University of Miami, under contract to NASA's Goddard Space Flight Center, Greenbelt, Md.

Easley named top professional woman

The receipt of a top national award for professional achievement adds to Elsie M. Easley's belief that high goals and confidence can help shape success.

Easley, Deputy Chief of the Logistics Division, was named one of the American Business Women's Association's Top Ten Business Women for 1985 during the national convention in San Antonio Oct. 10.

An independent, three-judge panel selected her for the award from a field of more than 2,100 business women from across the United States, and more than 6,000 business women were in

attendance for the announcement.

The second highest ranking woman manager at JSC, Easley oversees a working force of 210 civil service and contractor employees and a 30,000 item property inventory valued at \$350 million. The Logistics Division also handles transportation, travel and supply functions for the Center.

"From my earliest recollection, my father never allowed me to believe there was anything I couldn't accomplish," she said. Easley's husband Kenneth, who works for the Technical Services Division, has, she said, "always encouraged me to set and achieve high goals."

A newspaper clipping on Easley's desk is testimony to her belief that each individual is responsible for his or her own success in life. The clipping says: "Today has one thing in which I know I am equal to others — time. Today I refuse to spend time worrying about what might happen. I am going to spend my time making things happen."

One of the most fundamental happenings within the Logistics Division in recent years is a direct result of the efforts of Easley and her supply and equipment management counterparts at the other NASA centers.

As a result of their strategic

planning sessions, they formulated a plan for upgrading the way in which all of NASA's property is accounted for under a program call NIMS (for NASA Information Management System). In the past, each organization at JSC and throughout the agency has had to perform an annual, time-consuming inventory of property. The new system, instituted about a year ago, involves the use of bar codes on the NASA property tags. The codes can be scanned quickly by laser bar code readers and the data can be dumped into a computer.

"The new system is a real time saver," Easley said, "and updating

the data base is much easier now. It is one of the best things that has happened to our accountability of property."

Easley joined the Federal government 29 years ago and began at JSC in 1964 as a supply clerk. In 1965, she was promoted to an inventory management technician and one year later to an inventory management specialist. In 1969, she was named chief of the Redistribution and Utilization Section (R & U) and from 1973 to 1975 she received promotions to Chief, Center Property Section and Chief, Supply Branch. She was named to her present position in 1979.

Bulletin Board

U.S.-India ties to be celebrated

A celebration of the technical and cultural ties between the United States and India will be held from 4:30 to 8 p.m. Nov. 23 at the Bldg. 2 Auditorium. "NASA had made major contributions toward creating and promoting international understanding," said Dr. Kumar Krishen, the event organizer. "Advancements in weather forecasting, resource monitoring, communications and computers are some examples of NASA contributions." The event will include Shuttle film highlights, music and dance and refreshments. For more information, call Krishen at x2872 or 326-2282. The event is being co-sponsored by the Employees Activities Association and the Equal Opportunity Program Office.

Bus tours to festival set

The JSC Employees Activities Association is sponsoring two bus excursions to the 11th Annual Texas Renaissance Festival on Oct. 26 and Nov. 2. The price is \$15 for adults, \$10 for children ages 5 to 12, and \$7 for children under 5 who require a seat on the bus. The price includes transportation and admission to the festival. The buses will depart JSC at 7:30 a.m. and return at 5:30 p.m. Tickets are now on sale at the Bldg. 11 Exchange Store. For more information, call x4814.

PC Organization to meet

The Bay Area PC Organization (BAPCO), the local IBM-PC users' group, will hold its next monthly meeting at 7 p.m. Tuesday, Nov. 19, at the Sheraton King's Inn on NASA Road 1. BAPCO meets regularly on the third Tuesday of each month. For more information, call Earl Rubenstein, x3501 or Jack Calvin, 326-2983.

Aerospace Technology Symposium set

The 3rd Annual Aerospace Technology Symposium, sponsored by the Greater New Orleans Chapter of the American Institute of Aeronautics and Astronautics, is scheduled for Nov. 7 and 8 at the University of New Orleans. Dr. Terence T. Finn, Deputy Director of NASA's Space Station Office, will discuss "Man's Permanent Presence in Space" during the keynote address. A plenary session Nov. 7 will include presentations from the Johnson, Goddard, Kennedy, Lewis and Marshall Centers on the Space Station, and other sessions will cover such subjects as propellant management in orbit, composite structures, robotics, a second generation space shuttle and lunar bases. For more information on the symposium, call Leon Ronquillo at (504) 255-3730 or 255-3697.

METRO now services JSC

METRO's bus service from the Bay Area to downtown Houston now includes JSC. Buses depart eight times daily, Monday through Friday, from the intersection of Ave. D and Third Street (in front of Bldg. 1) for trips into Houston with connections at the Park and Ride lots at Bay Area Ave. and Edgebrook Rd. The downtown service is to and from the intersections of Preston and Louisiana and Jefferson and Milam. The buses arrive at JSC in the mornings at 8:56, 9:56, 10:56 and 11:56, and depart at 9:12, 10:12, 11:12 and 12:12. The afternoon schedule has arrivals at 12:56, 1:56, 2:56 and 3:56, with departures at 1:12, 2:12, 3:12 and 4:12.

NASA's Aerovan to visit JSC

The Aerovan, a large traveling exhibit designed to tell the story of NASA research in aeronautics, will be on display at JSC Nov. 1 to 3. The large walk-through trailer features nine exhibits that focus on current trends in aeronautical research, such as safety, energy efficiency and improvements in passenger comfort and convenience. Other exhibits address the future of aeronautical research and design. Aerovan lecturer William H. Gough will be on hand to answer questions.

Gilruth Center News

Call x3594 for more information

Guitar — This 6-week class for beginners will focus on simple songs, chord strums and melodies. The sessions meet Wednesdays from 7 to 8 p.m. starting Nov. 6. The cost is \$25 per person.

Banjo — Learn to play a 5-string banjo in this class which meets Wednesdays from 8 to 9 p.m. starting Nov. 6. The class runs for 6 weeks and the cost is \$25 per person.

Ladies weight training — Shape up and increase endurance in this class which meets Mondays and Wednesdays from 7 to 8 p.m. beginning Nov. 18.

Turkey Trot race — Entry blanks for the 2nd annual Turkey Trot race are available at the Rec Center. This 5-kilometer run will be held beginning at 8 a.m. Nov. 21. The cost is \$6 for early registration and \$8 the day of the race. T-shirts will be given to participants as part of the entry fee. Those not interested in T-shirts will be charged \$2 to register.

Weight safety class — This course is required for any person interested in using the weight room at the Rec Center. The class covers proper use of the machines and the safety aspects of the facility. The next available classes meet either Nov. 6 or Nov. 20 from 8 to 9:30 p.m. The cost is \$4 per person.

Defensive driving — Learn to drive safely and qualify for a 10 percent reduction in your auto insurance for the next three years. This class meets Nov. 16 from 8 a.m. to 5 p.m. at a cost of \$20 per person. Space is limited.

McCullough, Smith and Wilson honored for secretarial work

Three JSC secretaries have been recognized for exemplary performance and selected as Outstanding Secretaries for July, August and September.

Honored were Rose M. McCullough, Division Secretary for the Solar System Exploration Division; Maureen D. Smith, Secretary in the Astronaut Office, Administrative Support Group; and Helen Wilson, Branch Secretary for the Systems Branch, Propulsion and Power Division.

Cash awards and plaques were presented to the three by JSC Director Gerald D. Griffin.

McCullough, the Outstanding Secretary for July, is division secretary to an organization of about 45 people, supported by 70 contractor employees.

"Most work in the Solar System Exploration Division is 'hands-on,' resulting in a very active administrative burden, including travel orders, purchase requests, a high volume of letters and manuscripts intended for publication, and many requests for information," said Division Chief Dr. Michael B. Duke.

The knowledge McCullough displays of the administrative system is invaluable, he said, because it saves many hours of work as complex documents "flow through the system with little rework."

In addition to typical secretarial duties, McCullough maintains three important Division databases — the travel budget status, publications status and procurement obligations and tracking. "These systems are now running nearly flawlessly, due to her meticulous attention to detail," Duke said.

McCullough also coordinates the preparation of quarterly travel budget forecasts and the weekly activity reports for the Division, jobs formerly carried out by administrative personnel. She has also concentrated attention on the training of student workers and branch secretaries. Duke said that has meant a "highly competent team is now at work in the Division."

Smith, the Outstanding Secretary for August, is responsible for the secretarial tasks related to 13 astronauts. The job demands a great deal of attention to detail, said Administrative Support Group Chief Estella H. Gillette, as missions become more frequent but the large task of getting a flight crew to the launch pad remains.

In April, Smith worked under an especially heavy load as the STS 51-B crew prepared for launch only two weeks after the launch of STS 51-D. Smith, who was secretary to the 51-B crew, also had secretarial duties for eight additional astronauts during that hectic period.

"Through Ms. Smith's outstanding effort, attention to detail and willingness to work long extra hours, all of the numerous secretarial problems associated with getting a crew to the launch pad on time were completed in a timely manner," Gillette said. "The crew



Dr. Michael Duke, Rose McCullough and Center Director Gerald D. Griffin during the award ceremony.



Griffin presents the Outstanding Secretary Award for August to Maureen D. Smith.



Griffin presents the Outstanding Secretary Award for September to Helen Wilson.

of 51-B departed JSC for the launch knowing that all the numerous details were taken care of and were absolutely correct."

Smith's duties require that she work with the offices of some of the highest levels within NASA and the government, as well as coordinating with family members of the crew. "She was always courteous, efficient and represented NASA and the Astronaut Office in exemplary fashion," Gillette said.

Wilson, the Outstanding Secretary for September, is secretary to Cecil R. Gibson, Chief of the Systems Branch, who is responsible for nine major and critical Shuttle subsystems.

In that capacity, she deals often with people in the JSC line and program offices, different NASA Centers, NASA Headquarters and contractor facilities. "There are frequent and critical deadlines to be met and a considerable number

of formal and informal procedural controls to be maintained," Gibson said.

In the absence of the branch chief, Wilson assigns incoming action items to Shuttle managers, composes brief memoranda, prepares agendas and schedules program briefings.

Gibson said Wilson "continues to search for new ways to improve the administrative operation of the branch." On her own initiative, he said, she streamlined the work flow of a branch that consists primarily of Shuttle managers who are constantly making briefings, writing letters and traveling. She has completely reorganized the Branch filing system, implemented procedures to expedite the Division's heaviest typing load, and established a successful action item tracking system.

"She has repeatedly proven herself," Gibson said, "and she exhibits a high degree of professional competence."

Four NETS formed

Four more NASA Employee Teams (NETS) are engaged in training as the program enters its 18th month at JSC.

With the four new teams, JSC will have 20 NETS, 7 of which are combined teams of civil service and contractor employees.

The NETS concept, which is best likened to the quality circle management approach used in private industry, is part of NASA's effort to improve quality and productivity among its employees. Under the program, employees can voluntarily form employee

teams. They are trained by a team from Martin Marietta Corp. in problem solving techniques, and then encouraged to go after problems or difficulties within their own areas.

The Agency hopes to save money, improve quality and involve employees in day to day decision making through the program.

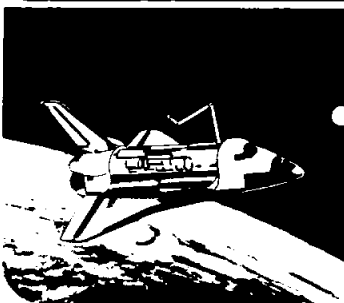
Three of the four new teams combine the talents of civil service and contractor employees. A team representing the Logistics Division

includes employees from Pioneer, while a team out of the Safety, Reliability and Quality Assurance Directorate — the third team in that organization — includes Boeing employees. A third new team combines employees from the Research and Engineering Business Management Office, the Office of the Comptroller and Lockheed. A fourth employee team has been formed in the Technical Services Division.

For more information on the NETS program, call Alma Martin at x3152.

NASA
Lyndon B. Johnson Space Center

Space News Roundup



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Editor..... Brian Welch

Awards ceremony set for December

Twenty-four individual honors and eight group achievement awards will go to JSC employees during the Center's Honor Awards Ceremony December 17 in the Bldg. 2 Auditorium.

Four of the awards have already been presented to JSC employees during ceremonies at NASA Headquarters in September.

The awards include two Outstanding Leadership Medals, two Exceptional Engineering Achievement Medals and 13 Exceptional Service Medals.

The NASA Distinguished Service Medal was presented to Capt. Robert L. Crippen, USN, Deputy Director of Flight Crew Operations, for his service as Pilot on STS-1 and Commander of three other Shuttle flights.

Named to receive Outstanding Leadership Medals were Leonard S. Nicholson, Manager of the STS Mission Integration Office, and Rob. R. Tillett, Manager of the White Sands Test Facility. Nicholson was honored for his role in establishing the payload integration and customer servicing process for the Space Shuttle. Tillett was cited for his outstanding leadership at the White Sands Test Facility.

Dr. Lubert J. Leger, Head of the Nonmetallic Materials Section, Structures and Thermal Division, was named to receive an Exceptional Scientific Achievement Medal for his work related to decomposition of some nonmetallic materials in space. During the early Shuttle flights, Leger discovered that some materials eroded and that the erosion was directly related to the velocity vector in which the Shuttle was flying. He then hypothesized that the new effect was associated with a highly reactive flux of neutral oxygen atoms encountered in low Earth orbit.

Two Exceptional Engineering Achievement Medals will be awarded. One will go to Capt. Bruce McCandless II, USN, for his work with the Manned Maneuvering Unit. McCandless was the first person in history to perform an untethered spacewalk, and along with Charles E. Whitsett, Head of the MMU and EVA Worksite Equipment Section, was a driving force behind the development of the MMU.

The second Exceptional Engineering Achievement Medal will go to Dr. William C. Schneider, Deputy Chief of the Structural Mechanics Branch. Schneider was honored for his work with the Orbiter Thermal Protection System (see related story, this issue) and for his role as leader of the team that developed the Delta space station configuration for the "Skunk Works" structures team.

This year's awards also include the NASA Equal Employment Opportunity Medal, which will go to JSC Personnel Officer Jack R. Lister. As personnel officer for the last 17 years, Lister has been in a position to influence the success and vitality of the Center's equal opportunity programs. One example of his success in that

role is the fact that JSC has met or exceeded NASA's 40 percent hiring goal for women and minorities into professional positions in each of the past 10 years.

Thirteen Exceptional Service Medals will go to JSC personnel this year. Three of those awards were presented to members of the 51-F Ascent/Entry team during ceremonies at NASA Headquarters in September. The three Ascent/Entry team members were Cleon Lacefield, Flight Director, Jenny M. Howard, the Booster Systems Officer and Brian Perry, the Flight Dynamics Officer. The three were honored for their competence and quick work when a Shuttle main engine shut down during the launch phase of 51-F, resulting in an unprecedented abort to orbit maneuver.

Ten other Exceptional Service Medals will go to:

- Philip N. Barnes, Manager of the Shuttle Mission Simulator Facility, for "outstanding professional leadership and technical competence" in the operation of the SMS;

- Harold E. Benson, for his work as Project Manager of the Orbital Refueling System flight demonstration on STS 41-G;

- Renato (Ray) Dell'Osso Jr., for his "exceptional performance" as Chief of the Systems Training Branch and for his work on "two of the most complex EVA flights (51-A and 51-D) since the beginning of manned spaceflight;"

- David D. Ewart, for his work within JSC's Space Shuttle Projects Resident Office (as Deputy Manager) at Downey, California;

- Robert F. Hall, Chief of the Personnel Programs Office, for his work in establishing JSC's labor-management relations program and in managing a series of diverse personnel programs;

- Vernon C. Hammersley Jr., Head of the Mockup and Trainer Section, for his management of critical flight crew training facilities;

- Dr. Carolyn L. Huntoon, JSC Associate Director, for her achievements as a key member of the JSC management team;

- Col. Orlando C. Severo Jr., USAF, who served as Deputy Manager of the NSTS Program Office in 1984 and early 1985 and contributed to the first successful Department of Defense - dedicated mission;

- Everett D. Shafer, longtime JSC Security Chief and now Deputy Director, Management Services Division, for his work within the security field for the last 20 years;

- William H. Taylor Jr., Manager of the Project Engineering Office, for his role as the focal point for all ground tests related to Space Shuttle Orbiters.

NASA Public Service Medals will be awarded to four of JSC's supporting contractors for their exemplary work in the program.

Louis L. Aldridge, Engineering Manager for the Space Systems Division at Martin Marietta Aerospace, will be honored for his leadership in the MMU program.



Satellite retrieval on 51-A.

A flight for which two teams will be honored.

William T. Bouchelle, Extravehicular Mobility Unit (EMU) Manager for the Hamilton Standard Division of United Technologies Corp., will be cited for his role in maintaining quality and reducing cost in the development of Shuttle spacesuits.

James Clint Hundley Jr., IBM Federal Systems Division, will be honored for his work in the development and certification of the Shuttle Avionics Data Processing System.

James A. Wolfelt, Chief Project Engineer for Systems Development at Rockwell International, will be honored for his work in the management and integration of the Shuttle ground and flight system elements.

The December ceremony will



Jenny M. Howard and Brian Perry.

Among the youngest employees to be cited for Exceptional Service, they were honored along with 51-F Ascent Flight Director Cleon Lacefield.

also see eight employee groups honored with Group Achievement Awards. Those awards will go to:

- **The Galileo/Ulysses RTG Cooling System Verification Test Team.** This team validated that a cooling system for the radioisotope thermoelectric generators on both the Galileo and Ulysses probes will work correctly. The tests showed that each of the three critical phases of the RTGs will work as these important spacecraft are carried into orbit for deployment next spring.

- **The Manipulator Foot Restraint Design and Evaluation**

Team. As EVA's have increased in complexity and importance, so have the many uses of the Manipulator Foot Restraint, a portable support platform which attaches to the end of the Shuttle's robot arm. The team was honored for "outstanding teamwork and individual contributions" in development of this important Shuttle tool.

- **The Orbital Refueling System Demonstration Team.** Many future activities in space will include the complicated task of transferring fuel and reservicing satellites. This team was cited for a pioneering effort which led to the first demonstration of that task on-orbit during STS 41-G. Their effort led to a "quantum step forward in

ular and widely heralded missions of the Shuttle program was STS 51-A, during which two healthy satellites were plucked out of unusable orbits and brought back to Earth for refurbishing and relaunch. It was a difficult task, even without time constraints, but the team was able to successfully pull off the development job in less than five months.

- **The Space Station Projects Resident Office Orbiter Vehicle Delivery Team.** The four-Orbiter Space Shuttle fleet is now fully operational, capping more than a decade of hard work. One of the many demanding jobs in this effort was that accorded to the Resident Office at Rockwell's Downey and Palmdale plants. The team was honored for "technical thoroughness and personal dedication" in this effort.

- **The Space Station "Skunk Works" Team.** Long after the Space Station complex is up and operating in low Earth orbit, many of the engineers involved in the program will look on the five-month "Skunk Works" days as the most intense and rewarding. It was during those few short months that the Station program got off the ground, and a reference configuration was produced so that Station Phase B requests for proposal could go out as planned. The 200 members of the team were honored for "exceptional contributions" in this effort.

- **The Westar and Palapa Satellite Recovery Mission Support Team.** As important as development of the EVA hardware for recovery of these two satellites was the design and coordination of mission plans and procedures. This team established the ground rules, identified hardware requirements, developed mockups, conducted thermal-vacuum tests and supported mission operations planning and real-time activities during the flight. The result was a proven capability of the Shuttle to retrieve expensive hardware and return it to Earth.

Center Director Gerald D. Griffin will present the awards during the ceremony, and a reception will follow in the Auditorium Lobby.

TPS was challenging, Schneider says

There were times, William Schneider admits, when the Shuttle's Thermal Protection System seemed like an ultimate engineering version of the proverbial can of worms.

The standards set in the early '70s for protecting Orbiters during reentry were breathtaking, and called for nothing less than marching out and inventing an almost completely new technology.

Schneider, who has been named to receive an Exceptional Engineering Achievement Medal for his work on the TPS, believes the system represents one of NASA's finest engineering accomplishments.

"It is an amazing thermal concept," he said. "It is revolutionary in the sense that the system heats up to 2,800 degrees and radiates 80 or 90 percent of that heat into space. The TPS is probably comparable with the Shuttle Main Engines in terms of the challenges involved. But it was a very difficult job because it hadn't been done before and because of the many, many different factors involved."

Schneider ticked those factors off: "There are 33,000 tiles on an Orbiter and each is different. They have to conform to extremely rigid tolerances, and they mount to different structures, on everything

from graphite epoxy to honeycomb to skin stringer. That means the acoustic excitation is different and gives different natural frequencies for the tiles. They also have different heat loads and different aerodynamic loads."

Schneider, Deputy Chief of the Structural Mechanics Branch, was in charge of structural integrity of the tiles during the complex development effort.

He also worked to improve the procedures for bonding white tiles to the upper fuselages of the Orbiters. "Some of those white tiles are as thin as three tenths of an

inch," he said, "and they had a planform of eight-by-eight inches. During installation, they sometimes cracked as many as half of them."

Schneider "ran some numbers" and showed that a smaller planform of about two-by-two inches would reduce stress on the tiles and increase the bonding strength. But it also would have increased the number of tiles necessary to fill a given cavity. So Schneider developed a way to bond the original eight-by-eight-inch tiles to a felt pad, then slice them with diamond wheel cutters without cutting the strain isolation pad underneath. These "diced tiles" now go on in

the same amount of time as the earlier versions.

Schneider also holds a patent on an auger attachment system for tiles. He developed the idea early in the program, although it was not baselined for the system until after acoustic tests were done in Bldg. 42 which showed that tiles on the body flap region would be subjected to excessive dynamic loads during launch.

The complicated system, Schneider said, "makes the tiles feel as if they are not getting dynamic loads, only static loads." It has been used on all 21 Shuttle flights.

Cookin' in the Cafeteria

Week of October 28 — November 1, 1985

Monday — Chicken & Rice Soup; Wieners & Sauerkraut, BBQ Ham Steak, Steak Parmesan, Beef & Macaroni (Special); Green Beans, Carrots, Au Gratin Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Tomato Soup; Potato Baked Chicken, BBQ Spare Ribs, Mexican Dinner (Special); Squash, Broccoli, Ranch Beans, Spanish Rice.

Wednesday — Seafood Gumbo; Baked Turbot, Liver & Onions, BBQ Ham Steak, Baked Meatloaf w/Creole Sauce (Special); Beets, Brussels Sprouts, Green Beans, Whipped Potatoes.

Thursday — Beef & Barley Soup; Chicken & Dumplings, Corned Beef w/Cabbage, Smothered Steak w/Cornbread Dressing (Special); Spinach, Cabbage, Cauliflower au Gratin, Parsley Potatoes.

Friday — Seafood Gumbo; Pork Chop w/Yam Rosette, Creole Baked Cod, Tuna & Salmon Croquette (Special); Brussels Sprouts, Green Beans, Buttered Corn, Whipped Potatoes.

Week of November 4 — 8, 1985

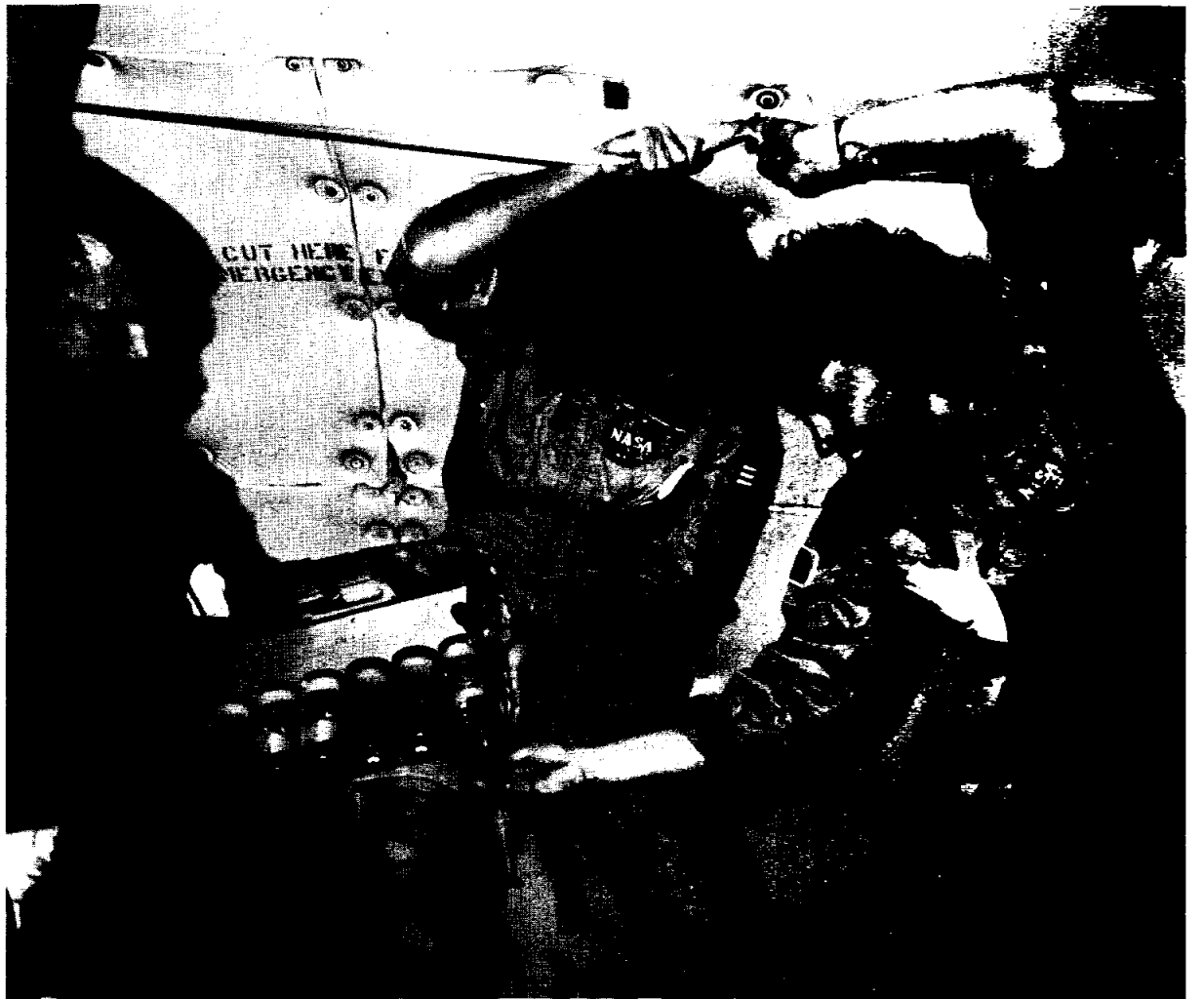
Monday — Cream of Celery Soup; Braised Beef Ribs, Chicken a la King, Enchiladas w/Chili, Italian Cutlet (Special); Navy Beans, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef & Barley Soup; Turkey & Dressing, Country Style Steak, Stuffed Cabbage (Special); Corn Cobbette, Okra & Tomatoes, French Beans.

Wednesday — Seafood Gumbo; Catfish w/Hush Puppies, Roast Pork w/Dressing, Pepper Steak (Special); Broccoli, Macaroni & Cheese, Stewed Tomatoes.

Thursday — Cream of Tomato Soup; Beef Tacos, BBQ Ham Slice, Hungarian Goulash, Chicken Fried Steak (Special); Spinach, Pinto Beans, Beets.

Friday — Seafood Gumbo; Liver & Onions, Deviled Crabs, Roast Beef w/Dressing, Tuna & Noodle Casserole (Special); Whipped Potatoes, Peas, Cauliflower.



Christa McAuliffe, right, and Barbara Morgan, participating in the Teacher in Space Project, team up with Bob Mayfield, a JSC aerospace education specialist, to preview some of McAuliffe's planned experiments on STS 51-L. McAuliffe is injecting a hydroponic solution into a cylinder to review one of the experiments planned for the flight.

Roundup Swap Shop

All Swap Shop ads must be submitted on a JSC Form 1452. The forms may be obtained from the Forms Office. Deadline for submitting ads is 5 p.m. the first Wednesday after the date of 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: Golf course lot, Columbia Lakes, oak trees, compare at \$16,500, will sell at \$15,500. Jack Brown, x3531 or 488-0433.

Sale: Wedgwood Village 3-2-2, covered patio, FPL, fenced, 1,700 s.f., detached garage, owner anxious to sell, \$55,500. Gayle, x4231.

Sale/lease: Bal Harbour 4-3-2 townhouse, 38' boat slip, flex terms, \$218,000 or \$1,500/mo. 486-0865.

Sale/lease: Clear Lake waterfront condo, 2-1.5, new AC, W/D, outside storage, covered parking, \$625/mo. or \$67,500. 474-2948.

Sale/lease: University Green 3-2.5-1, townhome, great view of JSC, assumable, \$72,600 or \$750/mo. Fred, x3829 or 480-1086.

Sale: 30 acres, wooded with creek, community water, hard top road, Lufkin area, lovely homesite. 488-7238.

Rent: Room and private bath in apartment near NASA, pool, jacuzzi, non-smoking female, \$250/mo., utilities paid. 280-9377 after 10 p.m.

Sale: Dickinson/Briarglen 3-2-2, immaculate, fenced, must sell, \$60,000 or offer. 480-8657.

Lease: Seabrook 3-2-2, brick, microwave, fenced, FPL, 4521 Coronado, \$575/mo. + dep. 326-1944.

Rent: Bacliff Villas 3-1-1, central AC/heat, fully carpeted, drapes, fenced, clean, immediate occupancy. 474-4885.

Sale: Middlebrook 4-2-2A, contemp. design, open floor plan, FPL, fenced, well kept, \$88,900. Ron, x3821 or 488-7387.

Sale/lease: League City 2-2.5 custom townhouse, FPL, garage, W/D, appliances, jacuzzi, lawn care, tennis, pool, etc. Mike, 280-4313 or 554-6378.

Lease: League City/Countryside 3-2-2, large fenced corner lot, covered patio, FPL, fan, \$595/mo. 471-3231 or 471-4336.

Sale: Alvin 3 BR, den, study, FPL, large lot, dbl. garage, quiet, assume 9% non-exc. Kaye, x5222 or 585-3570.

Lease: Baywind II condo, 2-2.5-2, large 2-story unit, FPL, W/D, fans, pool, tennis, \$480/mo. Jeff, x5595 or 280-8608.

Sale: '83 mobile home, 14' x 60', 2-1, in nice park, no equity, take over payments, must sell, \$306/mo. 488-1621.

Sale: Time share condo in Galveston, 365-day use, pool, tennis, sauna, whirlpool, \$3,900. 488-1809.

Sale: Large 2 BR south Austin condo, new paint, carpet, all appliances, equity free, assume 12% of less than \$43,000. 482-7910 or (512) 445-5310.

Lease: El Dorado Way 2-2 condo, FPL, W/D, new carpet & mini blinds, tennis, sauna, pool, weight room,

\$460/mo. 488-3497.

Lease: Heritage Park 3-2-2, new section, good location, many extras, \$475/mo. 482-9062 or 488-0887.

Rent: LaPorte 2-1.5-2 townhouse, 2-story, fenced, storage area, close to pool and tennis, on quiet cul-de-sac. 471-3425.

Rent: Baywind 1 BR completely furnished condo, \$450/mo. incl. util. and phone. 333-3925.

Lease: 2 units at Sunbird Lodge, Vail, Christmas week (Dec. 21-28, each unit sleeps 4-6, \$700/wk. ea. + deposit. 474-3839.

Lease: Pebblebrook condo, El Lago, 1 BR, 2nd flr., W/D, mirrors, \$310/mo. + dep. Lindemann, 488-3300 or 532-2218.

Rent: Galveston/Tiki Island, furn. new 3 BR home on canal, boat dock, fishing, etc., TV, master bath spa, weekend, weekly or monthly rates. 486-9335.

Cars & Trucks

'79 Chevy Impala SW, V8, 305 2br., auto, PS, PB, AC, AM/FM, tilt, cruise, new tires, 1-owner. \$1,850. Glenda, x3341 or 482-2157.

'81 VW Rabbit, 4-spd., 2-dr., AC, radio, excel. cond., brown, must sell, \$2,795. 480-3036.

'75 Jeep, dual tanks, posi-trac, roll bar, grill guard, 3 tops, heavy duty suspension, extra engine, 40" x 18" tires, \$2,500. Quinn, x4171 or 482-2821.

'80 Buick Skylark, loaded, original owner, excel. cond., \$3,450. 474-3839.

'81 Mazda RX-7, red, 5-spd., 30K mi., good condition, \$6,500. Costello, x4017 or 532-2001.

'77 Dodge maxi-van, customized, PB, PS, CB, AM/FM/tape, auto, plus more, excel. cond., \$6,900. Bob, x3445 or 921-1715.

'76 Chevy Blazer, 4WD, 350 V8, AT, AC, PS, AM/FM/cassette, CB, canoe rack, Chevy pkg., \$3,000. 333-2218.

'78 Chevy Nova, good body, engine needs work, many extras, \$500 or trade for microwave or VCR. Rusty, x4691 or 486-5581.

'85 Saab 900S, 3-dr., 5-spd., 6K mi., \$14,000. 333-4991.

'81 280 ZX, GL, auto, T-tops, leather, tinted glass, 37K mi., immaculate, \$9,800 OBO. Michael, x5576 or 484-7527.

'81 Chevy Silverado, 1/2 ton, SWB, auto, AC, PS, PB, tilt, cruise, aux. tanks, AM/FM/cassette, \$4,800. 455-4864.

'82 Chevy S-10 Tahoe, longbed, V6, 4-spd, cruise, AC, PS, PB, AM/FM/cassette, new tires, excel. cond., below NADA avge. 482-1535.

'82 Datsun King Cab, 5-spd., AC, AM/FM/stereo, jump seats, 63K mi., good cond., \$4,600 firm. Chuck, 326-4387.

'78 Malibu classic, V6, auto, AC, PS, PB, AM/FM, 83K mi., good cond., \$1,500. Tam, x2997 or 534-3376.

'75 Buick convertible, nice classic, \$2,500. Floyd, 482-7005.

'81 Rabbit diesel, 4-dr., 5-spd., AC, sunroof, AM/FM/cassette, \$2,000. Oliver, x3458.

'83 Datsun 280ZX, loaded, T-tops, red out, gray in, excel. cond., 50K mi., \$10,000 neg. 559-1654.

'79 Malibu classic, 2-dr., PS, PB, AC, AM, rear defrost, Virginia, x3803 or 480-4131.

'74 Plymouth Suburban SW, good working condition, best offer. Kumar, x2872 or 326-2282.

'84 Audi 5000S, sunroof, auto, premium AM/FM/cassette, 23K mi., must sell, \$14,000. Ron, 480-8101 or 326-3106.

'81 Plymouth TC-3, auto, AC, PS, PB, FM, \$2,500. 474-4535.

'80 Dodge B100 van, 8-cyl., auto, AC, PS, PB, \$2,980 OBO. Eric, x3458 or 532-2311.

'71 Buick Skylark, good 2nd/student car, extra clean, peppy performance, excel. main. record, new tires/pump/belts, etc.; loaded, mags, stereo/tape. Connie, x5565 or 333-2271.

'70 Plymouth Duster, not running, \$200 OBO. Dan, x4451 or 486-1102.

'75 Corvette, white w/T-tops, Pioneer stereo sys., \$5,300 neg. Kelly, x3441 or (409) 925-5477.

Boats & Planes

VW airboat, alum. hull, 14' x 72", electric start, gauges, lights, trailer, \$1,000. Quinn, x4171 or 482-2821.

'83 Renken w/sportsman's trailer, 19 ft., 120 HP, all accessories, low hrs., mint, \$4,800. 334-7659.

'77 Skeeter bass boat, wrangler type, 140 HP Evinrude, custom trailer, tilt/trim, 12/24 vlt. troll mtr., other extras, \$4,500. 482-1582.

'80 Monark bass boat, 50 HP Evinrude, troll mtr., depth finder, galv. Dilly trailer, \$4,000. Don, 280-6307 or 554-6205.

'85 wetbike, 800cc. Bullock, 326-4949.

Cycles

'71 Honda CB450, 2,400 mi., Wixom fairing, crash bars, carrier, mint, \$1,100. 486-9335.

'80 Yamaha 650 Special II, 9,900 mi., \$950 OBO. Eric, x3458 or 532-2311.

'80 Suzuki GN400X, mint, 4,200 mi., new tires & battery, \$750. Dave Shulkin, x2201 or 486-8264.

'84 Honda Aero 80 scooter, excel. cond., over 75 MPG, \$500 OBO. Mark, x2551.

'74 Yamaha on/off road, 100cc, \$375. 482-4260.

'83 Kawasaki GPZ1100, garage kept, excel. cond., \$3,100 OBO. Tim, 480-1208.

'79 Honda XL-500S, street legal, runs well but needs some repair and TLC, 15K mi., \$425 firm. Ed, 480-1225 days.

Girl's 26" 3-spd. bicycle, \$25; boy's 26" 10-spd. Murray dirt bike, \$40. 482-6607.

'75 Honda 750F supersport, low miles, excel. cond. Bullock, 326-4949.

Audiovisual & Computers

New 5" B&W portable, batteries included, adapts to car, boat, etc., \$49. Don, 280-6307 or 554-6205.

Amateur radio, AZDEN PCS 4000, Kenwood TR2500 H/T, drop-in charger, accessories. John, 538-2803.

Zenith 160 PC, portable, IBM-compat., 320K RAM, 2 disk drives, built in amber monitor, \$1,500. Paul, x3791 or 486-9266.

IBM PCjr parallel printer attachment, \$90. 480-2776.

Atari video computer system, games, like new, \$110 OBO. Walt, x2951 or 532-1032.

Atari 2600 w/17 games & controllers, make offer. 482-6607.

Hitachi AM/FM stereo radio, Datsun orig. equip., \$35; AM/FM stereo, Volvo orig. equip., \$40. Gene, x6513.

Cobra 25GTL 40-channel CB, antennas included, \$75. Ed, x5489 or 480-0273.

Household

Large black naugahyde couch, gold trim, \$45 OBO; nice floral pattern couch, \$75. Kaye, x5222 or 585-3570.

King size motionless waterbed, 2-tier/12-drawer base, \$300; Bose 301 speakers, \$110/pair; Eureka canister vacuum, beater bar, \$70. 488-1809.

Gold GE refrigerator, 5 yrs., like new, \$350 or trade for VCR or microwave. Rusty, x4691 or 486-5581.

Semi stoneware service for 8, gold w/brown trim, \$50. Bob, 488-0397.

Single bed, mattress, box spring & frame, \$80 OBO. Tim, 480-1208.

Rattan papasan chair & stool, wicker love seat, \$175; nice end table, \$50; 7 ft. couch, \$60. Ed, 480-1225 days.

JC Penny microwave oven, 650 watt, 10 pwr. levels, temp. cooking probe, programmable cycles, was \$500, sell for \$200. 532-3515.

Large sofa in good condition, \$100. 538-4198.

Blue floral sofa, \$25; dinette set, \$20. Kerrie, 496-0194 or Kellie, 484-0463.

Self-cleaning GE Americana elec. range, 30", avocado, good cond., \$150. 480-3595.

Double bedframe, box springs, mattress and brass plate headboard, nearly new, \$150. Gene, x6513.

Two captain's style swivel barstools, 30" high, brass plated metal footrests, solid wood/dark pine finish, were \$160 ea., now \$50 ea. Debbie, 554-6929.

Foam backed draperies, 72" x 61", burnt-orange, like new, \$10. Ed, x5489 or 480-0273.

Musical Instruments

Cortley acoustic guitar, hard case, excel. cond., \$235 OBO. Walt, x2951 or 532-1032.

Spencer flute, excel. cond., perfect for beginner, \$200. 488-6521.

Pets

Free kittens, born Aug. 30, need homes before I move Nov. 1. Kerrie, 496-0194 or Kellie, 484-0463.

Free part German shepherd puppies, mother good natured & smart. Pat Lancon, x7254.

Sale: AKC registered Doberman Pinscher pups, born 9/22/85, pick from a litter of 12 for Christmas gifts. Ruby, 472-6980.

Wanted

Want 16mm mopix editing equipment: splicer (cement), viewer, frame counter, etc. Terry White, 332-5177.

Want folding card t, 100cc, \$375. 482-4260.

Miscellaneous

Baby crib w/mattress, stroller, 1 boy's and 1 girl's Big Wheel, 2 green sleeping bags. Delia, 333-5511 or 585-5062.

Bumper pool table, balls and cues, excel. cond., \$95 OBO. 474-4885.

Royal portable electric typewriter, \$20. 488-1621.

Wheel covers for '82 Dodge 400, Bobs, 4 & 5, all excel. cond., reasonable. 488-6521.

18" Sears round above ground pool, liner, sand filter, pump, new pressure gauge & coping, good condition, bargain at \$450; good 30 gal. water heater, \$5. Shannon, x2755 or 331-6260.

20 lb. CO2 cylinder, for home beer keg, \$60. Eggleston, 482-4239.

Wagner airless paint sprayer, series 200, std. accessories plus nozzle for stain, excel. cond. used once, under warranty, \$55. 488-4069.

Camper top, for short wide bed truck, \$75. Lou, x4267 or 538-3458.

Walnut desk, \$150; mahogany laminated desk, \$150. Vi, x4596.

Desk with glass top, \$50. Teresa, x5948.

Ladies snow skis and bindings, used one season, cost \$350, now \$200; wheel rims, 15 x 6, excel. cond., \$80 for 4. 482-7546.