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Lyndon B. Johnson Space Center

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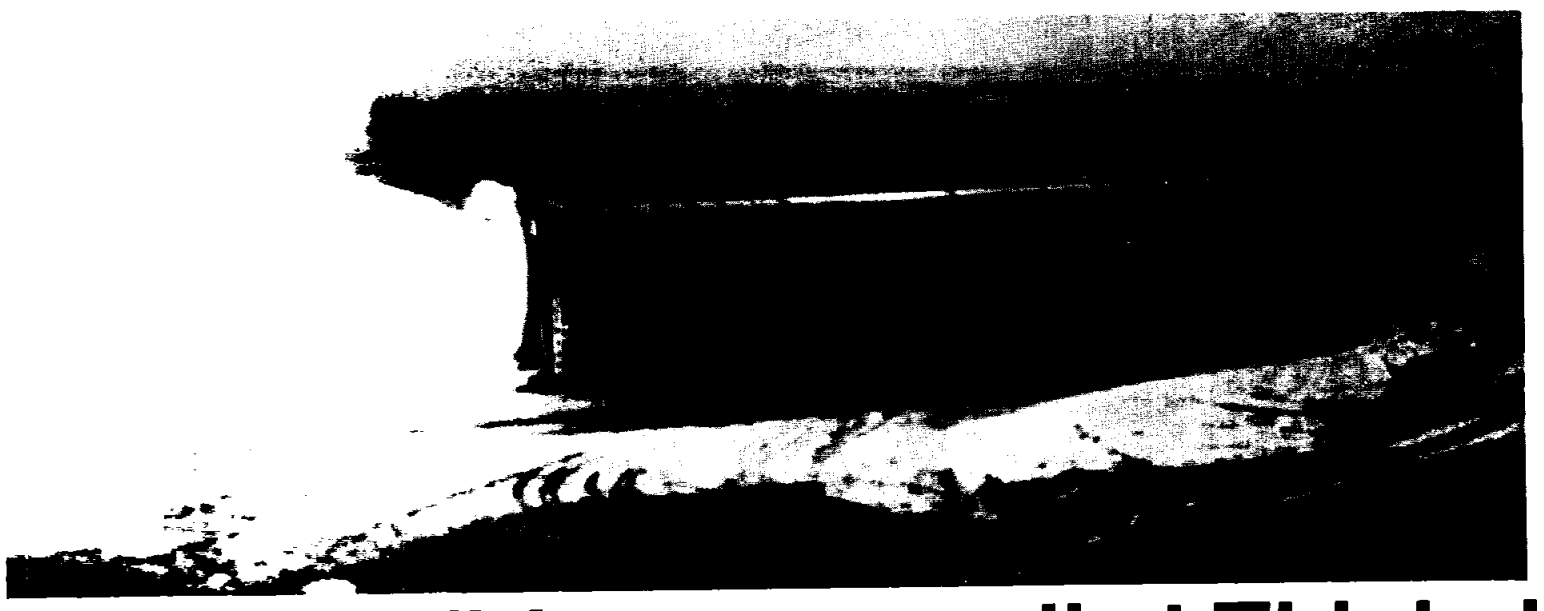

Full-scale firing goes well at Thiokol

The first in a series of full-scale solid rocket motor firings since the Challenger accident was successfully conducted May 27 at Morton Thiokol's Wasatch Operations site in Utah.

The test was part of the Shuttle motor redesign program.

Although the motor tested was not of the configuration to be used when Shuttle flights resume, it did provide data that can help evaluate materials and engineering concepts which ultimately could be incorporated in the redesigned Shuttle solid rocket motor.

The extensively instrumented 126-foot long, 1.2 million-pound Engineering Test Motor (ETM-1A) underwent a full-duration 120-second burn in a horizontal test firing.

The ETM-1A test was the first full-scale, full-duration test firing of a Shuttle motor since May 1985. The case segments and internal insulation for the motor were the same type used on previous Shuttle flights.

The first full-duration test of a redesigned motor, which will include the capture feature and third O-ring, will be conducted in August when Development Motor-8 (DM-8) is test fired.

The seven major objectives of the test included evaluating motor pressure rise rates, new seal materials, effectiveness of the composite overwrap, performance of the joint heater system, structural integrity of the external tank attach ring under motor pressurization loads and of new nozzle nose-inlet rings.

"Predictions for the motor were essentially right on," said John Thomas, Manager of Marshall's SRM Design Team. "We got valuable data from this static test that we will use as we progress with the redesign of the SRM."

Although the ETM-1A case segments are of the original configuration, changes were incorporated into the motor prior to the test. The two forward field joints had original Viton (TM) O-rings, but external graphite reinforcing bands were added to those joints. The aft field joint incorporated one Viton and one silicone O-ring and was fitted with an external tank attachment ring.

All three joints were equipped with a wrap-around electrical joint heater.

The ETM-1A test was the first full-scale static firing test to incorporate graphite overwraps, joint heaters and an external tank attach ring. In addition, several improvements in nozzle construction and assembly were tested. The motor and nozzle were heavily instrumented with 400 sensors to acquire engineering data.

One nozzle feature tested was

(Continued on page 2)

Ride to depart NASA in August

Dr. Sally K. Ride will leave NASA in August to assume the position of Science Fellow at the Stanford University Center for International Security and Arms Control, Palo Alto, Calif.

"It has been my good fortune to work with the men and women of NASA," Ride said May 26. "The scientific opportunities presented to me over the past nine years have given me invaluable experience. The various projects I have participated in have provided unique challenges and have allowed me to grow as a scientist and a person. It is in that same spirit of challenge that I have accepted a position at Stanford University. I am confident of the future of our nation's space program and will always remember my friends at NASA," she said.

"Sally Ride departs NASA with a superb record of accomplishment for which the nation owes her a debt of gratitude," said NASA Administrator Dr. James C. Fletcher.

"Her flight as the first American woman in space firmly established an equal role for women in the space exploration program. Today, the assignment of women to Shuttle crews is a routine matter based on ability and need and is no longer a cause for notice.

"Her assignments in Shuttle systems development, mission control activities and Shuttle flights, in the Challenger accident investigation and in managing studies that will help the nation choose its next major goal in space mark her

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Studies to focus on lunar base systems, uses

Five one-year studies of how a base on the Moon could be built and operated and an assessment of its uses and benefits will be conducted under contracts or grants administered by the Johnson Space Center.

Over $1.2 million is expected to be spent in the effort during the next year.

NASA is considering development of a lunar base as one of four candidate initiatives that could become the focus for the agency's next program beyond the space station.

Two of the studies, to be conducted in-house using civil service and contractor manpower at JSC, will deal with utilization of a Moon base and advanced lunar transportation.

The total value of the effort is estimated at $578,000.

Additional studies will define lunar base systems, develop a computer model which incorporates the elements of the Space Transportation System (Shuttle, Space Station and expendable rockets) along with lunar base elements and construction requirements, and analyze concepts for space vehicles which are propelled by other than chemical rockets.

The lunar base systems definition contract, valued at approximately $438,000, is expected to be awarded in the next few weeks. The Large Scale Programs Institute and the University of Texas at Austin will receive in July a $135,000 grant for the computer model development, and the California Space Institute of the University of California at San Diego received a $75,000 grant June 1 for the alternate space vehicles study.

Other future NASA programs under consideration include a manned mission to Mars, a significantly expanded unmanned planetary exploration program, and an expanded, intensive investigation of the Earth from space.

Recent NASA strategic planning has considered the possibility of establishing a significant scientific outpost on the Moon by the year 2005.

The rationale behind creation of a lunar base includes the establishment of the next generation of planetary science, astronomical and other research facilities in space, development of the natural resources of the Moon for use in space, and use of the lunar initiative as a test bed for the technologies which will enable humans to live away from Earth for extended periods without total dependence on Earth.

The Moon represents the closest source of materials outside of the Earth. Materials can be transported into space from the Moon for about 5% of the energy required for transporting the same materials from Earth.

The Moon is relatively rich in certain elements, specifically oxygen, silicon, iron, calcium, aluminum and magnesium. A permanent lunar base can be created to access and utilize these resources to sup-

(Continued on page 2)

Office of Exploration established

NASA has created an Office of Exploration to coordinate activities that could lead to an expansion "of the human presence beyond Earth."

Administrator D. James C. Fletcher appointed Dr. Sally K. Ride to serve as the office's acting administrator until her departure from the Agency in mid-August.

Fletcher said a decision to establish a lunar base or begin a major Mars initiative would not impact the first phase of Space Station Development. With the current plan to build the Station in two phases, a lunar or Mars initiative would influence the design of the second phase so it could serve as a technology test and a logistics terminal for lunar or Mars activities.

"There are considerable—even urgent—demands for a major initiative that would re-energize America's space program and stimulate development of new technology to help the nation remain preeminent both in space and in the world's high-tech marketplace," Fletcher said.

Fletcher said the office is "a step in responding to that demand.

"It will analyze and define missions proposed to achieve the goal of human expansion off the planet. It will provide central coordination of technical planning studies that will involve the entire Agency. In particular, it will focus on studies of potential lunar and Mars initiatives," Fletcher said.

Fletcher noted that Ride's study group has recently identified four major initiatives as possible new national space objectives. The initiatives are an intensive study of Earth from space, a substantially increased robotics program for the exploration of the Solar System, establishment of a lunar base and human exploration of Mars preceded by intenstive robotic exploration of the planet.

Fletcher said the Ride study group developed these possible goals in a "workshop/task force environment," and added that "at that plateau, Sally concluded that these and two other potential initiatives deserved further intensive and systematic consideration to help determine a NASA position on a goal and to follow through after a goal is identified. Therefore, in the case of the two initiatives related to human expansion off the planet, she recommended that this new office be established."

Further studies of the Earth systems and robotic exploratation proposals will be managed by the Office of Space Science and Applications At Headquarters.

The new office will concentrate on mission concepts and scenarios, schedules, transportation requirements, facilities utilization, resources requirements and science opportunities.

Energia launch testimony to ambitious program, NASA says

NASA's reaction to the Soviet Union's successful launch of the Saturn V-class Energia heavy lift launcher May 15 was reflected in a statment released at Headquarters May 20.

Following is the text of that statement:

"This success is additional evidence of the determined nature ofthe Soviet space program. "It is well-funded and makes steady progress, some of it spectacular. It is ambitious, especially with its plans in space science to explore Mars and Phobos. It is enlarging its space station and rapidly expanding its experience in manned spaceflight.

"While the Soviet Union was building its capabilities, the budget for the U.S. space program contracted dramatically following the Apollo program. Today, budget considerations have forced us to go to a phased space station development program, and to postpone the time we will put the first element into operation.

"Numerous authorities on the subject agree that if the United States space program is to remain ahead of the Soviet Union's, funding must rise to a new plateau so NASA can simultanously build and operate the Space Station, maintain a vigorous space science program, develop advanced technologies and begin work on some ambitious new projects, such as establishing a permanent base on the moon or beginning human exploration of Mars."

Space News Briefs

Longest SSME firing in history successful

The longest Space Suttle Main Engine (SSME) test firing in history was successfully conducted May 9 at the National Space Technology Laboratories. The 850-second firing using engine 2105 was intended to demonstrate the main engine run times which would be necessary to support some of the worst case Shuttle abort scenarios. A 761-second firing on the same engine, conducted in February, simulated the firing duration of the mains during a return -to-launch-site abort. engine 2105, used as a research and development engine for certifying design modifications, has acquired 23,950 seconds of run time. Since the beginning of the year, 16,041 seconds of testing have been run on SSMEs at the Louisiana laboratory.

AC-68 launch date set for Atlas - Centaur 68

NASA has set Friday, July 24 as the launch date for the Atlas Centaur 68 vehicle presently undergoing pre-launch checkout at the Kennedy Space Center. The window for launch from Pad 36-B opens at 6:58 a.m. CDT and concludes at 7:54 CDT. Should technical problems or weather require a flight delay, launch op portunities are available on succeeding days. The payload is the FLTSATCOM F-8 communications satellite for the Navy and the Department of Defense. AC-68 will be the last Atlas Centaur launched by NASA. The program is being transferred to the General Dynamics Space Systems Division for commercial operations. The agreement between NASA and General Dynamics for the inception of Atlas Centaur commercial operations was recently signed and approved by Congress.

Missing wrench located in Discovery

A wrench lost inside the Orbiter Discovery during its assembly at Rockwell International's Palmdale plant was located and retrieved May 21 during structural inspections on the spacecraft. X-rays of the foward fuselage area revealed a standard open-end wrench located between the crew cabin pressure vessel and the ship's outer hull in the vicinity of the right side forward cockpit windows. In a review of how it got there, engineers found that the wrench had been lost at Rockwell during the final months of work on Discovery. Rockwell was unable to locate the wrench at the time and the matter was closed with NASA's concurrence prior to Discovery's delivery. An analysis conducted then showed the wrench would pose no danger or threat of causing damage. During the spacecraft's six spaceflights, the wrench migrated forward into the fold of an insulation blanket.

Klineberg is new Lewis director

Dr. John M. Klineberg has become the new director of the Lewis Research Center. Klineberg, who has served as deputy director at Lewis since Junly 1979, was deputy associate adminstrator for Aeronautics and Space Technology. He joined NASA in 1970 at the Ames Research Center. Klineberg's appointment fills a vacancy left when Dr. Andrew Stofan was named associate administrator for Space Station last year.

License plate sales exceed expectation

Florida's sale of license plates commemmorating the Challenger is exceeding expectations, officials said. According to United Press International, 76,000 plates had been sold as of March 31. The state Department of Motor Vehicles gives $15 from each plate sold to the Astronauts Memorial Foundation, which plans to build a memorial to the 14 astronauts killed since the space program began. The group hopes to raise $24 million for the memorial, which is to be built next to a reflecting pool on land donated by NASA north of the Kennedy Space Center's visitor complex. A national contest will be held for design of the memorial, with a winnner to be announced in January 1988 and dedication of the monument planned for 1990.

Bulletin Board

White-water rafting trip tickets on sale

JSC's Employment Activities Association has chosen two Saturdays, June 20 and July 25, as the dates for its annual White-Water Rafting and Barbecue on the Guadalupe trips. Tickets for the first date are on sale now; the last day to purchase tickets is June 12. Tickets for the second date will be available June 29; the last day to purchase tickets will be July 17. Cost of the June 20 trip is $32 a person, and includes bus transportation, raft trip, barbeque beef dinner and progressive Country and Western dance at Gruene Hall. Cost of the July 25 trip is $27 a person, and includes everthing but the dance. You'll be required to show your NASA badge when you purchase tickets. For more information, call x35350.

Cut a rug at the Rec Center on June 13

The ContraBand Swing Band will provide the music for an EAA-sponsored Ballroom Dance on Saturday, June 13, at the Rec Center. Social hour begins at 7 p.m., dinner at 8 p.m., and dancing will be from 9 p.m. to 1 a.m. Cost is $10 a person. A limited number of tickets is available at the Bldg. 11 Exchange Store from 10 a.m. to 2 p.m. through June 10..For more information, contact Larry Davis at x38055.

Astros vs. Mets tickets to be offered

Tickets to the July 10 meeting of the Houston Astros and the New York Mets will go on sale in the Bldg. 11 Exchange Store on June 24. About 500 field level seats on either the first-base or third-base lines will be available for $6 each. You'll be required to show your NASA badge when you purchase tickets, and there will be a limit of eight tickets per purchase.

Technical Societies banquet is June 12

JSC Director Dr. Aaron Cohen will be the featured speaker at the fourth annual awards banquet of the Clear Lake Council of Technical Societies June 12 at the Gilruth Recreation Center. The event will begin with a social hour at 6:30 p.m., followed by dinner at 7:30 and the awards ceremony thereafter. Three awards, for technical educator of the year, technical manager of the year and technical person of the year, will be given. For more information, call Marcia Taylor at x30195.

Photography to be on exhibit at Ford Bldg.

"In Space: A Photographic Journey," an exhibit now showing at the Transco Tower, will be on display in the lobby of the Ford Aerospace Bldg. June 20 and 21. The exhibit, sponsored by Transco, Gerald D. Hines Interests and NASA JSC, will be free and open to the public from 10 a.m. to 6 p.m. June 20 and from noon to 6 p.m. June 21. For more information, call the Clear Lake Area Chamber of Commerce at 488-7676.

On May 20, 1987, NASA and contractor employees attended the PC Graphics '87 Expo held in the Product Demonstration Facility to see graphics software demonstrated by 12 vendors. Approximately 1,000 employees visited the PDF to see 20 graphics packages demonstrated and disccussed. With the success of this event, the Data Processing Systems Division (DPSD) plans to sponsor additional expos in the future. Details will appear in the DPSD Newsletter, flyers distributed throughout JSC, and the JSC Roundup.

Firing tests nozzle changes

(Continued from page 1)

a ply-angle change on the forward nose and aft inlet positions of the exhaust nozzle. The term ply-angle refers to the angle at which composite tape is wound onto a shaped mandrel during manufacture. Changed ply-angles are expected to provide better control of nozzle material erosion during firing. Another feature tested was a backfill technique for applying sealant into the nozzle exit cone attachment joint.

Four days before the ETM-1A test, Thiokol successfully conducted Nozzle Joint Environment Simulator (NJES) test, which encompassed diversified motor system operations such as evaluating and characterizing the solid rocket motor nozzle-to-case joint, obtaining information on the joint deflection data and validating the test article in its original design.

The NJES test article was configured from full-scale Space Shuttle solid rocket motor metal case hardware. The test article consisted of a forward dome, an aft dome, a nozzle fixed housing and a piston assembly. The test will incorporate an Arctic Nitrile O-ring primary seal and a Viton O-ring secondary seal.

A deliberate leak path, through the insulating putty to the primary seal, was built into the test configuration.

Three previous NJES tests, using pressurized water instead of propellant, have been conducted. These tests successfully provided engineering data on the performance of the nozzle-to-case joint used in both the original design configuration and in the radial bolted redesign configuration.

Additional tests of the NJES are planned through 1987.

Ride receives praises for work

(Continued from page 1)

career as one of the most varied and productive in agency history.

"The country is fortunate that her energy, intelligence and good sense will continue to be focused on matters of vital public interest security and arms control," Dr. Fletcher said.

Astronaut Office Chief Dan Brandenstein said, "Dr. Ride has been an exceptionally valuable member of the NASA team and very valuable to us in the Astronaut Office during her tour with the Agency. Her talents will be missed, but we wish her well in her new endeavors and thank her for her efforts."

Ride joined NASA as an astronaut candidate in 1978. During her career in NASA, she participated in development of the Shuttle remote manipulator system, served as CapCom in Mission Control for four Space Shuttle flights, and participated in two flights STS-7, launched in June 1983, and STS-41G, launched in October 1984.

Following the Challenger accident President Reagan appointed her as the astronaut member of the Rogers commission that investigated the tragedy.

Upon completion of the investigation she was assigned to NASA Headquarters as special associate administrator for long range and strategic planning. She will remain at NASA Headquarters until August 15 to continue the assessment of NASA's long-range goals.

Ride earned a B.S. (1973), M.S. (1975) and Ph.D. (1978) in physics from Stanford Univerity. She will work as a physicist in her new position.

Liquid booster RFP issued

NASA has issued a request for proposals for system studies and design concepts of liquid-fueled rocket boosters for possible use on the Space Shuttle and other future vehicles.

The Marshall Space Flight Center's Advanced Projects Office said nine-month multiple studies of both pressure-fed and pump-fed liquid-fueled rocket boosters could begin as early as this summer.

The overall liquid rocket booster study also involves several other NASA centers, including JSC, the Kennedy Space Center and the Langley Research Center.

JSC will evaluate the effects of liquid rocket boosters on the overall flight characteristics of the Space Shuttle. KSC will analyze the integration requirements of liquid rocket boosters on launch facilities. Langley will assist in aerodynamic analyses and evaluation of wind tunnel tests of Space Transportation System/liquid rocket booster concepts.

Lunar base options studied

(Continued from page 1)

port the growing space infrastructure, minimizing the resources needed from Earth and thus lowering the overall operational costs of many space activities.

Many astronomers believe the Moon would be a prime location for certain astronomical observations, especially with radio telescopes. The Moon's hard vacuum, low gravity, stable thermal environment, permanently shaded polar regions and very low magnetic field could simplify many experiments that would be difficult to accomplish on the Earth or in free space. On the far side of the Moon, astronomers would be free from Earth's pervasive light and electromagnetic pollution problems.

The JSC lunar base studies represent second-level definition of the lunar base elements and Earth-to-lunar transportation systems that have been identified in previous studies.

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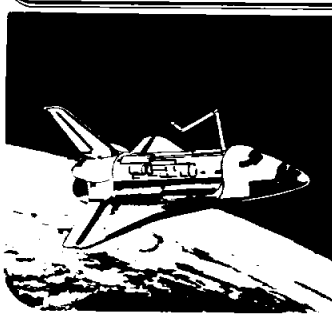

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Editor . . . . . Brian Welch
Assistant Editor . . . . . Kelly Humphries

Mary Henry, one of two Payroll Section Work Leaders, and Bertha Corbett, a Financial Programs Specialist in the Systems Office, discuss an upcoming payroll before a desk full of computer printouts and cards.

A JOB THAT PAYS

Payroll Section keeps checks coming for JSC's employees

Do you frequently encounter errors in your pay and leave statement?

Probably not.

When you do have a problem with your pay or leave, is the Payroll Section surly and uncooperative?

Probably not.

Did you know that it takes only 12 people to put out the payroll for the approximately 3,600 civil servants at JSC, White Sands and Downey every other week?

Probably not.

Do you know how much extra effort JSC's Payroll Section has been exerting to process new W-4 payroll deduction forms for every employee, keep two separate retirement systems working smoothly and implement the new Thrift Savings Plan?

Probably not.

Has your paycheck ever been late?

Never, even though there have been more than 2.5 million paychecks issued at JSC since 1962.

Those are some of the reasons everyone in that section recently received a Special Achievement Award for being among the center's unsung heroes.

"The average person on the center doesn't actually know how involved it is to get their paycheck," said Bertha Corbett, a Financial Programs Specialist in the Systems Office who started working as a Payroll Clerk at JSC in 1963. "These people are really special; they really put their whole hearts into it."

The Payroll Section in Bldg. 17, part of the Payroll, Travel and Accounting Control Branch in the Financial Management Division of the Administration Directorate, has one Payroll Supervisor, Patricia Rieck; one Payroll Technician, Cynthia Neal; two Work Leaders, Mary Henry and Shirley Randolph, and six Payroll Clerks, Barbara McClenan, Kimila Mikesell, Mary McLain, Carol Ochoa, Joyce P'Pool and Judithe Savely. Two Computer Sciences Corp. employees, Dawn Berniek and Kim Brennan, also work in the section.

Chuck Morman, the Branch Chief who supervises the payroll section, said the title "Payroll Clerk" was appropriate years ago, but that their work has changed as the payroll system has evolved from partially manual, partially punch card to computerized and fully on-line.

"Today that's not a correct title; the people in payroll are all technicians," Morman said. "The payroll has become so complicated now that they have to be a technican and an expert in those matters in order to process the payroll."

Nevertheless, the basic qualities employees need to work in payroll remain the same.

"You have to be good at math and dealing with detailed information," Morman said.

Cindy Neal, who started as a Payroll Clerk 2 1/2 years ago, now checks the totals of each pay block - about 450 checks - to be sure they balance. She prepares vouchers for that money, various other reports and correspondence, and acts as supervisor when Pat Rieck is gone. She said the responsibility of making sure everyone gets paid accurately and on time can be tough on people.

"It is very interesting work, but it can be extremely stressful because of the time constraints," she said. "You can put just one wrong number in and it can just blow the whole thing apart."

Some pay periods are worse than others, depending on the number of actions - promotions, new hires and such - that are occurring around the center, she said. And the knowledge that some of the paychecks being processed belong to high-ranking center officials is always there.

"One time I accidentally sent (then Associate Director) Carolyn Huntoon's check to a bank in San Antonio, Texas," Neal recalled. "She was real nice about whole thing, and we took care of it, but ..."

"You have to have a very good personality because you deal with all levels of management," Corbett added. "I think a payroll clerk has to be very much a diplomat. The aim of a payroll clerk is to see to it that people get paid on time, and also to handle people's problems in such a way that after the employees talk to payroll they feel good, satisfied and pleased with the way payroll has handled their problem."

Pat Rieck, who has been Payroll Supervisor for a year, said the section's employees show their dedication by working late at night or on weekends to ensure that the payroll gets out on time. Their dedication comes from putting themselves in the places of the employees in their pay blocks.

"You have to put yourself in the position of the people you are taking care of," she said. "You feel like you owe something to your pay block."

William Kelly, Director, Administration, presented Special Achievement Awards to all of the payroll section employees May 27.

Above, William Kelly, Director of Administration, presents a special achievement award to the Payroll Section. At right, Payroll Section Supervisor Pat Rieck accesses payroll data on a computer terminal.

JSC develops payroll system for all centers

Because JSC uses one of NASA's most modern payroll systems, the entire agency is using the JSC system as the baseline for an integrated personnel/payroll system prototype.

The proposed system, called NASA Personnel Payroll System (NPPS) or "nips," would consolidate the separate systems at individual centers and integrate the personnel and payroll databases, said Norris Taylor, NPPS Development Project Manager at JSC.

The prototype is to be completed by July 1, Taylor said. Then, it will be evaluated by a user committee consisting of representatives from all NASA centers as well as members of the Headquarters' Program Management Team, automated data processing, personnel and payroll offices.

The prototype is to be implemented at JSC after the evaluation period - probably by September. Taylor said after revisions are made to accommodate evaluations and additional requirements, agencywide implementation of the system is targeted to begin in fiscal year 1988 and be complete by fiscal year 1989-90.

The main objective of the integrated payroll and personnel system is to improve productivity and cut costs, he explained. For example, now when an employee is promoted separate paperwork must be completed in personnel to make the promotion effective, and in payroll to reflect any change in salary. In the future, once the appropriate personnel paperwork has been completed the appropriate salary change will occur automatically.

Also, the new system will allow sustaining software maintenance to be performed only once, Taylor said. Regulatory changes will be made first at JSC, then forwarded to all other NASA installations for implementation. Now, changes are made by each center on different schedules.

"The average worker won't know any difference," Taylor said. "Who it's really different for is the payroll unit and personnel."

In addition to Taylor, four other JSC employees are working on the system - Jerry Greif and Bertha Corbett from Financial Management, Rich Campbell from Personnel and Kenneth Truman from the Mission Planning Analysis Division. Eighteen support contractor employees from Computer Sciences Corp. (CSC) also are working on the prototype.

"It's a very enthusiastic team throughout the agency," Taylor said.

The new system will run on an IBM-compatible "ADABAS" Data Management System that uses the Natural programming language. The current system runs on a Sperry Univac that uses the COBOL programming language.

Taylor said the drive to create a common NASA system began two years ago as part of the initiative to save money and reduce sustaining maintenance costs. Headquarters invited proposals, and JSC's suggestion to use its existing system as a baseline to develop an agency standard was accepted, he said.

Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP 3 *Roundup*, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

Sale/lease: CLC 4-2-2, near schools, park. $600/mo. 282-3479 or 532-1112.

Sale: Middlebrook 3-2-2, split BR, FPL, new A/C. $81,900 or assume 8 ⅛% ARM. 280-8566 or 333-4149.

Lease: Piper Meadow CLC large 3-2-2 FPL, game room, deck, drapes, fenced, new paint, carpet, $625/mo. 486-0315.

Rent: Deats Road 1BR apartment, Dickinson area. $259/mo., $89 deposit. 337-2376.

Lease: CLC area, large 2-2-2PS condo, FPL, wet bar, fans, W/D, security system, pool, tennis, sauna, children and pets OK. $395/mo., $200 deposit. 480-4525 or x36228.

Sale: Heritage Park 3-2-2, large backyard on quiet cul-de-sac, high efficiency A/C, new drapes, floor, garage door openers, storm doors. $53,990. 482-9103.

Sale: 420 acres 1 mi. outside Center, TX. 300 timber, 120 pasture, half mineral rights. 482-4365.

Sale: Shoreacres 3-2-2 country house, half-acre wooded lot, fenced, knotty pine kitchen, game room, beam-ceiling master BR, walk to Galveston Bayou, boat ramp, pier. $69,500. Jon S., x30159 or 470-9267.

Sale: Baywind II 1-1 condo, FPL, mirrored walls, miniblinds, fans, W/D connections, assumable loan. 471-6814.

Sale: 3-2-2 brick house on 30.5 acres near Lake Pinkston, Shelby County, near Nacagdoches, Tx. 713-488-6169

Lease: 3-1.5-2 townhouse, fenced, corner location, quiet neighborhood, pool, tennis basketball, $450/mo., deposit. 486-4466.

Sale: Rockport waterfront house, 1,400 sq. ft., 3BR, 2.5BA, 60-ft. dock, deep water access. 473-2709.

Sale: Toledo Bend lakefront modified A-frame, 2BR, loft, LR, kitchen, BA, needs work, $40,000. 409-565-4114.

Sale: Toledo Bend lakefront modern rustic house, tri-level, 3BR, 2BA, FPL, split-level deck, $59,900. 409-565-4114.

Sale: Mobile home set up at Texas A&M, 14x65, 2-2, central air/heat, $9,500. Doug, x30964 or 480-2929.

Rent: El Dorado Trace condo, furnished, 1BR, study, W/D, color TV, pool, exercise room, jacuzzi, $450/mo. 488-6414.

Rent: Room in Webster condo, $225/mo. plus utilities, $50 deposit. Rick, x36156 or 480-1218.

Sale: Univ. Trace townhouse, 2-2.5-2CP, all appliances, FPL, security system, under $50,000, assumption. 333-4044.

Sale: East Huntsville, 10 acres on the hill in Acorn Hill Estates. $3,000/acre., assume 8.5% note. 333-4044.

Lease: Egret Bay condo, 2-2-2CP, fans, FPL, new carpet, $390/mo., $100 deposit. references. 486-8551.

Rent: Galveston Gulf-front condo, fully furnished, sleeps 6. Glen, 280-8644.

Sale: Country house, 1.33 acres, 3BR, 2BA, large garage/carport, high efficiency A/C, all electric, deep well, 2 blocks off 518 near 146. $90,000. Nelson, 334-1883.

Sale: Custom-built 3,100-sq.-ft. house across from water, large wooded lot, 4-2.5-2, open floorplan, many decorator features. $149,000. Jerry, x38922 or 474-4310.

Sale/lease: Nassau Bay, 2,200-sq-ft. townhouse, 3-2-2, study new carpet, paint, large garage, deck, atrium, 20-ft. FPL. $109,000 or $790/mo. Jerry, x38922 or 474-4310.

Sale: Austin, TX, Lakeway, Lake Travis townhouse, 2,000 sq. ft., on golf course, beautiful area, fully funished, ex. cond. 326-2461.

Lease: Lake Livingston waterfront house, 3-2, sleeps 8, fully furnished, pier, fishing, skiing, swimming, weekend or weekly rates. 482-1582.

Rent: Galveston condo, 2BR, pool, tennis, 72nd and Seawall, 2 day min. Clements Jr., 474- 2622.

Lease: Baywind II 2-2 condo, FPL, W/D connections, downstairs corner, near pool. $375/mo. plus deposit. John McLeaish, 480-7445.

Rent: Galveston Gulf-front condo, sleeps 6, fully furnished, tennis, whirlpools, affordable rates. 480-5270.

Sale/lease: Meadowbend, 3BR, 2BA, large rec room, new paint inside, drape/-miniblind, fenced, children and pets OK. $772/mo., $200 deposit, or assume mortage and pay closing costs. 334-1345.

Lease: Two 1BR condos, fan, new paint, drapes, FPL, microwave, W/D connections. Jim Briley, 282-1880 or 488-7902.

Lease: West Galveston Island beach house, 3-2, furnished, day, week, month. Ed Shumilak, x37686 or 482-7723.

Cars & Trucks

'76 Grand Prix loaded sunroof, runs great, maintenance records. $1,050. Doug, x30964 or 480-2929.

'80 Pontiac Bonneville, 4 dr., V6, $2,995 OBO. Rick, 480-1218 or x36156.

'80 Buick Skylark LTD, ex. cond., manual, AM/FM, A/C, 4 dr., new trans., $1,950 OBO. 333-2717.

'79 280ZX, 5 spd., A/C, AM/FM/cassette, removable sunroof, tinted windows, louvers, Le Bra, new tires, brakes, clutch, 66K mi., slight fender damage. $3,200 OBO. Kay, x34826 or 331-3379.

'85 Jeep Cherokee SW, 4x4, PS, PB, A/C, AM/FM/cassette, roof rack, tint, deluxe interior, good cond., 46K mi., $8,900. 480-6805.

'78 Chevy Camaro. $1,200. x37470 or 337-4990.

'79 Toyota Corolla station wagon, hatchback, good cond., 83K mi., $1,400. 534-4369.

'76 Ford Van, auto., A/C, PS, PB, 351 V8, body fair cond., runs, $1,300. Tom, x35488 or 482-9172.

'78 Bonneville Brougham, good tires, A/C, $1,250. Nelda, 326-1438 or 333-6464.

'59 Mercedes Benz 220S. David, x35464.

'80 Plymouth Horizon, low miles, no A/C, ex. cond., 4 dr., AM/FM/cassette, $1,000. 337-6760.

'82 Chevy Impala wagon, PS, PB, A/C, AM/FM stereo, ex. mechanical cond., 47K mi., $3,650. 333-3913.

'76 Toyota Chinook motor home, A/C, stove, sink, refrig., 110V converter w/battery charger, pop-up top, sleeps 4, $4,170. 333-3913.

'78 Toyota Corolla TE31, brown, 2 dr., one owner, good cond., $1,400. Sue, x34008 or 482-9408.

'81 Pontiac Phoenix, auto., air, PW, $1,400. x30524 or 485-2165.

'80 Phoenix, 5 spd., A/C, PW, $1,200. x30524 or 485-2165.

'76 Ford Elite, A/C, cruise, good tires, battery, $500. 333-6509.

'53 MG-TD, suitable for reconditioning. x35039.

'80 Cutlass Calais, ex. cond., full power, $1,000 stereo, tint, velour, runs great, 80K mi. Chris, x30225 or 338-1699.

'85 Jeep Cherokee 4x4, gold, rack, AM/FM stereo, A/C, 25K mi., $9,000. Sherril, 280-3951 or 332-4416.

'71 VW Super Beetle, good cond., engine overhauled, interior redone in '78, 140K mi., $950, owner guaranteed. Janine, 282-3035 or 480-9105.

'74 Pontiac Grand Safari wagon, all power, body rough, good 455 engine, cheap. 534-4839.

Boats & Planes

S2 5.5 Grand Slam sailboat, trailer, rigged for chute, spare lines, life jackets, boat hook. $4,000 OBO. Jay, 474-2622.

17-ft. Cobia tri-hull boat, 90HP Evinrude, trailer, needs steering cable, $1,295. x33782 or 332-5725.

Mistral Maui windsurfer, 2 sails, 6 sq. meter, 4.5 sq. tware. $780. 480-1763.

'86 Searay Seville 5.0/16 ft. 6 in., 140HP Mercruiser I/O, 75 hrs. freshwater only, full instrumentation, AM/FM cassette, custom fit marine cover, regulation equipment, Sure Land Sportsman Trailer, $9,450, owner financing avail. Janine, 282-3035.

17-ft. Glassmaster V-bottom walk-thru, windshield, 140HP Evinrude, galvanized trailer, loaded, garaged, ex. cond. 485-9796.

18-ft AMF Trac Catamaran, galvanized trailer. $3,850. 333-3056.

Cycles

Schwinn Continental bicycle, 26 in., 10 spd., good cond., $75. David, x35464.

'80 Peugeot lady's 10-spd., foam handgrips, sheepskin saddle cover, water bottle/holder, gear bag, good cond., $100. Ken, x32517.

'85 Yamaha Virago, 700cc, black, all chrome, 2,200 mi., black Fulmer helmet, $2,700 OBO. 331-8079.

Girl's 20-in. Schwinn bicycle, $15. x33836 or 946-7028.

Suzuki GS1100, needs repair, $350 OBO. 282-3155 or 409-948-6128.

'80 Suzuki GS1100, needs work, $350 OBO. 282-3155 or 409-948-6128.

Audiovisual & Computers

Cobra 40-channel electronic CB, antenna. $35. x30225 or 338-1699.

Bogen DB240 stereo receiver, one channel out, easy to fix, free. 534-4839.

Big Board Z-80 computer, dual 8-in. disk drives, monitor, keyboard, $450. 334-4894.

Atari 520 ST system, SF314, DS/DD 720K disk drive, SC 1224 color monitor, software, $780. 480-1763.

Atari 400, joysticks, cassettes, $40. Marge, x36536.

oscilloscope, 20MHz dual trace/hameg, $400; generator signal, 10Hz-100KHz/Heathkit $200. Multimeter digital/Fluke, $165. 984-1906

CP/M 86-based microcomputer, power supply needs repair, full-page CRT, 2 8-in. floppies, $200. Jim, x35566.

Household

Montgomery Ward frostless refrig., 16.4 cu. ft., icemaker connections, almond, no-fingerprint finish, ex. cond., 2 yrs. old. $450. Ken, x32517.

Vacuum cleaners, Kirby upright, no attachments $35; portable w/attachments, $10; Remington typewriter, $50. Marge, x36536.

Mirror, 3x6 ft., $55. Dianne, x37595 or 488-1359.

Couch, love seat, good cond., $100; glass coffee table, 2 end tables, ex. cond., $60; Sears garage door opener, 2 yrs. old, $175. x33340 or 438-1521.

Copper-bottom cookware, never used, 10-pc. set, was $130, now $95. 480-2265.

Kirby upright vacuum, was $700, now $150. Michelle, x31165 or 925-7878.

Fireplace tools, screen, grate, $45 set or separate. x30112 or 482-1317.

Bedroom furniture, 5 pc., cherry, $950; assorted tables, marble inlay, $100/ea. 488-3588.

Twin-sized bed, BO. Bob, x34596 or 488-3413.

Microwave, 10-min. timer, good cond. Bob, x34596 or 488-3413.

Philco 12 cu. ft. refrigerator, ex. cond., $100. 332-7035.

Kenmore sewing machine, ex. cond., extra attachments, carrying case, $250 OBO. Sandi, x30086.

Sofa, traditional, gold print, good cond., $50. 488-6521.

Photographic

Canon G3 w/f1.7 40mm lens, auto./-manual explosure, Canolite flash, case, $125 OBO. Dennix, x34405 or 480-5076.

Yashica TL Electo X 35mm SLR, 50mm 1.7 lens, Vivitar auto. flash model 252, 90-230 zoom, set of close-up lenses, 2X converter, hard plastic briefcase style case, $185. 334-1934.

Minolta SLR 110, zoom lens, auto. flash, $50. 334-1934.

Pets & Livestock

Free female Pointer, white/liver, 4.5 yrs. old, 60 pounds, goes to pound after June 19. 476-9940.

Two large South American Tiger Oscars, 1 large African Cichlid, $45 or trade for Cockatiel or related bird. 668-2230.

Cocker Spaniel, free to good home, male, 5 yrs. old, buff. x38961 or 944-6457.

Fluffy 6-wk.-old kittens need good homes. Terri, x36634 or 409-925-4264.

AKC Cocker Spaniel, red/white male, 6 mos. old, shots, wormed, $125; Abby Guinnea pigs, $10; Dutch-Dwarf rabbits, $10. 477-3341.

Golden retrievers, AKC registered, large, gentle, free to good home. E. Rubenstein, x33124 or 326-2354.

AKC registered German shepherd pup, born Jan. 24, tan w/silver markings. Billie, x38334 or 482-4365.

Mother cat and 5 kittens, free to good home. Shirley, x36659.

Black female Labrador, 1 yr. old, must have fenced yard, good watchdog. x33306 or 554-2464.

Musical Instruments

Piano, good cond., recently tuned, $300. x39218 or 486-6813.

Baldwin Organ, 2 keyboards, 13 pedals, bench, instruction manuals, ex cond., $1,600. Tom Clark, x39842.

Alhambra classical guitar, ex. cond., hard-shell case, $350. John, 333-5238 or x31929.

Want ride to and from work for blind person, work hours 8 a.m.-4:45 p.m. Monday thru Friday, lives in Bay Glenn subdivision, 14607 Chase Dr., works at CSC, 16511 Space Center Blvd. 486-7673.

Want any NASA memorabilia items, serious collector. Gene, 476-9080

Lost & Found

Two cannisters of instructional film, found in Bldg. 4 lobby during badging process, identify by title. Karen, x30665.

Wanted

Want comic books, baseball cards, any years. Tom, x35488 or 482-9172.

Want telescope, preferably Newtonian w/6-12-in. mirror. Chuck, x31701 or 333-3763.

Want to rent room with aerospace computer-type, student working on degree and new career. Don, x31995 or 486-5692.

Want 350-450cc motorcycle to ride in Clear Lake area, 5K-10K mi. Don, x31995.

Want 3 tickets to Astros-Dodgers game June 19, seats must be together. x37535.

Want ladies bike, $20 or less x37535.

Want 2 gallons of Chinese Tallow honey. Leah, x38687.

Want couples interested in playing party bridge once a month starting in August. Chris, 486-0193.

Want home for rat terrier puppy June 7-Aug. 2, must have experience w/pets. Debbie, x36620 or 554-2999.

Want 4x8-ft. trailer. N. Payne, x37652 or 488-3957.

Want AMC AM/FM radio or AM/FM/-cassette to fit '80 CJ7. Greg Williams, x30695 or 482-6763.

Want male roommate in 4BR Nassau Bay house, 2 blocks out JSC main gate, W/D, microwave, $200/mo. plus utilities. John, x31929 or 333-5238.

Want large tricycle, high chair, x30112 or 482-1317.

Want vanpool riders from SW Houston, ride for about $50-$55/mo. Jim, x35566.

Want camera equipment for Yashica fxD 35mm, lenses, macros, wide angles, zooms, infrared filters, prefer 67mm, fish-eye lens. Scott, x38497 or 488-1044.

Miscellaneous

Ladies solitaire diamond ring, platinum body, was $1,350, now $700. Scott, x38497 or 488-1044.

Small couch, $25; baby carriage, $30; Rattan chair, $10; wagon wheel light fixture, $15. 474-3181.

Wagner heavy duty series 200 airless paint sprayer, accessories, 3 spray tips, was $109, now $65. 488-4487.

Barbell weight sets, various weights, long, short bars, one vinyl coated, one offset. John, 488-4487 or x30018.

'79 Luv parts, engine, standard transmission, body parts, etc., $500 OBO. Paul, x3426.

German Luger, S/42, 1937, matching clip, original 1936 holder, proofed tool, 99% original rust blue, bore perfect, $1,200. x35331 or 488-2656.

White wedding or formal full-length dress, size 9/10, $55. Pamela, x36536.

A/C compressor unit, 4 ton, used 8 mos., $400; 15-ft. x 20-in. Formica bar top, $50. 554-2908.

Sears 3.5HP self-propelled mower, electronic ignition, good cond., 22-in. cut, $125; simplicity 11HP riding tractor mower, 42-in. cut, ex. cond., $600. 921-7212.

Band saw on stand 1/3HP motor, 9-in throat, good cond., $130; antenna rotator model AR-40, electronic control box, $75. 921-7212.

Sears weight bench w/leg lift, 120 pounds, $35. x33836 or 946-7028.

New big wheels for Chevy 4x4 pickup, were $1,200, now $500. 332-7035.

Pair of tubular bicycle racing wheels, Dura-Ace hubs, corncob freewheel, one tire, $50. x38004

Three mobile homes, 14x56 and 14x60, take over payments of approx. $200/mo. each or pay balance of approx. $5,800/ea. 486-4466.

50HP Chrysler outboard plus control cables, $375. x31588 or 488-1326.

Sears electric typewriter, correction feature. Ethel, x36148 or 332-5830.

British Seagull motor, OB, '83 long shift, 6HP, runs well. 554-6678.

Rudder, tiller off 22-ft. Spindraft sailboat. 554-6678.

'78-'81 Honda A/C compressor, 2 mos. use, was $390, now $250 OBO. Vincent, x30874 or 333-1316.

Coin-operated lounge pool table, 3.5x7-ft., 1-pc. slate 3/4-in. slate top, ex. cond., accessories, $250. Chuck, 487-2978 or x34241.

22-in. K&S rotary lawnmower w/catcher, 3.5HP Briggs & Stratton engine, $55 OBO. 482-9168.

Kenmore vacuum cleaner, cannister type, self-adjusting power agitator, like new, all attachments, $125. 482-9168.

South Park Memorial Cemetery lots, No. Sec. J, Lot 39, perpetual care, were $495/ea., now $395/ea. Cookie, x30328 or 474-5610.

Machinist's precision caliper, Mauser, stainless steel, 6-in. dial measures inside, outside, depth, $85. Cookie, x30328 or 474-5610.

Baby items: girl clothes 0-6 mos., 2 walkers, ex. cond. Carla, x30181 or 538-1148.

Motorcycle helmets, 2 full-coverage Simpson Model 61, 1 Arthur Fulmer full-coverage, $75/ea. 282-3155 or 948-6128.

Cookin' in the Cafeteria

Week of June 8 — 12, 1987

Monday — French Onion Soup; BBQ Sliced Beef, Parmesan Steak, Spare Rib w/Kraut, Chili & Macaroni (Special); Ranch Style Beans, English Peas, Mustard Greens. Standard Daily Items; Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Split Pea Soup; Meatballs & Spaghetti, Liver & Onions, Baked Ham w/Sauce, Corned Beef Hash (Special); Buttered Cabbage, Cream Style Corn, Whipped Potatoes.

Wednesday — Seafood Gumbo; Cheese Enchiladas, Roast Pork w/Dressing, BBQ Link (Special); Pinto Beans, Spanish Rice, Turnip Greens.

Thursday — Beef & Barley Soup; Roast Beef w/Dressing, Fried Perch, Chopped Sirloin, Chicken Fried Steak (Special); Whipped Potatoes, Peas & Carrots, Buttered Squash.

Friday — Seafood Gumbo; Fried Shrimp, Baked Fish, Beef Stroganoff, Fried Chicken (Special); Okra & Tomatoes, Buttered Broccoli, Carrots in Cream Sauce.

Week of June 15 — 19, 1987

Monday — Cream of Potato Soup; Franks & Sauerkraut, Pork Chop, Potato Baked Chicken, Meat Sauce & Spaghetti (Special); French Beans, Buttered Squash, Buttered Beans. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Navy Bean Soup; Beef Stew, Liver & Onions, Shrimp Creole, Smothered Steak w/Dressing (Special); Corn, Rice, Cabbage, Peas.

Wednesday — Seafood Gumbo; Roast Beef, Baked Perch, Chicken Pan Pie, Salmon Croquette (Special); Mustard Greens, Italian Green Beans, Sliced Beets.

Thursday — Beef & Barley Soup; Beef Tacos, Diced Ham w/Lima Beans, Stuffed Cabbage (Special); Ranch Style Beans, Brussels Sprouts, Cream Style Corn.

Friday — Seafood Gumbo; Fried Shrimp, Deviled Crabs, Ham Steak, Salisbury Steak (Special); Buttered Carrots, Green Beans, June Peas.

Week of June 22 — 26, 1986

Monday — Cream of Chicken Soup; Beef Burgundy over Noodles, Fried Chicken, BBQ Sausage Link, Hamburger Steak (Special); Buttered Corn, Carrots, Green Beans. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday — Beef Noodle Soup; Baked Meatloaf, Liver & Onions, BBQ Spare Ribs, Turkey & Dressing (Special); Spanish Rice, Broccoli, Buttered Squash.

Wednesday — Seafood Gumbo; Broiled Fish, Tamales w/Chili, Spanish Macaroni (Special); Ranch Beans, Beets, Parsley Potatoes.

Thursday — Navy Bean Soup; Beef Pot Roast, Shrimp Chop Suey, Pork Chops, Chicken Fried Steak (Special); Carrots, Cabbage, Green Beans.

Friday — Seafood Gumbo; Broiled Halibut, Fried Shrimp, Baked Ham, Tuna & Noodle Casserole (Special); Corn, Turnip Greens, Stewed Tomatoes.