

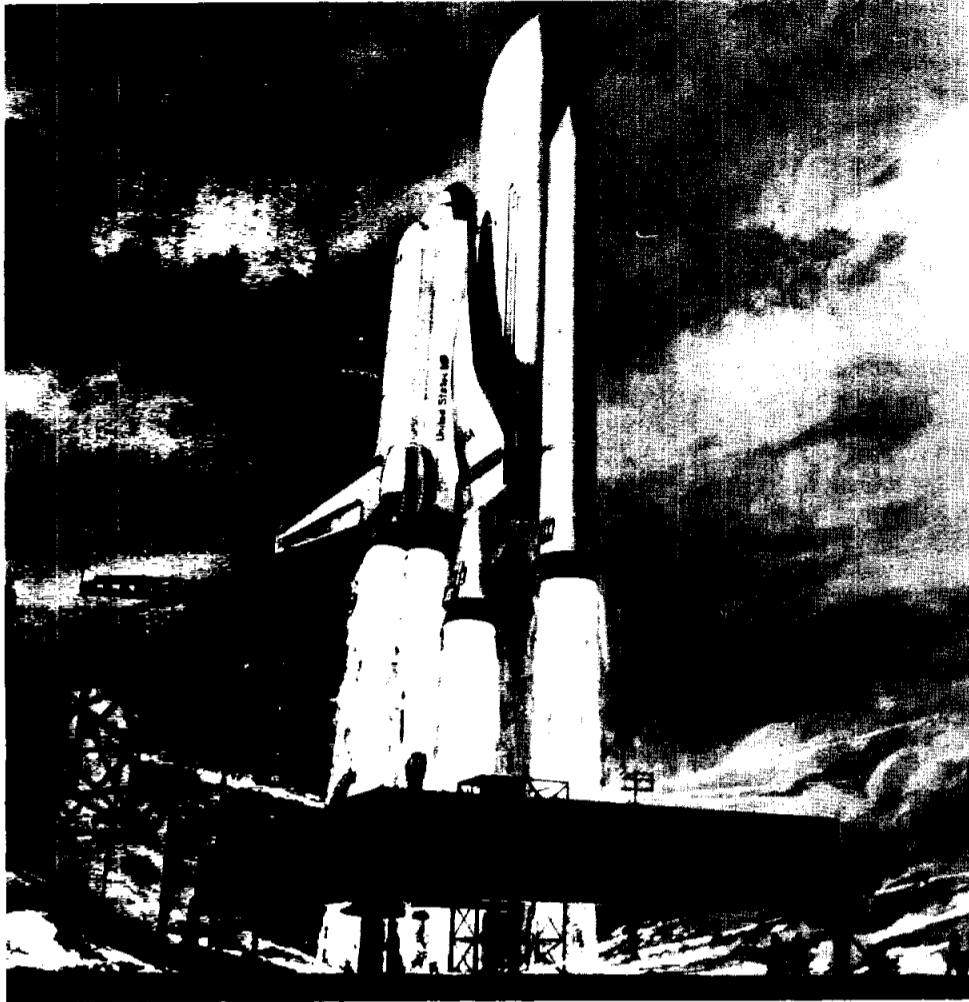
ROUNDUP

Lyndon B. Johnson
Space Center

NASA

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UP, UP AND AWAY . . . testing of the Shuttle components continues to progress. Vibration testing at MSFC goes well as does main engine testing at NSTL. Meanwhile here in Houston, astronaut candidates are due to arrive on the 10th for the beginning of their training period, see related story.

Orbiter Engines Test OK

The Space Shuttle's main propulsion system was static fired successfully June 22 in a test lasting almost 40 seconds and reaching 90 percent of the rated power of the engines.

This was the third test of the propulsion system which features a cluster of three main engines installed in an Orbiter aft fuselage section. Liquid hydrogen and liquid oxygen propellants are fed to the engines from a flight-type External Tank.

The test was originally planned to last 15 seconds, however, NASA extended the test duration on the basis of successful results from the first two tests.

Purpose of the tests is to evaluate the performance of the complete propulsion system and verify it for operation prior to the first manned orbital flight of the Shuttle.

The testing site is located at the space agency's National Space Technology Laboratories near Bay St. Louis, Miss., NASA's Marshall Space Flight Center is project manager.

A fourth test was to have been conducted today. This test would cycle the engines through 90 percent down to 70 percent and up to 90 percent again. The test was also to have tested the restart capabilities of one of the three engines during the test.

TRS Funds Freed

NASA has awarded a contract to the Martin Marietta Corp., Denver, for development of the Teleoperator Retrieval System (TRS), a reusable, TV-equipped propulsive device to be used by Space Shuttle crewmen to deliver, stabilize and recover satellites in orbit.

The contract award follows the release of fiscal year 1978 funds by the Congressional Committee that controls NASA appropriations.

The \$32 million contract, managed by The Marshall Space Flight Center, calls for the delivery of flight hardware by September 1979.

The TRS is a low thrust, box-like spacecraft to be operated by remote control from the Shuttle. It can be carried back and forth from Earth to orbit in the orbiter cargo bay or it may be left in space after completion of its mission to wait for the next Shuttle to retrieve it for return to the Earth where it can be refurbished and readied for subsequent missions.

The first mission planned for this new spacecraft will be to dock with the Skylab space station and boost it to a higher orbit or to control its reentry into the Earth's atmosphere. For such a mission the TRS will include additional propulsion kits for added energy.



WHAT IS IT? When the night hawk swoops, most people duck. This one was a little too young to swoop. For the rest of this bird story, see page 4.

Astronaut Candidates Due Here on Monday

Thirty-five new astronaut candidates are scheduled to be onboard by July 10, ready to begin a two-year training and evaluation period.

Formal training will begin on Tuesday, July 11, with all 35 astronaut candidates participating. Activities scheduled the remainder of July here at JSC include aircraft life support and ejection seat training for the T-38 aircraft, aircraft physiological training, T-38 aircraft systems and operations, and T-38 checkout flights.

July 31 through August 3 the astronaut candidates will travel to Homestead Air Force Base in Florida for the standard air

force water survival course given by USAF instructors.

In subsequent weeks the candidates will attend lectures on the history of spaceflight, technical assignment methods and procedures within the astronaut office, lessons on manned spacecraft engineering, Space Shuttle program, aerodynamics, flight operations, and the many disciplines associated with preparation for and operation of vehicles in space.

Instructors and lecturers for the series of lessons and briefings will be astronauts, engineers, management, and support contractors here at JSC.

Houston Fire Dept. Assumes JSC Service

The Houston Fire Department assumed responsibility for firefighting, rescue, and emergency ambulance services at the space center on June 9, and moved their men and equipment into the fire station in Building 25.

Under the terms of a no-cost contract, the space center will provide facility support and equipment and the Houston Fire Department will provide the manpower and maintenance for the vehicles.

The station is a district station, Number 72. The district includes station number 71, located near the Harris County Courthouse Annex in Clear Lake City. Both stations will respond to calls in the Clear Lake area. Houston residents in the area should continue to call the main fire department number for emergencies. Space Center personnel should use the JSC emergency number — 3333.

Station 72 has a full complement of equipment: a ladder truck, a pumper unit, a paramedic-equipped ambulance, and the district chief's car. Station 71 has a pumper and an ambulance.

The fire crew at station 72 consists of 14 men on duty for each of three shifts.

The total manpower complement for the Clear Lake area (stations 72 and 71) is 66 firefighters.

The ambulances each have a paramedic and an emergency medical technician and are equipped with the JSC-developed telecare units which enable the paramedics to telemeter patient vital signs to the telecare center at Ben Taub Hospital.

Isaac Gillam Named DFRC Director

Isaac T. Gillam, IV, was named Director of NASA's Dryden Flight Research Center in Edwards, Calif. Gillam was Acting Director of Dryden since November 1977.

Gillam joined NASA Headquarters in 1963. In 1976, he left NASA Headquarters to become Director of Space Shuttle Operations at Dryden. He was named Deputy Director of Dryden in August 1977.



Houston Fire Department firefighters are pictured in front of the Station 72 pumper unit. The top row shows (l to r) J. J. Monnat, W. M. Scott, M. T. Cook, W. T. Rogillio, and R. W. Hale. Bottom row shows (l to r) R. E. Wooster, T. L. Shaffer, D. L. Fahr, R. B. Hammer, J. F. Bennett, C. O. Sharp, J. M. McMahon. Those pictured here represent only the "B" shift. There are two other shifts not shown.

EAA Attractions

BLDG 11 TICKET COUNTER

Astroworld - \$7 (reg. \$8.50) available all season.

Six Flags Over Texas - \$6.75 (reg. \$8.50) available all season.

Disney Magic Kingdom Cards - Free; good for discounts on rides at Disneyland and Disneyworld, and lodging at selected hotels and motels.

Funseekers cards - Free, good for discounts on entrance to Astroworld and all Six Flags and lodging at selected hotels and motels.

Dean Goss Dinner Theatre — \$16 couple, \$8 single, good any night except Saturday.

Fun-Time Card — FREE — good for \$1 discount at Sea-Arama Marineworld.

ASTROWORLD DISCOUNT

Another Houston-Galveston Area Industrial Recreation Council program will allow JSC employees to enjoy Astroworld at a \$3.00 discount. Tickets normally \$8.50 are on sale for \$5.50 for Sunday,

July 16. The park will be open from 10 a.m.-midnight. At this price - take the whole family. Children 2 yrs. and under are free. All others pay the low, low \$5.50 price.

ALLEY THEATER SUBSCRIPTIONS

The Alley Theater Corporate Subscription program is again being offered to NASA and contractor employees. Season tickets are available for next year's five performances at a low price of \$24.50, which may be charged on a variety of credit cards.

See your EAA representative for an Alley Theatre brochure which will explain the program. The brochure contains an order form for subscriptions.

If you are planning to subscribe, fill out the form, enclose a check payable to Alley Theatre or indicate a charge plan on the form and send to Doris Wood, EM (X-2831).

Corporate Subscription coupon books will be home-mailed just prior to the opening of the 78-79 season in October.

I.A.M. REVIEW COURSES

Two review courses will be held during the month of August for former students of the Intermediate Automotive Mechanics (I.A.M.) Courses. The first course will cover carburetor overhauls and brakes/shock absorber replacements. It will be followed by a separate course that will cover minor tuneups and ignition system trouble diagnosis. Both courses will consist of one lecture, covering procedures, and one lab. The labs will be four (4) hours (carburetor or brakes/shocks) and two (2) (minor tune up) hours in duration where the students will perform the actual work on their cars. Current plans are to offer these review courses once a year during the fall.

Course	Lecture Date	Lab Date	Enrollment Fee
Carburetor or brakes/shocks	8/9/78	8/12/78	\$19.00
Minor tune up	8/16/78	8/19/78	\$12.00

Auto Mechanics — New sections of both the basic and intermediate Auto Mechanics will be offered also. The basic course will start Wednesday, September 6th. Lectures will be on four consecutive Wednesdays from 7:15-9:15 p.m. in Room 215 of the recreation facility. The lab is set for Saturday, September 23. Cost is \$24.00 per person. The intermediate class will be on four consecutive Wednesdays starting October 11 with labs set for Saturday, October 21 and 28. This class will also meet from 7:15-9:15 p.m. in Room 215. Cost is \$45.00. Sign-up deadline for the classes are August 30 - Basic, and October 4 - Intermediate.

Instructor is R. H. Stanley, X6181 and C. W. Pace, X3278, will assist in the labs. All class sign-up is done at the recreation center. Payment is due upon registration and is non-refundable.

LONE STAR DRAMA



NASA nights at the Lone Star Drama in the Galveston Island State Park amphitheater will be July 7,8,9. The drama has been completely revamped this year and is faster moving than last year's edition.

Dance Club Classes

The JSC Dance Club is sponsoring a "mini session" of ballroom dancing beginning July 12th.

Instructors for the dance session are Bob and Rae Calvert. Classes will meet at the Gilruth Rec Center each Wednesday for six weeks with the Introductory and High Intermediate classes starting at 6:45 p.m. and the Low Intermediate and Advance classes starting at 8:15 p.m.

All classes are approximately 1-1/2 hours each. Cost of the mini session is \$24 per couple, with \$1 per person per year dance club dues.

The Introductory Class will consist of lessons in the Rumba, Waltz, Fox Trot, Swing, Cha-Cha, and Disco. For additional information and partner pairing, contact Lyyle Jiongo, extension 3258. The fall session of classes will begin September 13th.

CIRCUS TICKETS

The EAA has 300 tickets to the Ringling Brothers Circus in the Summit for the 6 p.m. performance on July 16. The tickets are \$3.50 (regular \$7.00) and will be on sale at the Building 11 exchange store starting June 19.

Aero Club

The NASA Aero Club will present a private pilot ground school which will satisfy the requirements in FAR Part 61.105 upon completion of the course. The first meeting will be at 5:00 p.m. in the Gilruth Recreation Center, Room 210, on July 12, 1978. For additional information please call Bernard Marcantel, extension 3287.

Hunter Safety Course Offered

A Texas Hunter Safety Course will be sponsored by the Texas Parks and Wildlife Department from 1:00 - 5:00 P.M. on July 8-9. The class will be conducted at the North County Building, FM3002, Dickinson, Texas. The class is designed primarily for the novice hunter, however, anyone who wants to improve their knowledge of firearms is invited to attend. The minimum age is 12 years.

Some 23 states now require successful completion of this course before the hunter can purchase a hunting license in those states. Texas is still a voluntary state. If you plan to hunt out-of-state this fall, before leaving on your hunt you should check to determine if you must take this course to obtain a hunting license in that state.

The class will cover such subjects as hunter safety, firearms responsibility in the field and in the home wildlife management and game conservation principles, survival, first aid, and several other related areas. Mr. A. G. Cook, Senior Game Warden in Galveston County, will discuss Texas game regulations, duties of the Texas Game Warden, and other related subjects.

To register for this class, contact the instructor, Mr. J. T. Kilpatrick, at telephone 534-4603, after 6:00 P.M. Fee for the class will be \$1.00. The class will be limited to 30 students, so register early.

Golf Winners

Recent winners in the JSCGA four-ball matches are shown below. In the top photo are (l to r) Milt Heflin, second, Bill Shropshire, third, and Steve Gorman, fourth. Not pictured is first place winner Ralph Najera. The match was played at Brock Park on May 29. In the bottom photo are shown (l to r) Dave Price, third, Tom Matuszewski, second, Bill Zuber, fourth, and Mike Gremillion, first. This match was at Glenbrook on May 15.



At Brock Park



At Glenbrook

Roundup will no longer be able to fill gaps in individual collections of Roundup issues. A consolidation of Public Affairs people and facilities into the office wing of Bldg. 2, and the resulting storage space crunch, has forced the trashing of 90 percent of the Roundup's supply of back issues going back to November 1961.

Tejas Group II Golf Winners

The JSCGA Group II played their tournament at Tejas Golf Course on June 24. Quite a few of the members were seen escaping the heat by playing through the woods.

Play was slow, and one member was able to get in a cat-nap at the tee while waiting for the foursome ahead to clear. It was the wrong thing to do — it took him three shots to get slightly off the tee box, (we won't say who the cat-napper was though).

The winners were wide awake, however. The winning scores were much lower than those of the lower-handicapped Group I who played Tejas two weeks earlier. Winners shown below (l to r) Bill Sartelle, net 68; Dot Robertson, 70; Bill Chamberlain, 71; and Bill Zuber, 72.



What's cookin' in the JSC cafeteria

WEEK OF July 10

MONDAY: French Onion Soup; Weiners & Baked Beans; Round Steak w/hash browns; Meatballs & Spaghetti (Special); Okra & Tomatoes; Carrots. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin; Selection of Salads, Sandwiches and Pies.

TUESDAY: Beef & Barley Soup; Shrimp Creole; Beef Stew; Fried Chicken (Special); Mixed Vegetables; Stewed Tomatoes; Buttered Rice.

WEDNESDAY: Seafood Gumbo; Fried Perch; New England Dinner; BBQ Plate; 8 oz T Bone Steak; Shrimp Salad; Swiss Steak (Special); Italian Green Beans; Beets; Lima Beans.

THURSDAY: Cream of Chicken Soup; Turkey & Dressing; Enchiladas w/chili; Weiners & Macaroni; Stuffed Bell Pepper (Special); Zucchini Squash; Green Beans.

FRIDAY: Seafood Gumbo; Broiled Flounder; 1/2 Chicken w/peach half; Fried Shrimp; Shrimp Salad; Salisbury Steak (Special); Mixed Vegetables; Cabbage; Breaded Okra.

WEEK OF July 17

MONDAY: Chicken & Rice Soup; Texas Hots w/beans; BBQ Ham Steak; Veal Parmesan; Beef & Macaroni (Special); Spinach; Carrots; Au Gratin Potato. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin; Selection of Salads Sandwiches and Pies.

TUESDAY: Tomato Soup; Baked Chicken; BBL Spare Ribs; Mexican Dinner (Special); Broccoli; Spanish Rice; Ranch Beans.

WEDNESDAY: Seafood Gumbo; Liver w/onions; BBQ Ham Steak; Shrimp Salad; Baked Meatloaf (Special); BBQ Plate; Brussel Sprouts; Green Beans; Whipped Potatoes.

THURSDAY: Beef & Barley Soup; Chicken & Dumplings; Corned Beef w/cabbage; Smothered Steak (Special); Cauliflower; Cabbage; Parsley Potato.

FRIDAY: Seafood Gumbo; Pork Chops; Creole Baked Cod; Ham Steak; Seafood Platter; Salmon & Tuna Croquette (Special); Green Beans; Beets.

ROUNDUP NASA

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June's Secretary is "Always Outstanding"

Judith Wyatt, secretary to the Director of Data Systems and Analysis, is June's secretary of the month.

Mrs. Wyatt has always been an outstanding secretary, according to Howard Tindall, "her performance regularly exceeds my expectations and produces a more effective and efficient office environment than could be expected." Tindall says her specific organization of work and productivity in the Director's immedi-

ate office over the last few months is certainly worthy of special recognition.

When the Outstanding Secretary Award was created by center management several years ago, Mrs. Wyatt agreed to serve as a member of the Directorate committee which was asked to recommend nominees for this award. She continued to emphasize the need and desirability to recognize the outstanding Division secretaries. "Serving on this committee, however, tended to preclude her own nomination," Tindall said.

Travel arrangements, typing support, information distribution, and records retention for this group are extensive, often complex, and usually independent for each of the five Directorate managers. According to Tindall, Mrs. Wyatt was able to budget her time and considerable talent to provide this support without impact to the Directorate. There were no schedule mixups, no lost documents and no events even tinged with the byproducts of such a massive work load.

Her boss thinks Mrs. Wyatt's intense desire to do an outstanding job is further shown in her interest and support for the mission of DSAD.

Congratulations Mrs. Wyatt. You have earned our respect.



Secretary Wyatt

I Saw Mom Kiss the President

Jim Johnston (ES64), wife Jodi, and children Becky, Pam, and Joe, were among the throng of folks on hand to greet President Carter when he arrived at Ellington AFB.

Jodi reports the President shook her hand and as he did she said "Super Prez." At that the President broke into a big smile, pulled Jodi closer to him and kissed her right on the lips.

Jodi says she was thrilled, as was her entire family and others nearby.

However, no one in the Johnston family was quick enough to get a photo of the famous buss. If anyone did happen to catch the kiss on film, Jodi would sure like to have a copy, 'cause as she says, "that's sure one picture I'd like to have for my scrapbook."

How about it folks, anyone out there record the historic smooch? If so, contact either the Roundup or Mrs. Johnston (481-1951).



President Carter is shown here at Ellington AFB addressing the crowd with some good local news. Ellington will be retained and a new purpose defined by a study performed by the General Services Administration.

Ginny Hughes Named ABWA Woman of Year

Federal Women's Program Coordinator Virginia Hughes will represent the Clear Lake Area Chapter, American Business Women's Association, as its Woman of the Year at the national convention to be held in Atlanta, Georgia, November 2-5, 1978. She will be honored at the chapter's meeting on July 11 at the Kings Inn.

"Ginny" Hughes was selected from among 80 business and professional women, representing a wide variety of career fields, who are affiliated with the local chapter. Selections are based on advancement in business with consideration given to continuing education and involvement in chapter and community affairs. She is a leader in the organization who has shown talent in bringing out the best qualities in others.

A past president of the local chapter, Ms. Hughes has been active on a wide variety of ABWA committees. She is a member of the JSC Exchange Council and is included in "Who's Who in American Colleges, 1978." She has been working during the past year as a part-time instructor in the evening division of San Jacinto College while taking night school courses to continue her own education. She became Federal Women's Program Coordinator in January 1978, and 3 months later at the Federal Women's program committee presented an outstanding series of programs to recognize Federal Women's Week.

The recipient of numerous group and performance awards, Ms. Hughes provided support in Moscow to working group personnel assigned to the Apollo-Soyuz Test Project.



Virginia Hughes

Roundup Swap Shop

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Non-commercial personal ads should be about 20 words and include home phone number. Typed or printed ad copy must be received by AP3/Roundup by Wednesday of the week prior to publication.

PROPERTY & RENTALS

Rent: Lakeside vacation retreat at Cape Royale on Lake Livingston. New 3-bdrm waterfront home compl furn. Facil inc tennis, pool, golf, boat launch. Rent by wk or mo. 488-3746.

For rent: Lake Livingston, Cape Royale compl furn home 3-2-1. Fishing, hunting, tennis, golf, etc. Reserve early wk/mo/yr rates 488-4487.

Lease: Nearly new 3-2-2 near San Jacinto Jr College. In rural Lomax. Carpets, drapes, built-ins. Available immediately. Whittington, 488-4394.

Galveston West End 2-BR By-the Sea condo, full furn, \$180/wk off season, \$260/wk in season. Clements 474-2622.

Land for Sale: Seven Coves on Lake Conroe, investment buy, need to sell, Parker, X4241 or 481-4372 after 5:30.

HOUSEHOLD ARTICLES

Antique primitive small washstand \$25, desk \$30, antique wood beaded chandelier \$75, old oak square kitchen table cut down for coffee table \$50 all in good condition. J. H. Levine 488-5564.

For Sale: Washer & Dryer \$100 for both. X-2271 Joan.

12 each, used 18 x 71 inch non-opening windows. Make offer. R. F. Park 481-2331.

Sears window air conditioner, 18,000 BTU/hr. Needs fan motor. \$50.00 (\$100 with new motor) Tanner, 482-1328.

For sale: Kenmore clothes dryer, elec., 220 v, white, Good working condition, looks perfect \$35, Smith 483-4468.

MISC.

Tennis Raquets-"Wilson" autographs (3 Stan Smith-4 5/8 M-\$25-\$15-\$10, Jack Kramer 4 5/8 L-\$20) Ken Westerfeld X-5169 or 482-1717.

No. 1 Cedar Shingles, 2 Bundles plus few ridge row shingles, \$30.00. Smith x-4468.

CARS & TRUCKS

For Sale: 1948 Chrysler Windsor, 2 door. Excellent condition inside and out. Hydramatic drive. Runs good. \$1900. Call after 6:00 p.m. 486-1151.

For Sale: 1978 Corvette, metallic & navy blue, 3,000 miles. Balance 9,000 mile warranty. Power loaded. Call 4511 or 446-2442

For Sale: 73 Vega GT Hatchback, auto, AM-FM, stereo 8, excellent condition, \$600 Firm. 474-4336.

For Sale: 74 Mustang II, 4 cyl. hatchback, gold, 4 speed, AM-FM stereo, air, 48,000 miles & 1700. 474-2906 after 6.

For Sale: 16 ft. cabover camper. Can put on pickup. Sleeps 4. Has icebox, stove, sink, dinette. A/C. for \$1000. Without trailer \$850. 332-1439.

One A78-13 Goodyear polyester cord tire-original off Pinto wagon used as spare 1/4 inch tread \$10. Ken Westerfeld 482-1717.

73 Olds Delta 88 48K miles ps/pb. a/c, one owner, beautiful shape inside and out, no problems. Mike 3522.

69 Mustang fastback, 302 V8-2V, beautifully preserved, orig. paint, new externals to engine, new shocks, 2 new tires, runs perfect, 19 mpg. hwy. 16 mpg city. Mike 3522.

71 VW 411 auto new tires/brakes, clean runs good. \$950 944-3795

62 Chevy, 4 dr. Bel Aire, excellent mechanical condition. First \$300 takes it Bill 5565.

1978 Cordoba, air, auto, 360-2 barrel, power windows, bucket seats, vinyl top, 9,000 miles, cruise, 24,000 mi warranty \$6100. 466-5127 Ellis.

Sears Car Top Carrier. Presuell 482-7786. 70 Ford Club Wagon Van auto, 302 eng. 11 Pax Riosas 7487, Tex City. 945-3094.

Wanted: Shop Manual for 1965 Plymouth Valiant. Thompson 332-2229.

1976 Pontiac Ventura SJ, 6 cyl., economical STD. Floor, Air/PS/PB, AM/FM stereo, bucket seats, radials, \$3300. 482-6542.

CYCLES

72 Yamaha 100, excellent shape \$235 488-1326 after 5:00 p.m.

"Granny Taxi", blue, 3-speed Adult Tricycle by Miami Sun. Must sell. Call 333-3940.

1973 Yamaha Enduro 125cc, electric start and only 5,000 adult street miles. Includes two helmets, (large and medium) with visors, all like new for only \$285. Bill Maas, 488-2965 after 5 p.m.

BOATS

Dolphin Senior, excellent condition, with trailer \$550.00. Morris 334-1407.

14 ft. Monark flat bottom, 18 hp Johnson, trailer. Boat has two bucket seats & storage/well seat, and flooring \$725. 471-2638 John Jones, Jr. BC73.

1970 Morgan 28 sailboat, mint condition, Merc equipped, 6 sails, full spinnaker gear, double life lines & rails, 6 barients, Palmer in-board, \$18,900. 474-4336

MUSICAL INSTRUMENTS

Flute, Gemeinhardt, solid Sterling silver head joint, one year old. \$200. 488-8143 J. W. Van Artsdalen.

Wanted: Bassoon 499-8143

PETS

Miniature Dachshund pups-AKC black & tan males, 9 weeks old. \$125. Also champion standard or miniature stud service. 645-3722 or 7210 Vance Carlin.

WANTED

Wanted: A set of left-handed golf clubs for teenager. 488-2613 Tommy Keeton.

Wanted: Co-op needs car, must run well. Maximum amount willing to spend \$300. Call Norma 488-7665, Office ext. 5007.

Carpool from Montrose/US 59 area. 8 to 4:30. Mathews x-5595.

Late Entries

Property & Rental: Female roommate wanted to share a house in Friendswood with woman and two small children. Private bedroom \$140 month. 482-2079 or 682-7024.

Miscellaneous For Sale: 12V Power Supply 1.75A at 13V \$10 Tex Ward 488-5445 or 3291.

Coleman 3 to 5K BTU Catalytic Heater, never used \$30, Coleman 2 gal insulated Water jug \$5, Coleman 13-1/2 gal metal/plastic ice chest \$16. Schliesing 488-0559.

Burgess AC&Battery Fluorescent Safari Light \$12, Three coleman children's sleeping bags \$3 each, Portable toilet with extra bags \$5. Schliesing 488-0559.

Coleman 13' x 10' Oasis 6-man tent, used 4 times, \$150, AMF professional gymnastic mat, \$110. Schliesing 488-0559.

Two sets of heatways blue floating scuba fins size 3-4, \$4 a pair. One Healthways mask, \$2, Four solid hardwood butcher block chairs \$14 each. Schliesing 488-0559.

Selling mixture of commemorative and regular US stamps (3 cent - 13 cent) in mint condition at face value. Any amount you desire. Sugano, X-7428 or 482-5393.

Used railroad ties for fence post, flower beds, landscaping, etc. 482-4421.

Scientists Continue to Provide Clues to Life

Scientists working for NASA Ames apparently have discovered a way to account for the formation on Earth four billion years ago of nucleic acids, one of the two most essential building blocks of life.

The discovery supplements earlier work in which the same investigators discovered a mechanism to explain the formation of the other critical building block, protein.

Taken together, the findings provide an answer to a vital question that for years has puzzled theorists on the chemical evolution of life on our planet.

Basically, the mystery has been: How could the building blocks of life—ran-

domly scattered on the shores of primitive oceans—be continuously collected and organized over millions of years in high enough concentrations to produce living organisms?

The scientific team which conducted the investigations at NASA's Ames Research Center, consisted of Dr. James Lawless, team leader at Ames; Dr. Edward Edelson, a National Research Council Fellow; and Lewis Manning, a student at the University of Santa Clara.

The explanation involves substances which would have been common on the shores of Earth's primitive oceans—metal clays. When low concentration solutions of DNA-forming nucleotides were mixed with commonplace metal clays, Dr. Law-

less' team found that most clays attracted them. (The very long DNA nucleic acid chain in every living cell contains a blueprint of the entire organism.)

Zinc Clay Key

One type of metal clay, containing zinc, preferentially attracts all six of the building blocks of DNA and RNA (nucleotides). Especially significant is the fact that zinc clay attracted 97 percent of nucleotide 5-prime-adenosine monophosphate (AMP). AMP is the most common DNA building block in living systems.

Further, AMP is the essential precursor to ATP, the basic energy molecule, pre-

sent in every life form.

The role of zinc-clay is especially interesting because zinc plays an important role in the enzyme, DNA polymerase, which performs the task of linking DNA building blocks (nucleotides) in living cells. Enzymes are super catalysts, which drastically speed up many life processes.

The work appears even more significant in light of earlier results from Dr. Lawless' group which showed that metal clays could effectively concentrate amino acids, the building blocks of proteins and could catalyze their reaction to form polypeptide chains, the basic structural units of proteins. In addition, it was found that certain metal-clays could preferentially attract those amino acids found in the protein of living things today.

A Little of This . . .

Most scientists accept the theory that life began by chemical evolution on the shores of primordial bodies of water. The theory says that various forms of energy such as lightning, heat and ultraviolet radiation converted the abundant carbon-containing methane, ammonia and water of the primitive atmosphere into building blocks of life (organic molecules). These molecules, according to the story, then rained into the primordial bodies of water and joined together into ever-more complex molecules until a molecule or group of molecules appeared which could replicate itself. This was the first living thing.

But until now, scientists have been unable to explain how the life-building blocks in the primordial waters were organized.

The group did another experiment. The most common DNA nucleotide, 5-prime-adenosine monophosphate, (AMP), is composed of three chemical units—a sugar, a purine base and a phosphate group. Three forms of the nucleotide are theoretically possible: a "2-prime" form, a "3-prime" form and a "5-prime" form, the three differing only in the position of the sugar ring to which the phosphate group is attached.

However, only one of these forms is found in living organisms, the "5-prime" form. Dr. Edelson reported that zinc-clay preferentially attracts the "5-prime" life form over the "2-prime" and "3-prime" forms. This suggests a mechanism for incorporating this important "life-specific" building block into the first DNA-like material.



GREAT FOR KIDS . . . Twenty four children from the Hughen School for Crippled Children, Port Arthur, toured the space center on Wednesday, June 21. The kids, accompanied by older helpers, made the tour on their own, preferring to take the self-guided tour. They visited the museum in Building 2 and the Skylab workshop in Building 5. The children are all physically handicapped but as the pictures aptly show, fun is fun no matter who you are. NASA tour guide Margie Pinkard was helping to explain some of the programs and equipment. The troop took time out for a picnic under the shade by Building 2.

Virginia Firm Gets Computer Services Contract

NASA has selected Computer Sciences Corp. of Falls Church, Va., for negotiations leading to the award of a cost-plus-award-fee contract for performance of institutional computer systems engineering, development and production operations work here at JSC for a five-year period. The contractor's estimated cost for the first three years is approximately \$40 million.

Computer Sciences Corp. will perform system engineering and definition, applied software development and computer systems and related facility planning and development for the Central Computing Facility (CCF) and computer operations for the CCF and Mission Control Center.

The contract will be under the management and technical direction of the Johnson Space Center and will be for that portion of the work currently being performed by Lockheed Electronics Co., Inc.

Proposals were also submitted by: Lockheed Electronics Co., Inc., Systems and Services Div., Houston; Kentron International, Inc., Dallas; and ITT/Federal Electric Corp., Paramus, N. J.



WHAT IS IT? If you guessed a baby barn owl in distress, two feathers for your hat. Jim Walker, MDAC employee here at JSC, is shown 25-feet off the ground returning this baby owl to his nest in Ed Lehman's house in Brook Forest. Lehman's neighbor, R. D. McCafferty works in Building 4 and passed word to "Birdman" Walker of the baby's plight. Needless to say, mother and her three offspring are presently reported as fine. (Photos by Susan McCown, Kentron.)

Meanwhile, Out There in Deep Space

The two Voyager spacecraft continue to speed towards their March and July encounters with Jupiter and its many moons. The following table is current as of July 1 and gives a good status for followers of the dual probes. NASA's Jet Propulsion Laboratory is managing the Voyager program and providing deep-space tracking. Roundtrip communication takes 76 minutes for Voyager 1 and 72 minutes for Voyager 2.



	Voyager 1	Voyager 2
Date of Launch	Sept. 5, 1977	Aug. 20, 1977
Distance from Earth: (miles)	(425,875,313)	(408,475,978)
Distance to Jupiter: (miles)	(152,714,714)	(172,112,418)
Distance to Saturn (miles)	(651,024,027)	(651,229,423)
Velocity Relative to Earth: (mph)	(99,422)	(98,770)
Velocity Relative to Sun: (mph)	(39,886)	(37,319)
Distance Traveled through Space: (miles)	(425,569,204)	(440,735,792)
Date of Jupiter Encounter (closest approach)	March 5, 1979	July 9, 1979
Date of Saturn Encounter (closest approach)	Nov. 12, 1980	Aug. 27, 1981