

# Space Center Converts To Surface Water

The Johnson Space Center, under an agreement with the Clear Lake City Water Authority, turned off its water pumps, which had been drawing about 700,000 gallons of water daily from the ground, and begin using surface water on June 15 furnished by the City of Houston and the CLCWA. JSC, Nassau Bay and Clear Lake City all converted to surface water from well water.

For the past decade the land area on the west side of Galveston Bay including substantial sections of the Houston Ship Channel have been subsiding at a rate up to three inches a year. Robert Gabrysch, US Geological Survey in Houston, and other local authorities have directly linked the subsidence with the withdrawal of drinking and utility water from the ground.

The conversion of the space center and the surrounding residential neighborhoods represented a first step in the Bay Area to curtail the subsidence. The space center's water use is a fraction of the

Houston metropolitan area use, presently upward to 600 million gallons a day.

Prior to 1954 nearly all water supplies for the Houston region were obtained from subsurface water. Approximately 350 million gallons a day were pumped from the ground in 1954. Ten years later this had increased to 411 million gallons. Current estimates reflect the 600 million gallon per day figure.

The USGS reported recently that subsidence in the Pasadena area measured 3.5 feet from 1964 through 1973. USGS figures for the Clear Lake City/NASA area show a subsidence of 2 feet from 1964 through 1973.

Since establishment of the space center in 1962, water for operations and maintenance has been furnished by three pumps. Daily JSC consumption has been between 600,000 and 800,000 gallons per day.

USGS and JSC geologists have shown that the degree of land

subsidence is directly related to the volume of water pumped from beneath the surface. There is also evidence that each water well has a zone of influence toward subsidence which in turn contributes to localized subsiding.

Numerous surface faults in the area of the space center are currently active, as indicated by vertical displacement of roadways and structures at and near Ellington Air Force Base. A study recently concluded by NASA geologists indicates these fault lines have been activated or accelerated by the continuing decline of fluid pressures caused by withdrawal of both water and crude oil.

NASA management has worked for several years with the USGS to document the local subsidence and to correlate the subsidence with

subsurface water withdrawal. JSC, however, could not consider conversion to surface water until a 42-inch water main was constructed under authority of the City of Houston.

Two years ago negotiations were begun with the Clear Lake City Water Authority for JSC purchase of surface water obtained through the Houston City main. A 10 year contract has been signed with contract terms calling for the CLCWA to furnish surface water to JSC at established industrial water rates.

A Houston-Galveston subsidence panel is working to obtain similar agreements from other Galveston Bay Area subsurface water users.

The treated surface water will be relayed to the Clear Lake vicinity from the City of Houston 42-inch main which runs alongside the Old

Galveston Road (Texas Highway 3). NASA, Nassau Bay, and the CLCWA shared the cost of installing a 24-inch line from Highway 3 to the CLCWA plant in Clear Lake, a distance of about 6,800 feet. NASA has absorbed the cost of the 18-inch water main from the CLCWA plant to the JSC water plant, a distance of another 6,400 feet.

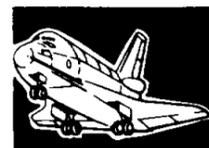
In addition, JSC has constructed a 600,000 gallon storage tank adjacent to the center's existing one million gallon tank. Clear Lake City, Nassau Bay and the space center collectively use about 4 millions gallons of water daily.

The three JSC wells will be maintained and placed on stand-by status for emergency use only in the event of a water-main interruption.

## ROUNDUP

NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS



VOL. 15 NO. 12

Friday, June 18, 1976

## Airstream Aircraft Back In Business

NASA 928, a modified WB-57F high altitude aircraft, was recently returned from the General Dynamics Fort Worth facility where wing-spar refitting and corrosion repair were completed. NASA 928 had been grounded since August of last year with the corrosion problem. The aircraft, originally designed by British engineers for high-altitude bombing missions, is being used for air-sampling missions performed by JSC under a cost-reimbursable, interagency agreement with the Energy Research and Development Administration.

The ERDA project is part of an on-going experiment begun by the then Atomic Energy Commission to sample radioactive particles suspended in the upper stratosphere. The WB-57F which JSC operates for ERDA is outfitted with a special air sampler which monitors and returns samples of the atmosphere directly in the plane's airstream, hence the project name - Airstream.

The Airstream equipment includes a compressor which collects samples of air at altitude, a particle detector which samples the air by placing a filter directly in the air path, and a tritium sampler.

According to Charles Anderson, JSC Flight Operations, the WB-57F sampling program has accounted for 85 percent of the information the government has gathered on the current fluorocarbon controversy.

The ERDA experiments call for repeated flights over specific flight paths at three different altitudes. Sampling is performed three times a year.

Of the four high-altitude civilian aircraft in the Western Hemisphere, JSC has two of them, both WB-57F's.

The other WB-57F, although

nearly identical to the ERDA-mission aircraft, is used for completely different purposes. The Earth Resources Program Office uses the second WB-57F to fly high-altitude earth resources missions and to provide a high-altitude platform for sensor development.

Leon Ballinger, JSC Project Airstream engineer, said the WB-57F was chosen by ERDA to fly the missions because of its high-altitude capability (it can fly up to 65,000 feet) and its large payload-lifting ability (up to 4,000 pounds).

NASA 928 was returned to JSC last month by General Dynamics just in time to fly one of the scheduled Airstream missions. According to Ballinger, the WB-57F returned 94 percent of the data requirements during this last mission. NASA 928 flew 14 flights during 17 days and covered 24,774 miles in duplicate flight paths from the Panama Canal to Alaska and back.

Perhaps appropriately, for an airplane just recently refurbished, Ballinger said that 928 performed perfectly and none of the Airstream equipment "glitched" during any of the flights.

ERPO operates both WB-57F's, Earth Survey II (a C-130) and a P-3.

## Gulfstream II Arrives JSC

The first of two Shuttle Training Aircraft (STA) arrived at Ellington AFB on Tuesday, June 8.

The STA is a modified Grumman Gulfstream II twin engine jet aircraft that will be used in crew training to simulate the flight characteristics of the Shuttle Orbiter.

Johnson Space Center personnel will perform a receiving inspection on the aircraft after its arrival. The STA will then be returned late this month to Grumman, Bethpage, N.Y., for installation of an electric aileron trim system. This minor

modification to the STA control system will take approximately one week.

The second STA will remain at Bethpage for continuation of the flight test program to insure that the various landing flight modes of the orbiter can be duplicated by the STA.

The remaining flight tests will concentrate on verifying the STA's ability to match the orbiter trajectory during the period from 35,000 feet through touchdown

and verifying several recent engineering changes.

Trajectory matching is accomplished by utilizing thrust reverser engines and direct lift control to vary the Gulfstream II aerodynamics to provide flight characteristics similar to the Shuttle orbiter.

The second STA is scheduled for delivery to JSC late in July.

## Bradley To DFRC Post

Ann Bradley, Assistant Executive Officer to the Deputy Administrator of NASA, becomes Director of Administration and Management Support at Hugh L. Dryden Flight Research Center effective July 18, 1976.

In her new role, Bradley will be responsible for administrative and management support of operations at the center, including the shuttle carrier aircraft tests and the orbital approach and landing tests for which extensive preparations are now underway. Specifically, these responsibilities include financial management, procurement, personnel management and institutional support.



NASA 928 - A WB-57F aircraft, returns to home at Ellington. When photo was taken the aircraft was undergoing engine inspection prior to flying a Project Airstream mission.

## Computer Contract Let

NASA has selected the IBM Corp., Gaithersburg, Md., for award of a contract to supply the Space Shuttle Data Processing Complex for the Mission Control Center at the Johnson Space Center. The estimated cost is approximately \$24 million.

The complex will consist of three computers and their peripheral equipment to be used in the Mission Control Center in support of the Space Shuttle program.

The work to be performed includes the design, fabrication, delivery, installation and checkout of the computer complex and associated software.

A cost-plus-award-fee contract with major fixed price elements is contemplated. The term of the contract will be for 44 months.

Control Data Corp., Minneapolis, Minn., also submitted a proposal.

# ROUNDUP



NASA LYNDON B. JOHNSON SPACE CENTER

HOUSTON, TEXAS

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**RECEIVING HER AWARD FOR THE MAY SECRETARY OF THE MONTH,** Dianne L. Smith is flanked by her boss, Joe D. Atkinson, Jr. chief, Equal Opportunity Programs Office, and Center Director Christopher C. Kraft. Dianne received the award for her outstanding performance of duties. The Equal Opportunity Programs Office deals daily with a wide diversity of persons of all races, economic and educational levels who exhibit varying degrees of courtesy and self-serving interests. Much of the activity within the office is highly sensitive and involves both JSC management, the community and news media. Dianne is the point of contact around which this activity revolves. According to her boss, she is unparalleled in the superb way she handles these diverse situations. "Her sensitivity and inherent understanding of the complete system of management, the employee and the community make her invaluable to the Johnson Space Center," Atkinson said. Dianne has been quoted as saying she wants to be the "best secretary JSC has ever had." Her boss thinks she is achieving that objective. **Congratulations, Dianne, for your award, and for your outstanding job performance.**

## Old-Fashioned Balloons Not So Old After All

Environmental concern and energy conservation have focused renewed attention on one of man's first aeronautical fancies — airships.

Airships were once an established element in world-wide transportation, providing the only means of non-stop rapid travel across the world's oceans. Later, during and after World War II, they were the bulwark of this nation's antisubmarine defenses. The only current role for the airship, at least in this country, is advertising.

However, new requirements for transporting heavy loads in power plant construction, transferring ship cargos to shore points, and providing economical, quiet and energy conservative inter-city transportation are reviving interest in lighter-than-air (LTA) vehicles. Military planners, too, are taking another look at the use of airships for some military missions for which they seem to be particularly well adapted.

These new civil and military applications will require vehicle concepts which do not resemble the airships of the past. Instead they may combine elements of both heavier-than-air vehicles (airplanes) and LTA vehicles (airships).

The Ames Research Center is currently studying two LTA concepts for civilian use through a contract with Goodyear Aerospace Corp., Akron, Ohio.

The first of these concepts is being studied for its potential as part of a future short-haul transportation system. The vehicle would be used as a feeder airliner and would be 60 meters long and carry 80 passengers. Although this is about the size of a Goodyear blimp, its carrying capacity is three times as great.

It would cruise at 160 knots and be able to land and take off vertically. Power would be furnished by four turboprop engines driving large prop-rotors which could be tilted upward for takeoff and landing.

This concept is particularly attractive today because of its potential for reduction of noise and fuel consumption.

The other concept under study is for a vehicle to transport large, heavy payloads over comparatively short distances. This so-called heavy lifter, combines features of large dirigibles and helicopter-type rotor systems to provide lifting capacity far beyond that of either vehicle type alone. Dirigible buoyancy is used to lift the vehicle empty weight, leaving the total lifting capacity of the rotor system to lift and support the payload. Vehicles capable of lifting payloads of up to 225 metric tons have been considered.

Of the two vehicles, the heavy lifter appears the most likely for immediate application, transporting

heavy power generating equipment or other outsize, heavy industrial equipment, particularly when the destination is a remote area not served by surface heavy transportation systems.

Substituting inert helium gas for the volatile hydrogen used in the German airships of the 20s and 30s, and benefitting from increased engineering know-how and better understanding of weather phenomena, a modern airship would be an extremely safe vehicle to fly.

## Space-Age False Teeth

Engineers at Lewis Research Center are using materials technology developed for aerospace purposes to improve the life of implantable false teeth supports.

Dental implants are devices attached to the jawbone which protrude through the gum tissue and serve as supports for dentures which remain permanently in the mouth.

The object of the Lewis Center research effort, conducted as part of the Ion Beam Applications Research program, is to attempt to simulate the texture and surface structure of natural teeth root by using ion beam sputtering techniques.

The titanium material samples are exposed to bombardment by kilo-electron-volt titanium ions. The ions are discharged from a thruster similar to ones developed for space satellites.

"Once a desirable surface treatment is attained, the titanium implants will be placed in dogs at a Cleveland-area hospital and the performance of the implants will be evaluated over a long period of time," explains Project Engineer Jack Weigand.

He added, "Researchers believe that tooth implants modified by ion sputtering techniques may result in long-lasting permanent dentures closely resembling the natural teeth they replace."

According to Bruce A. Banks, Head of the Small Thruster Section, titanium material is preferred for implantation because of its mechanical characteristics and compatibility with body fluids.

Surface sputtering by ion beam has demonstrated that the microscopic structure it creates closely resembles natural tooth root surface. Dental researchers feel that the duplication of this structure could result in improved performance and disease resistance of the implantable denture supports.

## Fire Extinguishers

The JSC Exchange, through a special bulk-purchase arrangement with a safety equipment distributor, is making several items of great importance to home fire safety available to JSC employees at reduced prices.

Prices are as follows:

BRK Model SS74R Battery Operated ionization-type smoke detector w/Mallory Mercury Battery . . . . . \$36.00

Fenwall Model RSD 117AL AC Powered ionization-type smoke detector w/8½ ft. cord . . . . . 26.50

Walter Kiddie Model 2 5/8 tps tri-class fire extinguisher ultrated IA IOBC w/wall mounting bracket . . . . . 9.00

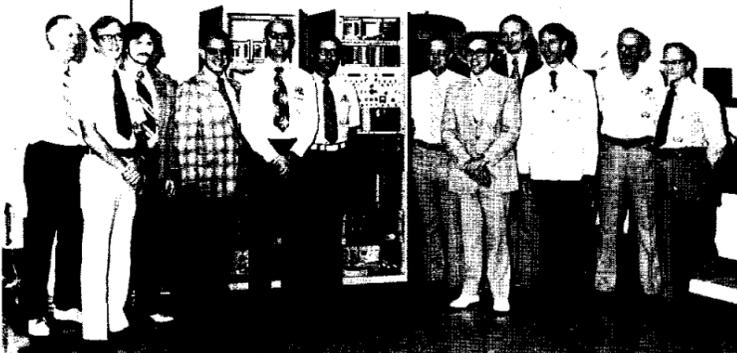
Walter Kiddie Model MB15 vehicle mounting bracket for above extinguisher . . . . . 1.50

Walter Kiddie Model GTPS tri-class fire extinguisher. Ultrated 2A UOBC w/wall mounting bracket . . . . . 15.50

Walter Kiddie Model MB16 vehicle mounting bracket for above extinguisher . . . . . 2.00

Data sheets on each product can be reviewed on bulletin boards around the site. In addition, samples for your inspection will be available at Bldg. 11 Exchange Store. Orders will be taken from June 21 to July 9, 1976 in Bldg. 11. Payment must accompany the order. Orders can be picked up at the store approximately 30 days after the close of the sale. Bldg. 11 store hours are 10:00 a.m. to 2:00 p.m.

## A JSC Team Profile



Shown above are members of the NASA team which led the development and early delivery of the first Shuttle MSBLS-GS (Microwave Scanning Beam Landing System Ground Station). From left to right are: Joe Tucker (KSC/PRC), Jim Lamoreux (JSC), Dennis Horn (JSC/Boeing), Raoul Smith (KSC), Hank Perkins (KSC), Oscar Fell (KSC), Don Willis (KSC), Ed Lattier (JSC), J. D. Collner (KSC), Harry Erwin (JSC), John Weber (JSC), and Paul Harton (JSC/LEC). The equipment racks in the background are partially assembled portions of the dual-redundant system.

## They Did What?

The MSBLS-GS is being provided as government furnished equipment to the Shuttle landing sites under a JSC contract with AIL Division of Cutler Hammer. The project is managed by Jim Satterfield in Tracking and Communications Development Division. Technical expertise is provided by The Tracking Techniques Branch, supported by Lockheed Electronics Company. Jim Lamoreux is subsystem manager and Ed Lattier is project engineer. Contractual and financial management are provided by Gene Easley, the contracting officer, by John Weber, the contract specialist, and by Jerry Prejean of the Orbiter Project Office.

KSC personnel, who will install and maintain the ground stations, have participated in the design and

status reviews from the beginning and influenced the design of the control units and other operational interfaces.

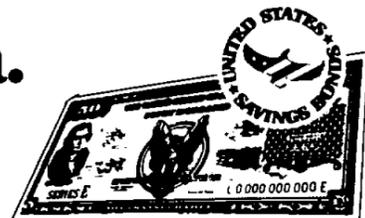
Following installation of the ground station on lakebed runway 17 at Edwards AFB, a series of system performance tests will be conducted by JSC, KSC, and AIL using the ground station in conjunction with a Shuttle MSBLS Navigation Set. These ground and flight tests will verify the system performance and the compatibility of the government furnished ground station and the Rockwell-furnished navigation set. The performance tests will provide early MSBLS assurance for the forthcoming Shuttle Approach and Landing Test flights.



**FIRE ROARS** from the flame trench as the Space Shuttle acoustic model undergoes a test firing at the Marshall Space Flight Center. The model, 6.4 percent the size of a real Shuttle vehicle, is used in tests seeking the best methods of reducing sound during a launch. Although less noise is expected from Shuttle than that produced by some rockets in the past, engineers want to decrease the level of sound reaching sensitive equipment which will be carried in the Shuttle Orbiter's payload bay, achieving the desired degree of noise suppression.

## Take stock in America.

Buy U. S. Savings Bonds



# 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 20 words or less, and include home telephone number. Typed or scribbled ad copy must be received by AP3/Roundup by Thursday of the week prior to publication.

## BOATS

Sweet 16, working sails, trailer, good condition, \$1800, 344-2095.  
For Sale - 14' Hobie Catamaran Sail Boat with extra accessories, xint cond, \$1,150, call Supkis 334-2309.

## PROPERTY AND RENTALS

Wooded, Lake access, lot, Lake Rayburn, Forest Hills, all utilities, \$4,995, Colton 488-2962.  
Lease - 3-2-2 Contemporary home in Seabrook, near schools, atrium, shade, fenced, available July 1st, \$425 + deposit, 482-5482.  
Wooded waterfront lot on Lake Rayburn, 12x50-ft mobile home w/8x28-ft screenporch, all utilities, \$14,500. Beaumont 713/892-8826.  
Beach house, Jamaica Beach, on canal, modern, well furn, private dock, central air, city water, paddle boat, etc. Immaculate \$225-wk, Harvey 621-5311.  
For Rent - 2-br Townhouse on Dickinson Bayou - 2 car garage, 2 balconies plus swimming pool, tennis courts, boat ramp, x 3977 or 534-6649 after 5 p.m.

## VEHICLES

Cab-over Camper, Idle Time, 8 1/2-ft, new with jacks, boot and other extras, \$1,400, 534-3802 after 5:30 p.m.  
Rent - Deluxe Coleman Camper, slips 6, stove, sink, dinette table, ice box, Plan early, reserve now for June and July vacations! 488-2387.  
74 Duster, ac, ps, pb, auto, trans., vinyl top, radio, fold down rear seat, \$2900, 483-4393 (work), 333-4606 (home).  
69 Dodge Charger, good condition, automatic, a/c, new tires, \$850, 944-6062 after 5:30 p.m.

71 Buick Skylark, V-8, air, radio, power steering, vinyl roof, \$1,600, 339-2035 after 5 p.m.  
71 Ford LTD, 4-dr, V-8-429, air, power, needs hood and body work, runs good, \$400 or best offer. McGhee 481-3648.  
73 Gremlin, Auto, air, AM/FM, radials, power steering-brakes, \$1975, 482-6702.  
70 MGB Cream puff yellow, Michelin radials, low mileage, AM/FM, tape deck, \$2200, David 946-0275.  
73 Hornet Sportabout, auto, pwr, air, extras, xint cond, 30,000 mi, 488-1718 after 5 p.m.  
59 Fury III, 4-dr, radio, air, pwr. \$495, Bullock 3681/488-1042.  
72 Chevy Caprice, 4-dr, power, air, 35,000 mi, \$2,000, 946-6658.  
73 Honda 350 twin, 3200 mi, like new, luggage rack, backrest, \$595, 482-5607.  
Men's 3-speed bicycle, Triumph, with Stormey Archer hug, both coaster and caliper brakes, \$30, 481-3900.  
73 Suzuki TS-250, xint cond, 3,000 mi, Hawkins 332-2306.

## PETS

3 registered toy poodles male 6 weeks old - apricot and lt. brown. Barnes x3466 \$100 each.  
Small black/tan female Manchester Terrier xint with children. Must sell because of allergy. 334-2129 or 433-9601.  
Cocker Spaniel pups, purebred, born 5/31/76, 3 blacks and 3 reds, mother and father can be seen. \$65, Payne, 485-3821 after 5 p.m.  
AKC registered wire hair fox terrier pups. 1 male, 1 female available. \$90 each. 482-0553.

## MISCELLANEOUS

Bay Area Singles Club get-acquainted dance 8 p.m. tonight (June 18) at Kings Park Apts. party room, 1315 NASA Rd. for info call Ray or Jim at x2815.  
23 channel CB never used, meter, delta tune, ANL, PA, etc. \$175 value, sell \$105, 333-2974.  
Kodak 300 slide projector, xint cond, 522-4738.  
Alterations and repairs - men, women and children's clothing, custom fitting, waist, length, crotch, pockets, zippers, anything in alterations, 473-9871 or 946-5459.  
Royal '72 Irons, xint cond, 2 through 9 including PW. Bordano x2856 or 337-2147.  
MINOX minofilm enlarger. New \$125, sell \$50. 333-3770.  
Rolex "GMT-Master" superlative chronometer, new manufacturer's guarantee, \$325 firm, Massaro, x2631, 482-5218.  
One goodyear custom polyglas E78-15 WSW, new \$15. Parker 946-4628.  
Full size, new cello in used case. \$800. 333-4669.  
Delux waterpik shower massage, 60-in chrome hose. \$30, includes standard installation in local area. 488-5037.  
75 IHC Cub Lowboy w/3 pt. hitch and 5' belly mower, like new, 120 hrs, \$2675. Propp 473-8411.  
Componet Stereo system, Pioneer speakers, Kenwood amp, dual turntable \$600. 944-6062 after 5:30 p.m.  
3.5 HP Briggs & Stratton lawnmower engine, good condition, \$40. Samouce 488-0406 after 5.  
**WANTED**  
Motorcycle, 750 cc or larger, will pay up to \$1000. 944-6450.



# EAA ATTRACTIONS

## SPECIAL EVENTS

The Summer Tennis Lesson Program began Wednesday, June 14th. Daytime and Evening Classes for Beginners and Intermediates, Adults and Children are available. 8, 1 hr. group lessons cost \$30.00. Group lessons will be instructed by Al Pavone, David Voss and Kit Overmyer. Individual and Small Group Lessons will be instructed by Gid Weber or Ken Westerfeld. Prices for these vary and range upwards, starting at \$30.00. Please sign-up in person at the Recreation Center. Bring your EAA Membership Card. Fees are payable when you sign up.

The Recreation Center will accept tennis court reservations for 7:00 - 8:00 A.M.

## From your EAA rep

Six Flags Fun Seekers Club cards, good for \$1 off each Astro-world and Six Flags Over Texas tickets. The FSC cards are also good for a 10 percent discount at hotels listed in the club guide and for family vacation packages. Disney Magic Kingdom cards are also available from reps. Some reps have already distributed these cards to their employees. Additional supplies have been requested and will be available within the next two weeks.

## RIDE FOR YOUR LIFE

What: American Heart Association Clear Lake Unit Cyclethon

When: Start times - Saturday, June 26, between 7:30 and 11 a.m.

Where: From Pasadena Fire Station on Kirby Rd. to Clear Lake High School and back (10-mile course)

Calling all bike riders - raise funds for heart research and enjoy healthy exercise at the same time.

## ENTER THE CYCLETHON

Get your friends and co-workers to sponsor you. Sponsor a rider and challenge other riders.

Many prizes awarded - first prize is a Raleigh International bike. For further information, call either Robert Frost (4667) or Doug Lilly (3669).

## TICKETS

On sale bldg. 11 - 10 a.m. to 2 p.m.: Windmill Dinner Theatre, \$14 couple - May 25 thru June 27 Dwayne Hickman in "Natalie Needs a Nightie" Dean Goss, \$16 couple - May 18 thru June "Night Watch" a mystery. ABC Interstate Theatre - \$1.50. Tickets are on sale now for SeaArama \$3.25 adults and \$2.25 children. Houston Astro gift coupons, \$4 boxseats and \$3.15 reserve seats.

## TENNIS

The set of tennis lessons scheduled to start June 14 will be postponed 1 week and start on June 21 instead.

The second set of tennis lessons will start the week of July 19th, using the same format as the 1st group. Sign-up will begin on June 21 at the Recreation Center.

Tennis Court Reservations. Effective June 14th courts may be reserved for 7:00 - 8:00 a.m. This is a change from starting reservations at 8:00 a.m.

## LEAGUE SPORTS

The Mixed Volleyball Season is nearly complete. The NASA team, Upshots, have clinched at least a first place tie. Their present record of 16-2 is 3 games over the second place contender, the Cavaliers, with 3 games left on the schedule. Finishing behind these two teams are the LEC Aces, Rats, Knockers-Up, B-Squad, Fapers and the Nerds.

In softball the womens league and mens "B" leagues have been completed. In the womens league, the Blazers went undefeated with a 7-0 record. All seven victories were shutouts. Their closest competitors were the McDonnell-Douglas Roadrunners, finishing with a 6-1 record. The mens "B" league was played on 3 separate nights. Monday night champion with a 5-1 record is the Dudes. Wednesday night was captured by the NADS, posting a 6-0 mark. The Bandits, also with a 6-0 record, took 1st place honors on Thursday night. In the play-offs, completed Wednesday, May 26, the Dudes beat the NADS in a hard fought championship game 10-8 to become B league champions. The mens "A" and "C" leagues are not yet completed. Both leagues have one week remaining on the schedule. The "A" league is locked in a 3 way tie for 1st place. The METS, Blazers and Dreamers have identical 4-1 records. Close behind are the Dynamos at 3-2. They are followed by the Animals and SoPac sporting 2-3 records. The "C" league is led by the Fokkers at 4-0. The Marx Bros. are close behind, 1/2 game out of 1st with a 4-1 record.



The spring softball season has been completed. The following leagues finished as follows:

Mens "A" League - Mets & Blazers tied for 1st place. 6 - 1

Mens "B" League - Dudes, 1st place, 6 - 0; Nads, 2nd place, 6 - 0

Mens "C" League - Fokkers, 1st place, 6 - 0; Marx Brothers, 2nd place, 5 - 1

Womens League - \*Blazers, 1st place, 7 - 0; Roadrunners, 2nd place, 6 - 1

The womens Blazers team in compiling their 7 - 0 record posted seven shut-outs scoring a total of 137 runs in six games. A 7th game was forfeited. After the conclusion of the womens season, an all star team consisting of outstanding players from the other 5 teams was selected. This team played the Blazers on Wednesday, June 9th. The 1st game finished a bit lopsided with the Blazers recording another shut-out, 21 - 0. In the 2nd game that evening the All Stars made some position adjustments and settled down to playing with each other as a team. The Blazers found themselves giving up 3 runs in the top of the 6th allowing the All Stars to tie the game up at 4 - 4. The Blazers & All Stars both failed to score their next times up. That brought the Blazers to the bottom of the 7th inning. They scored, so the final line reads Blazers 5, All Stars 4.



Helping Small Businesses . . . Mary T. Cook, (BB531) left, and Donald C. Humes, (BB532) right, receive certificates from James Neal (far left) and H. T. (Chris) Christman (far right) for their efforts during the past year to promote small business set-asides. Mary received her certificate as buyer for the largest dollar value of set-asides and Don received his certificate as buyer for the largest number of individual set-asides. This was the fifth annual award ceremony for contributions to small business.

## Radio Control Club

The JSC Radio Control Club will be sponsoring radio control model airplane races this weekend, June 19-20, behind Bldg. 14 on the antenna range. The races are open to the public and will start about 9:00 in the morning. Contestants from radio clubs from other areas around the state along with members of the local clubs are expected to participate.

Races on Saturday will be for Quickie-500's. These fly at speeds of 80-90 mph and are used as trainers for the faster Formula-One racers which will be flown on Sunday. The Formula-One's are scale models of racing airplanes and fly about 120 mph.

## Hurricane Show On TV

Channel 8, KUHT-TV, will be re-running a hurricane documentary that the station originally prepared for last season. The re-run is entitled "Hurricane, Don't Get Caught," and will be shown on June 24 at 8:00 p.m.

A Program on land subsidence will be shown following the hurricane show. We owe it to ourselves to be informed on these matters.

## CREDIT UNION REPOS

1971 Cadillac  
1972 Buick  
1972 Camaro  
1974 Datsun  
1975 Chevrolet Nova  
1968 Chevrolet  
Cars may be inspected 6/21/76 thru 6/23/76 10 am to 2 pm. Bids close 5:30 6/23/76. Will be opened 6/24/76. We reserve right to refuse all bids. For appointment call collection dept. 488-7070. Cadillac and Buick subject to prior sale.

don't LUMBER around JACK... send us a LOG on the costs you CHOPPED ...we'll WEDGE you in the records!

\*NASA FORM 1105A



BH4 (your friendly) Cost Reduction Office

# BUSS Test Outta Sight

A one ton scientific instruments package which drifted across the central Texas sky for 12 hours gathering information on various stars, including far distant giant and super-giant stars, was described by its U.S. and Dutch designers as the most successful balloon flight of its type ever conducted. It was the culmination of the 3-year international collaboration between the NASA Johnson Space Center, Houston, Texas, and the Space Research Laboratory at Utrecht, the Netherlands.

Dr. Yoji Kondo, JSC astronomer and co-principal investigator for the U.S., said the flight of the balloon-borne instruments was the best yet, in this seventh in a series of star studies which began in 1971. The 1,300 pound package was launched by a football-field-sized helium-filled balloon from the National Center for Atmospheric Research at Palestine, Texas. The Dutch team was lead by Dr. C. de Jager, internationally prominent space scientist.

The Balloon-borne Ultraviolet Stellar Spectrometer (BUSS) experiment was raised to an altitude of 25 miles by the balloon. At this altitude the balloon is nearly 100 percent above the Earth's atmosphere and gave the BUSS instruments a clear look at the stars. The balloon floated westward for nine hours at night. Data on 16 separate stars was gathered and radioed to the ground station where Dr. Kondo and his fellow scientists were monitoring the incoming information.

The entire payload was returned by an 85-foot diameter parachute, similar to chutes used on the Apollo command module. The payload, chute and balloon landed at Ranger, Texas, midway between Abilene and Fort Worth and, was recovered by NASA engineers who returned it to Houston.

The purpose of these balloon flights is to evaluate the experiment systems for possible use aboard the Space Shuttle, America's next manned spaceflight program scheduled to fly in early 1979.

Dr. Kondo said the BUSS package can gather information on spectral variations of a variety of stars and thereby aid scientists in determining their structure and evolution. Dr. Kondo, along with

Drs. Roel Hoekstr, Karel vandeer Hucht, and Dutch project manager Theo Kamperman of the Space Research Laboratory, controlled the instruments while they were airborne by ground command.

Information on one star, super-giant 'Deneb', was of particular interest, according to Dr. Kondo. The huge star, in the Cygnus (or Swan) constellation is 1,400 light years away and the light recorded by the BUSS instruments was emitted at a time in history before Anglo-Saxons settled in England.

'Deneb' is so large, Dr. Kondo explained, that if you placed the Sun in its center, the Earth would orbit the Sun totally within the star's outer limits. 'Deneb' is several hundred times larger than the Sun. It is also losing a large amount of matter (more than several quadrillion tons a year), as it burns.

Among the other stars scanned during the nine hour data take were 'Arcturus', giant star in constellation Bootes, super-giant star alpha Scorpii (Antares), alpha Lyrae (Vega) and alpha Virginis (Spica), a

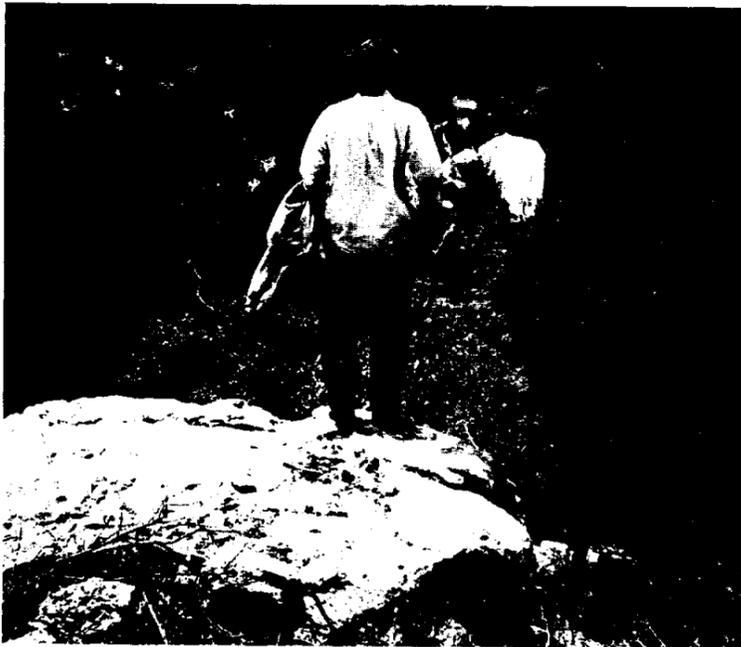
very hot star and one of the brightest observed during the flight.

The team of U.S. and Dutch scientists, who have returned to the Netherlands, now begin an in-depth analysis of the information. It is anticipated that preparations for another balloon flight, now scheduled for sometime this fall, will be started soon.

Dr. Kondo had high praise for the engineers and technicians of the Lockheed Electronics Co. which furnishes JSC technical and operational support in this program. The NASA engineering manager was David White, Curtis Wells was the Lockheed team leader. The launch balloon was made by Winzen Research, Inc. Sulphur Springs, Texas, and was filled with 20-million cubic feet of helium.

Dr. Thomas H. Morgan and Dr. Jerry L. Modisette, Houston Baptist University are co-investigators with Dr. Kondo in this experiment.

The BUSS instruments are an Echelle spectrograph and an SEC vidicon telescope.



**LOCKHEED ENGINEER** Tom Doebbler surveys the BUSS parachute and payload landing area near Ranger, Texas. The payload is barely visible on the far left about one inch from the tree-sky line. Area is midway between Abilene and Ft. Worth in some of Texas' rockiest terrain.

## Looking For An Educational Lift?

The Johnson Space Center will select a second group of participants in "Project Increased Qualifications." The objective of this program is to provide college study opportunities to selected employees during duty hours. It is intended to assist employees in improving their skills and qualifications thus enabling them to be more productive in their present position and better qualified for upward mobility opportunities that may occur in the future. Selection and successful participation in this program will not directly result in promotion to a higher grade. It is basically an opportunity for self-improvement that may prepare an employee to compete for future advancement.

This training program provides participants with an opportunity to enroll in one or two college courses during duty hours for four academic semesters. Actual time off during duty hours will not exceed eight hours per week. JSC will pay training costs including tuition, required fees, and textbooks; mileage or other costs associated with travel to the training site will not be reimbursed. Courses sponsored must bear some relation to the employee's current duties, to some future duties to which the employee may reasonably aspire or to the participant's general educational development in the areas of mathematics, science, or communications skills. For example: English composition would be acceptable while English literature would not. Participants may register at the local college or junior college of their choice if appropriate courses are available. If the trainee registers at a college with which JSC does not have a contract, he will be required to pay the tuition and fees and request reimbursement through the Employee Development Branch. Course selection will be individual and tailored to the trainee's needs and aspirations.

Applicants for this program must be permanent employees occupying non-professional positions in grades GS-1 through GS-11. They must have successfully completed a minimum of six semes-

ter hours of college level work in order to demonstrate the ability to successfully complete the training if selected. Applicants already possessing a bachelor's degree may not participate in this program. Such individuals should contact the Employee Development Branch or their personnel specialist for individual counseling. Participation in this program is also not available to persons presently enrolled in any other formal JSC training program such as the Worker-Trainee Program or any of the various upward mobility training programs.

Qualified employees may apply by submitting JSC Form 75 (Application for Training). They should complete item 2 of the application by entering the name of the college they wish to attend (if known). In item 5 they should write Project Increased Qualifications. Items 8 and 9 should be left blank. In item 10 (course description) enter the kinds of courses desired, for example: Business Administration, English, Mathematics, etc. Item 11 (justification and cost) should be left blank. Successful applicants must furnish this information for each individual course before registering for classes.

Applicants must attach a transcript of all college courses completed or a CSC Form 226 (List of College Courses and Certificate of Scholastic Achievement) which is available from the Employee Development Branch in Building 45, Room 543. Applicants submitting the above form must sign the certification on the back of the form.

The complete Form 75 must be approved by the applicant's immediate supervisor and division chief before forwarding it to the Employee Development Branch, Code AH3. Applications must be received not later than July 2, 1976.

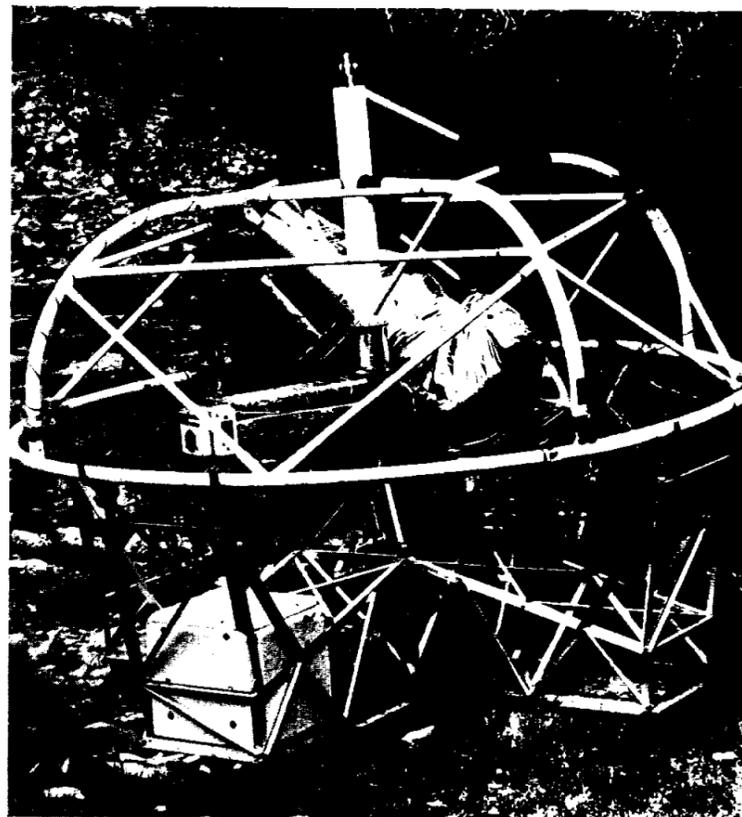
Employees who applied previously and were not selected do not need to complete a new application. They will be contacted by memorandum to determine if they wish to be reconsidered.

Any applicants needing further information should call John Lovejoy at 3734.

## Pepsi Honors Former JSC VOE Employee

Jacque Ramsey, 18 and a recent JSC employee, was awarded a Pepsi-Cola Youth of the Week award and a scholarship for her academic activities and her extracurricular interests. Jacque worked for JSC from June 9 of last year until the end of last month. She started as a summer aid and worked full-time during the summer.

Last fall she was converted to a Vocational Office Education (VOE) employee which allowed her to go to school and continue working. She is a 3.5 grade average student at E.E. Worthing Senior High.



**BUSS PAYLOAD** cage with instruments nesting securely inside as it was found by search team near Ranger. Object wrapped in reflective tape pointing up and to the left is the telescope spectrometer section of the experiment. Electronics and telemetry are in white box at bottom. Axis assembly is visible between the electronics module and the telescope. Dutch and U.S. investigators were extremely pleased with instrument's functions during this, the first successful test of the BUSS.



**JACQUIE RAMSEY**

While at JSC Jacquie worked in the Quality Engineering Branch.

## Phone Call Gets Government Info

Did you know that the Federal Information Center at 515 Rusk in Houston (77002) is a clearinghouse for distributing information about the federal government to the general public.

The information specialists who staff the office are familiar with the operations and missions of the various departments and agencies of the government and are trained to refer persons to appropriate sources of information.

The Federal Information Center will also provide a booklet explaining the responsibilities and duties of the FIC upon request.

Their telephone number is 226-5711.