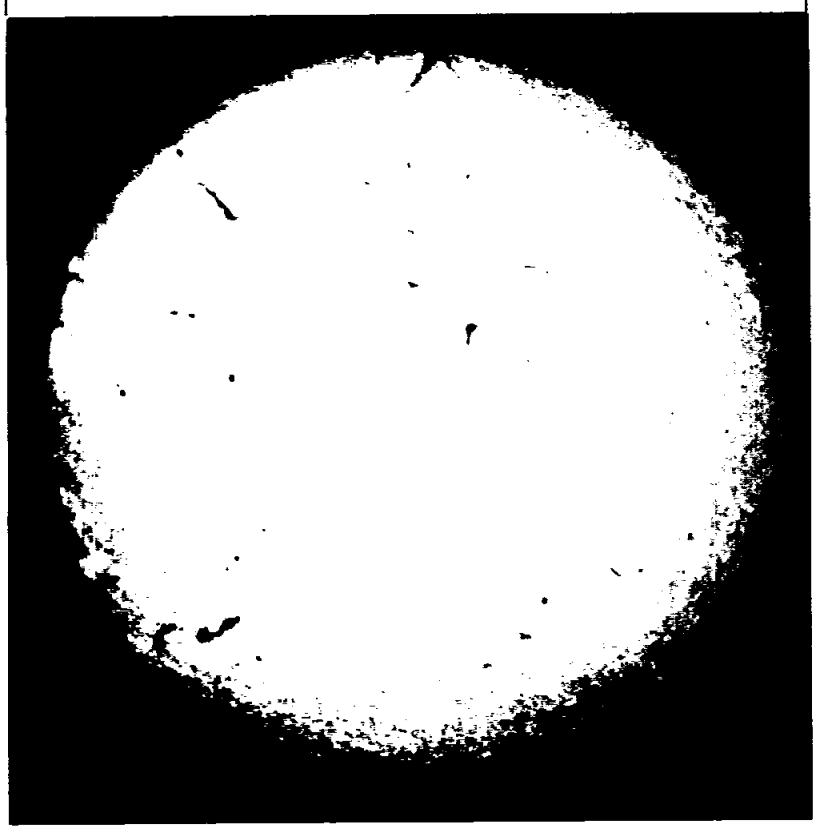
ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 7, NO. 20 JULY 19, 1968

MSC Records Solar Flare



SUN HOT SPOT—This photo which clearly shows a recent flare on the Sun was made by the automatic 35mm camera housed in the solar telescope at the NASA Manned Spacecraft Center. The telescope, part of the Solar Particle Alert Network, recorded this event at 11:05 a.m. CDT on July 8. A bright importance 3 solar flare—the bright spot on the left side of the Sun—interrupted radio communications throughout the world. Scientists with MSC's Space Physics Division said this particular flare would not have interferred with normal mission operations during an Apollo lunar mission.

Health Forces John S. Bull To Quit Astronaut Program

A pulmonary disease about which little is known has forced Lt. Cdr. John S. Bull, 33, to withdraw from the astronaut program, the National Aeronautics and Space Administration announced Tuesday.

Bull reported Tuesday to the National Naval Medical Center, Bethesda, Maryland, for an examination to determine whether he is medically fit to remain on active duty in the Navy. He has been placed on non-flying status.

MSC medical authorities said the disease is uncommon and has been defined in only the past few years. It has no medical name, but is sometimes called "Aspirin Asthma." Its cause is unknown, and there is no cure.

The disease is characterized by three factors: (1) chronic sinusitus, (2) chronic obstructive pulmonary disease, and (3) marked sensitivity and intolerance to aspirin.

Doctors said the disease is not a true allergy and is much more serious than asthma. It most frequently strikes young men in the late 20's and early 30's and is a progressive disease, they said.

Lack of knowledge of the disease restricts treatment to alleviation of the symptoms. Medical research on the disease is being conducted. Climate and environment apparently do not cause the disease or affect its progress, doctors said.

Bull's problem first became apparent in August 1967, when he was treated for sinusitus. In November, he developed a slight cough, and in January 1968, he experienced his first asthma-like attack.

Bull is one of the 19 astronauts selected by NASA in April 1966. He was assigned to the crew for Lunar Test Article-8 thermal vacuum tests, but was replaced because of the medical problem. In addition, he has been

a member of the support team for the third manned Apollo mission.

Bull's departure leaves 53 astronauts active in the NASA program.

Bull, a native of Memphis, Tennessee, is married and has a 2-year-old son. He has a Bachelor of Science degree in mechanical engineering from Rice University. Prior to joining the astronaut team, Bull was a Navy test pilot.

Automatic Weather Station In Gulf To Aid LRD Water Test Schedules

A new facility recently installed in the Gulf of Mexico by the Manned Spacecraft Center's Landing and Recovery Division, as an aid to test schedules for qualifying spacecraft and supporting recovery equipment, will no doubt be of interest to area boating enthusiasts and fishermen.

The installation, located about 25 miles south of Galveston on a Shell Oil Company rig, is an automatic weather station which measures and transmits wave height, wind speed and direction, relative humidity, air and water temperature.

This information is transmitted to the U.S. Weather Bureau Office at Galveston, where the data are recorded and the information is then supplied to the Spaceflight Meteorology Group at MSC as required to support LRD test programs in the Gulf.

The U.S. Weather Bureau at Galveston will also make this information available to the public. Initially, the data will include wind direction, velocity and wave height and later temperature and relative humidity will be added. This information will be available every three hours and if weather conditions should warrant, will be disseminated hourly.

MSC's Landing and Recovery Division is involved in numerous operational test programs requiring the at-sea testing and qualification of spacecraft and supporting recovery equipment. These tests are normally carried out in the Gulf of Mexico, from the NASA Motor Vessell Retriever, under operating conditions which closely simulate the actual ocean environment in spacecraft recovery operations.

The majority of the LRD tests are performed subject to specific minimum and maximum weather constraints and some tests require an accurate knowledge of the actual wave heights and periods. Initially, the tests were conducted on weather forecasts with visual observation and estimations during the actual test.

To facilitate this type of testing and to improve test schedules and quality of information, it was decided to install a weather transmission site onboard an offshore oil platform in close proximity to the area where testing is normally carried out. The Shell Oil Company authorized MSC to install this equipment on its Buccaneer Platform A, located approxi-

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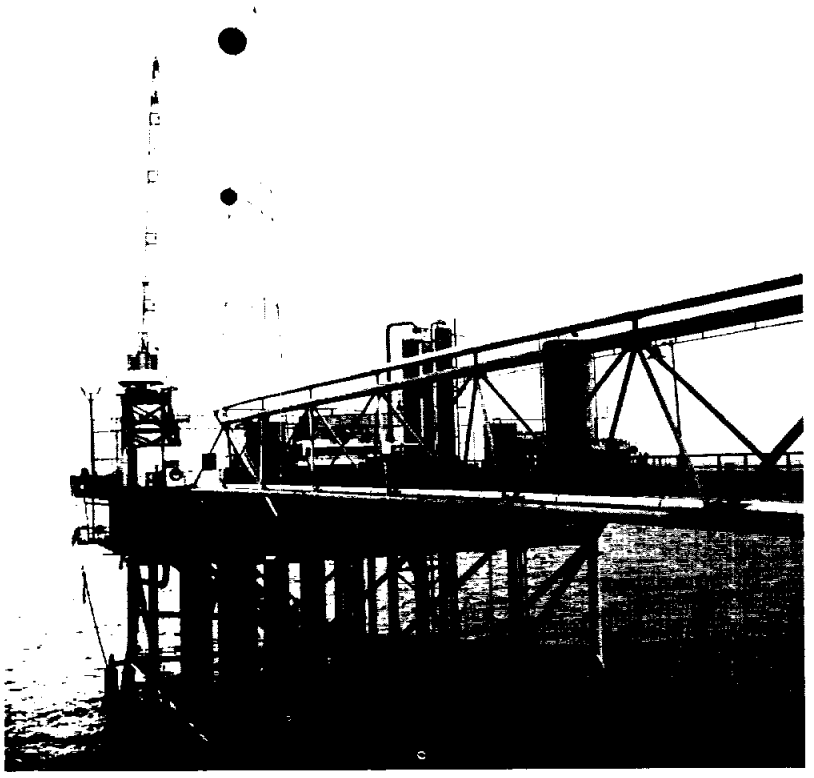


WEATHER STATION BASE—The new automatic weather station recently installed by MSC's Landing and Recovery Division in the Gulf, is located on this Shell Oil Company platform 25 miles south of Galveston. The telemetry and transmitter equipment is located in a small building at the base of the micro-wave tower and an antenna on the tower is used to send the data to the U. S. Weather Bureau office in Galveston.

Proposed Apollo Experiment To Observe Fires In Space

The zero-gravity environment of space may be a natural fire extinguisher. Limited results from zero-g aircraft studies show that during periods of weightlessness convective air currents are not produced by a flame as they normally are on earth. As a result, oxygen supplies are not replenished, and a fire tends to suffocate in the products of its combustion.

J. H. Kimzey of the NASA Manned Spacecraft Center's Structures and Mechanics Division has developed an experiment which may be flown on Apollo Applications missions to learn more about how fires behave in a zero-g environment.

Of particular interest is the kinetic energy which, as observed in aircraft studies, is still present after the visible flame is extinguished. MSC engineers want to know how long after a flame is smothered it could be rekindled if a fresh supply of oxygen is furnished by forced convection or a return to

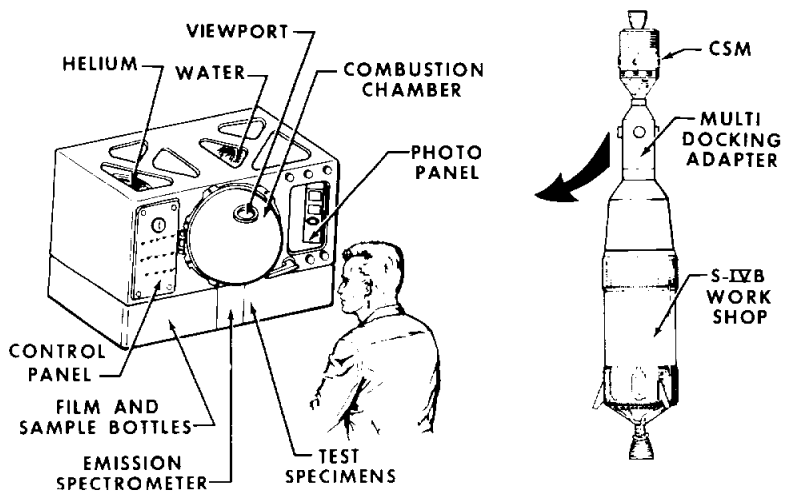
(Continued on page 2)

Apollo 7 Status

AT ROUNDUP PRESS DEADLINE

The spacecraft for Apollo 7 is in the altitude chamber at the Kennedy Space Center. An unmanned altitude run preparatory to manned runs has been delayed first by problems with an S-band power amplifier and later by telemetry dropouts. Duration of the unmanned run, which could later come at any time, is about 12 hours at altitude. The manned run with the prime crew of Astronauts Schirra, Eisele and Cunningham would follow about three days after the unmanned test. During this test the crew would spend some nine hours in the spacecraft most of the time in a 100 per cent oxygen environment at five pounds per square inch.

The launch vehicle for Apollo 7 is erected on Launch Complex 34. The first stage is undergoing engine purge and propulsion checks and the second stage propulsion system checks are continuing. The second stage J-2 engine has been modified to prevent the problem which occurred during the Apollo 6 test earlier this year. This modification covers strengthening the propellant lines leading to the augmented spark igniter on the engine. Guidance and control tests of the instrument unit are continuing this week.



Flammability Experiment

(Continued from Page 1)

gravity. They also will want to learn more about how fires spread in a weightless environment. Will gases of combustion propel burning materials into new areas creating secondary fires? And how far must two flammable objects be separated in zero-g to prevent a fire's spreading from one to the other?

Methods of extinguishing fires in space are also of interest, particularly fires which must be extinguished in a breathable cabin atmosphere, with a minimum of toxic or irritating by-products.

The MSC experiment plan calls for installation of a 1.1 cubic foot pressure chamber in the Apollo Applications, S-IVB Multiple Docking Adapter (MDA). AAP crewmen would conduct the experiments, observing, photographing and taking radiometric readings on some one hundred flammability tests.

Fuels such as polyethylene, mylar, nylon, polyurethane, polycarbonate, cellulose and teflon will be electrically ignited inside the chamber while the results are observed and recorded through glass ports.

The atmosphere of the chamber will be oxygen at 5 PSIA, and the chamber will be equipped with a fan to reproduce convective air currents that would normally be set up by spacecraft ventilating systems and astronaut movement. There will also be provisions for evaluating water, helium and vacuum extinguishment systems.

The equipment will be designed for six months life in orbit so that revisits may enable further testing after replenishing fuels, film and extinguishing agents.

Most of the design, development and production of the chamber and its support equipment will be done in-house at the Manned Spacecraft Center. Pending final definition of the experiment, it is expected NASA will award a contract for fabrication of an emission spectrometer. The spectrometer will be used to measure infra-red, visible light and ultra-violet energy levels during flammability tests.

Weather Station . . .

(Continued from Page 1)

mately 25 miles south of Galveston. Shell has provided this, as well as other assistances in the past, at no cost to the government.

The weather station is automatic in operation and normally transmits for 21 minutes every three hours. Provision is made to transmit on a continuous mode if required, and also from external battery packs if power is lost aboard the Shell platform.

By utilizing electronic equipment on hand in the Electronics System Section of the LRD Recovery Electronics Branch, the cost for the weather recording and transmission facility was kept to a minimum. Actual cost was less than $7,000. Leroy Penn of LRD was the project engineer for the installation.

Mission Trajectory, Systems Analysis Contract To TRW

The National Aeronautics and Space Administration has awarded TRW, Inc., TRW Systems Group, Redondo Beach, Calif., a contract for work on the mission trajectory control program and Apollo spacecraft systems analysis program for the Manned Spacecraft Center.

Under the contract, TRW provides work in the areas of flight control computer program development, trajectories, orbital maneuvers, range safety analysis and mission error analysis for the Mission Planning and Analysis Division at MSC. For the Apollo spacecraft program office, the contractor performs studies, technical fact finding and evaluation, technical systems analysis and investigations.

Estimated value of the cost-plus-incentive award-fee contract is $27.6 million.

Astronomy Group To Show Slides Observatory Trip

The next MSC Astronomical Society Meeting will be held 7:30 p.m., Wednesday, July 24 in building 336 at Ellington AFB. The program will include slides of the club's recent trip to the McDonald Observatory. The book, *Red Giants and White Dwarfs,* will also be discussed.

The next observing night will be July 26 if the weather is clear. For further information on the club call William Chanis, 4371.

Nobel Prize Winner Speaks At Seminar On Venus Atmosphere

Dr. Willar F. Libby, Nobel prize winner will be the speaker Tuesday on "Atmosphere of Venus" at a seminar sponsored by the Science and Applications Directorate.

Dr. Libby is from the University of California, Los Angeles. The program is scheduled to begin at 9 a.m. in the Building 1 Auditorium.

Your Job in Focus

Disability Retirement Procedures Changed to Strengthen Due Process

Major procedural changes in the handling of Federal employee disability retirement cases initiated by agency managers have been approved by the Civil Service Commission. The changes became effective for claims received in the Commission on or after July 1.

Cardinal features of the changes, which were developed by the Commission after lengthy consultation with agencies, personnel directors, employee union officials, and medical practitioners, are:

- The employee for whom disability retirement is sought will have the right to be informed, to be heard, and to be represented at all stages.
- Specific steps will have to be followed by agency management in referring employees for physical or mental examinations.
- Clear-cut avenues of appeal will be prescribed for both the employee and the agency.

Objectives of the new procedures are to provide Federal employees with maximum assurance of fair treatment and a just decision in all cases where disability retirement is initiated by management, while at the same time offering to agencies logical and equitable means for the retirement of employees whose disability is detrimental to the accomplishment of Federal missions.

Health Benefits Open Season Scheduled for November '69

The next open season for the Federal Employees Health Benefits program has been scheduled for November 10-28, 1969. There will be no open season in 1968.

During the open season in 1969, eligible employees who are not enrolled in a health benefits plan will be permitted to enroll. Employees who are already enrolled in a plan will be able to change to another plan or option.

Co-op of Month

VALUABLE STAFF MEMBER — A senior at the University of Houston working toward a degree in electrical engineering, Widge Stamback has been performing all the impurity diffusions required to make silicon integrated circuits in the lab of the Flight Data Systems Branch, IESD. His supervisors state that he has proven himself to be a valuable and dependable member of the staff and capable of assuming considerable responsibility.

Gaseous Nebulae, Magnetic Fields, Seminar Subjects

"Physical Processes In Gaseous Nebulae" will be the subject of a Space Physics Division seminar today at 3 p.m. in Room 193 of Building 31.

The speaker will be David Van Blerkom, research assistant, Joint Institute for Laboratory Astrophysics, University of Colorado, Boulder, Colorado.

A seminar on "Quasars and Galactic Magnetic Fields" will be presented at the same location next Friday, July 26 at 3 p.m.

The *Roundup* is an official publication of the National Aeronautics and Space Administration Manned Spacecraft Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for MSC employees.

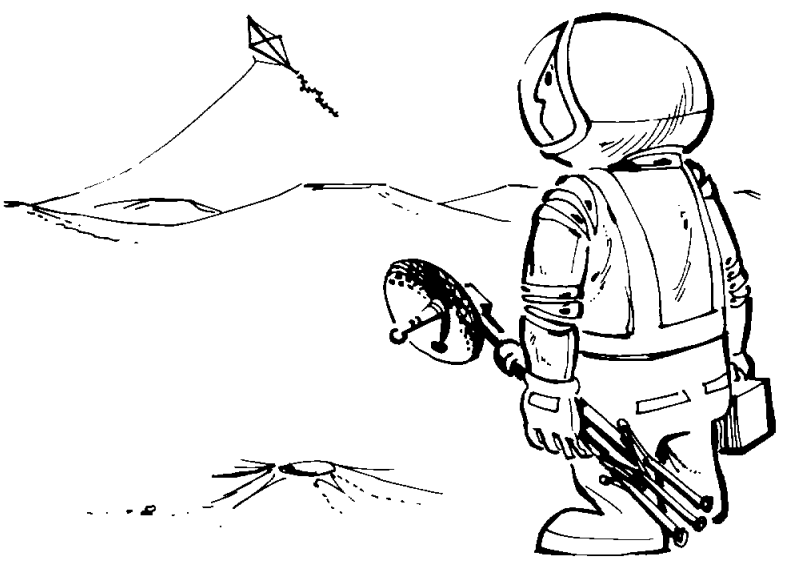
Director . . . . . Dr. Robert R. Gilruth
Public Affairs Officer . . . . . Paul Haney
Editor . . . . . Terry White
Staff Photographer . . . . . A. "Pat" Patnesky

Getting The Word On The Future

CO-OP BRIEFING—To help keep the MSC co-ops up to speed on the NASA programs, seminars are conducted periodically in various areas of the Center. Above, William E. Stoney, chief of the Advanced Spacecraft Technology Division conducts a recent seminar for the MSC co-ops on the topic "What After Apollo." Some 70 students attended the seminar.

THE ASTRONUTS

(filched from TRW Systems Group)



Roundup Swap-Shop

(Deadline for classified ads is the Friday preceding *Roundup* publication date. Ads received after the deadline will be run in the next following issue. Send ads in writing to *Roundup* Editor, AP3. Ads will not be repeated unless requested. Use name and home telephone number.)

FOR SALE/RENT—REAL ESTATE

Five acres of land off Manvelle Highway on County Road 101. MI 5-0188.

8-month old French Provincial in Baybrook: 4 bedrooms, separate dining room and living room, large family room w/fireplace, kitchen and dinette, utility room and separate two-car garage with fenced backyard, refrigerator, washer, dryer and miscellaneous furniture included, central air/heat, located on court, away from main traffic and apartments. Cost $25,000 equity and assumption. Dave Peterson, GR 4-3681 after 5.

3-bedroom frame in Dickinson, convenient to shopping center and school. Central heat, two-ton air conditioner. Nice neighborhood. Very good condition. $12,500. 4102 Victoria Ave. Jean White, 534-4073.

Rent by day or week, 1 bedroom furnished beach house, all electric kitchen, at Bolivar. Has boat dock in front. Evelyn Huvar, HU 3-7626 (no home phone).

Clear Lake City—1½ story brick, 4-2-2, paneled den w/built-in bookcases, fireplace; separate dining; terrazo entry and baths; kitchen w/many cabinets, dishwasher, disposal; carpeted throughout except den; fenced. Equity and assume 5¾% note. 944-0053 or 944-9033 after 6 or weekends.

Friendswood—Brick 3-2-1, oversize lot. Gas built-ins, carpets, Central heat/air, landscaped yard, walk to elementary school. Assume GI 6% loan. Equity $1,400—would consider lease/option to buy arrangement. Immediate occupancy. Stuart, 591-3210 after 5.

For rent 2 rooms with house privileges in quiet residential section. Male or couple with teenagers. L. Palmer, 877-1269 after 6.

2 bedroom, small cottage, lakeside, block from south shore Clear Lake, $8,900. C. Perrine, 877-2165

House for lease. Available end of August. Pasadena, Parkview Manor story and a half, 4 bedrooms, 2 baths, fenced, central air. Dave Bruce, 944-3166.

Rent property for sale in Pasadena. My half of partnership in small mobile home park, including 5 rent trailers and two apartments. Good investment, but I expect to leave on long-term training program end of August. Dave Bruce, 944-3166.

Six acres—beautifully wooded, excellent deer hunting, no restrictions, and all year fishing creek borders this property. $2,650 total price, $500 dn and $20/mo. 645-0372.

Two wooded waterfront lots on 230 acre private, stocked lake near Cleveland, Texas. Recreation hall, swimming pool, hunting privileges. Utilities available at lots. Sell one or both. Ben Hood, MI 3-6716 or WA 3-4290.

Furnished cottage apartment for 1 or 2 adults. Bay view. Quiet, private yard, carport, community pier, monthly rental or lease. 15 minutes from MSC. R. Hill, 471-4305.

Sagemont—Modern three bedroom brick, two baths, all electric kitchen, central air-heat, carpets, intercom, and double garage. Assume 6% loan. Equity. HU 7-2748.

FOR SALE-AUTOS

63 MGB, good condition, new tires, $750. Bill Gravett, MI 4-4468 or GR 1-3284.

63 Chrysler, 4 door sedan, A/C, excellent condition. Too good for a dealer. $700. D. N. Johnson, 591-3541.

65 Mustang Fastback. Black—2-2 Hipo 289"—4 speed. Must see to appreciate, call Kenneth Robinson at Texas City, WI 8-0959.

64 Pontiac Tempest Custom 4-door sedan, 326 V-8, automatic, air-conditioning, new brakes, new shocks, 2 new tires, orginal owner, $1,250, J. O. Covington, 487-3066.

66 Toyota Crown station wagon, 35,000 miles. $150 over NADA Blue Book average wholesale. Hugh Jones, HU 3-2931 (no home phone).

62 4 dr. Pontiac Bonneville sedan. Excellent condition. $750, Andy Knight, 488-1859.

61 Falcon 4 dr, body, tires, engine in excellent conditiin. $295. C. F. Malone, 877-2339. Ext. 5974.

60 Studebaker Hawk (V-8) std shift overdrive, 64000 actual miles, good running condition. L. Aguilar, 932-4511, ext. 3569.

66 Pontiac GTO. Air, 4-speed, reverb unit, $1795. 645-0372.

Chevrolet, 64 Biscayne 6, standard shift, radio, clean, good condition, $550, call 591-3133 (TRW), ext. 2946 or 932-3792, League City.

67 427 Corvette. Both tops, air, pwr. steering, brakes, windows, $3,700. U. Orr, 932-3110 after 5.

62 Dodge 440, 2-door hardtop, automatic, power steering, radio, air conditioning, new tires. Will negotiate a fair price within blue book limits. Ben F. McCreary, 946-5583.

61 VW Sedan. 78,000 miles excellent for "beach buggy" application, new battery, good running condition, trailer hitch, will negotiate price. Call Jerry Goodman, HU 8-0609.

61 Olds 88. Very good condition, power steering and brakes, factory air, new transmission, good tires (several other new and rebuilt items). Must see and drive to appreciate! $495. Beverly Duncan, 986-7438, Hitchcock.

65 T-Bird. Beautiful condition, fully equipped, eliminate dealer profit. If you want a good T-Bird, see this one and you'll buy it. Owner will sell at wholesale price of $1720. Roy Parker, 591-2253.

65 Mercury Colony Park Station Wagon, Power steering, power brakes, air conditioning, new brakes, shocks and tires, $1450. Charlie Swearingen, Nassau Bay, 591-3438.

65 Volkswagon Sunroof, 28,000 miles, excellent condition. $950. Charlie Swearingen, Nassau Bay, 591-3438.

FOR SALE—MISCELLANEOUS

16 ft. fiberglas boat, big two-wheel tilt trailer, 100-hp Mercury motor, canopy. MI 5-0188.

Mobile home for lease, furnished, air. Will relocate to your choice area, if on a long-term lease. Reasonable rent. Floyd A. Turner, RE 3-7667.

1964 Corvette Postraction rear axle assembly, complete w/traction bars, suspension assy, wheel hubs, brakes, etc. $115. Also Corvette dashboard (all instruments except radio) $45. Ron Hagood, WI 8-2870, Texas City.

Antique gold wrought iron table with champagne glass top and four matching chairs with apple green leather cushions. Original price $200. Used 2 mo. Sell $150. Evelyn L. Huvar, HU 3-7626 (no home phone).

Fireplace screen with draw drapes, log holder, tools with one extra large log prong holder, all match and grate. $50. Evelyn L. Huvar, HU 3-7626 (no home phone).

Stud service—Champion English stock, male silver blue AKC registered miniature poodle. Evelyn L. Huvar, HU 3-7626 (no home phone).

1 pair $18 dark men's dress slacks, waist size 44, length to fit 6' man. Cleaned once. Sell $10. Evelyn L. Huvar, HU 3-7626 (no home phone).

Dolphin Sr. Sailboat with 2 masts (1 brand new) and trailer, $475. Mrs. B. P. Gardner, 591-3781.

Sailboat: 13 foot, lateen rigged, can be put on car top, home built, best offer over $60. C. F. Deiterich, 482-1859.

Unused 1963 West Bend 7½ HP outboard motor with separate 2½ gallon fuel tank and 15 inch-transom. $175. GR 4-2041.

Black female—miniature toy poodle—AKC, 30 champions, 5 generations, $75. HU 2-7012 after 5.

Model railroad. Lionel H O gauge, scenery and table. 29 feet of track, 7 cars, engine, transformer, 2 switches. $25. G. Hawthorne, Jr., HU 8-3428.

Hardtop for Corvette Stingray Convertible. Fits '63 to '67. J. Whiteley, 946-3804 after 6.

4BBL Carb Manifold for any 301, 318 c.i. Ply., Dodge, Chry. engine. J. Whiteley, 946-3804 after 6.

Martin Busine Bb clarinet. Needs some work. $40. Also, Getzen Bb bass clarinet, excellent condition. $150. Both for $175. One music stand throw in free. Linda Bennett, MI 9-3576 after 8 p.m. Anytime Saturday and Sunday.

Baby bed, $10. Play pen, $15, highchair, $15. S. E. Jacobsen, HU 7-0792.

Sunfish type sailboat with trailer, ready to sail, $200. D. H. Johnson, 591-3541.

Console color TV (1962 Model) excellent condition. First $200. See to appreciate. Call 487-2109.

28' Cris Craft bridge cruiser, completely refurbished November, 1966. New Chrysler engine less than 100 hr. documented running time. Marine surveyed replacement value $12,500 priced $4750. Can be financed approximately $750 dn. Must see to appreciate. Shed A Stall 12, Seabrook ship yard. Stuart, 591-3210 after 5.

Sale/Trade 16' aluminum Lone Star fishing rig. Semi-Vee, family size seating. Good for riding or fishing. 12 Hp Sea King, factory trailer. Ready to go. $350 or trade on ski rig. E. L. Wright, 877-3059.

Baby grand piano, 5' Detmar, very ornate. Just been moved to new home and need tuning. $350, would consider trade for player piano. Stuart, 591-3210 after 5.

Eico F.M. tuner, factory built, excellent condition. $30. Call MI 9-7852, N. Prince.

Rent my 1966 Cessna 150 or 1967 Skyhawk. Attractive Rates! Instruction also available. Earn your Private Pilot Certificate for as little as $450. N. Tilton, GR 9-1176.

8mm. movie equipment, camera f2.5 lens and case, Eumig projector, editor and splicer, movie bar lights and case. Complete outfit for your vacation. Cost $200 new, sell $50. Armitage, 877-4258.

Toucan—This So. Am. bird with six vivid colors will provide hours of enjoyment and conversation for you and your family. Priced to sell (encl. cage). G. O. Miller, 932-2646.

Communications RCVR, SW Bands, CB, tunes to nearest 200 KC. Exc. cond. for CB or SWL. Has 80-40-20M Ham Bands. Microscope, 900X, exc. optics, cheap. Goodrick, 2291 (no home phone).

Zenith stereo console, looks good, sounds good, $115. F. C. Littleton, GR 4-3418.

Speed Queen automatic washer; white, 3 cycle, 3 temperature, 2 speed agitation, excellent condition, $100. Carter Alexander, 488-2272.

20 ft. cabin boat at Clear Lake, twin engine; for fishing charter. Andy Knight, 488-1859.

Crown Graphic 4 X 5 camera with flash and 7 holders, $90. Also, one motor bike, $75. Call 534-2894, Dickinson.

Sunbeam electric lawn mower, with 75 ft. extension cord. In very good condition. $25. 944-5658, Marion Bailey, after 5.

Lone Star 16 sailboat with galvanized tilt trailer, 4 life jackets, masthead fly, bottom paint, tarpaulin, 3½-hp outboard, all in excellent condition. Ed Simon, 488-4043.

Luxurious full-head wig, champaigne blonde, hand tied edge, adjustable cap, worn only twice, w/case, sacrifice at $50. J. W. Samouce, HU 8-0406.

Lawn mower, 22", 3½ hp Briggs and Straton engine, good condition, $15. W. G. Glover, 877-3384.

20' Shark Catamaran racing sailboat. $2100 w/trailer, $1900 without. HO 5-2973 after 6.

Surfboard—Hobie (Standard) 9' x 5", redwood skeg, two redwood stringers, just reglassed and tinted by Blaker Surf Shop, $90. Shelley Schnitzer, MO 7-1894.

Frigidaire refrigerator, apartment size. Ideal for beach house or cabin. $30, 471-4390, J. D. Miller, LaPorte.

Honda Dream, 1965, electric start, excellent condition, sacrifice at $275. Floyd Eaton, HU 2-7047.

16' fiber glass Aristocraft boat with canopy, 40 hp Johnson electromatic motor, tilt trailer, set of skis, slalom ski, all 3 years old and hardly used, excellent condition, cost new $2800, will sell for $1400, call 488-3641 after 5, Frank Van Reusselaer.

2-wheel camping trailer, $225, solid, enclosed, excellent clearance, running lights. R. J. Reining, 946-6396.

Collie puppies: AKC registered, champion bloodlines, 2 females, sable and white, born April 12. Vaccinated and dewormed. $20 or best offer. Hooper, 488-4120.

Yamaha 12-string electric, brand new, show room condition, $200. R. B. White, 877-4011.

Racks for surfboard. Phyllis Morton, 946-4752.

Amana 18 cu. ft. upright freezer in excellent working condition. Outside has small rust spots due to being kept in the garage. Orig. cost in 1959 was $599.95, will sell for $150. Alice Barker, HU 8-2177 after 5.

Hemisfair—two single gate admission Bonus Books. Value $9.85 each, price $5.75 each. Frank Newman, GR 4-3497.

14' Falcon Fitts plywood runabout, canopy, bigwheel trailer, 35 hp Johnson electric, life jackets, $375. Frank Newman, GR 4-3497.

16 foot semi-vee aluminum fishing rig, w/12 hp Sea King motor, little dude trailer, 6 gallon tank, fine shape, ready to go. Will trade for aluminum or fiber glass ski rig and pay difference, or sell for $375. E. Wright, 877-3059.

UHF, solid state converter, 2 months old, $16.50 (Bought color) E. L. Wright, 877-3059.

US Auto., a beauty with adjustable sights, walnut grips, new barrel, 2 extra clips, 100 rounds ammo. Must see to appreciate, $100. J. Townsend, 591-2545.

VOX Super Beatle amplifier, John T. Weber, 944-3256 after 6.

17' fiberglas boat with 75 hp Johnson outboard motor and tilt trailer. The trailer has a new white rustoleum paint job and the boat is complete with all water skiing equipment and all safety requirements. Complete price is $1200. Call Sam Cerniglia at 944-0710.

B&W TV, '66 RCA 24" screen, UHF channel, excellent condition, walnut finish, $150 cash, call 946-0547, anytime.

Royal standard typewriter, good condition. $50. Armstead Feland, 591-4270.

For sale boy's AMF 20' junior bicycle with training wheels, excellent condition, $15. 932-4612.

Trundle bed. Good condition, $35. Danish modern sofa, good condition. $85. Call Gwen Boykin, 591-2160, after 5.

16 ft. sloop, heavy duty big wheel trailer, 4½ HP aux. Could use sails, has cotton sails, lots of access, $400. J. Orr, 932-3110 after 5.

Man's and woman's 5 speed Schwinn collegiate bicycles. The pair cost $160 in January. For sale at $100. Bill Campbell, 488-3635.

Are you paying more and flying less? Rent my 1967 Cessna Skyhawk and save! $13.00 per hour straight or $12.00 per hour by the block. Aircraft based at Clover Field. N. Tilton, GR 9-1176.

Columbia tandem bicycle, good condition, $35. Also, boy's 24" bike, $8. Wayne Dyer, 944-5098.

WANTED

Ride in air conditioned comfort. Carpool or will take riders from vicinity of exit 13, Gulf Freeway. 8:30-5:00, Bldg. 2. Call Marlo, ext. 2755.

Will share driving from U. of H. to MSC, 8-4:30. Richard France, 747-3547.

Shop manual for 1960 Volkswagon sedan. Jim McCaulley, GR 1-3298.

Used typewriters, electric fans, electric percolators, and sewing machines for VISTA Community Center in the 5th Ward. John Hirasaki, 591-3779.

Cars to wash and wax while you work, only $8. Pick-up and delivery at MSC. Mark Johnson, GR 4-2422.

Much used wood desk suitable for use in a workshop. Maximum length of 52 inches. D. W. Sherwood, 877-2909.

Old model electric trains: Lionel, Ives, American Flyer, etc. Phone HO 5-5302.

Bowlers for fall Moon Shot Couples Bowling league at Mimosa Lanes, Tuesdays at 6:30 p.m. Call Shirley Yeater, 946-2390 for information.

Wanted: TV, Hi-fi components, working or not; also self-propelled lawn mower, edger, sailboat. Don Frisbee, 946-7193.

Will share driving or ride. Freeway Manor to MSC, 8 to 4:30. Don Frisbee, 946-7193.

Portable paint spray gun and compressor, photo enlarger timer, photo print dryer and bullet sizer and lubricator such as Lyman 450, also any bullet casting equipment. Carroll Hopkins, 944-2838.

Hemis-fair bonus books containing adult gate admission tickets. Total of six adult tickets desired. R. S. Davis, HU 7-3094.

College Professor wants to rent 3 bedroom house available to MSC within school district. Must have by week of August 19, 1968 for one year. Call L. R. Daniel, 504-766-2500, Baton Rouge, Louisiana anytime, or James L. Youngblood, 488-0716 evenings.

Slow-Pitch Softball Standings

As of July 12, 1968

(League 1)	W	L
GAEC	2	0
Coyotes	2	0
All Stars	1	0
Peanut Shells	2	1
CAD	2	1
LEC 2	2	1
BRN	2	2
Dynalectron	1	3
ALS	0	4
LEC 4	0	4
(League 2)	**W**	**L**
Bullets	4	0
Packers	2	0
Red Birds	2	0
TSD	2	1
CSD	1	1
Ten Diamonds	1	1
Lunartics	1	2
Gnats	1	3
GRPB	0	3
S&AD	0	3
(League 3)	**W**	**L**
Rats	3	0
LEC 3	2	0
Ball Busters	3	1
A-Burners	3	1
IBM	3	1
Link	2	1
Bombers	2	2
TTA	1	2
F-Troop	1	3
Philco-Ford	0	9
(League 4)	**W**	**L**
Animals	3	0
Association	3	0
Apollos	2	1
SMD	2	1
Blazers	1	1
Boeing	1	2
Link Trainers	0	2
Base Runners	0	2
LRD	0	3

Fast Pitch Softball Standings

As of July 12, 1968

(Amer. League)	W	L	Tie
Lonestars	4	0	
Link	3	0	2
LEC 1	1	1	1
Philco-Ford	1	1	1
FCD	1	2	
BRN	0	2	
Wackenhut	0	4	
(Natl. League)	**W**	**L**	**Tie**
STC	4	0	1
IESD	3	1	1
IBM	2	1	
TRW	3	2	
Boeing Bombs	1	3	
GE	0	4	

Whoa, Whoa You Son-Of-A-Gun!

SKIING THE HARD WAY—Astronaut Charles Duke is dragged through the water on Lake Texoma during life support training exercises at Perrin Air Force Base, Texas. The object of this exercise was to release the two risers attached to the parachute harness to prevent being dragged by an inflated chute. Others taking the training July 8-9 were Astronauts Edwin Aldrin, Alan Bean, Fred Haise, James Irwin, Joseph Kerwin, Thomas Mattingly, Russel Schweickart, and John Swigert. Also from MSC were pilots C. L. Harshfield and Thomas McElmurry and Dr. James W. McGee, flight surgeon from Medical Operations.

Apollo 7 Crew To Benefit From High School Girl's Suggestion

A chemical sensing device developed from the suggestion of a seventeen-year-old California high school chemistry student, Stephanie Black, will enlarge the confidence of Apollo 7 astronaut crewmen in their spacecraft fuel cell power system.

CONGRATULATIONS IN ORDER—Stephanie Black (second from left) whose suggestion led to the development of a chemical sensing device for Apollo fuel cells is shown with the letter she received from Dr. Robert R. Gilruth. Bill Gray, manager of the Resident Apollo Spacecraft Program Office, Downey (l.) presented the letter and Stephanie's mother, Mrs. Diane Thompson and stepfather, Don Thompson proudly stand by their daughter.

Stephanie has a letter from Dr. Robert R. Gilruth, Director, Manned Spacecraft Center, attending to the value of her suggestion that Hydrion paper be used as a back-up to electronic sensors to warn of an impending failure in the Apollo 7 fuel cells that generate electrical power for the spacecraft and provide an important by-product for the crew drinking water.

The detection system must be able to discriminate between small quantities and large quantities of highly alkaline potassium hydroxide in the water of the fuel cell, where a large amount could cause corrosion damage to the cell and contaminate the drinking water.

Two years ago, engineers of North American Rockwell's Space Division at Downey, California, where the Apollo spacecraft is being built, began looking for a simple, reliable back-up system to the electronic sensors in the fuel cell.

North American Engineer Don Thompson was thinking out loud at home one evening when Stephanie, his step-daughter, suggested the use of Hydrion paper, a relatively new type to which she had been introduced in her high school chemistry class.

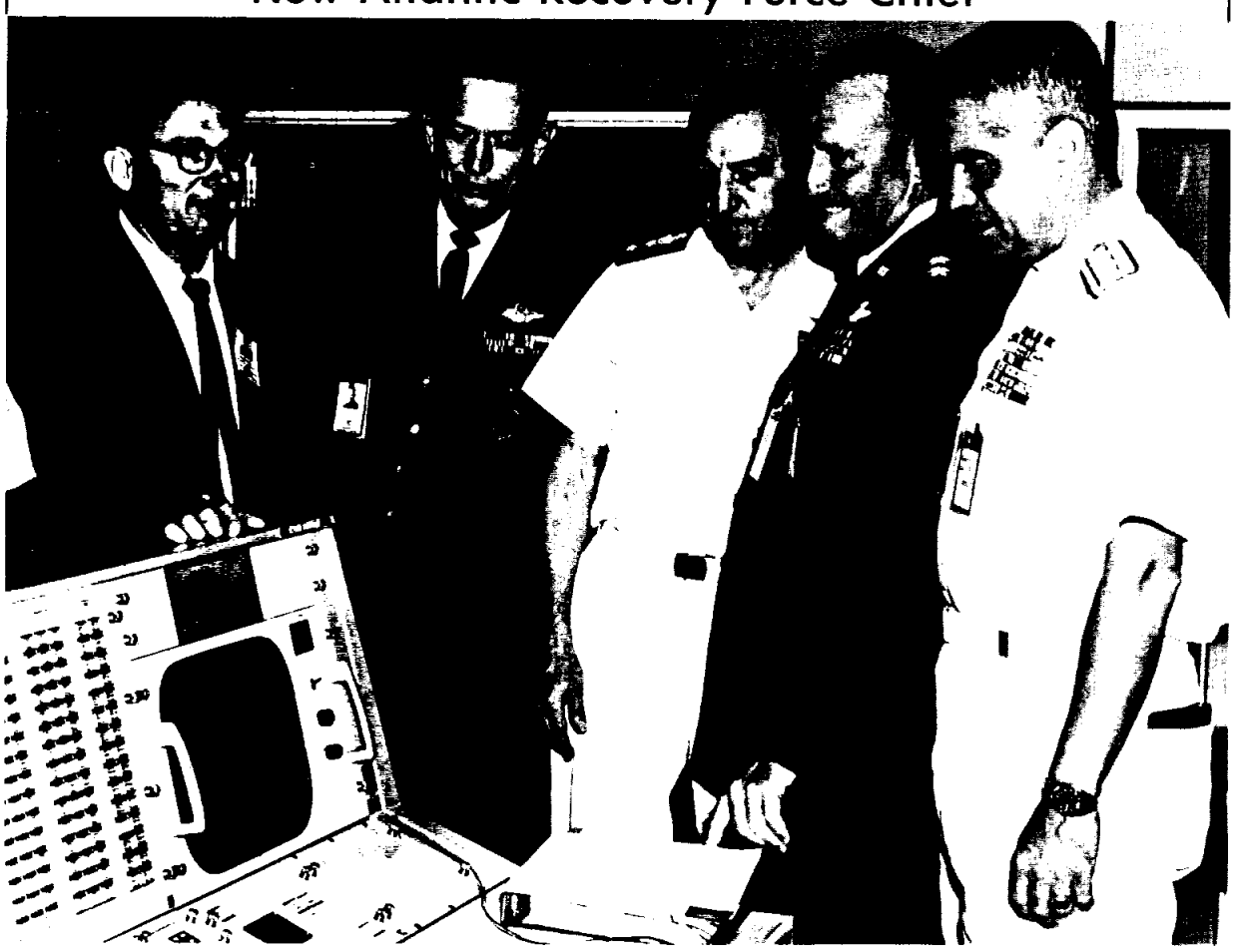
Unlike ordinary litmus paper, which NR engineers were then considering, Hydrion paper not only detects alkalinity; it also indicates its quantity.

Thompson obtained samples of Hydrion paper from Stephanie's high school chemistry teacher. He sent them to the NASA Manned Spacecraft Center where they were qualified for use as a back-up for the more sophisticated electronic sensors in the Apollo 7 spacecraft, in which Astronauts Walter M. Schirra, Jr., Walter Cunningham and Donn F. Eisele fly the first manned Apollo mission late this year.

Dr. Gilruth, in his letter to Stephanie thanking her for her contribution to the Apollo program, said: "Sometimes it takes the fresh outlook of someone detached from the manned space flight program to hit upon what might seem to be the obvious solution to the problem. Perhaps all the engineers working in the Apollo program should have bright and imaginative daughters as a back-up."

Miss Black is now in her freshman year at Golden West Junior College, Huntington Beach, California, and plans to earn a degree in science.

New Atlantic Recovery Force Chief



INTRODUCTORY TOUR—Rear Admiral Philip McManus, (right) new Commander-In-Chief Manned Spaceflight Recovery Force Atlantic, Norfolk, Va., here at Manned Spacecraft Center last week to meet with Landing and Recovery Division people, is shown on a tour of the Mission Control Center. Accompanying Admiral McManus on the tour were (l. to r.) Jerome Hammack, Chief, Landing and Recovery Division; Colonel Royce G. Olson, Director of DOD Managers' Manned Spaceflight Support Office, Patrick AFB, Fla. Rear Admiral T. A. Christopher, who has served his tour of duty and is being replaced by McManus; and Major General Vincent Huston, DOD Manager for Manned Spaceflight Support Operations, Washington, D. C.

Most Powerful Nuclear Rocket Passes Tests At Jackass Flats

The most powerful nuclear rocket reactor Phoebus 2A was successfully tested June 26 at the Jackass Flats, Nevada, Nuclear Rocket Development Station.

Phoebus 2A was the 12th nuclear rocket reactor designed and developed by Los Alamos Scientific Laboratory to be tested since the first Kiwi series in July 1959. The laboratory in New Mexico is operated by the University of California for the Atomic Energy Commission.

During this test the Phoebus 2A reactor was operated at significant power for a total of about 32 minutes, including 12 minutes above 4,000 megawatts; the peak power reached was about 4,200 mw. The equivalent of 4,000 megawats is about 200,000 pounds of thrust.

The test was terminated when limits set by available propellant and water were reached.

The primary objective of the test was to obtain data on this advanced reactor at intermediate and high power levels, high power density, and high temperature operation. Included were experiments to get data on a new method of reactor control using the liquid hydrogen in the core to regulate the fission process.

The tests were part of the nuclear rocket program — a joint program of the Atomic Energy Commission-National Aeronautics and Space Administration to develop the technology of nuclear-powered rockets capable of extensive space exploration.

NUCLEAR ROCKET FIRING—The nuclear rocket reactor Phoebus 2A (right) is shown (left) in a successful test firing June 26 at the Jackass Flats, Nevada, Nuclear Rocket Development Station. The tests are part of a joint nuclear rocket program of AEC-NASA to develop a nuclear rocket engine for propulsion in deep space exploration missions.