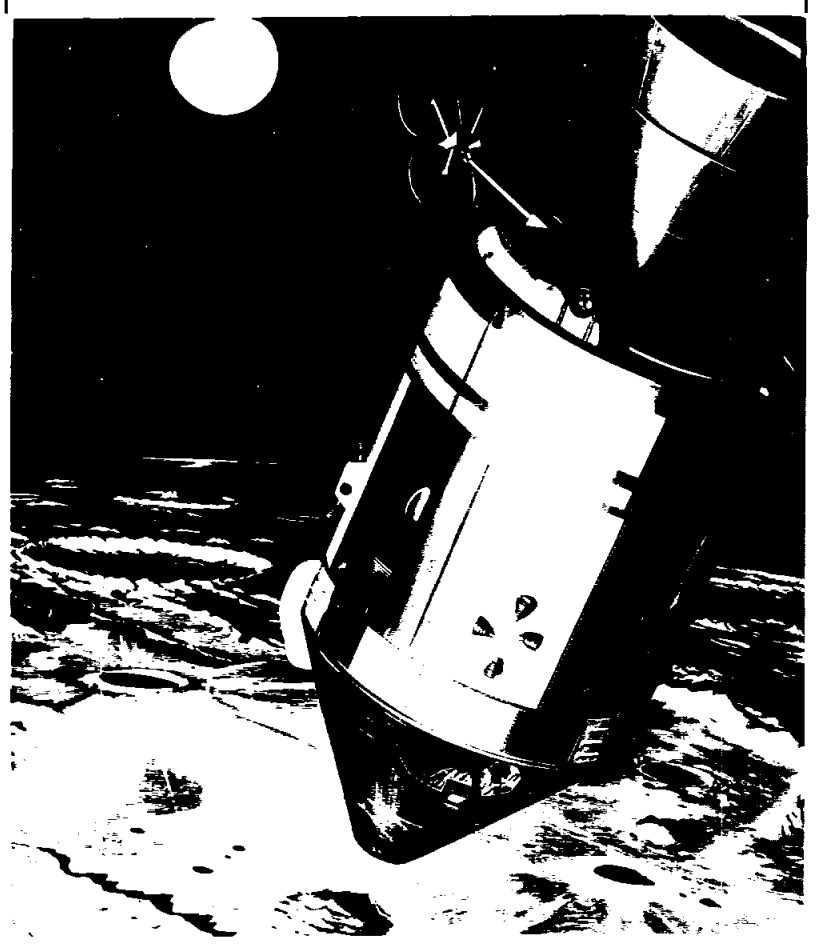
ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 8, NO. 5 DECEMBER 20, 1968

A Long Way From Home



PATHFINDER—Artist's concept shows how Apollo VIII will appear while in lunar orbit, with the spacecraft pitched down for lunar landmark tracking and photography. Orbital surveillance of lunar farside features and selected nearside Apollo landing sites will provide landing crews with valuable information. Moreover, the Apollo VIII mission will be the type mission for which the spacecraft was designed—manned operations in deep space.

LANDING PRELUDE—

Apollo VIII Lunar Mission Set for Launch Tomorrow

Apollo VIII, a six-day lunar orbit mission in the step-by-step buildup to a manned US lunar landing, is scheduled for launch tomorrow at 6:51 am from Cape Kennedy, Fla. The mission will fly the identical profile that will be flown on lunar landing missions with the exception of actual descent and landing on the lunar surface.

The prime objective of the Apollo VIII mission is to prove the capability of the Apollo command and service modules in the type of mission for which they were designed—operations at lunar distance. Earlier developmental Apollo earth-orbital manned and unmanned flights have qualified all the spacecraft systems — including the command module heatshield at lunar return speeds—and the Apollo VII ten-day failure-free mission in October demonstrated that the spacecraft can operate for the lunar mission duration.

Apollo VIII will gather data to be used in early development of training, ground simulation and crew inflight procedures and timelines for later lunar orbit and lunar landing missions.

Crewmen for Apollo VIII are commander Frank Borman, command module pilot James A. Lovell, Jr., and lunar module pilot William A. Anders. (A lunar module will not be flown on Apollo VIII, but a ballasted dummy—Lunar Test Article B —will be carried in the spacecraft/LM adapter.)

The mission will be carried out on a step-by-step "commit point" basis. This means that decisions whether to continue the mission or to return to Earth or to change to an alternate mission will be made before each major maneuver based on the status of the spacecraft systems and crew.

Ten Moon Orbits

A full duration lunar orbit mission would include 10 orbits around the Moon. Earth landing would take place some 147 hours after launch at 9:51 am CST, December 27.

Tomorrow's launch date is at the beginning of the December launch window for lunar flights. These windows hinge upon the Moon's position and lunar surface lighting conditions at the time the spacecraft arrives at the Moon and upon launch and recovery area lighting and weather conditions. The December window closes December 27. The next comparable window opens January 18 and closes January 24.

The mission will be launched from Complex 39A at the Kennedy Space Center on an azimuth varying from 72 to 108 degrees depending on the launch date and time of day of the launch. The first opportunity calls for liftoff at 6:51 am CST tomorrow on an azimuth of 72 degrees. Launch of Apollo VIII will mark the first manned use of the Moonport.

The Saturn V launch vehicle with the Apollo spacecraft on top stands 363 feet tall. The five first-stage engines of Saturn V develop a combined thrust of 7,500,000 pounds at liftoff. At ignition the space vehicle weighs 6,218,558 pounds.

Apollo VIII will be inserted into a 103 nautical mile Earth orbit.

Anders Lovell Borman

During the second or third Earth orbit, the Saturn V third-stage engine will restart to place the space vehicle on a path to the Moon. The command and service modules will separate from the third stage and begin the translunar coast period of about 66 hours. A lunar orbit insertion burn with the spacecraft service propulsion engine will place the spacecraft into a 60 x 170 nm elliptical lunar orbit which later will be circularized at 60 nm.

Free-Return Path

The translunar injection burn of the third stage will place the spacecraft on a free-return trajectory, so that if for some reason no further maneuvers are made, Apollo VIII would sweep around the Moon and make a direct entry into the Earth's atmosphere at about 136 hours after liftoff and land in the Atlantic off the west cost of Africa. During a free-return trajectory, corrections could be made using the spacecraft Reaction Control System.

Ten orbits will be made around the Moon while the crew conducts navigation and photography investigations. A trans-earth injection burn with the service propulsion engine will bring the spacecraft back to Earth with a direct atmospheric entry in the mid-Pacific about 147 hours if launch goes on schedule tomorrow. Missions beginning later in the window would be of longer duration.

Several alternate mission plans are available if for some reason the basic lunar orbit cannot be flown. The alternates range from ten days in low Earth orbit, a high-ellipse orbit, to a circumlunar flight with direct Earth entry.

As Apollo VIII leaves Earth orbit and starts translunar coast, the Manned Space Flight Network for the first time will be

(Continued on page 4)

Apollo VIII Onboard TV Gets World-Wide Relay

Millions of people in their homes in Europe, America and Japan will see live television pictures taken by the Apollo VIII crew circling the Moon on Christmas Eve.

The Apollo VIII crew — astronauts Borman, Lovell and Anders—will carry a cigar-box-size TV camera identical with the one which brought live TV pictures of astronauts Schirra, Eisle and Cunningham on their Apollo VII flight.

Live pictures from the camera will be beamed six times to Earth during the Apollo VIII mission including two times while the spacecraft is orbiting the Moon. Manned Space Flight Network stations near Madrid, Spain, and Goldstone, Calif., are equipped to convert the camera's slow-scan signal into a picture that can be viewed on home TV sets.

This equipment converts the camera's 227-line picture scanned at 10 frames-per-second into the standard 525-line picture used by US television networks. As on Apollo VII, NASA will release the picture live to the TV networks as it is received at the Mission Control Center at MSC.

In addition, European networks will be able to receive the signal live from the MSFN station near Madrid.

The times for television transmissions from Apollo VIII depends on the time that the mission begins and it can be determined when the Apollo spacecraft passes over the Goldstone and Madrid stations.

Assuming that liftoff of the Saturn V is on schedule—at 6:51 am CST tomorrow—Dec. 21—here is the schedule for television transmissions in the Apollo VIII flight plan:

- First pictures at 31 hours and 15 minutes after liftoff at 2:06 pm, Dec. 22. This transmission will be to Goldstone for release from MSC, and transmission to Europe and Puerto Rico via the Application Technology Satellite III, and to Japan via ATS-I.

- The second transmission on Dec. 23 at 2:06 pm also will be received at Goldstone, released

(Continued on page 3)

What better time...

Tomorrow's launch of Apollo VIII marks man's first attempt to leave the space that surrounds our familiar planet and venture out into the depths of space toward another celestial body. Perhaps the ancient mariners had the same feeling of anticipation as they set sail through the straits of Gibraltar past the limits of the known world.

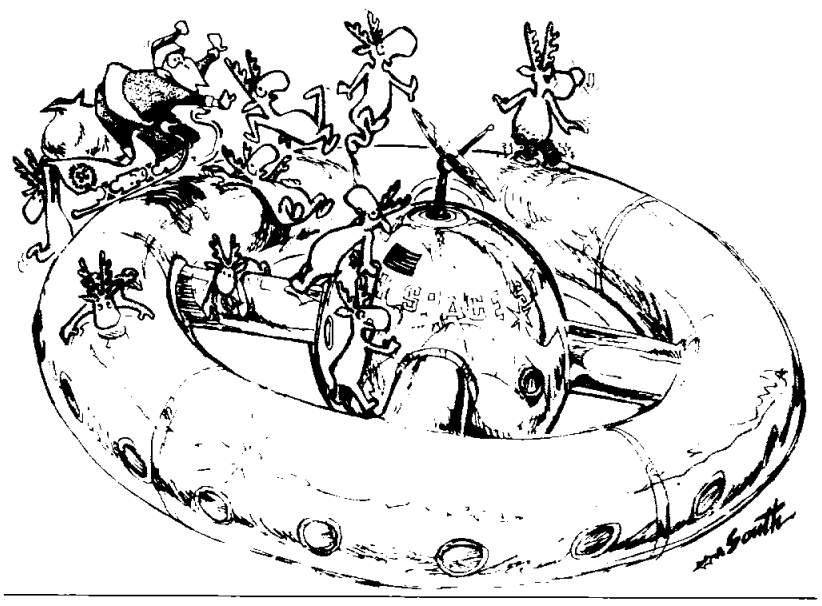
Our technology gives us an advantage over those iron men in wooden ships as we push outward into a different kind of ocean. And coming as it does during the Christmas season, the Apollo VIII mission epitomizes the effort that this center has put forth during the last several years to reach the national goal of a manned lunar landing.

Apollo VIII commander Frank Borman said a few weeks ago that he hoped the mission would be "the type of experience that might lead to at least some basic understanding among the peoples of the earth." He was speaking of viewing the entire sphere of the earth for the first time from deep space when indeed our planet would appear as "one world" where hopefully peace will come to all men of good will. What better time is there for such sentiment than now in this Christmas season.

I should like to extend to all employees of this center my personal greetings and best wishes for a Merry Christmas and a Happy New Year.

Robert R. Gilruth
Director

THE ASTRONUTS (filched from TRW Systems Group)



Federal Employees Top Incentive Award Record

Chairman John W. Macy, Jr., of the U.S. Civil Service Commission hailed the "inventiveness, creativity, perseverance, and productivity" of Federal employees whose adopted suggestions and superior achievement in Fiscal Year 1968 broke several all-time records.

He reported that 145,623 useful suggestions were adopted, which contributed to economies and improved operations valued at $149,761,851—the third year in a row that employee suggestions have topped the $100 million mark. Employees received a record $4,799,868 in cash awards, averaging $44 per award.

There were 97,390 superior achievement awards for outstanding job results and work achievements, the highest number ever granted in a single year. Achievements by Federal employees resulted in measurable benefits to the Government valued at $99,460,059, plus such intangible contributions as scientific advancement, better service to the public, and more effective accomplishment of programs. Awards for superior achievement totaled $14,270,980, for an average of $159 per award.

Chairman Macy called on managers and supervisors at all levels to "recognize the great potential of our human resources" and to encourage individual ingenuity and enthusiasm.

Individual Standouts

The highest single cash award, for $8,645, went to Dr. Otto Reitlinger, a chemical engineer at the Naval Ordnance Station, Indian Head, Md. He discovered a safe liquid fuel now called Otto fuel for torpedo propulsion which, in its first year of use, resulted in measurable benefits of $7.6 million through lower cost in the manufacture and loading of torpedoes. In addition, the fuel has contributed significantly to the safety and improved performance of the torpedo and is expected to yield continuing benefits.

Seven agencies exceeded the million-dollar mark in first-year measurable benefits from adopted suggestions: Post Office, $6.5 million; Defense Supply Agency, $3.9 million; Agriculture, $3 million; and NASA, $1.7 million.

PEANUTS Charles Schulz

Talent Sought For January 21 Linkletter Show

MSC employees who have unusual hobbies or talents may be interested in trying out for Art Linkletter's House Party program to be filmed in the MSC area January 21.

House Party producer Charles Fagan will be at Ellington AFB January 7 to talk to adults who feel that they would like to share their talent or avocation with television viewers. Fagan will talk to third-grade children the following day to select two boys and two girls for the January 21 House Party filming.

Offspring of MSC employees and assigned military are eligible to try out for the show. For additional information or to volunteer, call Trudy Cooper at 877-1659 or Ann Abbitt at 488-4038.

Do-it-yourselfer

MONEY SAVER—Robert R. Dittman recently received a top MSC award for his "Do-It Yourself Pay Raise Kit" which has produced more than $4.5 million in reportable cost reduction actions and has fostered greater participation in the MSC Suggestion Program.

A Tree for Apollo VIII

TOO TALL FOR A LIVING ROOM—Logger Mike Clark prepares to cut down a 40-foot Douglas fir near Shelton, Washington for railcar delivery to MSC. The tree, donated for display at MSC's west gate by the Boeing Company, was erected and lighted this week as a holiday tribute to all people associated with the Apollo VIII mission.

Your Job in Focus

Summer Employment Exams

The Civil Service Commission has announced its 1969 examination schedule for those who will be seeking summer jobs with federal employers. The written test will be conducted nationwide, with applications received by January 3 tested on January 8, and those received by January 30 tested on March 8.

Civil Service jobs such as clerk, typist, and engineering and scientific aids paying from $75 to $100 per week, and clerk-carrier jobs in the postal service paying $2.81 per hour, will be filled from this examination. A single test will be used for both civil service and postal jobs. *Applicants rated eligible in the 1968 examination will not have to take the 1969 test.* They will receive forms from the Civil Service Commission for updating their qualifications.

Engineering and physical science students who will have completed two years of college (60 semester hours or equivalent) by the start of the summer employment period and have a cumulative grade point average of 3.5 or above at the time of application are not required to take the examination to be considered for summer jobs in grades GS-1 through GS-4. They should submit a Qualifications Statement, Form SF-171, and either CSC Form 226 or a college transcript indicating their grade point average to the Interagency Board of Examiners serving the geographical area where they wish to work.

Candidates should obtain Announcement 414, "Summer Jobs in Federal Agencies," which contains detailed information on procedures and the application blank to be used in registering for the required test in the city of the applicant's choice. These may be obtained from college placement offices, post offices, Interagency Boards of US Civil Service Examiners, and the US Civil Service Commission.

Pending Legislation

Following is a summary of personnel legislation on which some action was taken during the 90th Congress, Second Session, January 15 through October 14, 1968:

S. 1035—Employee Rights—Prohibits (1) requiring employees and applicants for Government employment to disclose certain information concerning finances, family personal relations, and other intimate personal information; (2) checking attendance at meetings not job related; (3) forcing participation in political activities; (4) coercing employees to buy bonds or make charitable contributions; and (5) interrogating employees without presence of counsel, and restricts use of the polygraph. Passed Senate; hearings completed in House. Pending before Manpower and Civil Service subcommittee of House Post Office and Civil Service Committee.

S. 1157 & H.R. 8474—Leave—Requires Agencies to excuse from duty, without loss of pay or charge to leave, all non-essential employees in areas covered by an official U.S. Weather Bureau forecast for hurricane or other severe weather conditions. Hearings completed in both Senate and House; pending before Senate and House Post Office and Civil Service Committees.

H.R. 6784 and 17682—Retirement—H.R. 6784 provides for transferring credits for Federal service to the social security system if no retirement benefits are payable when the employee dies, becomes disabled or reaches retirement age; and for raising retirement benefits to a level which, together with any OASI benefits payable on the basis of other employment, would equal the amount payable if the Federal service had been covered by social security. Hearings held in House; pending before the Retirement, Insurance and Health Benefits subcommittee, House Post Office and Civil Service Committee.

H.R. 17682 amends Title I, Civil Service Retirement Financing. Provides that: (1) full normal costs of benefits will be met through equal contributions from employees and agencies; (2) the Government pays the costs of all increases in unfunded liability created by future legislation, financing each increase through annual installments over a 30-year period; (3) the Government meet is responsibility for financing existing unfunded liability through gradually increasing permanent indefinite appropriations, which after 10 years would equal interest on the unfunded liability; (4) annuity increases after the first full fiscal year would be payable only if Congress appropriates the amounts needed for disbursement; (5) the Secretary of Defense be required to transfer to the Retirement Fund each year an amount equal to annuity disbursements attributable to military service; and (6) each agency be required to transfer to the Fund an amount equal to the value of unused sick leave for a retiring employee or an employee who dies and leaves qualified survivors.

Use Christmas Seals.

20-Year Man

Chester H. Jenkins
Apollo Spacecraft Program Office

Roundup Swap-Shop

(Deadline for Swap-Shop classified ads is the Friday preceding *Round up* publication date. Ads received after the deadline will be run in the next following issue. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 20 words, including name, office code and home telephone number. Send ads in writing to *Roundup* Editor, AP3. Ads will not be repeated unless requested.)

FOR SALE/RENT—REAL ESTATE

Three lots on Lake LBJ, will sell all or individually $500 each. M. Dunn, GR 9-1295 after 5.

Large, heavily-wooded corner lot on cul de sac with view of Taylor Lake, ½ block to park and docks. 591-4632.

FOR SALE—AUTOS

63 Rambler 660 Classic 4-door straight 6, std shift, 22 mpg, reclining seats make into bed. Under retail at $460. Barbara Matelski, 944-1280 after 5.

68 Corvette Stingray convertible, blue, wite top, 327, air, autotrans, radials, positraction, AM/FM. Jere Cobb, 591-3516.

60 Rambler American 4-door, straight stick, good rubber—clean peppy little car. $200. Bob Merrifield, 591-2437.

66 Olds Delta 88, 4-door hardtop, fully equipped, xclnt condition, $1795. C. Kraft, HU 2-7357.

Trade or sell 64 Ford Falcon Futura V-8 4-door hardtop, radio, air, $250 under retail. Barbara Matelski, 944-1280 after 5.

61 Chevy Impala 2-door hardtop V-8, autotrans, radio, good tires, one owner. Xclnt second car. $555. D. White, HU 8-1024.

66 Mercury Colony Park 9-passenger station wagon, fully equipped, $1750. George M. Low, 591-2866.

65 Impala Super Sport 327, 4-speed, factory air, 50,000 miles, xclnt condition, orig owner, $1385. Tom Graves, 643-9341.

65 Chevy ½-ton panel truck, new 68 6-cyl engine, trade for car of equal value. John Weber, 944-3256.

Ford Torino GT 69, Indian fire, white int custom, pwr steer, V-8 autotrans, radio, $2995. Bernie Oczkowski, WA 6-8994.

68 Volkswagen delux sedan, radio, heater, whitewalls, clean, $1585. Kutalek, 946-8416.

67 Cougar XR-7, loaded, factory air, FM stereo, power steer, recent tuneup, good tires, $2100. William Bean, 468-2149.

62 4-door Ford Galaxie 500, radio, heater, air, good tires, recent tuneup, 69 state sticker. N. Jevas, MI 4-5832.

57 Volkswagen, 64 engine, like-new paint, coral red, nice interior, 30 mpg, very reliable. $350. G. Gammon, GR 4-2295.

63 LeMans V-8, autotrans, R&H, air, buckets, red and white, black interior, clean, $925. F. Bennett, MI 3-0160.

FOR SALE—MISCELLANEOUS

Large variety new HO model trains: engine $5, freight cars $75, passenger cars $2. M. J. Bledsoe, 422-2505 Saturdays.

Girls: for a free Pennyrich bra, call Ruby Berka, GR 2-1774 after 5.

Learn to fly with Aero Club. Cessna 150 $7/hr wet; C-172 $9/hr, K-Bonanza $5/hr. Ward, 877-3187.

Three guitars, each suitable for Flamenco, classical or folk accompaniment, $25, $50 and $200. Hal Johnson, GR 4-2422 after 6.

RCA portable TV, good picture (clean) $45. Electric edger $9. W. S. Forrester 591-3245.

Electric train set, 10 cars, 2 engines, 2 transformers. Mounted 4 x 8 ft. plywood. $35. Robert Hahne, GR 4-3784 after 5.

Beautiful 18" golden blonde fall. Cost $79.95. Sell for $25. William Lindsey, 591-3917.

Full-width rollaway bed $30. Baby bed and dresser, $40. 17" portable TV, $40. M. A. Carson, 946-0319.

Zenith 19" portable TV with UHF and stand. 3 years old, $95. G. Corley, 944-0854 after 5.

Formica dining table with 6 chairs, excellent condition, used for less than a year, $60. D. Corbett, 534-3770 after 5.

Full membership, Clear Lake Country Club, includes golf and social, original cost $350, make offer. Al Triche, 488-0188.

Admiral refrigerator in excellent working condition, $75. National Encyclopedia set, $70. P. B. Higdon, HU 2-7029.

Pedal surrey with fringe on top, for children up to 10, completely assembled, new top, $20. Ben Locher, GR 1-4387.

Coldspot refrigerator, 17 cu. ft. freezer on bottom, $65. 100% human hair wig, frosted beige, worn twice, $50. Case and head included. Lucy Stafford, 473-8024 after 6.

19' fiberglass keel sloop, dacron sails, big-wheel trailer, aluminum mast, extras $1,095. Marvin Williams, 474-3954.

1967 Honda 160 Dream, black, electric start, good condition. G. D. Waddell, 932-3881.

Rent my Cessna Skyhawk (Clover Field) or "150" Commuter (Genoa Airport) and save. Flight instruction available. Neel Tilton, GR 9-1176.

Vox Super Beatle Amplifier, excellent condition, new cost, $1400. Will sell for $695. John Weber, 944-3256.

Girl-boy Huffy 20" bicycle with training wheels, good condition, $18. H. Greider, 877-2290.

1965 Honda 50 Deluxe, automatic clutch, electric start, nice condition, make offer. Bill Douglas, HU 7-0446.

Schwinn—10-speed varsity 26" bicycle, with fenders, excellent, $50. J. C. Fischer, Jr., GR 2-6910.

BY APPOINTMENT ONLY: Dressmaking, alterations and tailoring. Evelyn L. Huvar, 946-5565.

Old Winchester Model 70 250-3000. Groups beautifully, $125 or best offer. D. Saucier, GR 9-4354.

1967 Coldspot (Sears) airconditioner, 16,500 BTU's (comparable ¾ ton), excellent condition, $125 or reasonable offer. Cecil Dorsey, 591-4554 after 5.

390 C. I. Ford engine, no intake manifold, $75 or trade for Chev. or Pontiac 3rd member 5:38 or lower, Bill Douglas, HU 7-0446.

Healthways wetsuit, 5 zipper, medium-large, hood, sealskin nylon liner and neoprene, 3/16 inch, $20. Jack Dunaway, PR 4-2367.

348 Chevy engine, 1962 model, $95. Blankenship, 944-0750 after 4:30.

Chihuahua puppy, male, 2 months old, AKC registered, $50. Gwen Seate, 932-6020.

Veneer secretary's desk with center typewriter well. Needs refinishing. John Copeland, 932-2708.

RCA Stereo Phonograph with new diamond needle cartridge, $100. Lester Wynn, 932-4397.

Shure M-55-E, phonocartridge, diamond stylis. Excellent condition, never tracked over 1.5 grams, $8.50. FM stereo signal booster, $5. R. Musgrove, 488-3966.

Vox Super Beatle amplifier. Gibson EB-2, bass. Fender Reverb sure mixer w/mikes. Sell Separately or trade for car. Gordon Cragg, 946-7002.

Have AKC prize winning tricolored Basset Hound for stud. Bob Law, 944-7596.

Stereo record player—AM/FM combination, Airline, blond, 7 yrs old, good condition, $69. F. Bennett, MI 3-0160.

Harmony electric guitar, dual pickups, Epiphone amplifier (Gibson) 3 outlets, foot switch microphone, stand, case, $250. Chauvin, 877-4921.

WANTED

Want to join or start carpool from area north of Red Bluff Road and south of La-Porte Fwy, 8-4:30. M. Pettit, 472-1425.

Chair that converts into bed; Simmons Co. has built these in past, condition not important. Stephen Jacobs, PR 4-9924.

Three girls to help sell Pennyrich products. Ruby Berka, GR 2-1774 after 5.

15 or 17 foot Grumman canoe. Schomburg, 748-2745.

Used doghouse, sewing machine, ladies' bike. Dr. S. C. Freden, 877-1866.

Used bay fishing boat, fiberglas or aluminum, 13 to 16 ft. with 20 to 60-hp outboard, galvanized trailer. Dave DeAtkine, HU 7-1556.

Fifth member for carpool from UofH area to MSC 8-4:30. Jonny Ferguson, 747-0403.

Five-string Gibson or Fender Blue Grass style banjo. G. A. Nixon, HU 3-3758 (no home phone).

Rent UHF TV set for evening of December 29. Bob Law, 944-7596.

Used 200 lb (approx.) bar-bell set in relatively good condition. David Grissom, 932-4206.

Apollo VIII TV

(Continued from page 1)

at Houston, and transmitted live to Europe, Puerto Rico and Japan.

Both of these transmissions will occur while Apollo VIII is headed toward the Moon and probably will include views of the receding Earth and looking toward the Moon, and crew activities inside the spacecraft.

• The third transmission is scheduled 71 hours and 35 minutes after launch at 6:26 am CST, Dec. 24 during Apollo's second orbit of the Moon. This transmission will be received at Madrid, released to European networks there, and transmitted via Communication Satellite Corp. satellite to Houston for release to US TV networks.

• The fourth transmission is scheduled at 85 hours 40 minutes—at 8:31 pm CST, Christmas Eve—into the mission during Apollo's ninth lunar orbit. It will be received at Goldstone, released at Houston, and transmitted live to Europe, Puerto Rico and Japan.

Both of these transmissions will feature out-the-window shots of the Moon's surface from the 70-mile altitude of Apollo VIII.

• The fifth transmission will be at 104 hours and 15 minutes into the flight at 3:06 pm, Dec. 25. Received at Madrid, it will be released live there to European networks, transmitted via Comsat satellite to Houston for release to U.S. networks and relayed via ATS-I to Japan.

• The last scheduled transmission will be 128 hours into the mission at 2:51 pm, Dec. 26. The signal will be received at Goldstone, released at Houston and relayed to Europe, Puerto Rico and Japan.

Both these transmissions will be during the flight back to Earth and will include pictures of the receding Moon, Earth as well as activity inside the spacecraft.

At Madrid, Goldstone and Canberra, Australia, still photographs will be taken of a television monitor during live transmissions and the pictures will be released in Madrid, Los Angeles and Canberra.

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

NSA Organizes Local Chapter

The Houston Chapter of the National Secretaries Association January 14 will hold a final meeting with Clear Lake area secretaries for organizing an NSA chapter in this area. The meeting will be at 7 pm at Southwestern Savings Association, 18014 Nassau Bay Drive.

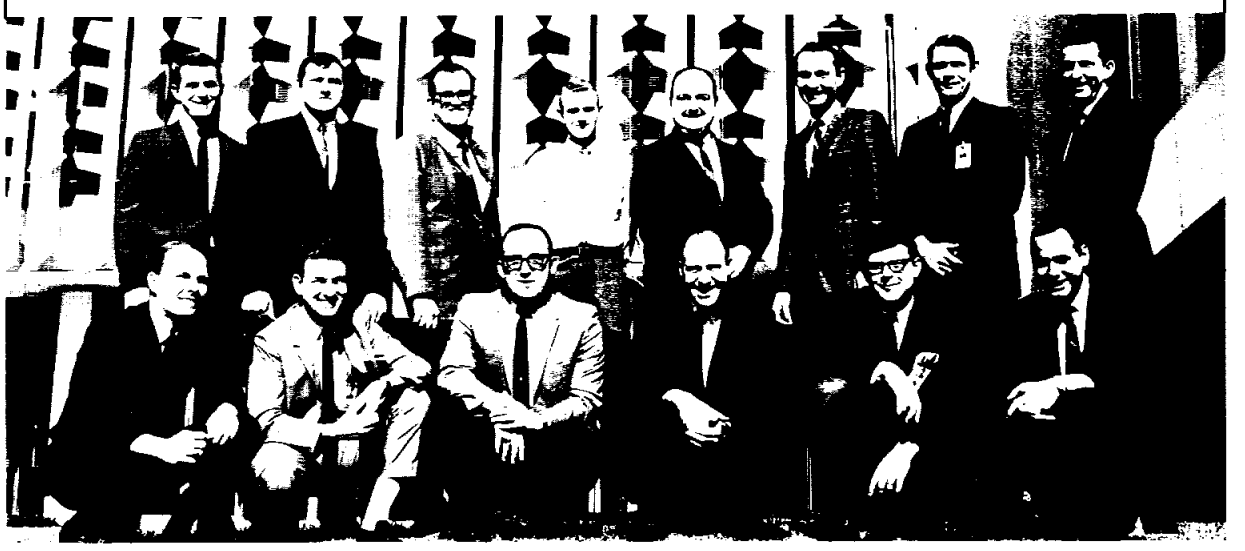
To form an MSC-area chapter, NSA must have a minimum of 15 applications on file prior to the January 14 meeting. NSA membership fees are $21, which cover initiation fee and international and division dues. Membership applications should be accompanied by a $10 deposit; the $11 balance will be due at the final meeting.

Applications and additional NSA information are available from Houston NSA chapter member Barbara Dailey at 228-9361 or from Clear Lake chapter coordinating committee chairman Dixie Cummings at 488-0080.

Earlier orientation and organization meetings were held November 18 and December 3.

NSA is devoted to advancing and raising secretarial performance standards through a Certified Professional Secretary program. Membership requirements call for a high level of character and integrity, at least two years of secretarial experience and employment as a full-time secretary or part-time with no other employment.

Touchdown Aces



LEAGUE CHAMPS—When the last whistle blew on the final 1968 MSC Flag Football League season game, the Computation and Analysis Division team walked away with first place with 11 wins and no losses. Front row, left to right are: K. Westerfeld, O. McCafferty, R. Becker, Manager B. Whatley, L. Corcoran and W. Blackmon. Back row: E. Svrcek, R. Parten, D. Holkan, R. Kruse, J. Long, G. Weber, assistant manager L. Ratcliff and D. Doherty. Not in photo: W. Weber and J. Miller.

RUNNERS-UP—The Flight Crew Support Division team nailed down second place in the Flag Football League with nine wins and two losses. Front row, left to right are: J. Waters, G. Nannish, L. MacWhorter, A. Jackson and C. Seaman. Back row: M. Gremillion, W. S. Curran, J. Axford, P. Hendrickson, R. Burke and B. Jackson.

There Comes a Time When It's Better to Go Than Stay

PUNCH OUT—All went well for the first few minute of the December 8 flight in Lunar Landing Training Vehicle No. 3 piloted by MSC Aircraft Operations Office chief Joseph Algranti. But lateral oscillations built up and Algranti elected to "punch out" with the rocket-propelled ejection seat. Algranti, who had flown more than 30 times in the LLTV, was uninjured as he parachuted to earth. LLTV No. 3 had logged 14 flights at the time of the mishap. On May 6 of this year, Neil Armstrong had to eject from a Lunar Landing Research Vehicle—an earlier version of the LLTV—when loss of attitude control fuel pressurant caused erratic performance. An LLTV accident investigating board chaired by Walter M. Schirra, Jr. has been appointed. Members are Bud Ream, Conway Roberts, Dick Lucas, John French and Don Cheatam, all of MSC, and Calvin Jarvis of NASA Flight Research Center.

NASA Outlines Plans For 1973 Mars Probes

NASA December 5 announced additional plans for landing scientific payloads on the planet Mars in 1973, Project Viking.

NASA had indicated previously in its fiscal 1969 operating plan that the agency intends to proceed with the Mars 1973 landing missions authorized by Congress.

While specific science instruments for the missions will not be selected until the results of the scheduled Mariner 1969 missions are known, the mission objectives place particular emphasis on providing information relevant to life on the planet.

Dr. John E. Naugle, NASA's Associate Administrator for Space Science and Applications, said that NASA plans to use the Titan IIID/Centaur as the launch vehicle for the two 6,000-pound spacecraft.

"These will be dual launches. Each spacecraft will consist of a Surveyor-type soft lander mated to a Mariner 1971 class Mars orbiter. Two spacecraft will be launched in mid-1973, about 10 days apart, with an arrival time about seven months later, also about 10 days apart. The Mariner orbiters will provide power and communications support to the landers during the cruise periods."

"Upon arrival at Mars, the orbiter propulsion systems will be used to place both the orbiters and landers into Mars orbit."

"After suitable reconnaissance of potential landing sites by the orbiters, the landers will be detached and will soft land using the techniques developed for Surveyor and the Apollo Lunar Module. The orbiters will then provide broad area surveillance in support of the landers in the same way that Lunar Orbiter and Surveyor spacecraft worked as a team in exploring the Moon."

The Langley Research Center, Hampton, Va., has overall project management and direct responsibility for managing the lander portion of the project.

Jet Propulsion Laboratory, Pasadena, Calif., has management responsibility for the orbiter.

Program management is under the direction of the Office of Space Science and Applications' Planetary Programs Division.

NASA Seeks Bids On DSN Antennas

NASA has invited industry to submit proposals for construction of 210-foot diameter deep-space tracking antennas at Madrid, Spain and Tidbinbilla, Australia.

Both antennas would be operational by 1973 and would join the Deep Space Network 210-foot antenna already in use at Goldstone, Calif. in command and tracking Mars Vikings, Jupiter Pioneers and other planetary missions planned for the 70s.

TRW Contract Gets Renewal For Two Years

MSC this week announced the awarding of a two-year contract to TRW Inc., TRW Systems Group, Redondo Beach, California, for Mission Trajectory Control Program and Spacecraft Systems Analysis Program.

The Mission Trajectory Control Program to be accomplished will cover analysis of space flight trajectories and mission simulations. It will consist of flight control computer program development, trajectory analysis, orbital maneuvers, range safety analysis, operational software and mission error analysis.

The Spacecraft Systems Analysis program will cover systems engineering and analysis of spacecraft systems and subsystems.

Apollo VIII Lunar Orbit Mission

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called upon to track spacecraft position and to relay two-way communications, television and telemetry in a manned spaceflight to lunar distance.

Except for about 45 minutes of every two-hour lunar orbit, Apollo VIII will be "in view" of at least one of three 85-foot deep-space tracking antennas at Canberra, Australia, Madrid, Spain, and Goldstone, California.

Speculation arising from unmanned Lunar Orbiter missions was that mass concentrations below the lunar surface caused "wobbles" in the spacecraft orbit. In Apollo VIII the ground network coupled with onboard navigational techniques will sharpen the accuracy of lunar orbit determination for future lunar missions.

Another facet of communicating with a manned spacecraft at lunear distance will be the use for the first time of the Apollo high-gain antenna — a four-dish unified S-band antenna that swings out from the service module after separation from the third stage.

The high-gain antenna relays onboard television and high bit-rate telemetry data, but should it become inoperative, the command module S-band omni antennas can relay voice communications, low bit-rate telemetry and spacecraft commands from the ground.

Rotisserie

Apollo VIII will gather data on techniques for stabilizing spacecraft temperatures in deep-space operations by investigating the effects of rolling the spacecraft at a slow, fixed rate about its three axes to achieve thermal balance. The Apollo VIII mission will be the first opportunity for in-depth testing of these techniques in long periods of sunlight away from the reflective influence of the Earth.

Any solar flares occurring during the mission will be monitored by Solar Particle Alert Network (SPAN) stations around the world. Solar radiation and radiation in the Van Allen belt around the Earth present no hazard to the crew of Apollo VIII in the thick-skinned command module. The anticipated dosages are less than one rad per man, well below that of a thorough chest X-ray series.

Although Apollo VIII's entry will be the first from a lunar flight, it will not be the first command module entry at lunar-return velocity.

The unmanned Apollo IV mission in November 1967 provided a strenuous test of the spacecraft heatshield when the command module was driven back into the atmosphere from a 9,769 nautical mile apogee at 36,545 feet-per-second. By comparison, Apollo VIII entry velocity is expected to be 36,219 feet-per-second. Heatshield maximum char depth on Apollo IV was three-quarters of an inch, and heat loads were measured at 620 BTUs per square foot per second as compared to the 480 BTUs anticipated in a lunar-return entry.

Apollo VIII entry will be flown with a nominal entry range of 1,350 nautical miles in either the primary or backup control modes. Adverse weather in the primary recovery area can be avoided by a service propulsion system burn prior to one day before entry to shift the landing point. Less than one day out, the landing point can be shifted to avoid bad weather by using the spacecraft's 2,500 mile entry ranging capability.

The crew will wear the inflight coveralls during entry—pressure suits having been doffed and stowed since one hour after translunar injection. Experience in Apollo VII, when the crew flew the entry phase without pressure suit, helmets or gloves, prompted the decision not to wear suits once the spacecraft's pressure integrity was determined.

Risks Weighed

The decision to fly Apollo VIII as a lunar orbit mission was made after thorough evaluation of spacecraft performance in the ten-day Earth-orbital Apollo VII mission in October and an assessment of risk factors involved in a lunar orbit mission. These risks are the total dependency upon the service propulsion engine for leaving lunar orbit and an Earth-return time as long as three days compared to one-half to three hours in Earth orbit.

Evaluated along with the risks of a lunar orbit mission was the value of the flight in furthering the Apollo program toward a manned lunar landing before the end of 1969. Principal gains from Apollo VIII will be experience in deep space navigation, communications and tracking, greater knowledge of spacecraft thermal response to deep space, and crew operational experience—all directly applicable to lunar landing missions.

Frank, Jim and Bill Show

As many as seven live television transmissions may be made from Apollo VIII as it is on its path to the Moon, in orbit about the Moon and on the way back to Earth. The television signals will be received at ground stations and transmitted to the Mission Control Center at MSC where they will be released live to commercial networks.

Lockheed Pact Gets Renewal

MSC has awarded a one year contract extension to the Lockheed Electronics Company, Division of Lockheed Aircraft Corporation, for general electronic, instrumentation, and engineering support services at the Center.

The cost plus award fee contract represents the fourth year of an approved five year program initially awarded to Lockheed Electronics Company, Houston, Texas.

The one year extension is valued at about $16.4 million and brings the total estimated value of the contract since September 1965 to about $46.4 million.