

'GUMDROP' AND 'SPIDER'—

Apollo IX Mission Packs Busy Timeline into 10 Days

Apollo IX, scheduled for launch at 10 am CST, February 28 from the NASA Kennedy Space Center Launch Complex 39A, is the first manned flight of the Apollo spacecraft lunar module (LM).

The Earth-orbital mission will include extensive performance tests of the lunar module, a rendezvous of the lunar module with the command and service modules, and two hours of extravehicular activity by the lunar module pilot.

To the maximum extent possible, the rendezvous in Earth orbit will resemble the type of rendezvous that will take place in lunar orbit following a lunar landing. Rendezvous and docking of the lunar module with the command and service modules, extensive testing of the lunar module engines and other systems, and extravehicular activity are among the mission's objectives.

Apollo IX crewmen are spacecraft commander James A. McDivitt, command module pilot David R. Scott and lunar module pilot Russell Schweickart. The mission will be the second space flight for McDivitt (Gemini IV) and Scott (Gemini VIII), and the first for Schweickart.

Most Ambitious

Mission events have been arranged in a work-day basis in what is perhaps the most ambitious NASA manned space mission to date. The first five days are packed with lunar module engine tests and systems checkouts, burns of the service mod-



McDivitt

Scott

Schweickart

ule's 20,500-pound-thrust engine while the command/service module and lunar module are docked, the lunar module pilots hand-over-hand transfer in space from the lunar module to the command module and back again, and rendezvous. The remainder of the 10-day, open-ended mission will be at a more leisurely pace.

The first day's mission activities revolve around docking the command module to the lunar module still attached to the Saturn V launch vehicle S-IVB third stage. When docking is complete and the tunnel joint between the two spacecraft is rigid, the entire Apollo spacecraft will be spring-ejected from the S-IVB. Maneuvering more than 2,000 feet away from the S-IVB, the Apollo IX crew will observe the first of two restarts of the S-IVB's J-2 engine—the second will boost the stage into an Earth-escape trajectory and into solar orbit.

Other first-day mission activities include a docked service propulsion engine burn to improve orbital lifetime and to test the command/service module (CSM) digital autopilot (DAP) during service propulsion system (SPS) burns.

The digital autopilot will undergo additional stability tests during the second work day when the SPS engine is ignited three more times. Also, the three docked burns reduce CSM weight to enhance possible contingency rescue of the lunar module during rendezvous using the service module reaction control thrusters.

A thorough checkout of lunar module systems takes up most of the third work day when the spacecraft commander and lunar module pilot transfer through the docking tunnel to the LM and power it up.

Among LM tests will be an out-of-plane docked burn of the descent stage engine under control of the LM digital autopilot, with the last portion of the burn manually throttled by the spacecraft commander.

After LM power-down and crew transfer back to the command module, the fifth docked service propulsion engine burn will circularize the orbit at 133 nautical miles as a base orbit for the LM-active rendezvous two days later.

The fourth mission work day consists of further lunar module checks and extravehicular activity. The spacecraft commander and lunar module pilot again crawl through the tunnel to power the LM and prepare the LM pilot's extravehicular mobility unit (EMU: EVA suit with life-support backpack) for his two-hour stay outside the spacecraft.

Two Hours Outside

Both spacecraft will be depressurized for the EVA and the LM pilot will climb out through the LM front hatch onto the "porch." From there, he will transfer hand-over-hand along handrails to the open command

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STARDUST—MSC geologist and Lunar Receiving Laboratory curator Dr. Elbert King scrutinizes a fragment of a meteorite which entered the atmosphere and impacted in northern Mexico February 8. King made a quick trip to the impact area last week and brought back 15 pounds of meteorite fragments for laboratory analysis.

IMPACT IN MEXICO—

MSC Lab Analyzes Meteorite Fragments

"Catch a falling star and put it in your pocket," crooned Perry Como several seasons ago from juke boxes, radios and TV sets.

MSC geologist Dr. Elbert King did not exactly catch a falling star, but he did bring back 15 pounds of meteorite fragments which entered the atmosphere and impacted near Pueblito de Allende, Chihuahua in northern Mexico early February 8. The fragments are undergoing detailed scientific analysis in the Lunar Receiving Laboratory low radiation counting lab.

King returned to MSC last week from a trek to the impact area with the fragments, the largest of which weighs 10 pounds. The fragments were collected by residents of Pueblito de Allende from village yards and roads. The village is 18 miles east of Hidalgo del Parral.

Testing of the meteorite fragments in the LRL marks the first time that so large a meteorite has undergone gamma radioactivity analysis so soon after its earth impact. Immediate analysis of the fragments into the counting laboratory permitted gamma counting before short-lived nuclides could disappear. Rapid analysis may also provide data on the fragments' composition and activation history.

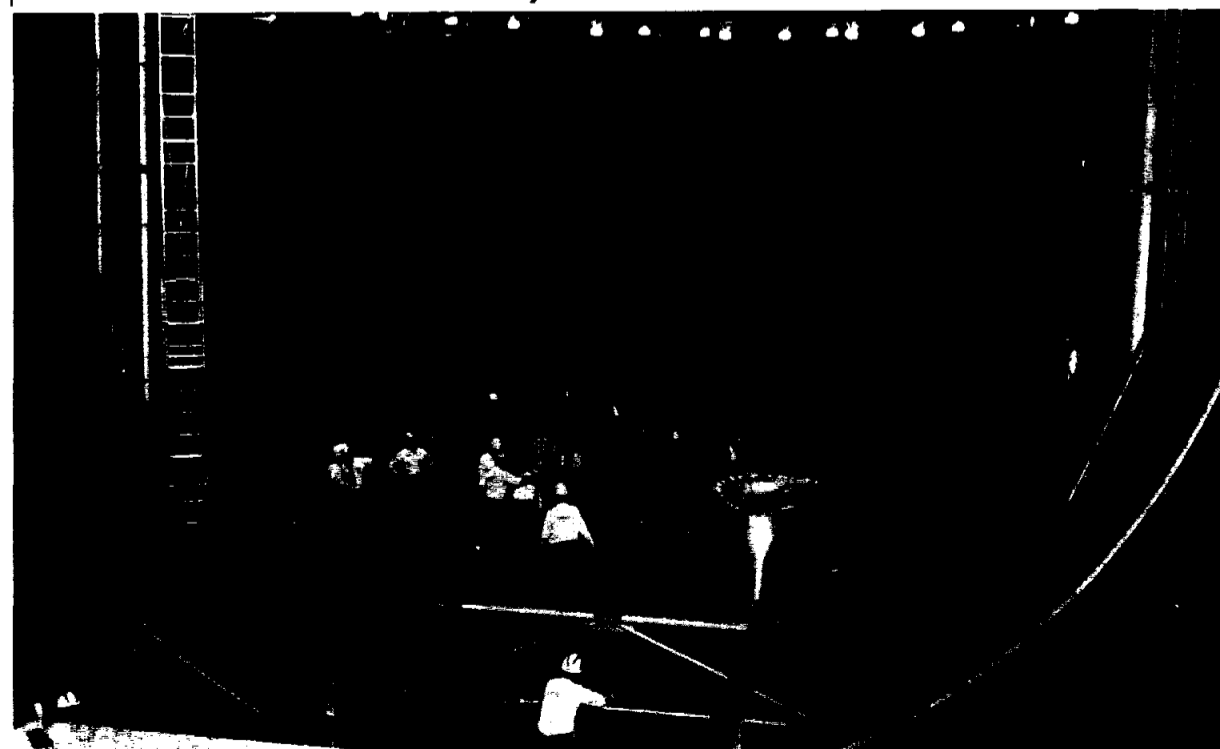
Preliminary findings show a large number of radioisotopes, including Cobalt 60, Aluminum 26, Sodium 22 and 24, Potassium 40 and Manganese 54. The meteorite fragments have been

classified as a rare type similar to a type III carbonaceous chondrite.

Mexican geologists retained other and larger fragments of the meteorite for scientific analysis. Data from the MSC analysis will be exchanged with the Mexican government as soon as possible.

Working with King in analysis of the fragments are Dr. Ernest Schonfeld, Dr. Jim Eldridge and Dr. Keith Richardson.

Little Grey Home in the Test



DRY RUN—The Mobile Quarantine Facility is positioned on the floor of Space Environment Simulation Laboratory's Chamber A for the February 6 altitude run to check out the MQF's emergency oxygen system during a simulated aircraft cabin pressure loss. Landing and Recovery Division recently completed sea trials with the MQF. The MQF will be aboard the Apollo IX prime recovery vessel USS *Guadalcanal*, but will not be used for crew return to MSC until the first lunar landing crew is recovered.

The Whale Who Came to Dinner



THE HAND THAT FEEDS—MSC Employee Activities Association president David Bell apprehensively holds out a fish to Sea-Arama whale Nemo as Bell's wife watches to see if hubby draws back a nub. Nemo is one of Sea-Arama's feature acts and will appear at performances during MSC Family Fun Days during March. Tickets at \$1.75 for adults and \$.75 for children (tads under five free) are on sale in the main cafeteria during lunch periods from a Sea-Arama representative. Sea-Arama hours are 10 am to 5:30 pm.

Army Transfers Retriever Title After 7 Years

More than a half million dollars has been saved MSC through negotiation with the US Army by a Center contract specialist. The negotiation resulted in title transfer of the NASA Motor Vessel *Retriever* from the Army to NASA.

The *Retriever* was loaned to MSC November 8, 1962 under an agreement with the Army. The converted landing craft utility (LCU) has since been carried in the MSC budget as a half-million dollar item reimbursable to the Army.

The loan agreement was renewable each year and provided that in a national emergency the vessel would be returned to the Army within 30 days rigged for military duty. All restoration costs were to be paid by NASA—an estimated \$250,000.

Extensive modifications have been made to the *Retriever*, such as a raised and enlarged wheelhouse and installation of an Apollo recovery davit crane on the foredeck. Landing and Recovery Division uses the vessel for operational testing of spacecraft postlanding and recovery systems and for flight crew post-landing and egress training. *Retriever* is skippered by Frank Gammon and is berthed at Seabrook Shipyard.

MSC contract specialist Marion I. Tillman of Procurement Division's Mission Operations Procurement Branch negotiated transfer of the 115-foot long vessel to NASA on a non-reimbursable basis. The transfer decision was made by the Army deputy chief of staff for logistics, and accountability for the *Retriever* was accepted February 5 by the MSC accountable property officer.

Shifting the vessel to NASA ownership not only saved the potential cost of rigging the vessel for military duty, but also eliminated any cost of buying and modifying another vessel to replace the *Retriever*.

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NHA-ISA Campaigns Start Here March 17

Preparations are underway for MSC's annual combined campaign for the National Health Agencies and the International Service Agencies. This is one of the two fund-raising campaigns authorized to be conducted at Federal installations each year (the United Fund appeal is made each fall).

Included in the International Service Agencies are Project

HOPE, the American-Korean Foundation, CARE, and Planned Parenthood — World Population. Eleven health agencies working to advance life-saving programs of research, information, and community services, have banded together to form the National Health Agencies. Thus, the combined campaign is designed to support fifteen individual agencies in their year-around programs.

During the period March 17-21, MSC employees will be asked to support this worthwhile cause. Contributions may be divided among all agencies, or designated for specific agencies of the donor's choice. No dollar goals or quotas are being assigned—in fact, contributions are to be placed in sealable envelopes and will not be opened at MSC.

We do, however, hope to attain our goal of 100% participation. Please plan to give, and to give generously, to this humane endeavor.

—Elwyn H. Yeater
 MSC Campaign Project Officer

KMSC Covers Apollo Missions

Apollo IX will be covered from liftoff to splashdown by KMSC-FM. Broadcasting on a frequency of 102.1 mHz, the Nassau Bay station will carry mission commentary and live air-to-ground transmissions from Mission Control Center and all press conferences from the MSC Apollo IX News Center.

The station's Apollo IX coverage is sponsored by North American Rockwell, builder of the Apollo command and service modules.

Dual Co-ops of the Month



OUTSTANDING PAIR—Thomas N. Gardner, left, and J. Nathan Leech are both mechanical engineering majors at Purdue, came from the same home town and went to the same high school. During their last co-op work stint at MSC, their supervisors were liberal with superlatives in praise of their work. Gardner had a complicated computer programming assignment in the Guidance and Control Division involving the Apollo entry monitoring system which he carried out diligently. Leech, assigned to Flight Crew Support Division, developed Apollo VIII star charts, navigation aid charts and summary flight plans as a member of the flight planning team.

Husband-Wife Team Active In Two Little Theater Groups

Pasadena Little Theater's production of Clifford Odet's play "The Country Girl" will have its final performances next weekend on Friday and Saturday nights at 8:30.

Propulsion and Power Division's Bill Simmons directs the production, and his wife Jo plays the lead role of Georgie. Jo Simmons' last appearance was in the PLT production of "A Streetcar Named Desire," and she directed productions of "A Period of Adjustment" and the "Diary of Anne Frank" for the Pasadena group. She also directed

"The Heiress" and "Picnic" for Clear Creek Country Theater in League City.

Jo returns to Clear Creek Country Theater to direct the production of Arthur Miller's play of colonial New England witchcraft accusations, "The Crucible," which opens April 11. Joan Aldrin, wife of Apollo XI lunar module pilot Edwin Aldrin, is production manager, and Bill Simmons is designing the sets. Joan Aldrin appeared in the CCCT productions of "The Heiress" and "Picnic."

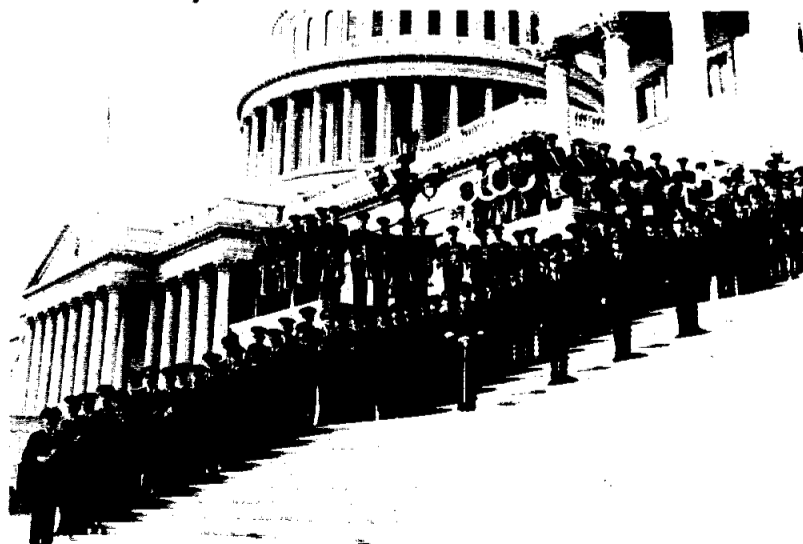
Pasadena Little Theater is located at 3339 Tulip, just south of Spencer highway and a half mile south of Bayshore Hospital. Clear Creek Country Theater is on State Hwy 3 in League City, one block south of the traffic light at FM 518.

Aero Club Opens Ground School

The Aero Club Tuesday will hold the second session of its private pilot ground school using the Sanderson audio-visual course. Classes meet at 5:15 pm in Room 517 Bldg 2.

Partly subsidized by the MSC Employee Activities Association, the ground school tuition is \$20. To register, attend the next class or call Charles Krpec at 645-6089.

Army Band Presents Concert



MUSICMEN—The US Army Field Band Monday will present a free concert at 8 pm in the University of Houston Cullen Auditorium. The Field Band last year played more than 600 concerts to a total audience of two million people and travels as much as 40,000 miles a year. Tickets to Monday's concert are available from the UofH Department of Music.

NASA Signs CSM Contract Change Pact

NASA has signed a supplemental agreement with North American Rockwell Corp., Space Division, Downey, Calif., valued at approximately \$61,757,000 for changes in the Apollo command and service module contract.

The agreement formally incorporated into the North American contract 141 changes previously authorized by NASA for modification to the contractor's documentation and reporting procedures for test and checkout of the CSM, for modification to flight and ground test hardware, additional tests and analyses, and for crew safety hardware changes. Adjustments to the contract delivery schedules were also negotiated because of the schedule impact associated with this large group of changes.

The modifications bring the total estimated value of the North American Contract since August 1963, to approximately \$3,212,560,000.

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

Large heavily wooded corner lot with view over Taylor Lake, half block to park and docks. 591-4632.

Fairmont Park 3-2-2 very nice brick, central air/heat, fenced, builtins, \$17,175, equity, low down, assume \$13,174. M. Owens, 877-1710.

Three lots in Frontier Lakes, Montgomery County, two miles from Willis. Great place to get away from it all. \$999 buys all three. Prim, 877-2856.

Gulf Freeway Oaks, 3-1-1 den, large lot, central heat, G.E. builtins, new range, 4 1/2% loan, equity. Barr, 649-1751.

2-story Colonial brick, 5 bedrooms, 4 baths, central heat/air, fireplace, wooded, landscaped 100 x 135, \$31,925 at 5 3/4%, equity \$6,075. 534-2478.

513 Baywood, Seabrook, 2-story, 4-2-2, 2000 sq. ft., wooded lot, Bay view pier and boat landing. Charley Stamps, GR4-2374.

Beautiful 1 acre residential lot loaded w/trees. All utilities, less than 15 minutes from MSC in Shoreacres \$7,000. L. G. Damewood, 944-6066.

10 acres, 1 mile off Hwy 6, south of Alvin—excellent investment, \$1,000 per acre. L. G. Damewood, 944-6066.

FOR SALE/AUTOS

65 Buick Riviera, silver, air, AM/FM, GS suspension, chrome steel wheels, exclnt mechanically, Tom McPherson, 877-1630 after 5.

64 4-dr. Olds F-85, factory air 3-sp, new muffler, shocks, brakes, good rubber, 38,000 m., runs perfect, \$900. E. Simon, 488-4043.

66 Olds Delta 88, 4-dr hardtop, fully equipped, new tires, excellent condition, one owner, \$1800. C. C. Kraft, HU2-7357.

64 VW; blue, sunroof; 33,000 miles; good condition; \$700. Vance Brand, 591-2592.

1968 Triumph Spitfire Mark III, wire wheels, radio, toneau cover, radial tires—\$1800. Jim Cooper, HU8-2410.

64 MG-1100, must sell—bought new car. \$400. Prim, 877-2856.

1962 Rambler station wagon, air, \$350. Ronald Evans, 877-2161.

62 Corvair Monza 2-dr bucket seats, 4-speed, new tires, good second car. Charlie Duke, 877-1389.

66 Pontiac Tempest, power steering, automatic transmission, radio, good condition, \$895. F. R. Tabor, 946-8366.

63 Galaxie 500, V8, 2-door hardtop, radio, air, standard, one owner, excellent condition, \$895. Mike Culling, 474-2167.

1960 Plymouth wagon, V-8, good engine, transmission, new brakes and exhaust system, \$150. Kranz, 534-4125 Dickinson.

1955 Chevrolet 2-dr 6, radio, H&R, new paint, good tires, transmission needs \$40. First \$95. S. L. Owens, 932-3011.

XKE Jaguar coupe, late 63, silver blue, chrome wire wheels, new Dunlop tires, stored 2 1/2 years, \$2,200. Dr. Sales, 877-2755.

64 Jaguar XKE roadster, radio, good tires, needs top, white with black interior, \$1995 or best offer. John Boynton, 946-1363.

68 Ford LTD 4-door hardtop V8, air, pwr-steer and brakes, vinyl roof warranty 1000 miles, \$2395, Bernard Oczkowski, WA 6-8995.

60 Hillman Husky (small sta. wagon), good-running utility car \$195. 80,000 miles, one owner. R. H. Foster, 932-3010.

1962 Mercury Meteor, automatic transmission, radio, bucket seats. \$400 (average retail \$515). Charles R. Parker, HU 8-3346 after 5.

62 Alfa Romeo, black, new paint, new top, engine overhauled 3000 miles ago, twin Webers. Bob Walker, 591-3779.

FOR SALE/MISCELLANEOUS

23-ft Chris Craft Cabin Cruiser, toilet, 2 bunks, glass bottom, trailer and flying bridge, exclnt. cond. \$1500, Ken Thoma, GR 1-2967.

Lone Star 16 sailboat, 3 1/2-hp motor, trailer, many extras, all in excellent condition. E. Simon, 488-4043.

HO trains—RTR sets, engines, cars. Mile Bledsoe, 422-2505.

Thomas Palace organ, 3 manuals (61 note), auto presets, band box. Walnut, 18 months old, under warranty, sacrifice \$3,800. D. Rafuse, 932-2468 evenings.

Calendar watch, day, date, month, moon phase all work. \$20. 23" Admiral table model TV, \$25. Bob Lindemuth, HU 2-1086.

Save \$50, Clear Lake Country Club Membership, \$400. Sam Palazzola, 488-0125.

TV-23" RCA B/W beautiful console, 3 years old; just got color, firm \$25. Sam Palazzola, 488-0125.

Recently upholstered, good as new, brown sofa, orange chair living room set, \$150. Sam Palazzola, 488-0125.

Will fly persons anywhere they want, on weekends, for cost. Blankenship, 944-0750 after 5.

Learn to fly with Aero Club Cessna 150 \$7/hr wet; C-172 \$9/hr and K-Bonanza \$16/hr. Instructor \$5/hr. Ward, 877-3187.

Aqua Lung standard tank with K-valve and strap harness. Mistral regulator, weight belt, \$40. J. Grayson, 474-3770.

1965 Allstate Mo-Ped, motor in good shape, \$50. Dana Murphy, 479-1942.

1966 30' Lyman, twin 185-HP motors, ship-to-shore radio, depth finder, excellent condition. Bill Parker, 591-2155.

Apache Mesa camper, sleeps six, metal top, plastic windows, curtains, add-a-room, dinette, spare tire. \$900. Prim, 877-2856.

Allstate motor scooter, runs but not used for two years, \$75. Prim, 877-2856.

Ames lawn roto edger, 2-wheel adjustable, hand-propelled, \$2.50. Adjustable cart-top carrier bars, ideal for surfboard, \$5. Chalfont, HU 2-7992.

V-W trailer hitch 1 7/8" ball \$6. V-W cartop carrier \$4. Chalfont, HU 2-7992.

Homart deep or shallow well jet pump with 3/4-HP 115-230V motor, new, \$60. Chalfont, HU 2-7992.

Books for girls 50c each: Bobsey Twins, 11 each; Cherry Ames, 12 each; Nancy Drew, 8 each. Chalfont, HU 2-7992.

Frigidaire washer, good working condition, \$20. D. M. McBride, 488-0686.

Two-pickup, six-string electric guitar, neck strap, extra strings. Used very little, \$50. Williams, 485-1729.

Kirby vacuum cleaner, upright. All normal attachments plus floor polisher. Good condition, \$40. Ed Lattier, 534-2756.

Rough-side-out roping saddle, bridle, reins, rawhide basal, breast-collar, padded blanket, excellent condition. L. Canin, 534-3721 Dickinson.

Forming stock investment group. Initial investment \$400 and \$25/mo. Members must be willing to work. Limited membership. Charles Krpec, 645-6089.

8' low camper top, insulated, for 8'x6' truck bed, excellent condition, \$160. Lopez, HU 2-1424.

Staffordshire Terrier and/or Pit Bull stud service by specialty show winner. Don Humes, HU 8-1137.

86" rust colored contemporary sofa, 6 mos. old, like new, sacrifice for \$100. W. P. Bays, 591-2413 after 5.

Sylvania portable stereo phonograph, used 4 mos., like new, cost \$150, sell \$100. W. P. Bays, 591-2413 after 5.

Drexel Italian round dining table, 3 leaves, 4 chairs fair condition, \$200. Grubbs, 488-3872.

20" boys bike, coaster brake, \$12. Grubbs, 488-3872.

IBM office electric typewriter, excellent condition, \$60. Antique desk chair, \$25. MI 9-2569.

54 Ford, V-8, stick, radio, air, daisies, good engine, needs water pump. Just inspected. \$125. Don Hagge, 591-4551.

Boy/girl 20-inch Sears bicycle in good condition, \$15. Dick Burghdoff, 488-3263.

Antique car parts swap meet, Joske's garage, West Loop 610, March 16, 9 to 5. Bring your parts to swap or sell. Jay Honeycutt.

19' fiberglass keel sloop, dacron sails, trailer, aluminum mast, and extras, \$995. Marvin Williams, 474-3954.

Piano instruction, call for appointments. M. T. Ward, 591-3628.

Couch and matching chair, mahogany end table, coffee table, rocking chair, excellent condition, all \$75. Rudy Trembl, Ext. 2225.

Wall murals painted. Materials plus hourly rate. \$25 deposit. All media, including oils and acrylics. John Boynton, 946-1363.

Danish walnut Story and Clark piano; 1964 like new, self tuner. \$500. Dorothy A. Childress, Texas City WI 8-8774.

Technicolor movie club membership, equipment: Super-8 camera, projector, lights, screen, splicer, film processing. Cost \$525, sell \$400. Robert C. White, 482-7529.

Stromberg-Carlson/Jensen stereo speaker system, 25-18000 cps response, dark Spanish finished enclosures, \$100. Thompson, 932-3653.

10-foot moulded fiberglass speedboat made in Germany with windshield and controls and trailer. Sacrifice—\$300. Vera Vick, 944-4144.

Beautiful 16' outboard w/75-hp Mercury, trailer, all accessories—top notch used in fresh water. See to appreciate, \$1,095. L. G. Damewood, 944-6066.

For VW up through 67, trailer hitch—\$12, sway bar, \$8. L. G. Damewood, 944-6066.

16-foot mahogany boat, semi-V, very good, in process of painting. Trailer needs repair, \$100. J. C. Lines, GR 3-1332 after 6.

WANTED

Want to start a carpool from the NASA area to UofH night school on Tuesday-Thursday. Kent Mize, 483-5171.

Ping-Pong table and net; 15-30 gal. aquarium and accessories; tent, sleep 4; slide projector; all good condition. Lindemuth, HU 2-1086.

1961 or later Volkswagen for second car. Prince, MI 9-7852.

Wrecked 1961 or later Volkswagen for parts. Prince, MI 9-7852.

Riders or carpool, site from Hiram Clarke area then South Loop-Gulf Fwy, 8:30-5. H. Kline, 433-5190.

Need pieces to complete service of Gaham Silver discontinued Stardust pattern. Prim, 877-2856.

Small used outboard motor in operating condition, about 3HP, for under \$100. John Erickson, HU 8-1901.

Going to California for a two-week vacation starting March 1. Can take one passenger. E. Bernard, Ext. 2023.

VOE Students Finish School

Six MSC Vocational Office Education (VOE) students were among the mid-term graduating class from the Evan E. Worthing senior high school. The combined baccalaureate and commencement exercises were held January 26 in the school auditorium.

Graduating with highest honors were Dianne Clark, valedictorian, and Celestine Jewel Holman, salutatorian. Miss Clark was employed in the Reliability and Quality Assurance Office, and Miss Holman worked in the Resources Management Division.

Among those graduating with honors were Sherrilyn Ann Sadberry, of the Apollo Spacecraft Program Office; Virginia Lamb, of the Flight Support Division; and Gwendolyn Mathews, of the Propulsion and Power Division. Brenda Joyce Scott, of the Resources Management Division, was also in the graduating class.

All six graduates have been given temporary appointments at MSC.

Bloodmobile Makes 9 Stops During March

The MSC Blood Bank has scheduled bloodmobile visits to MSC and contractor locations on nine days during March. Hours, except where noted, will be from 9 am to 3 pm.

March 7-Lockhead Beta Bldg; March 10-LTV-STC Bldg VI 9 am to noon; Gemini Bldg 1 pm to 4 pm; March 11—MSC Bldg 8; March 12—GE Bldg I; March 13—GE Bldg I; March 14—MSC Bldg 8; March 17—Boeing Bldg.; March 18—Miramar Shopping Center 9 am to noon; March 21—EAFB Bldg 276.

Federal and contractor employees desiring to take part in the Blood Bank should make an appointment through one of the following: Ed Stelly, MSC 3378; Dean Smith, Boeing HU 8-0910 ext 207; Mo Trembl, GE HU 8-0850; Lura Endlich, Lockheed HU 8-0080 ext 250; L. D. McFatter, LTV-STC HU 8-1312; Robert Totten, Dynalectron 483-7495; Sam Ognibene, Bell Aerosystems HU 8-7575; Larry Salyers, AT&T HU 8-1010; Bill Averyt, B&R-N HU 8-2500; and Jim Hallmark, NR HU 8-2720.

Lester Wynn will replace Ed Stelly as Blood Bank chairman after the March drive. Wynn's extension is 6121. Wynn and Smith of Boeing are authorized to release blood for patient use, although any of the above committee members may be called.

The Blood Bank has a total 417 pints on deposit and plans to release 50 pints to the Clear Lake Bayshore Chapter of the Leukemia Society and 67 pints to the Galveston Shriners Crippled Childrens Hospital Burn Institute.

The Blood Bank committee is interested in learning of any individual or charity group in need of blood.

Egg-Hiders Sought

Martha Caballero at 2421 is seeking volunteers to help organize an Easter egg hunt for offspring of MSC employees.

Silber to Speak To Texas Exes

Dr. John Silber, dean of the University of Texas College of Arts and Sciences, February 28 will speak to the Clear Lake Texas-Exes Club.

Silber is a Fulbright scholar and a Guggenheim fellow, and has studied and lectured extensively in Europe. He received the Coppini Gold Medal for oil painting. Before coming to Texas University, Silber was a fellow of Trumbull College at Yale where he was instructor of philosophy.

Silber's talk will be of interest to parents of college-age and near college-age students. The meeting is open to the public.

The meeting will be at the Holiday Inn on NASA Road 1 with cocktails at 7 pm, and dinner (\$4.50/person) at 8.

Kickoff in a Drive Toward a 100 Percent Goal



PEP TALK—MSC Associate Director Wesley Hjørnevik spells out for directorate and staff office campaign chairmen details of the annual combined National Health Agencies and International Service Agencies campaign. The 11 health agencies fight disease and disability through research, education and service, and the service agencies provide food, medical attention, instruction and tools on a world-wide basis. The NHA-ISA campaign and the United Fund drive are the only solicitations made at the Center. MSC's 1968 NHA-ISA participation was 82 percent, and the goal for 1969 is 100 percent. The campaign runs for the week of March 17.

Full House—and Then Some



FAMILY NIGHT—MSC Flight Operations Director Christopher C. Kraft, Jr. speaks to an estimated 1100 directorate employees and families who crowded into the 800-seat MSC auditorium January 27 for FOD Family Night. Mission Planning and Analysis Division chief John Mayer accepted for his division the Apollo VIII Group Achievement Award. The family night program also included a screening of the Apollo VIII film, "Go for TLI."

SNIFF MARTIAN ATMOSPHERE—

First '69 Mars Mariner Launch Scheduled at Cape Monday Night

Two 900-pound Mariner spacecraft, F and G, will be launched from pads 36A and 36B at Cape Kennedy on fly-by missions to Mars by NASA during a period beginning Monday.

Launch dates are 7 pm CST, Monday, for spacecraft F and 3 pm CST, March 24, for G. If successfully launched, the spacecraft will become Mariners VI and VII. The launch vehicle for each will be the Atlas-Centaur.

Arrival dates at Mars are July 31 for F, and Aug. 5 for G, each arriving at about midnight on these dates. Mariner F will make an equatorial pass over the Mars surface and Mariner G is scheduled for a polar pass five days later to furnish data as different as possible from the standpoint of geography and climate.

The '69 mission is a follow-on to the 1964-65 Mariner flight to Mars and a precursor to the 1971 and 1973 Mars missions. In 1971 two Mariner-class vehicles will orbit Mars for three

months, and in the 1973 mission, Project Viking, two spacecraft will orbit Mars and detach soft landers to descend to the surface.

The Mars '69 mission objectives are to study the surface and atmosphere of Mars to establish the basis for future experiments in the search for extra-terrestrial life and to develop technology for future Mars missions.

The '69 flights will not determine if life exists on Mars but will help establish whether or not the Martian environment is suitable for life.

Two television cameras aboard each spacecraft will photograph the disc of Mars during the approach to the planet and the surface during the fly-by. The best resolution of the approach pictures will be about 15 miles. Best resolution from Earth is about 100 miles. The highest resolution in the surface pictures will be about 900 feet, compared with two miles in the Mariner IV pictures taken in 1965.

Two instruments, an infrared spectrometer and an ultraviolet spectrometer will probe the atmosphere of Mars. An occultation experiment, in which radio signals pass through the Martian atmosphere, will yield data on atmospheric pressures and densities.

An infrared radiometer will measure surface temperatures on both the light and dark sides of Mars. A celestial mechanics experiment will utilize tracking information to refine astronomical data. This mission represents the first opportunity to make scientific measurements on the night side of Mars.

All the instruments on the spacecraft are designed to re-

turn information on Mars itself. No interplanetary instruments will be flown.

The instruments were chosen to allow correlation of the returned data. For example, surface temperature measurements will be made in the areas photographed to allow mapping of temperature variations as they may be related to specific surface features.

A sharp increase in data returns will be achieved over the '64-65 Mariner missions. For example, the television pictures returned by Mariner IV, in 1965, contained 240,000 bits of information. In '69 each picture will contain 3.9 million bits. In 1965 the transmission bit rate from the spacecraft was 8 1/3 bits-per-second. In 1969 the basic bit rate is 270 bits-per-second with an experimental capability, to be used at Mars if possible, of 16,200 bits-per-second. The latter depends on the condition of the spacecraft after a four to five-month journey through space and the condition and availability of the 210-foot-diameter antenna at Goldstone, Calif., one of the world's most sensitive antennas.

NASA assigned project responsibility including mission operations, tracking and data acquisition for the '69 mission to the Jet Propulsion Laboratory which is managed for NASA by the California Institute of Technology, Pasadena, Calif. Launch vehicle responsibility is assigned to the Lewis Research Center, Cleveland. The contractor to Lewis is General Dynamics/Convair, San Diego. Tracking and communications is assigned to the Deep Space Network, operated for NASA by JPL.

Apollo IX Busy Timeline

(Continued from page 1)

module side hatch and partly enter the cabin to demonstrate a contingency transfer capability.

The LM pilot will retrieve thermal samples on the spacecraft exterior and, returning to "golden slipper" foot restraints on the LM porch, will photograph both spacecraft from various angles and test the lunar surface television camera for about 10 minutes during a pass over the United States. This is a new model camera that has not been used in previous missions.

Both spacecraft will be closed and repressurized after the LM pilot gets into the LM, the LM will be powered down, and both crewmen will return to the command module.

The commander and LM pilot return to the LM the following day and begin preparations for undocking and a sequence simulating the checkout for a lunar landing descent.

A small thrust with the CSM reaction control system thrusters after separation from the LM places the CSM in an orbit for a small-scale rendezvous ("mini-football") in which the maximum distance between the two spacecraft is about three nautical miles. The LM rendezvous radar is locked on to the CSM transponder for an initial test during this period.

One-half revolution after separation, the LM descent engine is ignited to place the LM in an orbit ranging 11.8 nautical miles above and below the CSM orbit, and after 1 1/4 revolutions it is fired a second time, to place the LM in an orbit 11 nautical miles above the CSM.

The LM descent stage will be jettisoned and the LM ascent stage reaction control thrusters will next be fired to lower LM perigee to 10 miles below the CSM orbit and set up conditions for circularization. Maximum LM-to-CSM range will be 95 nautical miles during this sequence.

Circularization of the ascent stage orbit 10 nautical miles below the CSM and closing range will be the first duty in the mission for the 3,500-pound thrust ascent engine.

Rejoined

As the ascent stage approaches to some 20 nautical miles behind and 10 nautical miles below the CSM, the commander will thrust along the line of sight toward the CSM with the ascent stage RCS thrusters, making necessary mid-course corrections and braking maneuvers until the rendezvous is complete.

When the two vehicles dock, the LM crew will prepare the ascent stage for a ground-commanded ascent engine burn to propellant depletion and transfer back into the command module. After the final undocking, the CSM will maneuver to a safe distance to observe the ascent engine depletion burn which will place the LM ascent stage in an orbit with an estimated apogee of 3,200 nautical miles.

The sixth mission day is at a more leisurely pace, with the major event being a burn of the service propulsion system to lower perigee to 95 nautical miles for improved RCS thruster deorbit capability.

The seventh SPS burn is scheduled for the eighth day to extend orbital lifetime and enhance RCS deorbit capability by raising apogee to 210 nautical miles.

The major activities planned during the sixth through tenth mission work days include landmark tracking exercises, spacecraft systems exercises, and a multispectral terrain photography experiment for Earth resources studies.

The eleventh work period begins with stowage of onboard equipment and preparations for the SPS deorbit burn 700 miles southeast of Hawaii near the end of the 150th revolution. Splashdown for a 10-day mission will be at 8:46 am CST (238:45:51 GET) in the West Atlantic some 250 miles ESE of Bermuda and 1,290 miles east of Cape Kennedy (30.1° N Lat by 59.9° W Long.)

The Apollo IX crew and spacecraft will be picked up by the landing platform-helicopter (LPH) USS Guadalcanal. The crew will be airlifted by helicopter the following morning to Norfolk, Va., and thence to MSC. The spacecraft will be taken off the Guadalcanal at Norfolk, deactivated, and flown to the North American Rockwell Space Division plant in Downey, Calif., for postflight analysis.

Gumdrop and Spider

During the Apollo IX mission, communications between the spacecraft and the Mission Control Center, the spacecraft will be referred to as "Apollo IX" and the Mission Control Center as "Houston." This is the procedure followed in past manned Apollo missions.

During periods when the lunar module is manned, either docked or undocked, a modified call system will be used.

Command module pilot David Scott in the command module will be identified as "Gumdrop" and spacecraft commander James McDivitt and lunar module pilot Russell Schweickart will use the call sign "Spider."

Spider, of course is derived from the bug-like shape of the lunar module. Gumdrop is derived from the appearance of the command and service modules when they are transported on Earth. During shipment they are wrapped in blue plastic film, giving the appearance of a wrapped gumdrop.

Square Dancers Start Lessons

MSC employees who prefer their dancing bucolic rather than ballroom are invited to don their bluejeans and boots and attend the first session of Saturday night square dancing lessons tomorrow night.

Caller Eddie Hagan will holler "Face your partners!" at 7 pm as the Webster Frontier Squares begin the first lesson at Webster Recreation Center on Pennsylvania Avenue in Webster. Additional information on the group's activities may be got from Barbara Pope at 2878 or from Maxine Dunkin at 4336.

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