Apollo 10—last step to Moon—blasts off Sunday

Next Thursday two of the three Apollo 10 crewmen are scheduled to descend within eight nautical miles of the Moon's surface, the closest man has ever been to another celestial body.

This dress rehearsal for the first manned lunar landing in July, should blast off from Kennedy Space Center Sunday at 12:49 pm EDT.

The eight-day mission will mark the first use of a complete Apollo spacecraft in lunar orbit and the second manned flight for the lunar module.

Following closely the time line and trajectory to be flown on Apollo 11, Apollo 10 will include an eight-hour sequence of undocked LM activities during which the commander and LM pilot will skim the lunar surface twice and later rejoin the command/service module.

All aspects of Apollo 10 will duplicate conditions of the lunar landing mission as closely as possible: Sun angles at Apollo Site 2, out-and-back flight path to the Moon and the time line of mission events.

Apollo 10 is designed to provide additional operational experience for the crew, space vehicle and mission-report facilities during a simulated lunar landing.

Among the desired data points to be gained by the flight are LM systems operations at lunar distances and overall mission operational experience. The LM was successfully checked out in Earth orbit by Apollo 9 which included a rendezvous sequence simulating lunar orbit docking.

Space navigation experience around the Moon is another benefit to be gained from flying the practice mission. Closer study of the lunar gravitational effect through onboard landmark tracking will provide additional refinement of Manned Space Flight Network tracking techniques. Also, by updating the tracking and navigation methods used by Apollo 8 possible errors will be reduced.

Commander Thomas P. Stafford and LM Pilot Eugene A. Cernan will undock and make their descent inside Snoopy (LM call code), while CSM Pilot John W. Young manages the operations from Charlie Brown (CSM call code). The three men were recycled from the Apollo 7 backup crew.

Apollo 10 is scheduled for two Earth revolutions after launch, followed by translunar injection over Australia and three days to the Moon.

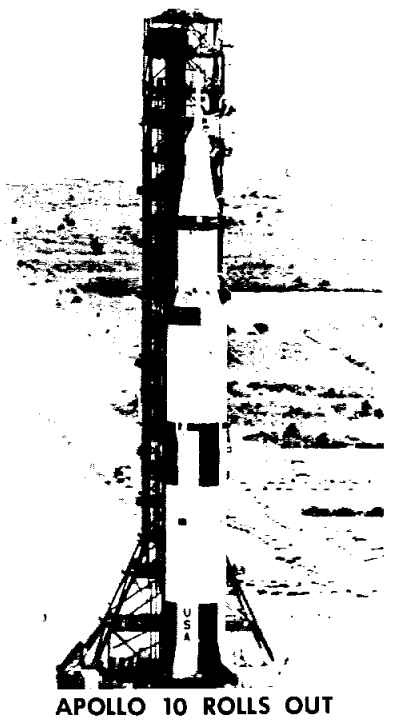
About an hour after TLI, the CSM will separate from the Saturn third stage, turn around and dock with the LM nested in the LM adapter. Spring-loaded LM holddowns will be released to eject the docked spacecraft from the adapter.

Later, leftover liquid propellant in the Saturn third stage, vented through the engine bell, will place the stage in a "slingshot" trajectory and into solar orbit.

During the translunar coast, Apollo 10 will be in a so-called passive thermal control mode in which the craft rotates slowly about one axis, stabilizing thermal response to solar heating. Four midcourse correction maneuvers are possible during the coast and will be planned in real time to adjust the trajectory.

Lunar orbit insertion burns, the first into a 60 x 170 nautical mile

(Continued on page 2)



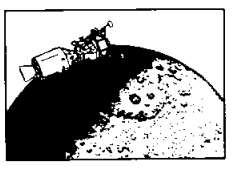
APOLLO 10 ROLLS OUT
'All up' stack ready to launch

Buy shares in America

ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 8, NO. 15 MAY 16, 1969



Good luck Snoopy, Charlie Brown

Apollo 10 plans first color TV from outer space

Apollo 10 will transmit the first live color pictures of space through the major television networks next week.

The new camera equipment was finally approved during the recent manned Countdown Demonstration Test and approximately 12 transmission opportunities were inserted into the flight plan.

"We hope to be able to share with you some of the experiences and things that go behind the 'gee whiz' and 'golly, isn't that beautiful'" said Lunar Module Pilot Gene Cernan.

The camera is designed for use only in the Command Module and no LM television, color or black-and-white, is planned until Apollo 11. Because of the rapid development cycle of color, it is considered to be experimental in nature, and will be backed up by a black-and-white system.

The color wheel system was selected to adapt a Westinghouse-built, black-and-white camera for Apollo 10. It weighs about 12 pounds and is equipped with a zoom-type lens adaptable for close-up and wide-angle shots.

The system also includes a three-inch monitor inside the capsule, giving the operator a black-and-white image of what he is transmitting.

FIRST MOBILE QUARANTINE FACILITY DELIVERED TO MSC
Metal Monster will deliver lunar landing crew to Lunar Receiving Laboratory.

Apollo 11's mobile home arrives

The traveling part of MSC's Lunar Receiving Laboratory the Mobile Quarantine Facility arrived by truck Monday. Two more of the trailer-type cabins are expected from the manufacturer within the next few weeks.

MQF units will be used to transport the Apollo 11 crew, their support personnel and lunar samples from the recovery site to MSC. Upon arrival they will be transfered to the permanent LRL for quarantine.

This segregation period is a precautionary measure to prevent back contamination—the possible return of harmful pathogens from the lunar surface to Earth. While the possibility is considered remote, the quarantine will be continued until such time as it can be established that no contamination exists.

The mobile facilities are fabricated of heat-treated aluminum and contain sleeping quarters, work, food preparation and medical areas. Each unit is self-sufficient and will be equipped with everything needed for debriefing and preliminary medical examinations during the transfer.

Specially prepared and packaged meals will be passed through a hatch to the crewmen. All waste will be retained in holding tanks and all exiting air will pass through a high efficiency filtering system.

Within the next two to two-and-a-half weeks the MQF units will have mission-essential hardware installed. This includes aircraft and shipboard communications equipment, medical hardware and provisions.

Each unit, when completely outfitted and provisioned, will weigh about 12,500 pounds and will be pallet mounted with a hoisting sling for placement aboard ship or flatbed trailer.

Bonds campaign gathers speed

After the first week of the 1969 MSC Savings Bond Campaign only the Program Controls and Contracts Directorate had reached 100% enrollment.

However, with six weeks still left in the drive, four directorates were above 90% and the Center average had risen from 74% to 77%.

If the Center average can be raised to 90% and held there every two weeks for 90 days, MSC will have earned the government's E-flag as a permanent trophey to the support of this year's "Share in America" campaign.

In connection with this year's effort, President Richard M. Nixon reminds that the program "plays a vital role in fiscal and debt management policies and provides a meaningful way for all Americans to protect the value of the dollar."

"This year's campaign to further the progress of the Payroll Savings Plan will be yet another step to help keep America growing."

Borman heads Space Station effort at MSC

Apollo 8 Commander Frank Borman was recently named Field Director of Advanced Space Stations following NASA's Request for Proposals from aerospace industry on a Space Station, to be handled by MSC, and a Space Shuttle system, to be handled by Marshall Space Flight Center.

Borman has been working as Deputy Director of Flight Crew Operations since his announced withdrawal from the astronaut program.

"Work with space stations and their development is something I have always been vitally interested in," said Borman.

He will report to Charles Mathews, deputy associate administrator for Manned Space Flight, who heads the Space Station effort. The other section of the program, that of developing an advanced Space Shuttle, will be handled by Dr. George Mueller, associate administrator for Manned Space Flight.

The preliminary design element will be a 12-man Earth-orbital Space Station scheduled for the mid-1970's.

(Continued on page 4)

Richard S. Johnston, special assistant to MSC's director, has been selected to coordinate all Center activities relating to the Lunar Receiving Laboratory and the reception of lunar samples.

Director Robert R. Gilruth said that Johnston will be responsible for assuring that the LRL is in a state of operational readiness prior to Apollo 11.

He will also coordinate activities relating to problems of back contamination during the landing, recovery and transfer to the quarantine facility.

What is an American?

He is the fellow who yells for the government to balance the budget, then takes the last dime he has to make the downpayment on a car.

He whips the enemy, then gives him the shirt off his back. He yells for speed laws that will stop fast driving, then won't buy a car if it can't make 100 mph.

He knows the line-up of every baseball team in the American and National Leagues -and doesn't know half the words of the "Star Spangled Banner".

He'll spend half a day looking for vitamin pills to make him live longer, then drive 90 miles an hour on slick pavement to make up for the lost time.

He ties up his dog, but lets his 16-year-old son do whatever he wants.

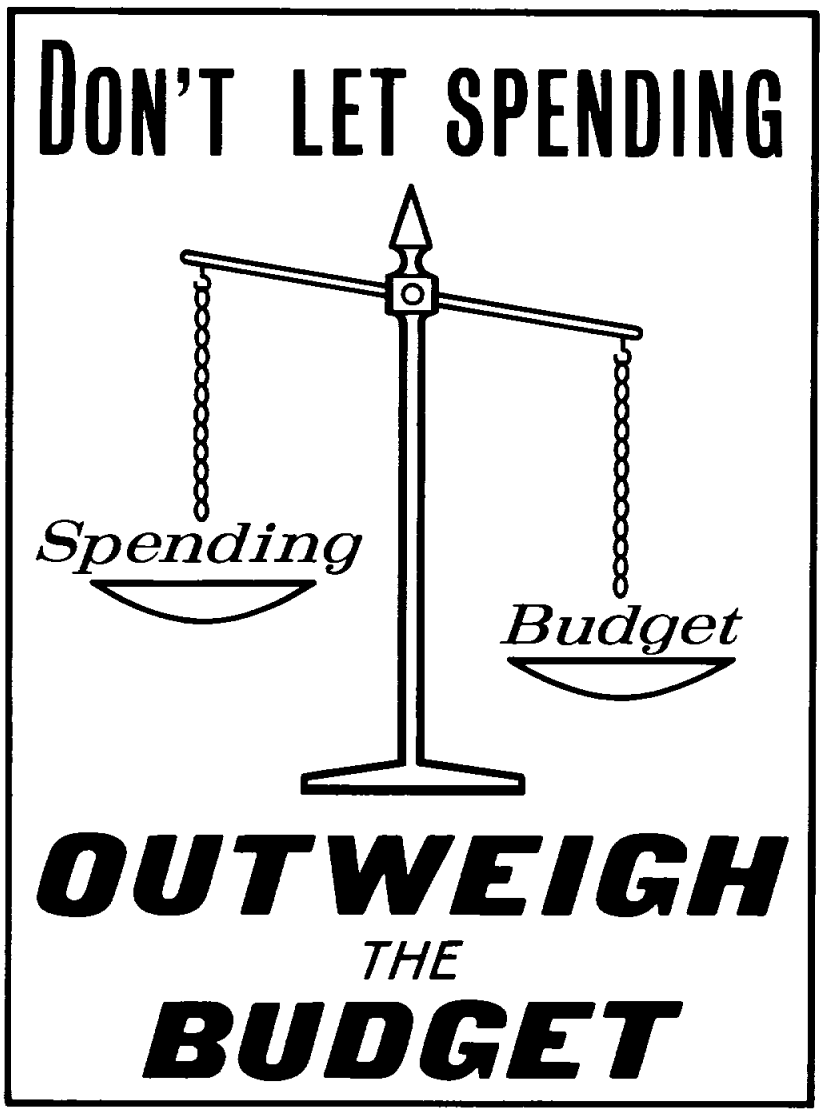
He will work hard on a farm so he can move into town where he can make more money so he can move back to the farm. He couldn't fight his way out of a paper bag, but spends 20 bucks for ringside seats, and tells the professionals how to fight.

We're the country that has more food to eat than any other country in the world and more diets to keep us from eating. We're the most ambitious people on earth, and we run from morning until night trying to keep our earning power up with our yearning power.

We're supposed to be the most civilized Nation on earth, but still can't deliver payrolls without an armored car.

But we're still pretty nice folks. Calling a person "a real American" is the best compliment you can pay him. Most of the world is itching for what we have, but they'll never have it until they start scratching for it as an individual.

(Reprinted courtesy of Armed Forces Press Service)



Co-op of Month

AIDS COMMUNICATIONS — Michael Brainard, May's Co-op, was recommended from Systems Engineering and Testing for his outstanding attitude and performance in Apollo communication systems tests. He gave valuable assistance in test analysis and application and helped to correct errors in the Apollo Look Angle Program.

KMSC-FM ready to cover Apollo 10

The flight of Apollo 10 will be covered from liftoff to splashdown by radio KMSC-FM.

Broadcasting 24 hours a day at 102.1, the Nassau Bay station will carry mission commentary and live air-to-ground transmission from Mission Control Center and all press conferences from the MSC News Center.

The station's Apollo 10 coverage is sponsored by North American Rockwell, builder of the Apollo command and service modules.

Your Job in Focus

Over 100 employee benefit bills have been introduced into Congress this year. Many of these represent significant reform and, since none has been passed, some constituent comment might be appropriate.

House proposes retirement benefits

One bill that has seen action in the House Post Office and Civil Service Committee comes in two parts:

Title I proposes improved funding of retirement annuities. Specifically, it calls for an increase in joint government-employee contributions from 6½% to 7%, effective January 1, 1970.

Title II provides for five increased benefits:

Use gross earnings rather than base pay in computing annuities.

Base computation on three rather than five highest years

Allow time credit for unused sick leave

Add one percent to any cost-of-living increase in annuities

Permit annuity to continue when surviving spouse, aged 60 or more, remarries

This bill was approved by the committee in executive session and refered for full committee action.

Other proposed legislation suggested the following benefits:

Permit retirement after 25-30 years, regardless of age

Permit employees to choose coverage under Social Security in lieu of the Retirement Act

-Exempt all or part of annuities from taxation

-Permit election of survivor annuities without reduction in basic annuity

—Allow credit for work with certain state instrumentalities

Establish an Institute on Retirement Income.

Senate considers more travel expenses

The Senate Committee on Government Operations is considering a bill to aid Federal Agency job applicants which would authorize payment of expenses for those who have to travel to interviews.

The same committee is also studying a bill that the House has already passed which would increase employee travel expenses. The maximum per diem allowance would jump from $16 to $22, the "actual expense" allowance from $30 to $35 and the foreign travel allowance (over and above per diem for the area concerned) from $10 to $15. This is essentially the same bill which was passed by the House last year but was killed in the Senate.

Apollo

(cont. from page 1)

eliptical orbit and the second into a 60 mile circular orbit, will be made behind the Moon and out of contact with flight network stations.

The LM's two lunar surface sweeps will survey Site 2, one of the primary targets of the Apollo 11 landing.

Maximum separation between the LM and CSM will be about 350 miles. This will provide an extensive checkout of the LM rendezvous radar and a backup VHF ranging device being flown for the first time.

After LM-CSM redocking and crew transfer, the LM ascent engine will ignite, throwing the lunar vehicle into solar orbit.

The remaining lunar orbit time will be spent conducting lunar navigational tasks and photographing Apollo landing sites.

The transearth injection burn will be made behind the Moon after 61.5 hours in lunar orbit. During the 54-hour return trip the same passive thermal control "barbeque" technique will be applied and three midcourse corrections will be available to adjust the Earth entry corridor.

On Monday, May 26, Apollo 10 will enter the Earth's atmosphere at 400,000 feet, 191 hours, 51 minutes after launch, traveling 36,310 feet-per-second. CM touchdown will occur about 34 nautical miles east of Pago Pago, Tutuila, in American Samoa.

Houston Symphony needs funds

With its $635,000 Maintenance Fund campaign incomplete, the Houston Symphony extended its intensive drive this week, pointing out that "the Symphony is for everyone and needs everyone's gift".

"The Symphony faces a financial crisis," said Campaign Chairman Max Levine, "... $635,000 is the minimum needed."

The orchestra is appealing to the public for gifts in any amount. "Perhaps some of the parents of the 54,000 boys and girls who attended the student concerts, or some of the 100,000 people who attend the free park concerts would like to have a part in helping to make these services possible," said Levine.

Checks should be made out to the Houston Symphony and sent to the Symphony office, Jones Hall, Houston, 77002.

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.

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Editor ..... Karen J. Lumpkin
Staff Photographer ..... A. "Pat" Patnesky

SNOOPY FEVER IS CATCHING ON

As the canine astronaut, watchdog for Apollo safety, and his friend Charlie Brown prepare for their historic lunar mission, NASA employees, like Penny Morrian and Ann Gerdes of Manned Flight Awareness, are getting on the bandwagon with Snoopy decals, posters, dolls, sweatshirts, slogans and, for a few lucky "dogs", the Silver Snoopy award pin.

ABBEY RECEIVES CERTIFICATE OF COMMENDATION

George Abbey, technical assistant to the Apollo Program manager, was awarded NASA's Certificate of Commendation Wednesday by Dr. Robert Gilruth, Center director. The award was presented in honor of Abbey's "outstanding technical contributions to the Apollo 8 flight."

AMA elects Berry

Dr. Charles Berry, director of Medical Research and Operations was formally installed as president of the Aerospace Medical Association at an Honors Night Banquet last week.

Berry will officiate at the 41st annual scientific meeting in St. Louis, Missouri in 1970.

Mariner tells secrets behind sun's radiation

Engineering data from Mariners 6 and 7, now enroute to Mars, have provided the first direct measurement in deep space of the amount of heat from the Sun.

The new direct value for the Sun's thermal radiation is nearly twice as accurate as previous measurements, according to Joseph A. Plamondon of the Jet Propulsion Laboratory.

Plamondon said the old value, used by JPL in simulating the Sun's heat of 129.5 watts per square foot has been corrected to 125.7 watts per square foot. The change in probable error in the new measurement, he said, is one-half that of the old figure.

The data are provided by instruments called temperature control flux monitors. They have been monitoring solar radiation since launch of Mariners 6 and 7 on February 24 and on March 27, 1969, respectively.

Results of the in-flight measurements will be compared with pre-flight predictions of solar radiation and actual spacecraft temperature variations in flight. This will establish a new standard for temperature control design and spacecraft temperature control testing. The testing is carried out in simulation chambers that duplicate the vacuum and cold of space and the Sun's radiation.

Data already recorded have been used in calculations to correct for effects of the pressure of sunlight on the flight path of the two Mariner spacecraft. It is now known that the pressure of sunlight on a spacecraft can alter its path in space by thousands of miles and must be allowed for in launch and trajectory correction maneuvers.

Subsequent measurements will also provide precise information on the variation of solar radiation – an engineering necessity for control of temperatures aboard a spacecraft.

A spacecraft in flight absorbs heat from the Sun on one side and loses heat to the sub-zero temperatures of deep space on the other. Equipment aboard the spacecraft generates additional heat that must be dissipated or retained, dependent on the temperature range requirements of a specific item of equipment.

Temperature control engineers use automatic louvers, highly polished surfaces, radiators, cooling gases, paint patterns and reflective thermal blankets to control temperatures.

European tour

May 30 is the deadline for reservations for the 22-day European tour which has been organized for NASA and NASA-contractor employees.

Roundup Swap-Shop

(Deadline for Swap-Shop classified ads is the Friday preceding *Roundup* 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.)

REAL ESTATE

Mobile home 2-1½, furnished, playground, swimming pool. $50 deposit. $45 week, bills paid. 2009 Charlotte, Baytown. G. Chamblin, 427-4477.

Timber Cove 4-2-2, owner, $39,000, $210 mo, assume 5¼% loan, D. Owen, 877-2030 (Kemah).

Romada Beach, Boliver Peninsula lot, second from beach, utilities, good drainage, low equity, terms, J. Tipton, 944-9338 nights.

Nassau Bay, Queen's Court Townhouse, 2-1½, furnished or unfurnished, pool, screened patio, sale or lease, D. Hagge, 622-3236.

El Lago 3-2-2 Ranch home, excellent cond. ½ acre, $25,500, D. Supkis, 877-4639.

Nassau Bay 4-2-2, fenced, assume 6% loan, X7256.

Hill Country, 8-14 acres, views, creeks, oak trees, paved road, owner, terms, Davis, 877-1155 or 422-5627.

AUTOS

65 Corvette, power, AM-FM, air, good cond, Z. Mitchell, 488-0210 X61 or 479-3215.

66 Galaxie 500, 2 dr HT, standard, power steering, air, 46,000 easy mi, $1,290, H Laup, 946-0542.

61 Ford, new tires, new seat covers, owner, best offer, L. Arnold, 785-5915 nights & weekends.

63 Corvair, 2 dr HT, auto trans, $195, J Harris, 471-2490, (LaPorte).

63 Rambler Wagon, 8 cyl, 9 passenger, fully equipped, good cond, $475, H. Rees, 534-5655 (Dickinson).

58 Chevy, $100, D. Donohoe, 644-7804.

61 Thunderbird, power, air, '67 high performance engine, C6 trans, $495, W. Douglas, 487-0446.

65 Corvair, 4-speed, tachometer, new Firestone 500's, extra clean, D. LaCombe, 946-7375.

68 VW Sunroof Sedan, radio, red, black vinyl interior, $1550, J. Sutton, 932-3979.

60 Super 88 Olds Wagon, power, runs good, nice interior, $250, C. Childers, 483-4020.

66 Mustang 2 dr HT, V-8, auto trans, power steering, air, radio, 38,000 mi, very good cond., $1350, A. Branscomb, 591-2893.

66 Porsche 911, 14,000 mi, new radial tires, AM-FM, deluxe interior, R. Schweickart, 591-2439.

60 TR3, new paint, top, tires, motor & interior, $800, or trade for pickup, D. Herron, 966-2036, (Bay Cliff).

PETS

Free puppies, half border collie, half German Shepard, J. Cooper, 944-9026 or 483-3786.

Miniature poodles, black females, 8 wks old, gotta go, 932-4692.

Toy poodles, AKC, black female, available May 6, T. Gallagher, 487-0149.

Puppies, male & female, 5 wks old, mother—registered beagle, father—small mixed breed, W. Mallary, X2191 or 482-7081.

Miniature Schnauzers, AKC, excellent lineage, 6 wks, J. Kaltenbach, 464-2426 after 4:30.

Free kittens, orange, calico & black, late May, make selection early, E. Whitsett, 488-1337.

Riding horses, ideal for trail rides & inexperienced riders, W. Smith, Alvin, 658-4957.

HOME FURNISHINGS

Drawer-type oak trundle bed, 1 sealy matress, $65; hot pink broadloom carpet, 8½ x 11, $20, B. Lenoir, 877-1843.

Living room furniture & dinette set, McCarty, 591-2093.

19" Motorola TV, antenna & stand, $20, M. Hagan, 488-0044.

Tell City Farmhouse Rocker, maple, $35, B. Ross, 643-6258 after 5.

3-piece corner sleeper couch set with table, $100 or best offer; modern walnut dining table with leaf, $40, or best offer, J. Bates, 944-4687.

30" Kenmore gas range, deluxe, automatic, surface grill, 1½ yrs old, $90, P. Durst, 474-2927.

Step-type table, needs refinish, $3; portable TV stand, $2; 2 steel cabinet doors, 6' x 34", $5, Hydrick, 487-2591.

High back swivel rocker, 19" portable Zenith w/stand; silvertone organ w/bench; custom drapes; marble top table; twin bed box springs, O. Loden, 488-3808 after 5.

Couch, 8' long, blue, excellent cond, $70, Nancarrow, 946-5075.

Cookbook, hardly used, "Mastering the Art of French Cooking" $5, R. Marent, 946-7039.

65 Honda, 150 cc, $195, C. Nelson, 483-3421.

Electric toaster, $3; bathroom scale, $2; lawn spreader, $2; table top broiler $1, 488-4005.

35 mm Argus camera, projector, screen, all $40; drop-leaf dinnette, 6 chairs, $60; J. Garcia, 591-2916.

Boy's bike, 24", good cond, $15, J. Vincze, 488-1040.

Playpen, $8; babybed, $15; desk, $10; auto air conditioner, $10; B. Westover, 483-4901.

Tektronix Ocilloscope: solid state audio oscillator, CTR for 5 in scope, 12V/20 A regulated power, RCA RF signal generator, R. Lang, 488-0149.

Aluminum patio umbrella with center pole, good cond, $25, McCarver, 453-1004.

62 3-wheel cushman motor scooter, enclosed cab, pickup truck-like body, good cond, $150, R. Bogt, 488-4069.

New Swiss Hilton wrist chronometer stop watch, new $25, now $15; complete 3-wing Gilbert Chemistry lab, new $11, now $6, Keener, 488-1193.

Games: Clue, Scrabble for Juniors, Spy Detector, others, good-excellent cond, Keener, 488-1193.

Child's entertainment center: 3 swings, glider, slide, $12.50, Forsyth, (Dickinson) 534-3113.

Unfinished picture frames, 8 x 10, 2" mahogany, glass included, $1.50 ea, or $7 for all, Keener, 488-1993.

30" Kenmore gas range, deluxe, automatic, surface grill, 1½ years old, $190, P. Durst, 474-2927.

Set of rugged Clarion transceivers, 6 with builtin ear outlets, AC adapter, new antenna, $20, Keener, 488-1193.

B-flat clarinet, Grenadilla wood, deluxe, used 6 mos, $85, P. Durst, 474-2927.

120 Bass Scandelli accordian & case, good cond, $100 cash, E. Hicks, 479-1294.

MISCELLANEOUS

Small girl's bicycle, like new, $15; Edlebrock 2-4 carb set, complete, $65, W. Douglas, 487-0446.

Rotary lawn mower, 1½ yrs old, good cond, $25, Aldrich, 482-7384.

Chartcraft long term P&F chart book, charts posted thru 12-31-67, $5, H. Hooper, 488-4120.

2 girls' Sears bikes, 28", 24", unused for 3 yrs, 2511 Lazy Lake, Swan Lagoon, 591-4585.

Ladies' modern jazz dance class, begins June, shape-up program, MI3-2190 after 5.

Jim Beam china bottle, Elks PPOE, Centenial, rare, $17.50, Minar, 877-3208.

4 8:55 x 14 WW tubeless tires, good cond, $8 for 4 or $2.50 each, C. Statz, 482-7607.

4' x 8' Brunswick pool table, slate top, like new, all accessories, $550, D. Supkis, 877-4639.

Lawnmower, 21" Jacobsen, self-propelled victor with grass catcher, used 1 summer, $100, J. Cohen, 488-3171.

New, inside-the-bed spare tire mount for Ford pickup, cost $17.50, now $10, F. McCreary, 946-5285.

Used trailer, 30' x 40', F. Godejohn 649-5293 after 4:30.

Playpen, $8; babybed, $15; auto air cond, $10, B. Watson, 944-2497.

Suzuki A-100, 1 yr old, 1800 mi, extras, $250, B. Campbell, 488-3635.

Will trade Sears motor scooter & hard hat for 10 hp o/b motor or make offer, H. Brendle, 483-5221 or 488-5085.

Skyrovers Flying Club, LaPorte, limited membership, students welcome, 172-$6/hr, 182-$9/hr, J3-$4.50/hr, Tom Grubbs, 488-3872.

Boy's 20" bike, used 2 mo, Spyder styling, $25, Aldrich, 482-7384.

3½ hp Sears o/b, 3 yrs old, detached gas tank, $30, J. Leonard, 944-4997.

3-speed turntable, 2 tone arms, mono (no x-tal) & andax stereo (x-tal), cherry base, good cond, $40, Hydrick, 487-2591.

26" Schwinn, 2-speed boy's bike, new tires, M Hagan, 488-0044.

15' fiberglass, windshield, top, folddown seats, 40 hp Westbend, tilt-bed trailer, $1,000, W. West, 932-4311.

3 speaker stereo record player, portable, excellent cond, L. Moore, 488-5132.

Rolleiflex camera, 2.8F/120-220, 80mm Planar, E/R case, penta prism, pistol grip, Roleikin 2.8, closeup lenses, more accessories, $550 takes all, M. Callaway, 524-2732.

9 x 12 side room umbrella tent, floor, external frame, $40; 9 x 12 low side wall tent, GI type, $25, Hydrick, 487-2591.

Fender twin-amp, very clean looking & sounding, used only by professional musician, $200 with cover, J. Bates, 944-4687.

60 Johnson electric longshaft 40 hp motor, bronze prop, throttle-shift controls, electric harness, $185, J. Cotter, 534-4838 (Dickinson).

66 Suzuki, 250 cc, X-6 Hustler, 2 hats, tools, manuals, 5,000 mi, $395, A. Spivey, 488-0369.

Manual typewriter, rebuilt & little used, Royal standard, excellent cond, L. Tilson, X2982 or 946-0656.

Plate glass in aluminum frames, 2, 3' x 6', ready to install, $12.50 each, J. Cotter, 534-4838 (Dickinson).

Set of 2 rugged Claricon transceivers, builtin earphone jacks, new antenna, AC adapter, $20, Keener, 488-1193.

Sunbeam electric lawnmower, heavy duty cord, used 3 times, $40, J. McCown, 471-0716.

66 17' Hydroyne, 165 hp, i/b, o/b, trailer, like new, $2200, 591-3787, A. Wardell.

Ouachita skiff, like new, takes up to 7 hp, 6 mo. old, $59, J. Horton, 877-4102 (Seabrook).

Soldering gun set, never used, $5; propane torch, never used, $5, Nancarrow, 946-5075.

57 Evinrude, 35 hp, spare parts: block, crankcase, flywheel, intake, etc., $15, J. Cotter, 534-4838 (Dickinson).

Adult & children's games: Clue, Rook, Hi-Q, Scrabble, others, good-excellent cond, Keener, 488-1193.

Orientals only, authentic Chinese Sampan, 16' teakwood oars, canvas shelter, 6 hp o/b, $100 or best offer to sell now, G. Horton, 877-4102 (Seabrook).

Stanley drapery rods, new, various length, single & double, ½ retail, J. Cotter, 534-4838 (Dickinson).

WANTED

Good 9 x 9 umbrella to 10 x 8 wall tent, waterproof with floor & screens; also, 12-14' flat-bottom boat, J. Bullard, 877-4155.

Large chest of drawers, junior rail and swing-a-matic, D. Hogg, 487-3656.

Two steamer size trunks, suitable cond for overseas travel, R. Nugent, 488-3136.

Someone to teach fluent conversational French, want to increase vocabulary & idiom, C. Manry, 932-2908.

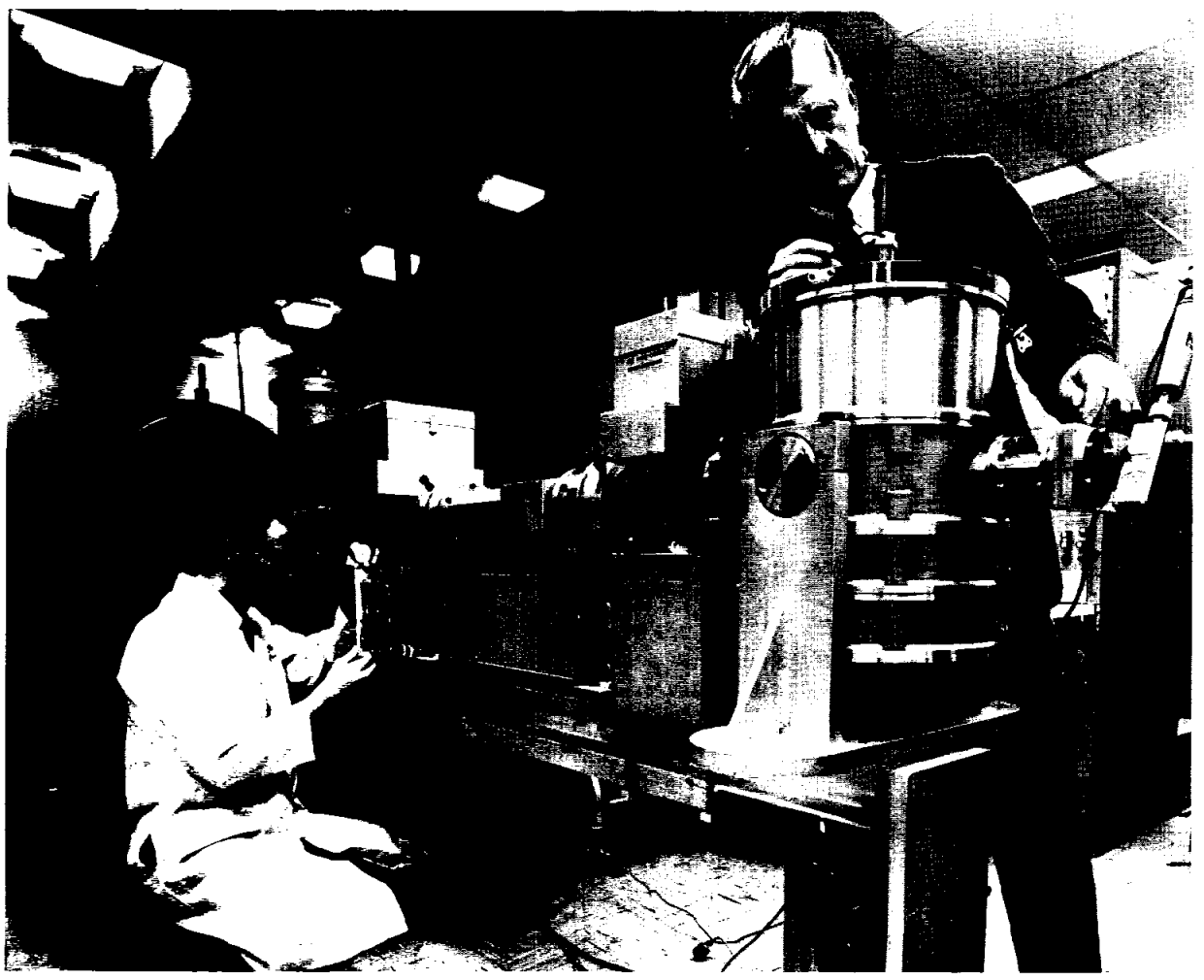
3 bdr house to rent, NASA area, June 1, L. White, 483-5171.

Someone to maintain swimming pool in Nassau Bay, H. Hughes, 591-2287.

Ride from Dickinson to NASA 8:30-5, will pay, B. Phenegen, 483-4311 or 534-2726.

Girl to share large 2 bdr apt for summer, Houston, K. Lumpkin, 524-2732 or X5111.

Need harp lessons, can begin immediately, prefer NASA area, O. Loden, 488-3808.



WORLD'S "FASTEST" GUN—A FAR CRY FROM THE OLD SIX-SHOOTER

Although not very effective against outlaws, the new Electrostatic Dust Particle Accelerator can fire its tiny iron particles at speeds up to 355,000 mph and should prove extremely valuable to scientists studying the unexplained cosmic dust found in space. Goddard scientists Gary Thom and Otto Berg will simulate micrometeorite impact on spacecraft and attempt to define their origin, direction of movement, velocity and composition.

Mercury's Shepherd rejoins flight group

The first American astronaut and present head of the MSC Astronaut Office has returned to full solo aircraft and spaceflight status after a six-year fight with an inner ear disorder.

Alan B. Shepard, Jr., one of the original seven astronauts, said he would maintain his position in the NASA administration until he is assigned to a flight crew.

The 45-year-old Navy Captain piloted the "Freedom 7" Mercury capsule on a 15-minute, suborbital space mission on May 5, 1961. He was removed from the list of eligible crewmen in 1963 when he developed ear trouble causing intermittent attacks of dizziness and nausea.

The disorder was corrected by a minor operation performed in Los Angeles last year and Medical Director Charles Berry reports that "Shepard's health has remained excellent during the past year and consultant ear specialists consider his former problem no longer presents a threat of recurring suddenly".

Shepard admits that it will take him at least nine months to regain full flight capability. He does, however, hope to be part of one of the Apollo moon landings next year and said, "the sooner I get off the ground, the better."

Lunar Mission will send back TV from Moon

Final flight plans for the Apollo 11 lunar landing in July include the live, nationwide broadcast of crew activities after the initial landing has been accomplished.

The actions of the two American astronauts will be followed by a television camera set up on the moon's surface. Under present plans, the first man down will unstow a camera from the exterior of the lunar module and mount it on a tripod while the second man descends.

Signals from a two-foot diameter antenna on the LM may be received and relayed from either NASA's 210-foot antenna at Goldstone, California or from an installation of the same size at the National Radio Astronomy Observatory in Parkes, Australia.

If there is a delay in the mission, the moon may not be visible from Goldstone while television is scheduled. In this case, NASA would rely on the Parkes station.

These two radio telescopes are the only ones expected to receive clear signals from the LM.

A scan converter will be installed at Parkes to change Apollo's slow-scan signals to the standard US TV system, 525 lines, 30 frames a second.

The signals would be transmitted to Sidney from Parkes (150 miles) by microwave. The converted picture would then be sent to Mission Control Center via the intelsat III Pacific satellite for release to U S networks. At the same time, any signal received via Australia and released in the U S would be available to Australian networks.

In the event that any problems occur while transmitting via the LM antenna, one of the crew will erect a high gain antenna on the lunar surface. This 10-foot diameter antenna could transmit to 85-foot antennas in the US, Australia and Spain.

Space Station Program plans cost reducing, self-commanding, reusable, modular vehicles

(cont. from page 1)

Subsequent plans are to place additional modules in orbit, working up to a 50-man Space Base by the late 1970's or early 1980's.

One of the primary goals of the Space Station program is that of achieving a major reduction in space operations costs.

"In my judgement, the future of manned space flight is clearly dependent on the degree to which costs can be reduced," Mueller recently told the Senate Committee on Aeronautical and Space Sciences.

Toward this end, three major guidelines have been set up to make the most efficient use of time, manpower and equipment.

First, an attempt would be made to create a more self-sufficient, self-commanding unit - eliminating costly ground-base operations in favor of a more independent spacecraft. Full onboard command and control functions will be incorporated into the system. As a result, round-the-clock mission control activities on the ground can be reduced.

Second would be the development of equipment with long operational lifetimes. This would include the refurbishing and reusing of recovered space vehicles — a cost-cutting technique planned for use in other NASA programs as well.

The third budget device, presently unique to the Space Station, involves innovations in testing and design.

By constructing the station in space, one module at a time, there will be ample opportunity for corrections and adjustments to be made in each succeeding stage based on tests made in the orbiting section. This will not only save time, but costly repairs in orbit will be greatly reduced or eliminated.

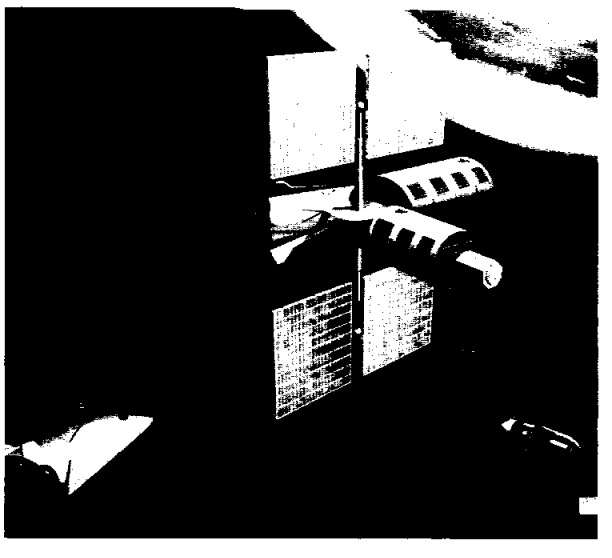
Unique features of the proposed five-level complex include both artificial gravity as well as weightlessness, a laboratory for scientific and technological experiments, unobstructed celestial viewing and the presence of skilled scientists, engineers and technicians with the minimum of astronaut-type training or physical conditioning.

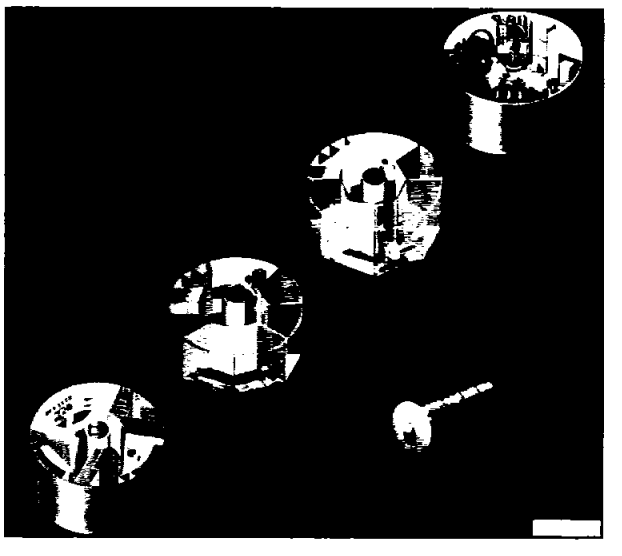
According to the RFP, the Space Base will be an assembly of cylindrical modules up to 33' in diameter. Artificial gravity will be obtained by rotating appropriate parts and modules around a non-rotating zero gravity hub. Electrolysis will be used to recover breathing oxygen from water and electricity will be supplied by a nuclear power reactor.

A two-stage Saturn consisting of an S-IC first stage and restartable S-II second stage is to be the booster.

Following an initial period of several weeks flight for engineering analysis and testing, the boom, hub and S-II counter-weight will be separated. Subsequent Saturn launches will add nuclear reactors and additional modules to the original orbiting vehicle.

Space Base experiments will cover a number of broad fields: Earth resources, meteorology, astronomy, space physics, space biology, biomedicine, biotechnology and space materials research.





ARTIST'S CONCEPTION OF A MANNED EARTH ORBITAL SPACE STATION PROPOSED FOR MID-1970'S
Completed complex might handle crew quarters, power systems, docking and cargo, maintenance, laboratories and storage.

SPORTS WRAP-UP

Ladies' volleyball champions announced

The winners of the six-team MSC Ladies' Volleyball League came out with a 12-3 record for the season. The team included Jo Ann Anderson, Janice Doherty, Leslie Lottinville, Jane Palisoul, Betty Waters, Carolyn Waund and Ann Williams.

'Wheels' win bowling trophy

The "Wheels" took first place in the recent playoff match to determine the MSC-Ellington AFB Men's Handicap Bowling League Championship.

The "Wheels" are Horrace Bell, Ray Brazil, Lloyd Cox, Doug Hendrickson, Dave Homer, Sal Esparza and James West, captain.

The "Optimists" team finished second and the "X-perts", third.

Trophies for team members and individual high scores were presented last Monday. Individual winners were:

Jack Lister—High Handicap Series (732)

Richard Hall—High Handicap Game (266)

Mike Hotz - High Scratch Series (602)

Bill Stransky — High Scratch Game (226)

Sam Mayfield - Most Improved Bowler (10 pins)