

# Summer Intern Group Reports to MSC Duty

The ranks of MSC employees will be swelled this summer by 144 summer-hire graduate and undergraduate college students—81 graduates and 63 undergraduates. Some 50 universities across the country are represented by the group.

About 55 of the undergraduate group will be clerical employees and the remainder will work as science aids. They report for duty June 10.

Reporting for duty June 17 will be the graduate student employees who will work in four categories: 28 aerospace technical interns, 12 aerospace administrative interns, 34 regular technical employees and seven regular administrative employees.

The college student employee group does not include the 114 summer employees hired under the Youth Opportunity Campaign and the Junior Student Trainee program. (See story on page 8.)

Two programs for college student employees have been established at MSC. The Aerospace Summer Technical Intern Program provides opportunities for outstanding college graduates who plan to continue their academic training in scientific and engineering fields to gain experience in the aerospace field. Summer work assignments at MSC will be under the direction of senior staff members or engineers and scientists who are specialists in their fields. Interns for the program are recommended by their deans or department heads.

The Aerospace Summer Administrative Intern Program is similar in concept to the technical program except that business and public administration students are assigned administrative-management work in line with their academic backgrounds. They are directed by MSC senior administrative-management specialists.

## Fuel Injectors Switched In First Manned LM

The Rocketdyne injector will be used in the Bell ascent engine of the first manned lunar module, it was announced by Apollo Program officials Tuesday.

The Bell engine powers the lunar module in its ascent from the surface of the moon. Injectors deliver fuel and oxidizer into the engine combustion chamber.

Qualification testing will continue on the original injector made by Bell Aerosystems Co., Buffalo, N.Y., as well as on the injector made by North American Rockwell Corp.'s Rocketdyne Division, Canoga Park, California. These tests are expected to be completed in August. A decision has not yet been made as to which injector will be used for the lunar mission.

In addition to their on-the-job training, specialized courses will be conducted for the interns. A 30-hour seminar, "Manned Spacecraft: Engineering Design and Operation," will be conducted for technical interns as well as for new regular technical employees.

## Apollo VII CM Shipped to Cape

The command module for the first manned Apollo flight was shipped May 29 from the North American Rockwell plant in Downey, Calif., to the NASA Kennedy Space Center, Fla.

The command module for Apollo VII, to be flown later this year, has been accepted by the Customer Acceptance Readiness Review Board of NASA.

One of the final items of work at the manufacturing facility was the strengthening of the module's structure in the area where the spacecraft parachute lines are attached. Last April 24 this area was deliberately stressed beyond expected maximum flight loads plus a margin of safety and some damage resulted to the test article being used.

Six remaining tests on the strengthened structure are expected to take about eight weeks. These tests will be conducted either on the modified test article or on another command module which has been used in the ground test program.

The service module for Apollo VII arrived May 17 at the Kennedy Space Center.

Following Kennedy Space Center inspection, the service module was prepared and moved into the Center's altitude chamber for integrated systems testing under simulated space conditions. These unmanned tests will be followed by mated command service module tests in the altitude chamber.

Bell manufactures the ascent engine under a subcontract to the Grumman Aircraft Engineering Corp., prime contractor for the lunar module.

On August 2, 1967, NASA selected Rocketdyne to design, develop, and qualify an alternate injector after the Bell injector experienced developmental difficulties. A joint NASA and Grumman team conducted a review of both injector programs in April and May 1968. This evaluation led to selection of the Rocketdyne injector for the first manned lunar module mission.

The Bell engine has been fitted with the Rocketdyne injector at the Rocketdyne Canoga Park facility. This engine is being installed in LM-3 by Grumman at Bethpage, Long Island, prior to its shipment to Kennedy Space Center, Florida, later this month.

# ROUNDUP

NASA MANNED SPACECRAFT CENTER

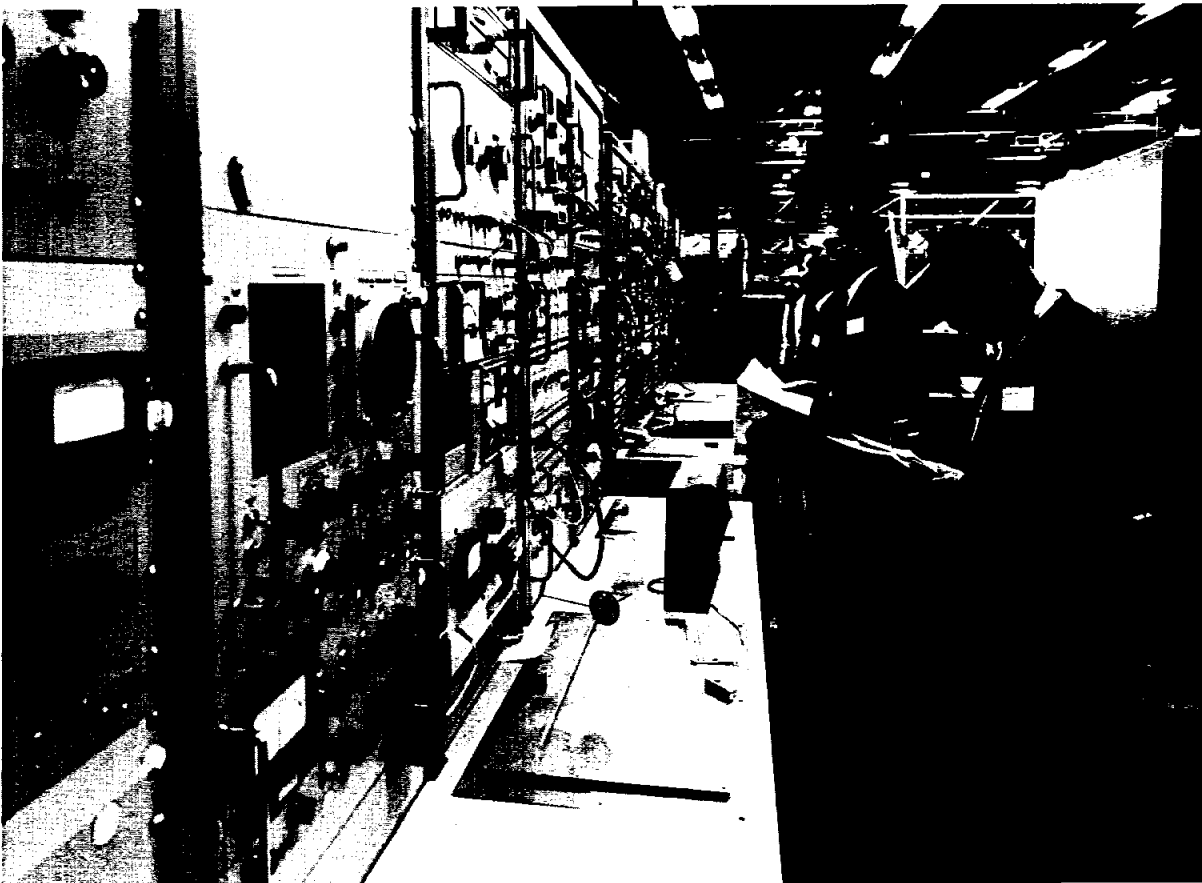
HOUSTON, TEXAS



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JUNE 7, 1968

## Hardware Supermarket



**NUTS-AND-BOLTS SHOW**—Prospective users of obsolescent Apollo hardware view some of the \$15 million worth of equipment at the first Apollo Surplus Hardware Exhibit—an idea originated by the Resident Apollo Spacecraft Program Office at NR-Downey. The exhibit was aimed toward reutilizing, preferably within NASA, excess hardware caused by obsolescence from end of development testing and unmanned missions. Some 380 persons attended the exhibit and turned in more than 3000 equipment requests, with an acquisition cost of about \$9 million, which will help other NASA programs meet budget and schedule limits.

## Testing Goes Into High Gear For 1st, 2nd Manned Apollos

Apollo command module 101, scheduled for the first manned Apollo mission, next week will be mated with its service module for manned and unmanned vacuum chamber tests at Kennedy Space Center Manned Spacecraft Operations Building. The command module was delivered to KSC May 30. (See story this page).

Manned vacuum chamber testing at MSC in support of the Apollo VII mission is scheduled to begin next week with the 2TV-1 command and service modules in Chamber A of the Space Environment Simulation Laboratory. Prime crew for the test series are astronauts Joseph Kerwin, Vance Brand and Joe Engle.

The 2TV-1 test, aimed at checking out the spacecraft environmental control system under simulated space conditions, will last seven-and-a-half days. Chamber A will subject the spacecraft to a temperature range of from -150°F to +150°F in a vacuum equivalent to 130 miles altitude.

An unmanned thermal-vacuum test was scheduled yesterday, and the crew was to have checked out the spacecraft suit oxygen loop in a four-hour test today with the chamber at non-vacuum ambient condition.

Other testing in support of the first manned Apollo mission included the fifth in a series of seven parachute drops at the

Naval Air Facility, El Centro, Calif. June 5. The drop was a simulation of a high-altitude abort in which only one of the two drogue chutes deploy at 20,000 feet and main chutes at 5,000 feet after a drop from 32,000 feet.

These full-scale boilerplate tests of the Apollo earth landing system began last summer to verify parachute modifications made to handle Apollo command module weight growth.

MSC testing for the second manned Apollo mission—first manned flight on Saturn V—a series of vibration tests to begin June 11 of the Apollo command module and LM in docked configuration. The tests also are aimed toward gaining additional data on spacecraft structural response to booster thrust variations, or "pogo effect," that were encountered in the April 4 unmanned Apollo VI mission.

The Structural Dynamics Branch will conduct the tests in the Bldg 49 Vibration and Acoustic Test Facility.

As a follow-on to the completed Lunar Module Test Article-8 thermal-vacuum tests in SESL Chamber B, (see story on page 3) the Apollo Portable Life Support System (PLSS) was scheduled for a manned check-out in Chamber B June 5. The test was expected to last eight hours and was to fulfill a secondary LTA-8 test objective which was not met in the four manned LTA-8 chamber runs.

MSC Crew Systems Division has accepted from Hamilton Standard, Windsor Locks, Conn., the first flight model of the PLSS which will be used by astronaut Russell L. Schweikart during EVA in the second manned Apollo mission.

## Bond Drive Nears Goal

At the midpoint of the 1968 MSC US Savings Bond Campaign, the Center had reached an overall participation of 75 percent, according to Campaign Chairman Dexter Haven. The MSC goal for the drive, which ends June 14, is 80 percent.

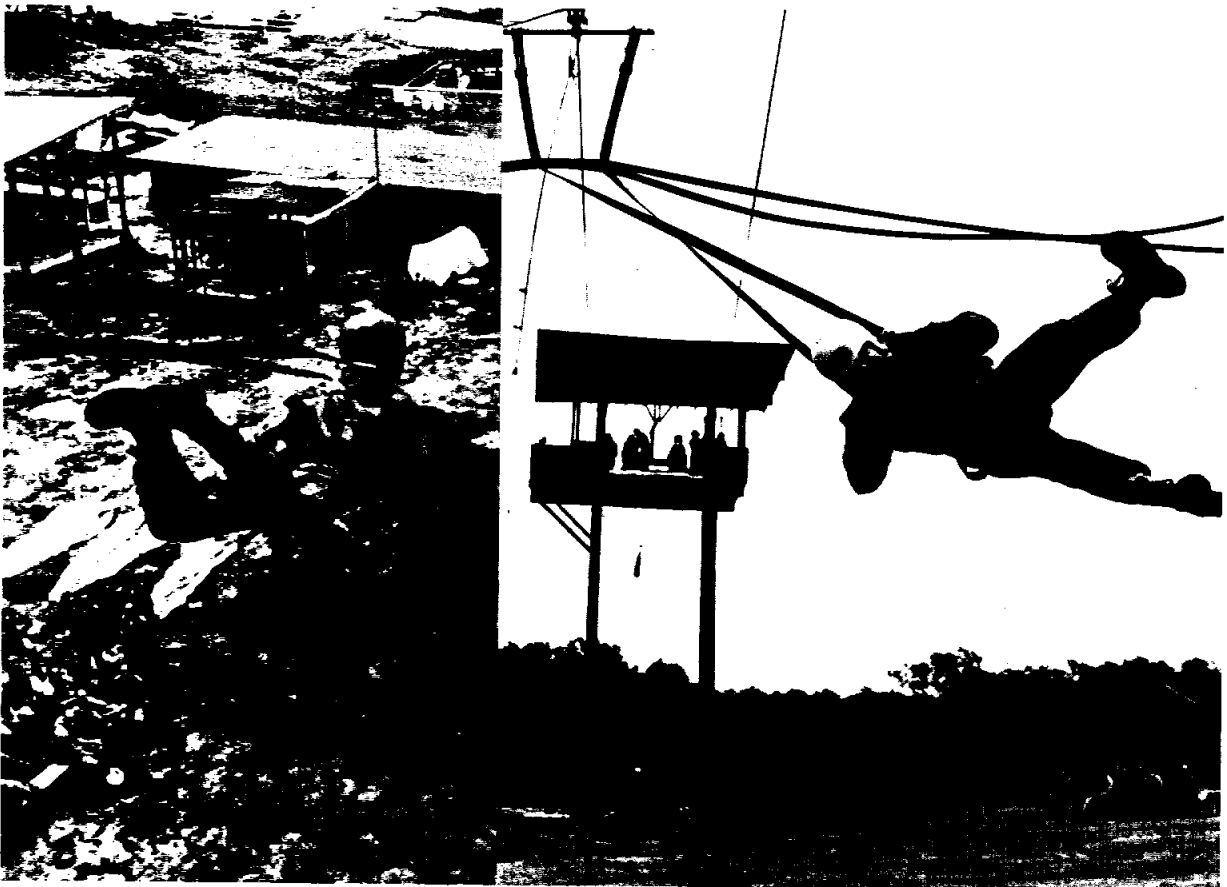
The Program Control and Contracts Directorate reached 100 percent participation, with White Sands Test Facility following at 93 percent.

A number of payroll deductions submitted were to take effect in July in anticipation of the scheduled civil service salary hike, but were returned to employees. Rules on effective date of deductions have been relaxed so that any authorization for Bond deductions received by Payroll by June 14 to be effective before the end of July will be credited to the MSC campaign.

Employees whose authorization cards were returned are urged to resubmit them.



**GETTING THE WORD**—USAF Air Defense Command life support school instructor MSgt Antonio Martino outlines for a group of MSC scientist-pilots what they are to expect in the two-day course at Perrin AFB, Texas. Left to right are Vance Brand, Stuart Roosa, Jack Lousma, Alfred Worden and Martino. At rear, behind Roosa, is Edward Gibson.



**JUMPING-OFF PLACE**—The brief trip in an ejection seat and the opening shock of a parachute were simulated in a jump tower. At right Don Lind comes to a sudden stop at the end of his slide down the cables. The pilots were hoisted to the tower platform in a helicopter hoist as part of the comprehensive bailout survival training.



**WATER WALKER**—A drop in the wind velocity causes a parasail to be sluggish in lifting off as the pilot seemingly runs across the surface of Lake Texoma. At right, pilots jump from the stern of a moving barge with parachute risers attached to simulate being dragged by an inflated parachute after a water landing.

**BUSY SCHEDULE**—

# Ejection Training Achieves Realism

By Milton Reim

A four-day course in life support training for pilots last week was condensed into two days of rigorous sessions for sixteen astronauts and five other MSC people at Perrin AFB.

The course conducted by the Air Defense Command life support school near Sherman, Texas, was oriented toward surviving without serious injury an emergency ejection from a high-performance aircraft.

The training included classroom sessions, demonstrations, participation in simulated emergency aircraft ejection, and parasailing over the waters of Lake Texoma.

Astronauts taking part in the training were from the fourth and fifth groups selected for the space program, the first group of scientists and the last group of pilots selected.

Classroom sessions included a briefing on equipment issued for the training, the will to survive, pre/post ejection procedures, personal/survival equipment, and rescue procedures and self aid.

Techniques on how to get loose from the parachute after it is no longer needed and the proper procedures to follow in ejecting from the aircraft, preceded simulated ejection training from a tower. A simulated ejection, including sound effects, was followed by jerky plunging rides down a cableway from a 35-foot high tower for about a five-second ride that ended in a rather abrupt swinging twisting halt and then release from the parachute harness.

Each man took four rides on this simulator and during the short descent he was required to do a simulated check of his canopy, release and deploy his survival pack, and open the safety covers over the two parachute releases in order to be prepared for landing after a low altitude aircraft ejection.

Helicopter hoist training was used as the means of getting the

trainees to the top of the jump tower for the simulated ejection training.

In another session, each trainee was dragged on the ground in various positions by a full parachute canopy billowed by a wind machine that produced 30 to 60 mph winds. The subject was required to release at least one of his chute attach points to collapse the canopy.

The trainees also made jumps forward and backward, from a platform on a moving boat, into the water with their parachute harness attached to straps on the rear of the boat. The pilots were then dragged through the water on their backs or face down until they were able to activate the parachute releases. Boats were in the water to pick up the wet soggy trainees.

Launching of the trainees on a parasail was from the shore of the lake on an 800-foot tow rope attached to a powerboat. Altitudes of up to 400 feet were reached by the trainees before their descent and splash into the lake and pickup by boat.

The final parasail ride of each trainee was with a survival pack. They deployed the pack while airborne and after landing, got into a one-man raft and paddled ashore.

Taking the training at Perrin were Vance Brand, Gerald Carr, Joe Engle, Ronald Evans, Owen Garriott, Edward Gibson, Don Lind, Jack Lousma, Thomas Mattingly, Bruce McCandless, F. Curtis Michel, Edgar Mitchell, William Pogue, Stuart Roosa, Paul Weitz, and Alfred Worden.

Others from MSC taking the training were Conway Roberts and Lawrence Gaventa, staff pilots; Donald White, flight engineer and quality control inspector for MSC aircraft; Jerald Rackley, parachute and personal equipment specialist; and Dr. Clarence Jernigan, who rides as a backseat passenger in MSC aircraft.

**NO SWIMMING PERMITTED IN THIS AREA**



**MARINER**—Each pilot deployed his survival raft on his last parasail water landing. Here, Joe Engle makes headway toward shore using a sail improvised from his flight suit and some limbs foraged from the opposite bank.

# LTA-8 Chamber Test 'Unqualified Success'

By Doug Ward

The Apollo Lunar Module completed a "highly successful" series of manned tests in an MSC vacuum chamber June 1.

Astronaut James Irwin and Gerald Gibbons, a Grumman Aircraft Engineering Corporation pilot and backup crewmen Glennon Kingsley, also a Grumman consulting pilot, and Joseph Gagliano of MSC's Flight Crew Support Division, manned Lunar Module Test Article 8 (LTA-8) four times between May 27 and June 1 to help qualify the LM for its first manned flight in earth orbit. The test was conducted in chamber B of MSC's Space Environment Simulation Laboratory (SESL), under temperature and vacuum extremes simulating space flight.

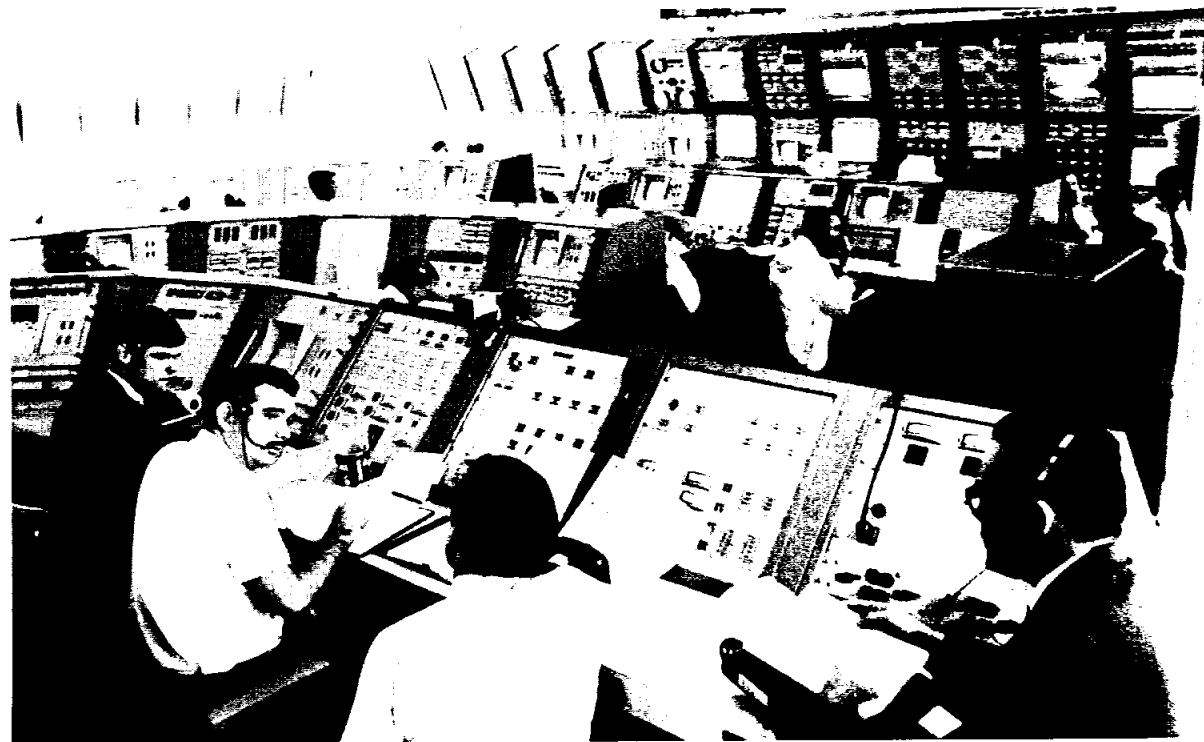
SESL Manager James McLane told newsmen Monday the test was "an unqualified success", with preliminary data analysis indicating all major test requirements toward certifying the LM for manned flight were met. McLane noted that the test was completed in one week instead of two weeks as originally planned. The speedup was possible, he said, because of excellent vehicle and chamber facility performance, allowing the two phases of the test to be run back-to-back, and because of a new procedure which permitted stabilizing the vehicle thermally prior to manned testing in a much shorter period of time.

Owen Morris, Chief of MSC's LM Project Engineering Division, said the test was conducted with "a significantly smaller number of problems and anomalies than we would have expected," Morris said, "indications from test data so far show no constraints on the LM 3 mission."

LTA-8 prime crewmen, Commander Irwin and Lunar Module Pilot Gibbons, manned the vehicle for 12-hour tests May 27, May 29, and June 1. Backup crewmen, Commander Kingsley and Lunar Module Pilot Gagliano, went aboard for a 10-hour manning May 31.

Crew activities during the test series closely resembled tasks to be performed in earth orbital and lunar missions with the LM. Systems were activated and checked out, on-board computers were exercised and maneuvers and engine firings were realistically simulated. Engine valves were instrumented to show whether or not they opened and closed in response to manual and automatic firing commands. And simulated propellants were removed from the LM tanks to simulate fuel and oxidizer "burned" by the craft's rocket engines.

The primary purpose of LTA-8 thermal-vacuum testing was to assure that the vehicle maintained the proper environment for crew and equipment in the vacuum and temperature ex-



NERVE CENTER—Test monitors for last week's manned thermo-vacuum testing of Lunar Module Test Article 8 (LTA-8) man consoles in the Space Environment Simulation Laboratory Chamber B control room.

tremes of space. The test was divided into two phases, each phase consisting of two mannings. The first test phase simulated temperatures expected on an earth orbital flight with the LM receiving minimum heating from the sun. The second test phase simulated maximum solar heating.

During the test series chamber B maintained a vacuum simulating an altitude of up to 133 nautical miles and the walls of the chamber were cooled with liquid nitrogen to a temperature of about -300°F. Strip heaters attached to the skin of the LM supplied solar effects and soak-back effects from engine firings.

A secondary test objective which was not met was the operation of the Portable Life Support System (PLSS) being developed for use in Apollo extra-vehicular activities and on the lunar surface. Irwin had planned to transfer from the spacecraft life support system to the PLSS with the spacecraft cabin depressurized. The test could not be conducted because adequate communications and data flow could not be obtained from the unit.

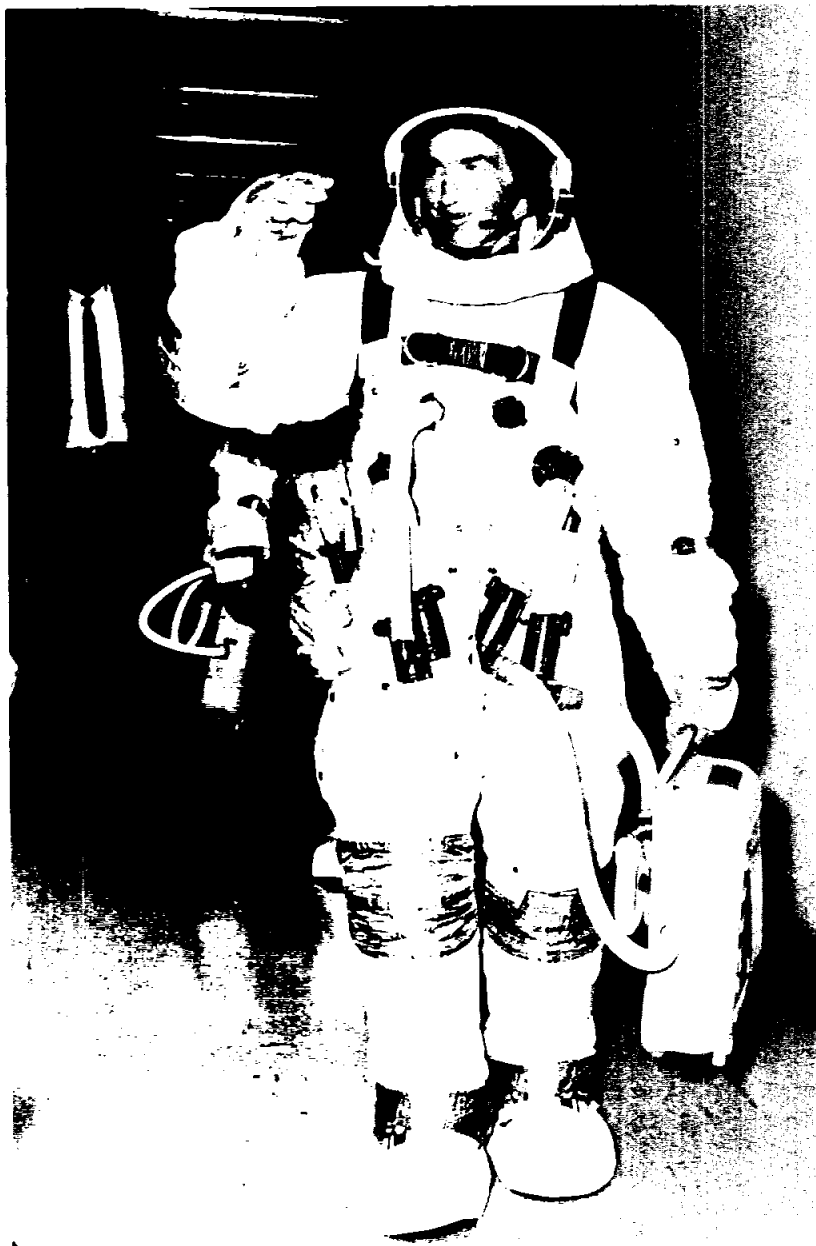
LTA-8 thermal-vacuum testing produced two "firsts" for the MSC chamber facility. It marked the first time a crew ingressed and egressed a spacecraft in the facility at hard vacuum and included the first unscheduled repair of a spacecraft under vacuum conditions by crewmen in pressurized suits.

All four of the crew ingresses were accomplished while the chamber was at hard vacuum, and two of the four egresses were done in a hard vacuum. Irwin commented on the psychological effects the first time he entered the chamber at space equivalent vacuum, noting that it probably played a part in raising his pulse rate.

The unscheduled spacecraft repair came on the fourth manning when Irwin and Gibbons discovered that both hinge pins on the hatch of LTA-8 had been inadvertently broken during the previous day's crew egress. Gibbons pointed out that the hinge pins for the test had been designed to break with a minimal

force as a ground test safety precaution which would allow easy exit or entry to the vehicle in an emergency. To pressurize the craft for the final day's testing it was necessary to replace the hinge pins—a task which had to be carried out with the chamber at vacuum and the crew in pressurized suits if valuable test data were not to be lost. Using a special tool constructed by

Grumman technicians the night before Gibbons removed the remnants of the old hinge pins and he and Irwin aligned the hatch so it could be sealed and the cabin pressurized. Later, while the hatch was held in place by internal cabin pressure the hinge pin alignment tools were removed and a new set of the break-away type hinge pins was installed.



FIRST TRIP—Grumman's Gerald Gibbons makes the trek to SESL Chamber B manlock for the first LTA-8 manned test in a thermo-vacuum environment.



ONE DOWN, THREE TO GO—The first 12-hour LTA-8 vacuum chamber test complete, astronaut James Irwin exits the Chamber B manlock followed by Gibbons. In a later test run, Irwin and Gibbons performed some first-echelon maintenance on a hatch hinge pin in simulated space environment.

## The Apollo EMU, From the Skin Out

Material	Function
Teflon-coated beta fiberglas fabric	Completely nonflammable in oxygen atmosphere. Withstands temperatures to 1200°F.
Aluminized Kapton/beta marquisette laminate (superinsulation)	Aluminized kapton film withstands 900°F. Beta fiberglas serves as a spacer separating reflective surfaces.
Bladder material	Neoprene-coated nylon acts as micrometeoroid protection.
Nylon fabric	Restraint layer for inside layer.
Bladder material	Neoprene-coated nylon, an impermeable layer holding suit pressurization.
Light-weight nomex fabric	Comfort layer.
Extravehicular suit assembly: Teflon-coated beta fiberglas, seven layers kapton/beta marquisette laminate, two layers of bladder material, blue nylon fabric, bladder, light-weight nomex.	
Intravehicular suit assembly: Teflon-coated beta fiberglas, one layer kapton/beta marquisette laminate, blue nylon fabric.	

A SPACESUIT epitomizes for many people the whole business of space exploration—toy manufacturers market pint-size spacesuits and helmets, cartoons show spacepilots in the most unlikely places garbed in spacesuits, and spacesuits have had an impact even on women's fashions and airline stewardess uniforms.

But while the spacesuit is a popular symbol for man's ventures into space, little is known except by those directly involved about what goes into the construction of these garments—which really are a sort of personal spacecraft which separate man from the hostile and deadly environment of space.

Photos on these two pages show some of the many operations that go into making the Apollo spacesuit at the International Latex Corporation plant.

**TAILOR SHOP**—Beta marquisette spacers for the Apollo A-7L spacesuit Integrated Thermal Micrometeoroid Garment (ITMG) receive finishing touches at an ILC worktable. The spacers serve to provide insulating airspace between reflective kapton layers.



The Apollo spacesuit is also known by the more lengthy moniker of Extravehicular Mobility Unit or acronym EMU. The EMU consists of the spacesuit, thermal micrometeoroid garment, extravehicular visor system, portable life support system, communications system and emergency oxygen system.

### Round Trip

Of all the Apollo operational equipment which will make the journey to the moon, the EMU is the only piece of equipment which will be taken to the lunar surface and returned to earth. The EMU in a sense is the fourth module of the Apollo spacecraft stack.

One requirement the EMU must meet is compatibility with both the Apollo command module and the lunar module. The EMU will be worn during the launch phase and then doffed by all crewmen after inflight check-

**BOOTERY**—Forgetting one's overshoes on earth at worst can bring on a case of the sniffles, but the man who steps out of the Lunar Module onto the lunar surface will depend upon these lunar overshoes for the Apollo A-7L spacesuit for more than snuffle protection. These overshoes await final assembly at the International Latex Corporation plant.

out of the spacecraft is complete. Unassisted donning and doffing were musts in the design of the EMU.

Should a spacecraft decompression take place after lunar injection, the crew will have to be able to operate the spacecraft for some 115 hours in pressurized suits until earth return is accomplished.

For such possible long stay times in a pressurized EMU, the suit has provisions for allowing crew eating, drinking and waste management while operating in a vacuum. One of the toughest design features was to provide sufficient pressurized mobility to permit spacecraft control operations and moving about for spacecraft maintenance.

In a normal mission, the LM crew will don suits prior to manning the LM, and they must be able to remove docking equipment from the command module tunnel.

One recent change to the EMU is the integration of the thermal micrometeoroid garment with the spacesuit, mainly to provide additional suit protection during spacecraft operations, to reduce thermal micrometeoroid garment bulk and to eliminate crew donning during the mission.

Once on the lunar surface, the LM crew will don the 60-pound portable life support system and EVA visors, run check-outs, decompress the LM and step out onto the airless surface of the moon.

# Apollo's Fourth Module: The Spacesuit



The EMU has been developed for crew protection in both lunar day and night operations. Suit materials have to be compatible in a range from -250°F to +305°F. One low-temperature problem is retaining flexibility in such components as boots and gloves. At high temperatures, the suit's structural integrity has to be maintained. The thermal garment has to provide adequate insulation over the entire 550° temperature range while limiting

the heat leak in and out of the suit. Tests have shown that the superinsulation material in use will keep heat leak values low enough to be handled by the overall system.

Lunar exploration has imposed mobility requirements never before needed in spacesuits. For example, LM crewmen must be able to crawl out the relatively small LM hatch and then climb down a ladder to the lunar surface. The crew then

**CUTUPS**—Two pair of hands carefully trace around a template for panels for the ITMG prior to the cutting operation. Where the commercial garment industry uses powershears to cut several layers of fabric at once, spacesuit parts have to be cut to closer tolerances.



must be able to unpack scientific equipment from the LM descent stage, move about while carrying out observations, measurements and sample gathering. They then must be able to carry equipment and samples back into the LM.

**Water Cooled**

Gemini EVA experience brought forth some concern over the metabolic loads required for lunar exploration and the EMU's ability to handle these loads without stressing the crewman. The Apollo EMU uses an entirely different concept for cooling the pilot than was used in Gemini EVA equipment. A water-cooled suit is worn under the spacesuit to remove metabolic heat by conduction. In the Gemini suit, metabolic heat was removed by sweat evaporation, and the harder a pilot worked, the more he sweated and the more difficult it became for the ventilating system to evaporate the water.

The Gemini system had a 1200 BTU/hr capacity, with peaks up to 1600 BTU/hr. The Apollo system has been designed for an average metabolic load of 1600 BTU/hr with peaks to 2000 BTU/hr. Tests of the Apollo portable life support system have shown that the PLSS can reject loads greater than 3000 BTU/hr and can operate successfully up to 5000 BTU/hr.

Some investigators believe that the one-sixth earth gravity of the lunar surface will reduce metabolic loads to about two-thirds that required for the same task at one-g, but only actual lunar exploration will verify this belief.

**SEAMSTRESS**—A spacesuit seamstress prepares portions of the ITMG for stitching together. Many special machines and a new regime of garment making technology had to be developed to deal with the materials that go into the A-7L Apollo spacesuit, such as Beta fabric and kapton.



**RACKED UP**—Several ITMG aluminized kapton insulation layers for the A-7L Apollo spacesuit await final assembly with the myriad of other layers of various material that go into the suit's structure.

Other simulations have shown that with moderate difficulty the spacesuit has sufficient mobility for lunar exploration, and continuing spacesuit improvements will make the crewman's job easier.

**Rechargeable**

The Apollo EMU is designed for reuse on the lunar surface—a total of four excursions per man are provisioned for with the current equipment, but the limiting factor will be the availability of consumables such as oxygen, water, lithium hydroxide and battery power. The PLSS has been designed for recharge after each exploration for a nominal three-hour lifetime plus a one-hour contingency. But the actual

useful lifetime of the PLSS depends upon the total metabolic load placed upon it by the lunar explorer.

The PLSS is recharged from LM oxygen and water supplies, and replaceable batteries and lithium hydroxide canisters are provided to complete PLSS recharge. The entire recharge operation can be carried out under lunar vacuum conditions.

After lunar exploration and rendezvous with the orbiting command module, the PLSS could possibly be called upon to perform one additional emergency task—life support during free-space transfer from the LM to the command module should docking not be possible. The EMU serves operationally for many emergency-type mission failures and as the prime lunar surface operation system.

EMU qualification was nearing completion at the time of the spacecraft 012 fire in January 1967, and subsequent changes have required additional testing. Manned tests have been run in MSC space environment chambers under three lunar surface conditions: lunar day on flat lunar plain, lunar day in simulated crater (worst heating conditions) and lunar night. The test subject exercised at a rate of 1600 BTU/hr with peaks of 2000 BTU/hr. Although minor problems in the spacesuit and PLSS were encountered, the tests on the whole were successful.

**Helmet Improvement**

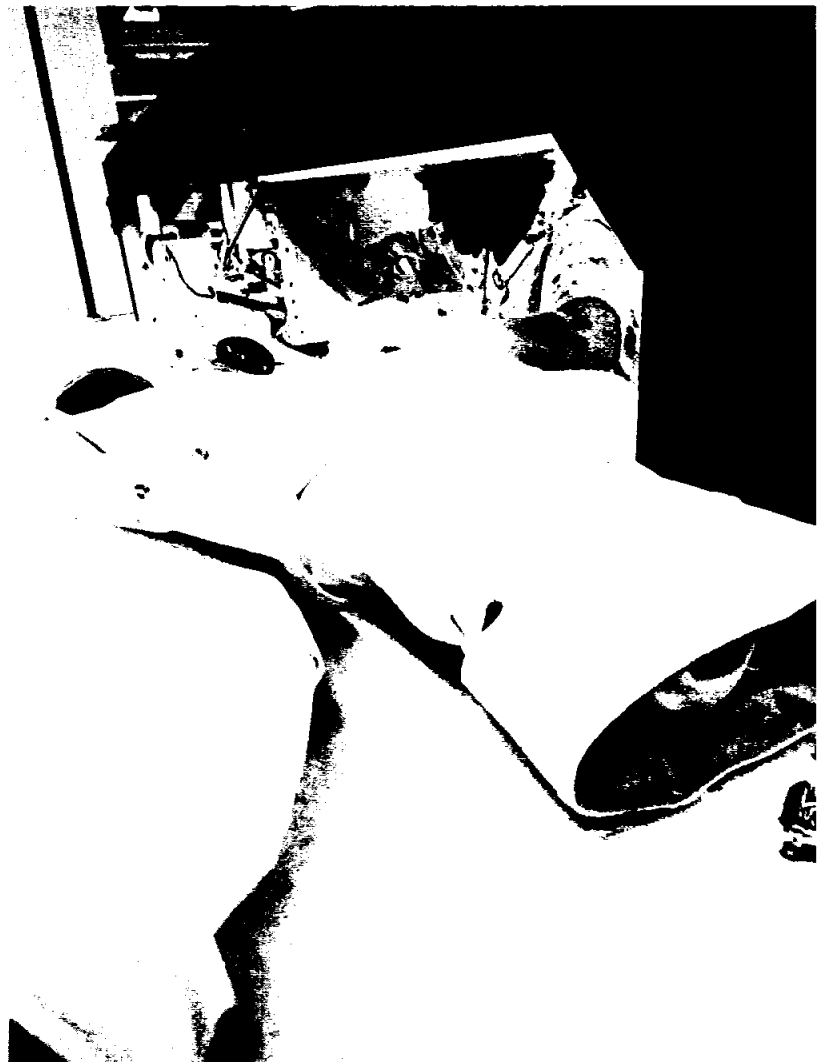
Some EMU development problems exist, such as improving suit mobility, and the helmet visor material is considered marginal for the worst lunar day condition. Efforts to increase the hardness and thermal properties of helmet materials are in work.

In the spacesuit itself, the major change has been a switch from nomex, a high-temperature nylon, to beta fabric, a glass fabric. Beta fabric will not support combustion and melts at a temperature of 1500°F. Beta fabric is also being substituted for cotton underwear and other nylon applications. The materials substitution program is felt to be the key to spacecraft fire protection.



**HEARPIECE**—Ear cups for A-7L helmet communications receiver headsets are fabricated as one of many helmet subassemblies.

**OVERCOAT**—Finishing touches are applied to an A-7L spacesuit Integrated Thermal Micrometeoroid Garment on a specially-built long-arm sewing machine. The ITMG will be worn during extravehicular activity.





## Red, white & blue chip Investment



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## NASA Sets Up Aerospace Safety Data Institute

NASA has established an Aerospace Safety Research and Data Institute to seek solutions to technical safety problems and to provide NASA and its contractors with the latest information on safety data and procedures.

The Institute will be under the management direction of the Lewis Research Center, Cleveland. I. Irving Pinkel is Director of the new institute.

Pinkel, a chemist at Lewis, has won international recognition for his extensive research into crash fire and crash injury in transport and personal airplanes.

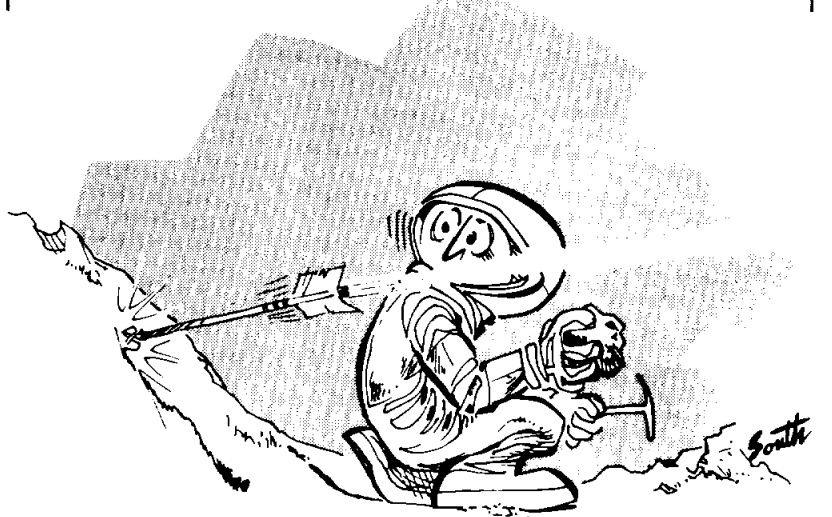
One of the immediate tasks of the Institute will be to set up a safety technical data bank for the storage and retrieval of safety information and to provide data and consultation on government, industry and universities. It will establish research programs to extend safety technology.

The research programs will include investigations of fire, explosion and chemical hazards; mechanics of structural failure; systems malfunction hazards; environmental hazards; and the relationship of hazards to man, including psychological and physical stress, hazard awareness, safety training techniques, safety equipment and practices.

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## THE ASTRONUTS

(filched from TRW Systems Group)



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## Your Job in Focus

### Relatives on Contractor Payrolls

Relatives of MSC employees desirous of securing employment with a NASA contractor should make application directly and routinely to the company. There should be no intercession, directly or indirectly, by interested family members employed by NASA.

While there is no general prohibition against a relative of a NASA employee working for a NASA contractor, there is a legal prohibition against any NASA employee participating personally and substantially in any matter in which he, his spouse, or minor child has a financial interest. Therefore, if an MSC employee has a significant role in the award, administration, or monitoring of contracts, and has a member of his family working for a NASA contractor, he should seek a waiver of the statutory prohibitions if his duties cause him to be engaged in the award or administration of contracts with the employer of his spouse or child.

Requests for waiver should be submitted in accordance with NASA Handbook 1900.1A, Appendix B.

### Hiring the Disadvantaged

"As a responsible employer, the Government has an obligation to offer job opportunities to all its citizens, including those lacking educational and experience advantages open to others," Civil Service Commission Chairman John W. Macy, Jr., recently told a group of Federal officials.

He said a number of special examinations have been issued and geared specifically to persons with limited education and skills, including worker-trainee, office aid, and related positions. A number of appointments have been made from these competitive examinations, which do not include written tests.

Government's experience with employees who previously had little or no opportunity is "highly encouraging," he reported. He added, "The responsibility of having a job and the realization that someone is willing to help the employee improve

his work have opened up a whole new world to some of these people."

Extending job opportunity to the disadvantaged does not mean preferential treatment for anyone, the Chairman said, beyond the traditional veterans preference stipulated by law and thoroughly established in the Civil Service system.

"Such a policy does not mean weakening the merit system, but strengthening it," Macy stated. "It does not mean a change in standards, but a change in attitudes. It does not mean reducing competition, but extending opportunity.

"It does not signal a reduction in the quest for quality, but a broadened and extended search — for top-quality employees are to be found at every level, including the very poor, the uneducated, and the unskilled can complete," he said.

## The Graduate



**CAP-AND-GOWN REHEARSAL**—Not every graduate has such help in setting the trim of his cap and gown as did James M. Hollis of Procurement-Center Support. Hollis June 1 received his MA in political science with a public administration option and is the first graduate in the NASA-University of Houston Graduate Program in Public Administration. He enrolled in the first UofH Clear Lake Graduate Center course in September 1965 and took all but nine hours toward his masters at the Clear Lake Center. Helping Hollis prepare for the pomp and circumstance are Pat Curry, left, of Procurement-Center Support, and Silvie Gaventa of Personnel-Employee Development.

## Nitrogen Can Become As Deadly as Cyanide

Since nitrogen is an inert, non-toxic stable gas, one would think that it would not be hazardous. But, it is, and deadly hazardous, for when it displaces oxygen in a closed area it can kill a person as surely as cyanide gas.

Nitrogen's seemingly tame qualities make it ideal for cooling, pressurizing, blanketing or purging space systems. These same qualities can induce a sense of false security in the user. Nitrogen is odorless, colorless and undetectable by the human senses. When cold, it sinks and puddles into invisible pockets of quick death by asphyxiation.

In one accident reported by the National Safety Council *Aerospace Newsletter*, a compressor room mechanic mistakenly activated a bank of nitrogen cylinders into the room. He left the room, but an operator came in to telephone for help and collapsed before he could complete the call. The mechanic returned with a second man and tried to remove the operator. All three dropped near the door. Emergency crewmen saved all three, but the operator was hospitalized for several days.

Liquid nitrogen can freeze skin tissues and the delicate eye structure. It is used in quick freezing foods.

In some climates, liquid oxygen can condense on liquid nitrogen piping to further compound the hazard. Liquid nitrogen boil-off, if tapped in a line or vessel by a frozen valve, can cause the vessel to rupture violently.

To forestall the hazards of liquid nitrogen, there are three precautions that can be taken by users of this widely-used gas:

- Wear personal protective gear when working with liquid nitrogen.

- Keep liquid nitrogen lines free of moisture to prevent relief valves from freezing.

- Ventilate low or closed storage areas and check oxygen content before entering.

Liquid nitrogen is a useful tool in many areas of MSC's work, but if improperly handled it can become a killer.

## Receives SSP



**Irwin D. Smith**  
MSC White Sands

## AFGE Veep Installs Lodge 2284 Officers

American Federation of Government Employees 10th district national vice president Omer W. Jordan Monday will install newly-elected officers of AFGE Lodge 2284 at 5 pm in Bldg 30 auditorium.

New officers are: President Alma Hurlbert, 1st Vice President Joe M. Pirtle, 2nd Vice President Robert E. Thrower, Secretary Jean Stone, Treasurer Norbert Philippi, and Chief Steward Herman P. Fisher.

# Roundup Swap-Shop

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

## FOR SALE/RENT—REAL ESTATE

Five acres of land off Manville Highway on Country Road 101. MI 5-0188.

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

Heavily-wooded corner lot, 90 x 200 ft., Oak Hollow subdivision in Dickinson. Most surrounding area lots already developed. Good price. Don Wade, MI 9-0554.

Clear Lake City, 4-2-2, family room, central air & heat; cul-de-sac. Membership in recreation center included, available about June 30. Lease \$245. RE 3-7667.

For rent, 4-2-2, brick, central air/heat, fenced, landscaped yard, walk to elementary school, completely carpeted, all built-ins. \$225/mo., lease option available. John Tuffy, HU 2-1326.

Brick 3-2-2, Deer Park, equity and assume loan, \$14,700 total. R. Gadbois, GR 9-1761 after 5.

Lot in El Lago Estates. 120 x 150 with view of Taylor Lake. 202 Lakeshore Drive. Ken Turner, AC 703/437-3391 after 6.

League City, 3-bedroom Spanish brick, 2 baths, den breakfast area, living room, electric built-ins, carpeted, central air and heat. Large lot, trees. 2-car garage. Buy equity. Barbara Salvato, 932-3888 after 5:30.

Brick 3-2-1 in Friendswood, central air and heat, carpeted, gas built-ins, fireplace, all landscaped, 2 blocks of new elementary school, buy equity \$1400 and assume 6% VA loan, payments \$129/mo. Stuart, 482-3079 or 932-4583.

League City across from high school. 3-2-2 with den, central air, heat, large fenced yard. \$20,500, \$3500 equity on 5 1/4% loan. Pete King, 932-2409.

3 1/2 acres Lake Livingston Acres, \$3150. John Richardson, 946-7587.

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

Nassau Bay: Old English 1 1/2-story 4-br, 3-bath, double garage, wooded lot, fence, swimming pool, large family room, carpets, drapes, etc. \$44,000 or long-term lease @ \$300/mo. Jere Cobb, 591-3167.

## FOR SALE—AUTOS

63 "98" Oldsmobile 4 door, clean, low mileage, cold air, R&H, 8-way power seat, nylon upholstery, carpet, excellent WSW tires, remote control outside mirror, other luxury items. Gold with white top. Has damaged right rear quarter panel and deck. Blue Book wholesale is \$950 plus. My price is \$595 or trade for clean ski rig. L. Wright, 877-3059.

62 Chevrolet Bel Air. 6 cyl., 4 dr., air conditioning, automatic transmission, good tires. Priced reasonable. C. W. Leaverton, GR 9-3759.

67 Suzuki, 250 cc; must sell. E. M. McElwee, GR 4-3476.

63 white Corvair, 79,000 miles standard transmission with radio still in good condition, treated like member of family. \$350. L. P. Murray, GR 4-3373.

63 Ford Falcon Futura, 4 door, standard transmission, radio, heater, and air conditioned, extra clean. Pavea Hollingsworth, 932-2031 after 5.

65 Mustang, fast back, 289 Hi-po 271 horsepower, chrome wheels, Kenny Robinson, Texas City, WI 8-0959 after 5.

63 Thunderbird convertible, white with black interior, excellent condition. W. Weber, 877-1739.

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

65 Ford Fairlane 500 sportscoupe two-tone, V-8 289 engine, Cruisomat xmission, pwr steer, air, radio, tinted glass, padded dash/visors, undercoated. \$1495. D. Swift, HU 2-7727.

Triumph TR-4 convertible, 1964, approx. 58000 miles, good mechanical condition, \$1000. Bob Bragg, 534-5217 after 5.

66 Pontiac Custom Tempest 4-dr. sedan OHC 6, auto. trans, power steering, air, other extras, excellent condition, shop manuals included. John Welch, MI 9-2601.

66 427 Corvette convertible, both tops, Nassau Blue, 26,000 miles, Firestone "500" tires, \$2600 cash. Roy Linton, WI 5-4651 Texas City.

## FOR SALE—MISCELLANEOUS

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

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

Trailmaster Honda 1965, 2300 miles, buddy seat, chrome rack, mirrors, helmet and goggles, like new condition, adult rider, custom-made cover. \$250. Underhill 469-3021 after 6.

Upright piano, excellent condition, good tone, complete with bench, \$285. Also double bed with bookcase headboard, \$20. C. W. Leaverton, GR 9-3759.

7% bonds, excellent long-term investment. Burl Kirkland, GR 4-3420 after 5.

Snare drum, stand, sticks, brushes, case, \$30. Cymbal stand, \$30. Or both for \$50. 5 mo. old, very little use, excellent condition. Burl Kirkland, GR 4-3420.

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

Piano, Wurlitzer 45" console with bench. Direct action, metal pin block, pads 3 years old, \$75. Golf clubs, bag, and cart. 10 irons 3 woods, \$40. Bike, men's 26" English style, \$20. Bench saw, 8" tilt arbor, with cabinet & accessories, \$30. James Rippey, 877-1859.

Frigidaire matched pink washer and electric dryer, good condition, ready for use, \$75. Walter Smith, Alvin, OL 8-4957.

2-bdrm. mobile home, Windsor 50 x 10 ft. Will relocate to park of choice—fully furnished, complete with builtin component Hi-Fi, Flush-mounted TV, dishes, silverware, central air/heat. Rental price negotiable, perfect home for two. Jerry Hedberg, 877-2470 after 6.

Scalloped border stones (used)—20c each; Penn 6/0 reel with line (used once)—\$40; 7 ft. popping rod and Pen #9 reel (good condition)—\$12.50; Berkely 10 ft. surf spin rod (used once)—\$18; 12-gallon rectangular boat fuel tank (used once)—\$20; Volkswagen heavy duty trailer hitch—\$15; 7.5 French Carbine with 95 rounds ammo—\$35. Bob Sherman, Friendswood, HU 2-7949, after 5.

Tent, Sears umbrella, one piece with floor, exterior poles, excellent condition, used slightly. \$60. L. P. Murray, GR 4-3373.

AKC registered miniature Dachshund; only one red female left. 7 1/2 wks., wormed, shots. \$45. George Keeler, GR 2-2817.

20-in. boxshaped electric 2-speed fan, and thermostatic electric heater, and like-new Bissell hand sweeper all for \$22.50. Dr. Johnston, 877-4118.

One antique wall clock from Holland. Three-quarter Westminster chime. Beautiful. Dan Ford, 944-2037.

1966 Honda Dream 300, good condition, will sacrifice for \$350. J. Reil, WE 5-6822 (LaMarque).

B-Flat Bardot clarinet, cost \$140. Slightly used for 4 months. Will sell for \$90. 3/4-size violin, \$35. B-B gun, \$5. International Royal Danish sterling, 45 pieces. Would cost \$630 new; will sell for \$475. Helen Amuedo, MI 9-2511.

Hoover canister vacuum cleaner, complete set of attachments stores inside case, perfect condition, \$25. Mike Loeb, HU 8-2190.

Porsche accessories: chrome luggage rack, \$20; two headrests, \$10/ea. W. L. Green, MI 3-5034 after 5.

TV, '61 Admiral swivel console, B/W-23 inch, scand. mod.-walnut fnsh, new picture tube. \$45. Reveley, 427-3973 (Baytown).

Sako .222 Rem., 3X scope with sling and case plus ammo. \$125, R. A. McComb, HU 5-2557.

Hemisfair tickets at EAA rates—2 adult books, \$9 each; 3 children books, \$2.50 each. T. W. Ullrich, HU 7-0307.

Dalmation pups: AKC champion stock registered, show quality. Shots and dewormed, males and females available. Jones, 944-1321.

14-ft. combination row boat, sail boat, motor boat; cedar lapstrake with double cedar bottom, single mainsail, centerboard, seats, oars, etc. included. First \$125. Ed Armstrong, 591-3279.

Gold nylon carpeting, 14' x 14' and 8' x 10' sections, good condition, both for \$65. Jim McBarron, 591-3778.

King-size twin-box inner spring mattresses, matching pair for \$50. Jim McBarron, 591-3778.

18" power lawn mower, 3 hp Sears Craftsman, \$25. Jim McBarron, 591-3778.

Early-American coffee and matching end tables, Sprague and Carlton, hard rock maple, \$85. Jim McBarron, 591-3778.

Free puppies, 5 weeks old. W. C. Young, 944-4940.

Baby Grand piano, 5 ft., include bench, very good condition, \$425. Three 14 ft. inflatable canoes, brand new, \$25 each. Skill/Bumper pool table, complete with cue sticks and balls, \$45. Stuart, 482-3079 or 932-4583.

1-ton air conditioner, \$55. 220-volt window unit, mahogany front, 30-day guarantee. L. Wright, 877-3059.

Syracuse China, Stardust pattern, like new: 7 dinner plates @ \$3.50 ea; 2 cups @ \$3 ea; 3 saucers @ \$2 ea; 1 salad plate @ \$2.75. \$35 buys all. Sharon Thompson, HU 7-2732.

Flying club membership. Four planes available at reasonable hourly rates. \$500 returnable fee. Terms. Bob Brown, 474-3750 after 5.

1 yr. old moss green 12 x 15 duPont 501 nylon rug with pad, \$50. Infants car bed, \$6. Yellow Cosco high chair/youth chair combination, \$5. Mike Howley, 488-3264.

Sonar FS-23 23-crystal control on transmit and receive citizens band radio, make offer. Complete HO trains setup. 75% still in unopened boxes new. Engines, cars, track accessories. Must sell. Mike Bledsoe, 471-2600.

Cleaning out attic: Deer rifle, youth bed, 1/4-hp electric motor, tricycle, camera, and other misc. items in garage sale at 9763 Rambling Trail, Sat. and Sun. June 8&9 from 10am to 5pm. C. Hopkins, 944-2838.



"I GOTTA HAVE A \$4,000 CAR! THE GUY NEXT DOOR JUST BOUGHT ONE FOR \$3,995."

Step table \$12.50. Pair of fireside chairs; set 4 folding doors plus hardware (never used) \$15. Two ball-bearing spice racks (new, still in boxes) \$2.50 ea. or \$4; several new cornice boards up to 12 feet (never used) 30c per foot; 5 fluorescent fixtures and tubes wired for cornice board indirect lighting as 2, 3, or 5 light strips from one wall plug; glass and 6 new unfinished picture frames of 2 inch material; mirror squares. Keener, HU 8-1193 after 5.

Need companion and supervision for 13 yr. old boy for summer in Clear Lake area. Keener, HU 8-1193 after 5.

1967 Sears 250 cc, immaculate condition always kept in a garage, bought 10 months and 1,100 miles ago for \$550, will sell with new Buco helmet for \$345. John May, 591-2474.

Two furry kittens, part Persian, male, 6 weeks old, free. Xenakis, 944-5284.

6-weeks old, registered American Eskimo Spitz puppies (females) \$50 each. Alice Wilson, ID 3-2351.

## WANTED

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

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

Not using your boat? Traveling this summer? Lease or rent me your boat and minimize your costs. Would like to lease or three months, several days per week or consecutively. Bob Allgeier, 591-4627.

Used deep freeze, must be in good condition. Walter Smith, Alvin OL 8-4957.

Wanted, ride or riders from vicinity of Alabama-Shepherd area, work 8 am-4:30 pm. Jan Levkoff, 529-8938.

Chevelle, Valiant, or Falcon convertible. 1965 or 1966. Must be clean, engine and transmission must be in good working condition, air conditioner desired. M. Broussard, 643-1611.

Wanted: donations of toys, card tables, chairs, and other supplies for a new neighborhood center in Fifth Ward, Houston. Robert Cooper, 645-3811.

Will share driving from Alvin to NASA, 8-4:30. Barbara A. Huepers, OL 8-4394.

Wanted: Carpool members—Bldg. 2 to Exit 13 of Gulf Freeway. Jim Null, Ext. 3931.

Would like to buy large-screen color TV, must be in xlent condition, less than 24 months old. L. Wright, 877-3059.

Wanted: 15 or 16-foot fiberglass boat w/50-hp or less motor, will trade 16-foot aluminum boat and trailer, 12-hp motor and cash. L. Wright, 877-3059.

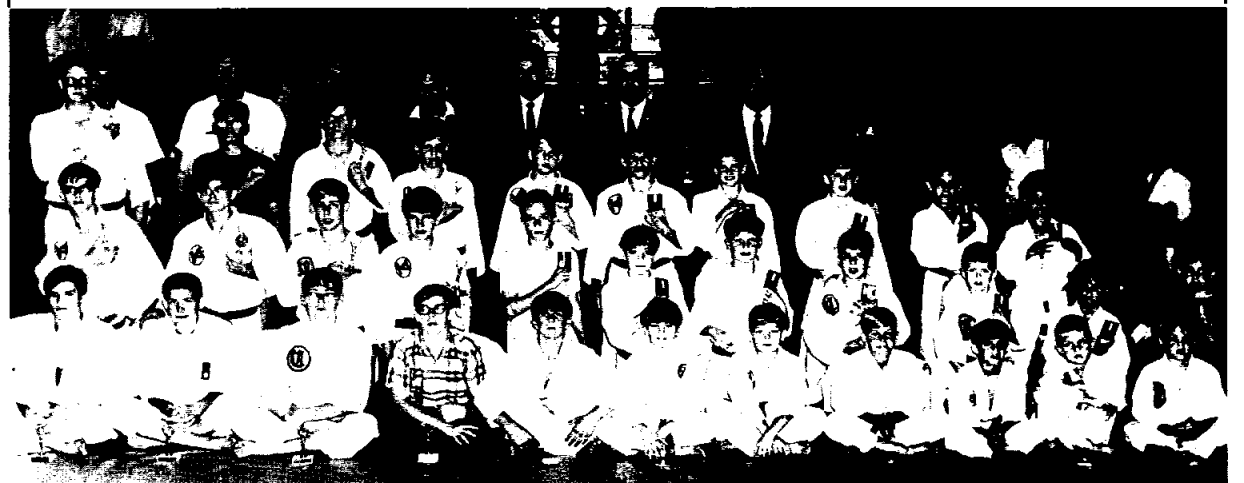
Second-hand 5-6hp Evinrude or Johnson outboard motor. Mike Bankey, 487-2794.

Would like to buy used boy's go-kart in good condition. Brown, 946-7663.

## Win CU Shares

Recent winners of \$5 MSC Federal Credit Union shares in monthly drawings were Harvey D. Meyers and Antone Smith.

## Junior Judokas



JUDOMAT—The NASA Judo Club and the Clear Lake Judo Club were co-hosts for the May 11 AAU Junior Judo Olympics at the Clear Lake City Recreation Center in which 156 children from the Gulf Coast area from Galveston to Bryan competed. Manfred "Dutch" von Ehrenfried of ASPO Mission Operations, second from right rear row, is president of the NASA Judo Club and president of the Gulf Coast Judo League. The NASA Judo Club recently bought new judo mats and have started a membership drive especially aimed at father-and-son judokas. Classes are held each Thursday from 6 to 8:30 pm in the new Harris County Park building. For further information, call Tom Murtagh at 3151 or Perry Ealick at 4846.

## EAA Charters Hemisfair Buses

MSC Employee Activities Association June 22 will charter buses for a day-long trip to Hemisfair in San Antonio. Buses will leave the main gate (across from Nassau Bay Motor Hotel) at 6 am and will arrive at Hemisfair at opening time, 10 am.

For the return trip, the buses will leave Hemisfair at 10 pm and arrive at MSC at 2 am June 23. Round-trip charter fare is \$7.47 a person. As many 39-passenger buses will be chartered as necessary to meet the demand.

Seat reservations should be made before June 12 with Judie Boin/AP5 at Ext 4241.

## ISA Meeting To Hear Talk On Fluidics

C. L. Mamzic will be the featured speaker at the June 26 meeting of the Apollo Section-Instrument Society of America. Mamzic's slide-illustrated talk, "Fluidics," will cover the operation of fluidics based upon interaction of fluid streams and highlights of current practical applications.

Mamzic is manager of Moore Products Company engineering department.

The meeting will be at a location to be announced and will begin with a social hour at 5:30 pm and dinner (\$3.50/person) and program at 6:30. Non-ISA members are welcome. For reservations, call Pat Todsén at HU 8-0900.

**Only for Americans—**  
**U.S. SAVINGS BONDS,**  
**NEW FREEDOM SHARES**

## Who's Minding the Store?



**NETWORKERS**—Station directors (StaDir) and representatives from the Apollo Manned Spaceflight Network recently gathered at MSC for a two-day briefing by Flight Support Division on upcoming Apollo missions. It was the first time all station directors were all together. Front row, left to right, are: Don Gray, StaDir-Tidbinbilla, Australia; John Dowling, StaDir-Merritt Island Launch Area, Fla. (MILA); Mike Dinn, Asst StaDir-Honeysuckle Creek, Australia; John Cook, StaDir-Goddard Space Flight Center Network Test and Training Facility; Richard Kephart, Asst StaDir-Goldstone, Calif.; Joseph Garvey, StaDir-Antigua, BWIF; Charles Force, StaDir-Guam; Richard Augenstein, StaDir-Ascension Island; Robert Eaves, Asst StaDir-Bermuda, and Otto Thiele, ship representative. Second row: George Jenkins, MILA; Wiley McMillan, Asst StaDir-Guaymas, Mexico, and Virgil True, StaDir-Hawaii. Third row: Wiley White, Asst StaDir-MILA; Daniel Hunter, StaDir-Madrid, Spain; Henry Schultz, StaDir-Corpus Christi, Texas; Al Washburn, Asst StaDir-Canary Islands; Charles Rouiller, StaDir-Canary Islands; Paul Hanson, ship representative; Steve Stompf, Asst StaDir-Madrid, Spain; Lynn Woodard, Asst StaDir-Corpus Christi, Texas; Larry Odenthal, StaDir-Grand Bahama Island, and Ken Sory, ship representative.

## Award, Cost Reduction Functions Combined

April 15, 1968 saw the merging of the Awards and Cost Reduction Office—a step taken by MSC management so that both programs would become more responsive to all MSC employees.

The program of awards and cost reduction are daily becoming more important. The idea of reducing cost without sacrificing quality or reliability has always been a prime goal and it is becoming more and more a necessity.

Under the new concept the employee will no longer be required to determine whether his method improvement is a cost reduction or suggestion. The newly-consolidated Awards and Cost Reduction Office will automatically channel the improvement submitted into the proper system.

The Awards and Cost Reduction Office will make every effort to reduce processing time required for suggestions through streamlining of paperflow within the office and involving the Awards and Cost Reduction coordinators more in the program. The employee suggestion should receive an answer within 60 days unless detailed investigation is required, and then no longer than 120 days.

A seminar will be held June 27 for all MSC Awards and Cost Reduction coordinators to assist them in their duties, and to become more responsive to the employees in their areas.

The Awards and Cost Reduction Office invites comments and suggestions. The staff consists of Joseph D. Atkinson, Jr., Office Chief and Executive Secretary of the Awards Committee; Joe D. Bennett, Jr., Awards and Cost Reduction Officer; Sandra Dunn and Hope Treffalls, secretaries, any of whom may be reached at Code BP33, Building 323, Ellington AFB or Ext 7283.

## EAA Sponsors Rollerskate Party

The MSC Employee Activities Association June 16 will sponsor a rollerskating party from 1 to 7 pm at the Gulfgate Roller Rink.

Tickets at \$.20/person (includes skate rental) are available from the following persons/buildings/extensions: Mary Lopez 12/2761, Kitty Cornish 30/3128, Carol Hopper 16/2401, Wanda Slack 45/3937, Helen Ragsdale 2/3885, and Edi Quinn 4/5558.

No tickets will be sold at the rink.

## Five MSC Programs Provide Jobs for 190

Ninety area youths will be provided summer employment by MSC through the Job Fair program, which was conducted recently in Houston.

Most of the jobs will be in the clerical field in offices throughout the Center. Five of the young men in the program will be assigned to a junior apprentice program on basic shop practices in the Technical Services Division.

Coordinating the activities of the Job Fair employees at MSC will be Erma Evans, a teacher from M. C. Williams high school in Houston who has been hired for the summer months.

In addition to this new program, MSC has four other programs providing employment and/or training to about 100 economically-deprived young

people of high school and college age.

These programs are: The Junior Student Trainee Program; Job Opportunity for Youth (JOY); Vocational Office Education Program (VOE); and Back to School Youth Opportunity Campaign (YOC). All five programs are under the direction of Stanley Goldstein, chief of Personnel Division Employee Development Branch.

"These four, plus the Job Fair, constitute MSC's efforts toward an active, balanced approach of placing economically-disadvantaged youth," said Goldstein.

Twelve youths are in the Junior Student Trainee Program. It is designed to provide meaningful work experience and compensation to selected minority high school graduates to enable them to begin college careers, Goldstein stated. This program, in its fourth year, also encourages and provides an opportunity for promising high school graduates to participate in the MSC Cooperative Education Program for college students.

Job Opportunities for Youth (JOY) program is now in its second year at MSC, and is providing useful work experience for 50 previously unemployed high school dropouts from low-income families, according to Goldstein. The JOY program's purpose is to motivate and prepare these young men and women to obtain regular gainful employment. This is done through work experience, academic (classroom) training and guidance counseling.

The Vocational Office Education (VOE) program is conducted at MSC in cooperation with the Houston Independent School District. The program is in its second year at MSC, and 23 students are currently enrolled, 21 girls and two boys.

Participating in the VOE program are C. H. Milby and E. E. Worthing high schools. The students spend three hours or more per day in an approved and supervised training station, which is the place of employment, and each student earns one credit toward graduation for the on-the-job-training. The program is designed for senior students in business education whose curriculum combines on-the-job training with occupationally related classroom instruction in a simulated business office laboratory.

Goldstein stated that a major objective of the VOE program is the eventual placement of qualified Negro and Latin American secretaries in permanent positions within MSC.

The Back-to-School Youth Opportunity Campaign (YOC) at MSC includes students between the ages of 16 and 21 who work a maximum of 16 hours a week and attend high school classes. This program is in its fourth year at MSC and has 12 students. YOC helps enable students finance their own education.

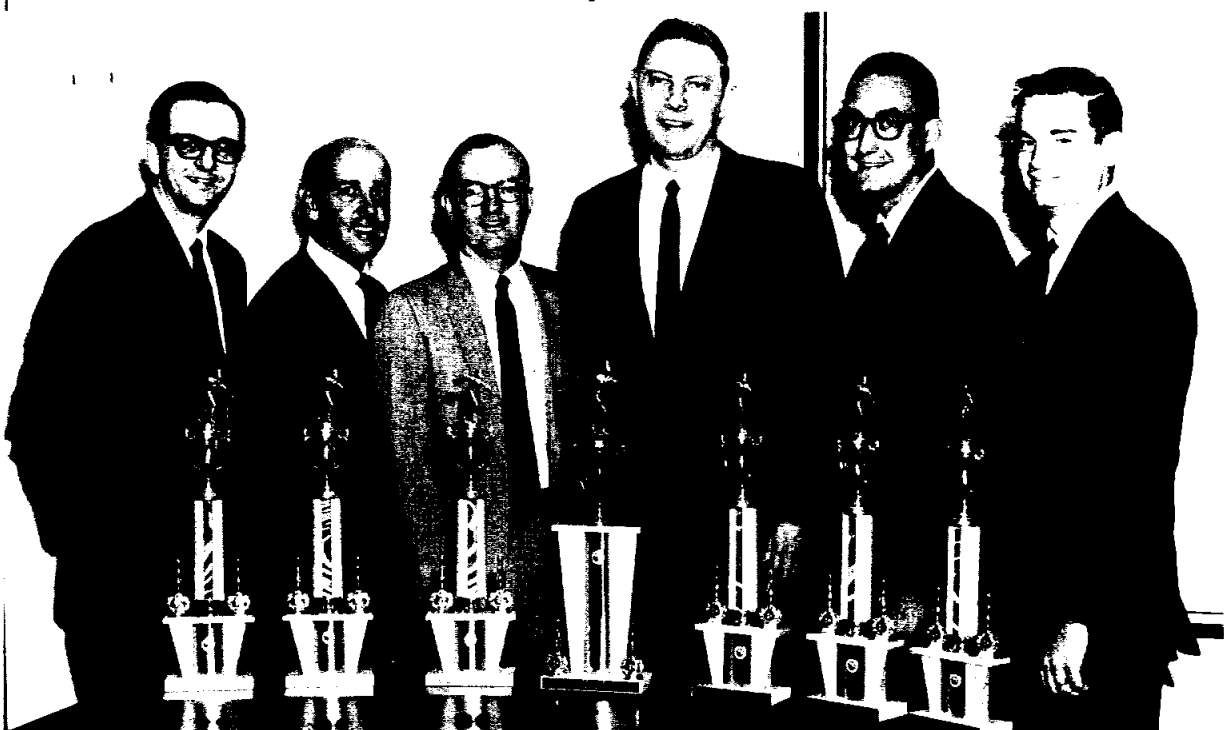
## Blood Deposits Set This Month

The MSC Blood Deposit Program has scheduled six visits this month by the bloodmobile to MSC and aerospace contractor locations. Operation hours at all locations will be from 9 am to 1:30 pm.

Dates and locations are as follows: June 17—MSC Bldg 8; June 18—General Electric; June 19—Ellington AFB Bldg 276; June 24—MSC Bldg 8; June 25—Lockheed Beta Bldg, and June 26—Lockheed Beta Bldg.

To add to a blood deposit account or to join the blood deposit program, call one of the following: Ed Stelly MSC, Ext 3378; Bill Averyt B&R-N, HU 8-2500; Jim Hallmark NR, HU 8-2720; Mo Trembley GE, 932-4511 Ext 2134; Shirley Kackley Lockheed, HU 8-0080 Ext 250; Lile Perrone Dynalectron, MSC Ext 7495; Sara Weyer Boeing, HU 8-1784, and Larry Salyers AT&T, HU 8-1010.

## Alley Aces



**PINPOUNDERS**—It was nip and tuck down to the last night of competition in the MSC Men's Handicap League as to which team would come out on top. But the Pinpounders prevailed and are shown here standing smugly behind their hardware. Left to right are Dick Wieland, Bailey Chaney, John Lottinville, Carl Beer, Jack Kochner and Jim White. Pinpounders established a league high three-game team series mark during the season and Beer was top man in individual high three-game series.