

## How to Build a Saturn V Stage



**BUILD-UP IN TIME-LAPSE**—A photo sequence taken over a three-month period illustrates the steps required to assemble the S-IC first stage of the Saturn V launch vehicle. The Boeing Company builds the S-IC stage at the NASA Michoud Assembly Facility near New Orleans. The assembly sequence begins with the thrust structure, far left; followed by the 210,000-gallon fuel tank; an intertank which acts as a spacer between the fuel tank and the 330,000-gallon liquid oxygen tank, shown being lowered in fourth photo; and the forward skirt to which the S-II second stage is mated is in position in the last frame.

## Astronautic Symposium Has Planetary Theme

"Voyage to the Planets" is the theme of the American Astronautical Society's Fifth Annual Goddard Symposium. The Symposium will be held March 14 and 15 at the Sheraton-Park Hotel, Washington, D.C.

The speakers and their topics at the first day's session are as follows: Dr. Glenn T. Seaborg, Symposium general chairman and chairman of the US Atomic Energy Commission will make the opening remarks; Arthur C. Clarke, past president of the British Interplanetary Society, "Exploration Missions and Roles"; Dr. William H. Pickering, director NASA Jet Propulsion Laboratory, "The Mariners"; Dr. John F. Clark, director NASA Goddard Space Flight Center, "Galactic/Jupiter Probe."

Edgar M. Cortright, deputy associate administrator NASA Office of Space Science and Applications, "Voyager"; Charles W. Mathews, director Saturn/Apollo Applications Program, NASA Office of Manned Space Flight, "Paving the Way for Manned Planetary Exploration"; E. Z. Gray, director Advanced Manned Missions Program, NASA Office of Manned Space Flight, "Manned Expeditions to Mars and Venus."

The Goddard Memorial Lecture of the National Space Club will be held the evening of the first day, and guest speaker will be Vice President Hubert H. Humphrey, chairman of the National Aeronautics and Space Council.

Second-day Symposium speakers and topics are: Dr. Colin S. Pittendrigh, dean of the Princeton University Graduate School, "The Scientific Harvest"; Dr. Charles S. Sheldon II, Library of Congress Science Policy Research Division, "Meanwhile, Back on Earth"; Hon. George P. Miller, chairman House Committee on Science and Astronautics, "National Prestige."

Robert F. Packard, director US Department of State Office of Outer Space Affairs, "The Role of the Diplomat," and Dr. John W. Findlay, National Radio Astronomy Observatory, "Planetary Exploration Strategy."

## Allis-Chalmers To Develop, Test AAP Fuel Cell

NASA has awarded a contract to the Allis-Chalmers Manufacturing Co., Milwaukee, for development and testing of an improved fuel cell power system for use in the Apollo Applications Program.

The cost-plus-fixed-fee contract was awarded by MSC. It is effective through Jan. 15, 1968, and is valued at approximately \$3.4 million.

Under the terms of the contract, Allis-Chalmers will optimize fuel cell system performance leading to a 2500-hour system operation capability.

## Still Part of the Scene



**FORGOTTEN BUT NOT GONE**—One mulepower was found to be the best way to dig shallow trenches for piping near the Saturn V static test stand at Mississippi Test Facility where S-IC stages develop the equivalent of 160 million horsepower.

# 204 Board Reports Tentative Findings

In an interim report to NASA Deputy Administrator Dr. Robert C. Seamans, Jr. the Apollo 204 Review Board outlined tentative findings in the quest for causes of the January 27 Apollo spacecraft 012 flash fire which took the lives of Apollo 204 prime crewmen Virgil I. Grissom, Edward H. White II and Roger B. Chaffee.

At the time of the interim report February 22 the Board had not identified the source of ignition after reviewing such possible sources as chemical reactions, spontaneous combustion of materials in the cabin and electrical phenomena such as electrostatic sparks, arcing and overheating of wiring from shorts or malfunctions. Examination of the spacecraft batteries and Environmental Control Unit (ECU) has ruled out chemical reactions, and all materials in the cabin have a flash point of 400°F or higher.

The most likely source of ignition is regarded as an electrical malfunction, but the Board further stated that the possibility exists that no single source will ever be pinpointed.

### Three-Phase Theory

The history of the fire after ignition has been traced by investigating teams and offered in a three-phase theory.

Phase 1 has the fire originating near the spacecraft floor under the command pilot's couch, where it was unnoticed for several seconds because the crewmen were on the suit circuits with faceplates closed and could not see or hear the fire.

The crew first reported fire at 5:31:04 CST. At 5:31:12 the fire had spread and become more intense, feeding upon nylon netting, velcro patches and ECU insulation in the cabin.

By 5:31:19, the fire had increased the cabin pressure to an estimated 34 psi at which time the cabin pressure hull ruptured in the floor under the right hand (pilot's) couch. Flames and gases moved from left to right and out the rupture to escape through access panels in the spacecraft heatshield—Phase 2.

Phase 3 was characterized by localized burning of water-glycol ECU coolant from burst plumbing combining with oxygen flowing from failed oxygen lines.

### Alertness Dulled

In reviewing design philosophy, the Board noted that the approach to controlling fire risks aboard an Apollo spacecraft either in orbit or on the pad was to isolate possible ignition sources. Flight and ground experience in six years of manned spaceflight had shown that spacecraft fire probability was low, and because of this record of safety, alertness had grown somewhat dulled. The Board further noted that emphasis was placed upon propellant and pyrotechnic fire hazards, and that cabin fire risks were low—an assumption that the Apollo 204 fire has proven wrong, according to the Board.

Following the assumption of low-hazard ignition sources in

the cabin, several solid combustible materials such as nylon and polyurethane foams were utilized in the spacecraft without breaks to help localize any fire that might occur.

### Slow Egress

Hatch opening time, said the Board, was too long for rapid egress in a spacecraft fire, since most pad emergency procedures were based upon propellant hazards.

Several preliminary recommendations were submitted by the Board in the report to Seamans. Among these are:

- Replace combustible materials with nonflammable materials arranged with adequate fire breaks; make oxygen and flammable liquid systems more fire resistant; conduct full flammability tests in a mockup of the new configuration.

- Design and install a hatch that opens more easily and rapidly.

- Revise pad emergency procedures to recognize cabin fire possibilities.

The Board's report further called attention to several areas where it felt crew safety and mission reliability could be increased. These include ECU solder joints, wiring locations, design and qualification of electrical equipment and the development of checkout procedures.

In touching upon the cabin atmosphere philosophy used in Apollo, the Board did not recommend a switch from pure oxygen in the suit circuits for either pre-launch or orbital operations nor that cabin atmosphere in flight be changed from 5 psi. The Board, however, did recommend that trade-offs between one and two-gas systems be re-evaluated and that pressurized-oxygen tests no longer be conducted pre-launch.

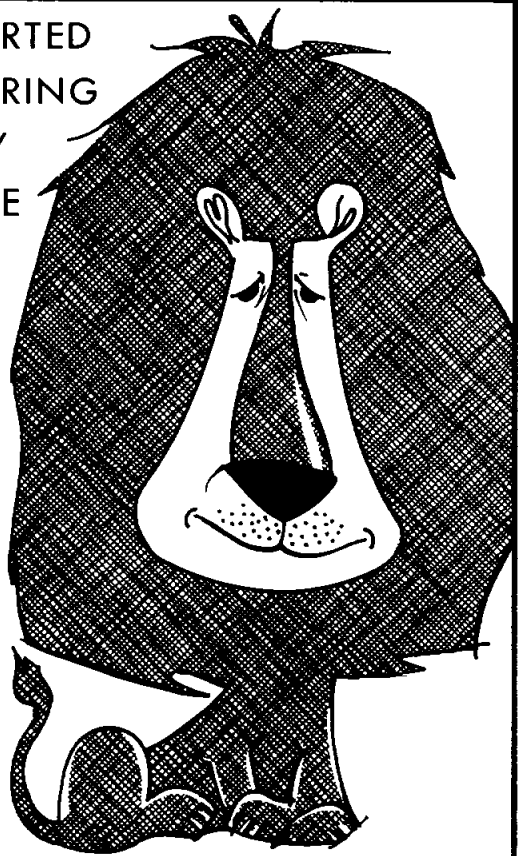
## Board Formed For Advice on Planetary Flights

Dr. John W. Findlay, Assistant Director of the National Radio Astronomy Observatory, Charlottesville, Va. has been named chairman of a new planetary missions advisory group for NASA.

Called the Planetary Missions Board, it will advise NASA's Office of Space Science and Applications on the interdisciplinary scientific opportunities of planetary flight programs.

The Board will be composed of internationally known authorities in various scientific disciplines and will report to Dr. Homer E. Newell, Associate Administrator for Space Science and Applications.

BE LION HEARTED ABOUT ASSURING TOP QUALITY WORK IN THE APOLLO PROGRAM



KEEP THE SYMBOL OF EXCELLENCE MANNED FLIGHT AWARENESS

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

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

First Golf Tournament Draws 87 Competitors

High winds did not keep 87 golfers from competing in the first MSC Golf Association tournament at Memorial Park February 22. First-prize money in one flight ran to \$26.

Dana Boatman and Max Engert tied for first in the Championship Flight, and Bob Reaves and Bob Kosinski placed first and second respectively in the First Flight. Tied for first in the Second Flight were Bailey Corbett and Ed Barker.

In Third Flight placing, Ed Cawley was first and D. W. Sparkman second. First and second place winner in the Non-handicapped Flight were Jim Anderson and Bob Richmond.

Membership in the MSC Golf Association has grown from 50

in 1966 to 104 at the present time, and the trend is toward more growth. The growing membership has caused modifications to the Association's 1967 tournament schedule, since six local courses have a 40-player limit. Tournaments will likely be split into Group A: Championship Flight and Third Flight, and Group B: First Flight and Fourth Flight.

The Association's next tournament is scheduled for March 18 at Glenbrook with no limit in number of entrants. Handicaps are running from two to 30.

Membership in MSCGA is still open. Call J. E. Jones, Jr. at 2231 to join.

New CU Shares Can Win Tickets To Local Events

Free tickets to Houston-area entertainment events will be given away by the MSC Federal Credit Union. But there is a slight catch: To be eligible for monthly drawings, employees must invest in a \$5 Credit Union share during the month preceding the ticket drawing.

Two tickets to events in the Houston Domed Stadium, the Houston Music Hall and the Jones Hall of the Performing Arts will be given winning shareholders each month beginning in April. To be eligible for the April drawing, shares must have been deposited during March, and so on through December.

Winners will be notified by telephone and by Roundup notices.

Buying at least one \$5 Credit Union share each month is a painless way to save while at the same time getting a chance to attend top entertainment events. Each \$5 share deposited means one chance at the tickets.

CATCH THE SAVINGS HABIT . . . BUY CREDIT UNION SHARES!



PIKES PEAK in the Colorado Rockies frames the 70-piece NORAD pops concert band which will perform in La Porte High School, March 17 at 8 p.m. under the auspices of the Bay Area Fine Arts Association. Based at North American Air Defense Command headquarters in Colorado Springs, the band has toured most of North America and is making its debut in the Bay area with a Cavalcade of Music.

NORAD Band Concert Scheduled for Mar. 17

A Cavalcade of Music by the North American Air Defense Command military band will be presented by the Bay Area Fine Arts Association on March 17 at 8 pm in the La Porte high school auditorium.

The 70-piece NORAD concert band, directed by USAF Maj. Victor J. Molzer, consists of musicians from the US Armed Forces and the Royal Canadian Air Force. It is the only international multi-service band in existence.

Spanish Course Second 10 Weeks Starts March 17

March 17 is the starting date for classes in another 10-week cycle in the EAA-sponsored series of conversational Spanish. No organizational meeting has been scheduled and all interested persons are urged to make reservations for places in the classes early.

MSC and contractor employees are eligible to participate in the course. Contact Nick Reyes at HU 8-1600 Ext 147 or OX 4-5042 nights.

In the more than seven years since its inception, the NORAD band has toured most of North America, including Mexico; played concerts in Carnegie Hall and the Hollywood Bowl; appeared at the New York World's Fair and the Canadian National Exhibition; and performed on numerous TV and radio programs, including the Bell Telephone Hour, Steve Allen show, and the Johnny Carson "Tonight" show.

Arrangements for the concert are being made by Brig. Gen. Russell F. Gustke, commander of the 446th Troop Carrier Wing, US Air Force Reserve, Ellington AFB.

Suggestion Plan Revised to Give Monthly Awards

MSC employees can now qualify for additional cash awards and recognition under the Suggestion Program. A recent MSC announcement provides for "Suggestor of the Month" and awards "Coordinator of the Month" recognition.

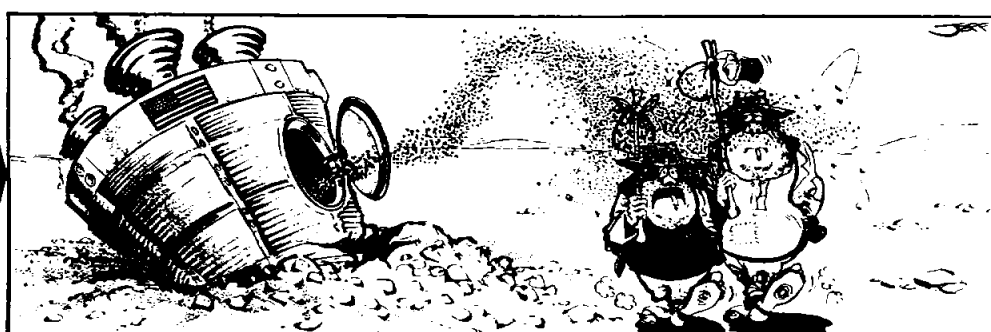
Under the plan, the MSC Suggestion Committee may select a suggestor and an awards coordinator each month. The "Suggestor of the Month" will receive a cash award in addition to other awards he has received for adopted suggestions. Each coordinator selected for recognition will receive a certificate.

Recognition of suggestors will be based on the number and quality of their suggestions that have been adopted. Overall contributions to the MSC Awards Program will be considered in singling out Awards Coordinators for recognition.

On The Lighter Side



TAKE A RED CROSS FIRST AID COURSE



"That's all we need — more blinkin' flies" — Filched from the Melbourne, Australia Sun

# ROUNDUP

## EMPLOYEE NEWS

### 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—REAL ESTATE**

4/2 1/2 in Clear Lake City, fenced, landscaped, 2300 sq ft, separate dining and family rooms, extras. Assume 6% \$22,200 loan with \$4000 equity. James W. Gray, HU 8-0415.

3/2/2 brick in Parkview Manor, Pasadena, central air/heat, RCA built-ins, carpets, paneled den, patio, cedar fence, 5 1/4% FHA loan, \$123/mo. Bailey Corbett, 2710 Raspberry Lane, HU 6-2172.

4/2/2, 2100 sq ft in Clear Lake City. \$21,500. L. W. Casati, HU 8-3662.

**FOR SALE—AUTOS**

1964 Pontiac station wagon, assume \$1900 Credit Union balance. Luther Palmer, 877-1269.

1965 Comet Cyclone, AM/FM, bucket seats with console, air, pwr steering/brakes, timed wipers, emergency blinkers, floor mats, tachometer, clean. \$1800. Hal Hunt, Kemah 877-1377.

1957 Ford 2-door, V-8 standard shift, radio/heater, no rust, clean interior. \$200 J. P. Kirk, Ext 4637 (No home phone).

1963 VW sedan, good condition, good tires, radio/heater, 45,000 miles. \$800. Lindy Barrow, Baytown 582-6475.

New 1967 Camaro, 327 V-8, radio, white-walls, 2-door hardtop, autotrans; must sell. \$2450. Joe Rogers, GL 3-2731.

1960 Corvette, white, black interior, 283 engine, 2-4 bbl, solid lifters, good top, tires and brakes. \$1250. R. Hergert, 591-3716.

1966 Chevy Caprice station wagon, 3 seats, all power, air, radio w/rear speaker, luggage carrier, trailer hitch, 2-tone, undercoated. Make offer and take up payments, will trade. R. E. Pryor, GR 4-2350.

1959 2-door Chevy station wagon, 6-cyl, stickshift, air, Volvo shoulder belts in front, new HD whitewalls, radio and heater. Ben Locher, GR 1-4387.

1966 Volkswagen, four months old, perfect condition, \$99 down—\$50/month. C. F. Malone, 877-2339.

1962 Rambler Classic station wagon 4-door delux 400 series, factory air, reclining bucket seats, headrests, vinyl interior, radio, autotrans. Original owner who ordered it from factory. \$875. Financing can be arranged; consider trade. Floyd Turner, RE 3-7667.

1964 4-door Corvair Monza, 4-speed 110-hp, air, xclnt condition. \$1150 or best over \$950 before March 16. 591-3186.

1964 Cadillac Coupe de Ville, beige, all power, xclnt condition. S. Deal, Dickinson 534-5642.

**FOR SALE—MISCELLANEOUS**

Zeiss Ikonflex 1 twin-lens reflex camera, shoots 12 2 1/4x2 1/4 pix on 120 film, f/3.5 Zeiss Navar lens in Compur shutter, ever-ready case. \$25. Terry White, 932-4472.

1966 Ducati Motorcycle, 160cc, 70-75 mph, 90 mpg, 1500 actual miles, xclnt condition. Also helmet, tinted bubble, cable lock w/keys tarpaulin \$300 for all. J. M. Walker, RI 8-5910.

Six registered standard poodle puppies: four black females \$50 each, two black

males \$65 each. Available March 1. Lynn Gripon, 932-3256.

Registered sable-color Shetland Sheep Dog (Toy Collie) puppies. Ideal child's pet. D. Greenwell, HU 8-1034.

1964 4x7-ft tent trailer, heavy white canvas top, blue sides, nylon floor, sleeps six, 4-inch thick mattress sleeps double, three big screened windows, plenty storage space, xclnt condition, spare tire included. \$400. Ed Lattier, 534-2756.

Spaulding golf clubs: four "Top Flite" woods, pro line; eight "Robert Wilson, Jr." irons and one putter, \$30. Rod Bass, 932-4763.

2-wheel utility trailer, 15-inch car wheels and springs, good tires, 1 3/4-inch ball hitch, removable 6x7x2 1/2 steel-frame plywood to cover. \$75. Jim Akkerman, HU 8-1493.

70x54x17 Brayhill walnut bookcase cabinet, finished both sides to use as room divider. \$110. J. P. Kerwin, 591-3930.

Girl's twin-size Princess bonnet-type bed complete with box springs and mattress, antique white with gold, must be seen to be appreciated, almost new. Shirley, Dickinson 534-4098.

19-inch Silvertone portable TV with stand, white finish, 18 months old. Originally \$160; sell for \$80. George Corley, MI 5-8625.

Two cot mattresses, \$2 each, two 3-inch Serofoam cot mattresses with cotten zipper covers, \$4.25 each. Frigidaire Dishmobile used two years, \$85. GE washing machine used two years, \$55. League City, 932-4709.

1965 Honda Trail 90, autotrans, 6500 miles, good condition. \$100. Richard Nygren, MI 3-2622.

Antique furniture, clocks, guns, telephones, marble-top tables, dishes, 1928 Model T Ford. R. E. Pryor, GR 4-2350.

Male silver AKC-registered miniature poodle at stud, accept puppy in lieu of fee; beautiful animal with fine bloodlines. Dorothy Baker, LaMarque WE 5-3912 after 6.

1965 Honda 150, windshield, crash bars, new clutch, good condition. \$350. Jessie False, 502 Honeysuckle Drive, LaMarque, WE 5-6546 after 4.

AKC-registered German Shepherd pups, Rin-Tin-Tin bloodlines, black and tan, solid silver. Barbara Williams, HU 4-1524 after 5.

Zenith portable stereo, solid-state, 30 watts, one detachable speaker, beige with wood-grain center panel. \$60. Jim Taylor, PA 3-7668.

Memberships in Dickinson Swim Club, corporate share \$250 until May 1, shares may be resold, Olympic size with diving L, kids wading pool, swimming lessons and team, lifeguard and pool manager. Harold Miller, 534-5735.

Full-ton window air conditioner, 220-volt. \$50. Twin-bed box spring, \$12.50. 24-inch boy's bicycle, \$10. Milton Reim, HU 4-3795.

Red Cushman motor scooter, good condition. \$75. C. F. Malone, Kemah 877-2339.

10x12 Western Field sideroom tent, exterior frame, heavy duty floor, 4 years old, good condition. \$35. Virginia Ellis, HU 7-1040 after 4:30.

Combination radio-phonograph with auto turntable and stereo lead for TV or auxiliary speaker, 22x24x16, new mahogany finish, xclnt condition. Robert Nanz, 7711 Belfort #23, MI 5-5329.

**WANTED**

Car pool or will pay from 2607 Cedar Drive, La Marque to Bldg 419, 7:30 a.m. to 4 p.m., Evelyn Villeneuve WE 5-3878.

Car pool from Baytown to Bldg 4 7:30 to 4. LeAnne Bible, Ext 3606 (no home phone). Rider from SW Houston 8-4:30. G. W. Harvey, 665-0947.

Car pool from 1119 2nd street, LaMarque to Bldg 2, 8:30-5. Mary Lee Boudreaux, WE 5-2912.

Gentleman to share expenses of 5-bdr 2 1/2-bath house, 2-car garage, completely furnished, color TV, must have references. J. S. Rollo, HU 4-3141 after 6.

Two people with cars to share car pool from near Gulfgate to MSC 8-4:30. D. Bland, MI 3-0173.

Want to buy from owner small house in Clear Lake City, need to move in prior to June 1. J. C. McLane, HU 8-0312.



REMOTE PILOTS—MSC Radio Control Club members give each other's aircraft and radio control units a going-over at the Club's January meeting. Left to right are Dave Hoffman, Neel Tilton, Tim Brown, Bob Ernull, Don Halter, Chuck Reese, John Kiker and Bob Tracy.

### EAA Sponsors Ice Skate Party For Youngsters

The MSC Employee Activities Association March 5 will hold a youth ice skating party at the Winterland Ice Rink. Four chaperoned buses will leave MSC Gate 1 at noon and will return at 4 pm. Skating will be from 1 to 3 pm.

Tickets for children and adults are \$1 each and include two soft drinks during the skating party.

Would-be chaperones can volunteer with Barbara Vickers at 5241. Tickets are available from Stephen Grega in Bldg 4, Betty Schick in Bldg 419, Kitty Cornish in Bldg 30, Jerry Haptonstall in EAFB Bldg 317, Carolyn Richardson in Bldg 45, Diana Bowers in Bldg 16, Tim White in Bldg 31 and Bobbie Wright in Bldg 2.

### AFGE Meets March 13

The American Federation of Government Employees will meet March 13 at the Webster State Bank at 5 pm. MSC employees, new AFGE members and would-be members are invited to attend.

For AFGE membership or activity information, call Jim O'Neill at 2261 or Alma Hurlbert at 3281.

## Radio Controllers Look Forward to Long Days

Membership in the MSC Radio Control Club has grown to 24 MSC and contractor employees as a result of a membership drive begun at the start of 1967. The club, while primarily devoted to radio control flying models, reports some interests in radio control model cars and boats.

The club meets the first Tuesday of each month and the business session is usually followed by a program covering some phase of radio control flying. As the days get longer and the weather warmer, club members anticipate flying sessions after work on remaining Tuesdays.

The club's "airport" is the Antenna Test Range west of Building 14, and most of the winter flying activity has been on Saturdays and Sundays. The club welcomes visitors and spectators, but autos are restricted to the Building 14 parking lot and children are not permitted to climb Antenna Test Range fixtures.

Club officials point out that the radio control hobby is not limited to those with extensive electronics and model-building experience or to those with a

large bankroll, for with less than a \$100 investment one can buy a ready-to-fly wood/plastic aircraft with installed control systems. These rugged models are forgiving to controller goofs which cause crashes. (The radio controller's euphemism for a crash is "hard landing.")

For those who prefer their own designs to an off-the-shelf factory model, club members stand ready to assist new members get their aircraft off the drawing board and into the air.

Club activity and membership information is available from Bill McCarty 3191, Bob Ernull 4286 and Tim Brown 5558.

## Bay Orchestra Plans Concert, Seeks Musicians

The Bay Area Orchestra is looking for more string players to join the orchestra, and members of MSC families who play a musical instrument are urged to contact Mrs. Andrew J. Yiannias at GR 1-4388. The orchestra's next rehearsal will be March 7 at 7:30 pm at the Seabrook Methodist Church.

A spring concert, conducted by Clear Creek high school teacher Joe McMullen, is planned by the orchestra, a member group of the Bay Area Fine Arts Association.

Compositions in rehearsal for the concert include an orchestrated version of a violin concerto by Antonio Vivaldi, Symphony in F major by Carl von Dittersdorf, "Russian Sailor's Dance" from *The Red Poppy* by Reinhold Gliere, *South American Overture* by Merle Isaac, *Ballet Parisienne* by Jacques Offenbach and *Lancaster Overture* by Paul W. Wear.

Mrs. Robert P. Burt, wife of Bob Burt, Guidance and Control Division, is a violinist with the orchestra.

## 1967 MSC/EAFB Basketball League

Standings as of February 24

American Division			National Division		
Team	Won	Lost	Team	Won	Lost
MPAD/RAB	8	0	Philco	8	1
FCD	8	0	IBM(G)	7	1
TRW	7	2	USCG	7	1
P&PD	6	2	IESD/LEC	6	3
IBM(B)	6	2	Univac	6	3
NAA	4	4	G&CD	4	4
ANG	4	5	MPAD Red Roaches	4	4
CSD	3	6	Link	4	4
ISD	2	6	LRD	3	5
FSD	2	6	MI	2	6
747th	2	6	Grumman	2	7
ASPO	2	7	FCSD	1	7
CAD	0	8	MPAD Hawks	0	8

A ladies volleyball league meeting will be held March 10 at 6 pm at the EAFB NCO Club. Call Ray Southers at 3241 for information or to register a team.

## MSC BOWLING

### MIMOSA MENS LEAGUE

Standings as of March 2

TEAM	WON	LOST
Chizzlers	58 1/2	37 1/2
Fabricators	55	41
Whirlwinds	54	42
Technics	53	43
Road Runners	52	44
Alley Oops	51 1/2	44 1/2
Real Timers	49	47
Strikers	48 1/2	47 1/2
Weightless Wonders	47	49
Foul Five	46	50
Agitators	37	59
Hustlers	24 1/2	71 1/2

High Game: Bill Whipkey 275, Bill Holton 271.  
High Team Game: Chizzlers 1093 and 1086.

FIRST DIVE THIS MONTH—

## Lunarfins Club Plans Active Diving Season

Underwater exploration and other aspects of oceanography will be the focus of this year's activities by the MSC Lunarfins skin and Scuba diving club. In addition to weekend trips to lakes and ocean areas, Lunarfins have planned classes in the use of Scuba gear, swimming and competitions in underwater hockey.

The season's first group dive will probably be in Canyon Lake near San Antonio later this month, and during the summer months at least one trip per weekend to the Gulf is planned. Most Gulf dives take place around oil rigs located 12, 20 and 30 miles offshore. Several Lunarfins are planning a diving trip to the Florida Keys and to the Grand Bahamas during the first week of June.

The spring Scuba diving course will begin March 13 and will be completed in time for the spring diving season. Class enrollment is limited and anyone interested in taking the course should contact Jim Peacock or Hugh Scott.

Fins, diving masks and snorkels are the only devices used by club members in playing underwater hockey. The game is played by moving a small brass puck along the bottom of the pool with a short hockey stick.

Players have to rely upon their breath-holding power to compete.

Underwater hockey enthusiasts meet each Thursday evening at the Tropicana Club pool on Telephone Road. Scuba club members from Texas Instruments and Schlumberger have been competing with the Lunarfins, and planning for a summer underwater hockey league is underway.

The Lunarfins recently sponsored a 90-minute Scuba diving film produced by the US Divers Company which featured diving activities in British Honduras. The film was introduced by Luther Swift of the Gulf Coast Council of Skin Diving Clubs.

Lunarfins next meeting will be on March 15. All members, prospective members and persons interested in diving sports are invited.

Lunarfins elected officers for 1967 at the February 15 meeting. New president is Fred Toole, 1966 vice president. Toole has been a Lunarfins member since 1965 and has represented the club at the Gulf Coast Council of Skin Diving Clubs. Paul P. Coan, club member for little more than a year, was elected vice president. Coan is a member of the American Society for Oceanography.

## 2nd S-II Flight Stage Goes Into MTF Tests

The second flight stage of the Apollo/Saturn V (S-II-2) to be tested arrived at the National Aeronautics and Space Administration's Mississippi Test Facility February 11 and is now being readied for installation in its test stand and captive firings this Spring.

The second S-II flight stage arrived at MTF less than one month after the first flight stage was shipped out to the NASA Kennedy Space Center, Florida, following static firings at MTF in December 1966.

Manufactured by North American Aviation, Inc. the S-II-2, completed the 4800 mile trip in 16 days aboard the ocean-going vessel *Point Barrow*.

Following its arrival at Michoud, the 86,000 pound 81½ feet long and 33 feet diameter stage, was loaded on the river barge *Pearl River* for its 45-mile trip on the Intracoastal Canal and up the East Pearl River to the NASA test site.

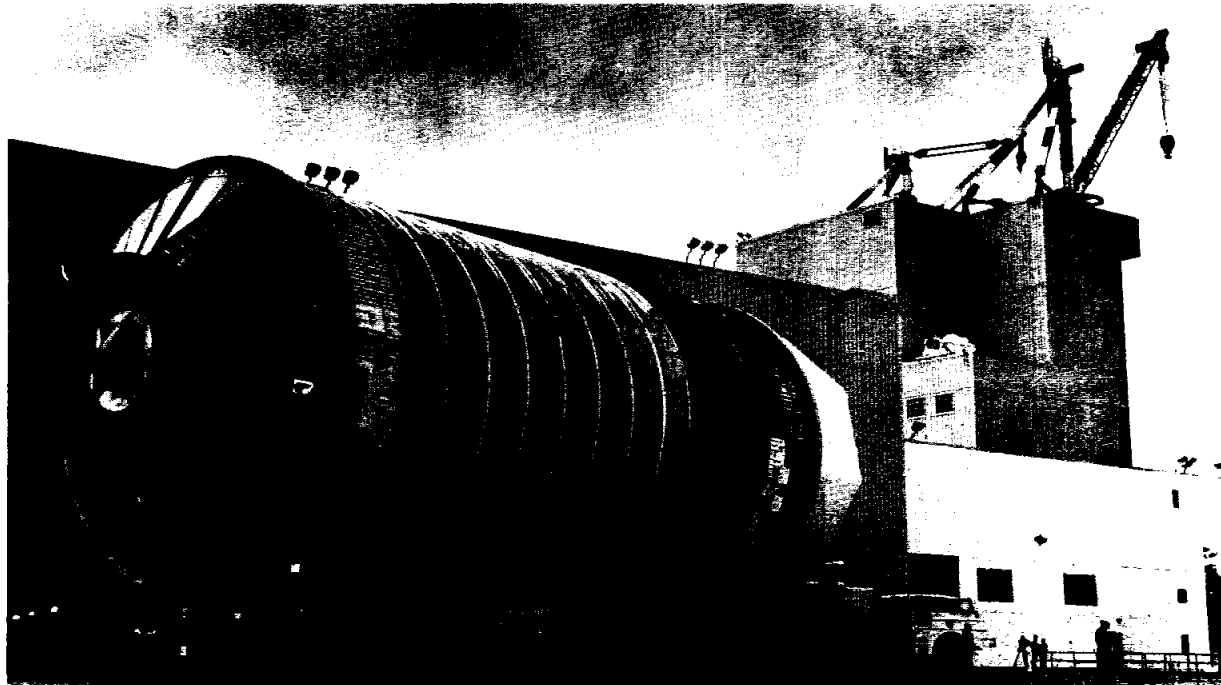
Upon arrival at MTF, the S-II-2 was unloaded at the Stage Storage and Service Building for checkout and servicing before being installed in the S-II test stand.

Once installed in the test stand, the stage will undergo two static firings of six minutes each, the burn time of the five clustered engines during flight. The five rocket engines develop a total of one million pounds of

thrust, equivalent to more than 21 million horsepower.

After the Apollo/Saturn V space vehicle has been launched, the first stage (S-IC) propels the spacecraft 40 miles into space and then the S-II takes over and carries the payload to a height of more than 100 miles into space during its six minute burn time.

First firing of the S-II-2 is scheduled for late March.



**STOPOVER**—The second flight stage S-II is shown after its arrival at the NASA Mississippi Test Facility for two six-minute static firings before moving on to Kennedy Space Center. The S-II stage made a 16-day 4800-mile trip aboard the vessel *Point Barrow* from North American Aviation in California to NASA Michoud Assembly Facility, from which it was moved aboard the river barge *Pearl River* to MTF. The first S-II flight stage, part of the Apollo/Saturn 501 stack, was test fired at MTF last month.

## They Carried Home the Loot



**CAFETERIA WEEK PRIZES**—Winners of the MSC Cafeteria Week daily and grand prize drawings are shown with their winnings. (Internal Revenue Service, please note.) First grand prize winner of a color TV set, top left, is Milton Contella, Flight Crew Support Division. Carolyn Dudley of Univac, top right, won the second grand prize trip for two to Acapulco, and James J. Taylor of Mission Planning and Analysis Division, lower right, won the third grand prize stereo hi-fi. Winners of the five daily portable TV prizes, lower left, are Brenda Matthews, Legal Office; Frank J. Suler, Mission Planning and Analysis Division; Carolyn Teal, Computation and Analysis Division, and D'Marie Pruett, ITT. Not in photo: Jack H. Dixon, General Electric.

## Aero Club Cosponsors Airshow

The Aero Club June 10 and 11 will cosponsor with the Clear Lake Chamber of Commerce the airshow portion of the 1967 Clear Lake Rendezvous. The airshow will be at Spaceland Airpark in League City.

Aerobatics, sky-diving, demonstrations of short takeoff and landing aircraft, and static displays of new aircraft and experimental home-built aircraft will be included in the airshow.

An airshow planning meeting was held February 2 between Aero Club members Jim Donnell, Ken Downing, Jim Campbell and Ron Miller, Spaceland Airpark manager Ham Moor, Airpark president Roger Davis and Chamber member John Bonney.

Two aircraft, a Cessna 150 and a Cessna 172, are currently being operated for members at Spaceland Airpark. With an in-

flux of new members, the club is considering buying a high-performance aircraft with a cruising speed of 150 mph. Aero Club vice president Jim Donnell is conducting a survey of members to determine the type aircraft best suited to current needs. Also, the Club has decided to buy a second training aircraft—a Champ.

Aero Club private pilot ground school began February 28 and instrument ground school began March 1. The classes are held in the MSC News Center, Nassau Bay Bldg. 6, and are conducted by Aero Club training officer Sal Tripoli.

Two hours of free flying time will go to the person who submits the winning insignia for the Aero Club. The design will be used for Club decals, patches and pins for members. Designs should be submitted to Aero Club president Don Bray/FC at 4766.

