

Countdown Continues For Sunday's Launch

Apollo 16 Crew Ready; Landing Thursday

The usual little glitches show up from time to time, but the Apollo 16 countdown, begun in earnest Monday evening, continues to tick toward a Sunday noon liftoff.

John Young, Ken Mattingly and Charles Duke are going through pre-launch routine at the Cape to ready themselves for the schedule 11:54 (Houston time) launch.

Given a good liftoff and orbital insertion, the 16 spacecraft will aim at the Moon about 2:30 Sunday afternoon.

Lunar touchdown, with Young and Duke at the controls of the lunar module "Orion", is programmed for 2:41 Thursday afternoon.

The Descartes landing site is a grooved, hilly region which appears to have undergone some modification by volcanic processes during formation.

The site is in the southwest quadrant of the visible face of the Moon.

series of experiments.

Young and Duke will climb down from the lunar module onto the lunar surface for three seven-hour periods of exploration and experimentation.

A major part of the first EVA will be devoted to establishing the nuclear powered, automatic scientific station — Apollo Lunar Surface Experiment Package (ALSEP) — which will return scientific data to Earth for many months for correlation with data still being returned by the Apollo 12, 14 and 15 ALSEPs.

The second and third EVAs will be devoted primarily to geological exploration and sample gathering in selected areas in the vicinity of the landing site.

As in past missions, the crew's observations and comments will be supplemented by panoramic, stereo, and motion picture photographic coverage and also by television coverage.

Crew mobility again will be aided by the use of the lunar

(Continued On Page 4)

EVENT	G.E.T. HR:MIN	C.S.T. HR:MIN	EVENT	G.E.T. HR:MIN	C.S.T. HR:MIN
---SUN APRIL 25---					
LIFT-OFF	11:54	11:54	TV COVERAGE (EQUIPMENT JETTISON, 12 MIN)	170:09	2:02 p.m.
EPD INSERTION	12:02	12:02	TV COVERAGE (LM LIFT-OFF, 25 MIN)	171:30	3:24
TRANS LUNAR INJECTION	12:02	12:02	OSM SECOND PASS OVER LLS (REV 50)	171:46	3:40
BURN INITIATION (REV 50)	12:02	12:02	LM ASCENT (REV 50)	171:45	3:39
CSM S-IB SEPARATION	12:04	12:04	LM LIFT-OFF	171:45	3:39
TV COVERAGE (TRANS & DOCK) 14 MIN	12:04	12:04	LM INSERTION (REV 50)	171:52	3:46
DOCKING	12:14	12:14	TV APOLLO = 3 SEC	172:39	4:32
CSM S-IVB INJECTION	12:14	12:14	TV COVERAGE (RENDEZVOUS PHASE, 5 MIN)	173:20	5:14
EVA MANEUVER (PERFORMED BY S-IVB)	12:22	12:22	RENDEZVOUS MANEUVERS	173:20	5:14
FIRST MIDCOURSE CORRECTION (MCC-1)	11:34	11:33	DOCKING	173:40	5:34
---MON APRIL 17---					
MCC-2	12:39	12:39	TV COVERAGE (5 MIN)	173:40	5:34
---TUE APRIL 18---					
MCC-3	12:24	12:24	LM JETTISON (REV 55)	173:46	5:40
---WED APRIL 19---					
MCC-4	12:24	12:24	CSM SEPARATION	173:51	5:45
LM JETTISON	12:24	12:24	BURN INITIATION (REV 55)	173:51	5:45
LUNAR ORBIT INSERTION (LOI)	12:24	12:24	ASCENT STAGE DEORBIT	179:16	11:10
BURN INITIATION (REV 55)	12:24	12:24	ASCENT STAGE LUNAR IMPACT (OSM REV 54)	179:19	11:13
S-IVB PRE-IMPACT LUNAR IMPACT	12:24	12:24	---MON APRIL 24---		
NELENDROGRAPHIC LATITUDE = 12.3°			SECOND CSM PLANE CHANGE (REV 55)	193:14	1:08 p.m.
NELENDROGRAPHIC LONGITUDE = 151.2°			---TUE APRIL 25---		
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24	SHARPEN FILE	214:49	12:43 p.m.
BURN INITIATION (REV 57)	12:24	12:24	BURN INITIATION (REV 57)	214:49	12:43 p.m.
---THUR APRIL 20---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02	SUBSATELLITE JETTISON (OSM REV 73)	218:02	1:56
CSM JETTISON (REV 12)	12:02	12:02	TRANS-EARTH INJECTION (REV 76)	222:21	6:15
DOCKING	12:02	12:02	BURN INITIATION (REV 76)	222:21	6:15
HIGH GATE TRANS-EARTH	12:02	12:02	---WED APRIL 26---		
LOW GATE	12:02	12:02	MCC-5	239:23	11:17 a.m.
TRANS-EARTH DEPART (REV 13)	12:02	12:02	TV COVERAGE (TRANS-EARTH EVA, 1 HR 10 MIN)	241:55	1:49 p.m.
DOCKING	12:02	12:02	---THUR APRIL 27---		
NELENDROGRAPHIC LATITUDE = 12.3°			MCC-6	268:23	4:17 p.m.
NELENDROGRAPHIC LONGITUDE = 151.2°			---FRI APRIL 28---		
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24	MCC-7	287:23	11:17 a.m.
BURN INITIATION (REV 57)	12:24	12:24	CSM SEPARATION	290:03	2:02 p.m.
TV COVERAGE (TRANS-EARTH)	12:24	12:24	ENTRY INTERFACE	290:03	2:02 p.m.
---FRI APRIL 21---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02	LM LANDING	290:36	2:30
CSM JETTISON (REV 12)	12:02	12:02	---SAT APRIL 22---		
DOCKING	12:02	12:02	UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02
HIGH GATE TRANS-EARTH	12:02	12:02	CSM JETTISON (REV 12)	12:02	12:02
LOW GATE	12:02	12:02	DOCKING	12:02	12:02
TRANS-EARTH DEPART (REV 13)	12:02	12:02	HIGH GATE TRANS-EARTH	12:02	12:02
DOCKING	12:02	12:02	LOW GATE	12:02	12:02
NELENDROGRAPHIC LATITUDE = 12.3°			TRANS-EARTH DEPART (REV 13)	12:02	12:02
NELENDROGRAPHIC LONGITUDE = 151.2°			DOCKING	12:02	12:02
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24	NELENDROGRAPHIC LATITUDE = 12.3°		
BURN INITIATION (REV 57)	12:24	12:24	NELENDROGRAPHIC LONGITUDE = 151.2°		
TV COVERAGE (TRANS-EARTH)	12:24	12:24	DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24
---SAT APRIL 22---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02	BURN INITIATION (REV 57)	12:24	12:24
CSM JETTISON (REV 12)	12:02	12:02	---SUN APRIL 23---		
DOCKING	12:02	12:02	LIFT-OFF	11:54	11:54
HIGH GATE TRANS-EARTH	12:02	12:02	EPD INSERTION	12:02	12:02
LOW GATE	12:02	12:02	TRANS LUNAR INJECTION	12:02	12:02
TRANS-EARTH DEPART (REV 13)	12:02	12:02	BURN INITIATION (REV 50)	12:02	12:02
DOCKING	12:02	12:02	CSM S-IB SEPARATION	12:04	12:04
NELENDROGRAPHIC LATITUDE = 12.3°			TV COVERAGE (TRANS & DOCK) 14 MIN	12:04	12:04
NELENDROGRAPHIC LONGITUDE = 151.2°			DOCKING	12:14	12:14
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24	CSM S-IVB INJECTION	12:14	12:14
BURN INITIATION (REV 57)	12:24	12:24	EVA MANEUVER (PERFORMED BY S-IVB)	12:22	12:22
TV COVERAGE (TRANS-EARTH)	12:24	12:24	FIRST MIDCOURSE CORRECTION (MCC-1)	11:34	11:33
---SUN APRIL 23---					
LIFT-OFF	11:54	11:54	NASA-MSC-FDD MISSION PLANNING & ANALYSIS DIVISION MARCH 13, 1972		
EPD INSERTION	12:02	12:02			
TRANS LUNAR INJECTION	12:02	12:02			
BURN INITIATION (REV 50)	12:02	12:02			
CSM S-IB SEPARATION	12:04	12:04			
TV COVERAGE (TRANS & DOCK) 14 MIN	12:04	12:04			
DOCKING	12:14	12:14			
CSM S-IVB INJECTION	12:14	12:14			
EVA MANEUVER (PERFORMED BY S-IVB)	12:22	12:22			
FIRST MIDCOURSE CORRECTION (MCC-1)	11:34	11:33			
---MON APRIL 17---					
MCC-2	12:39	12:39			
---TUE APRIL 18---					
MCC-3	12:24	12:24			
---WED APRIL 19---					
MCC-4	12:24	12:24			
LM JETTISON	12:24	12:24			
LUNAR ORBIT INSERTION (LOI)	12:24	12:24			
BURN INITIATION (REV 55)	12:24	12:24			
S-IVB PRE-IMPACT LUNAR IMPACT	12:24	12:24			
NELENDROGRAPHIC LATITUDE = 12.3°					
NELENDROGRAPHIC LONGITUDE = 151.2°					
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24			
BURN INITIATION (REV 57)	12:24	12:24			
TV COVERAGE (TRANS-EARTH)	12:24	12:24			
---THUR APRIL 20---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02			
CSM JETTISON (REV 12)	12:02	12:02			
DOCKING	12:02	12:02			
HIGH GATE TRANS-EARTH	12:02	12:02			
LOW GATE	12:02	12:02			
TRANS-EARTH DEPART (REV 13)	12:02	12:02			
DOCKING	12:02	12:02			
NELENDROGRAPHIC LATITUDE = 12.3°					
NELENDROGRAPHIC LONGITUDE = 151.2°					
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24			
BURN INITIATION (REV 57)	12:24	12:24			
TV COVERAGE (TRANS-EARTH)	12:24	12:24			
---FRI APRIL 21---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02			
CSM JETTISON (REV 12)	12:02	12:02			
DOCKING	12:02	12:02			
HIGH GATE TRANS-EARTH	12:02	12:02			
LOW GATE	12:02	12:02			
TRANS-EARTH DEPART (REV 13)	12:02	12:02			
DOCKING	12:02	12:02			
NELENDROGRAPHIC LATITUDE = 12.3°					
NELENDROGRAPHIC LONGITUDE = 151.2°					
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24			
BURN INITIATION (REV 57)	12:24	12:24			
TV COVERAGE (TRANS-EARTH)	12:24	12:24			
---SAT APRIL 22---					
UNDOCKING & S-IVB SEPARATION (REV 12)	12:02	12:02			
CSM JETTISON (REV 12)	12:02	12:02			
DOCKING	12:02	12:02			
HIGH GATE TRANS-EARTH	12:02	12:02			
LOW GATE	12:02	12:02			
TRANS-EARTH DEPART (REV 13)	12:02	12:02			
DOCKING	12:02	12:02			
NELENDROGRAPHIC LATITUDE = 12.3°					
NELENDROGRAPHIC LONGITUDE = 151.2°					
DESCENT ORBIT INSERTION (DOI, REV 57)	12:24	12:24			
BURN INITIATION (REV 57)	12:24	12:24			
TV COVERAGE (TRANS-EARTH)	12:24	12:24			
---SUN APRIL 23---					
LIFT-OFF	11:54	11:54			
EPD INSERTION	12:02	12:02			
TRANS LUNAR INJECTION	12:02	12:02			
BURN INITIATION (REV 50)	12:02	12:02			
CSM S-IB SEPARATION	12:04	12:04			
TV COVERAGE (TRANS & DOCK) 14 MIN	12:04	12:04			
DOCKING	12:14	12:14			
CSM S-IVB INJECTION	12:14	12:14			
EVA MANEUVER (PERFORMED BY S-IVB)	12:22	12:22			
FIRST MIDCOURSE CORRECTION (MCC-1)	11:34	11:33			

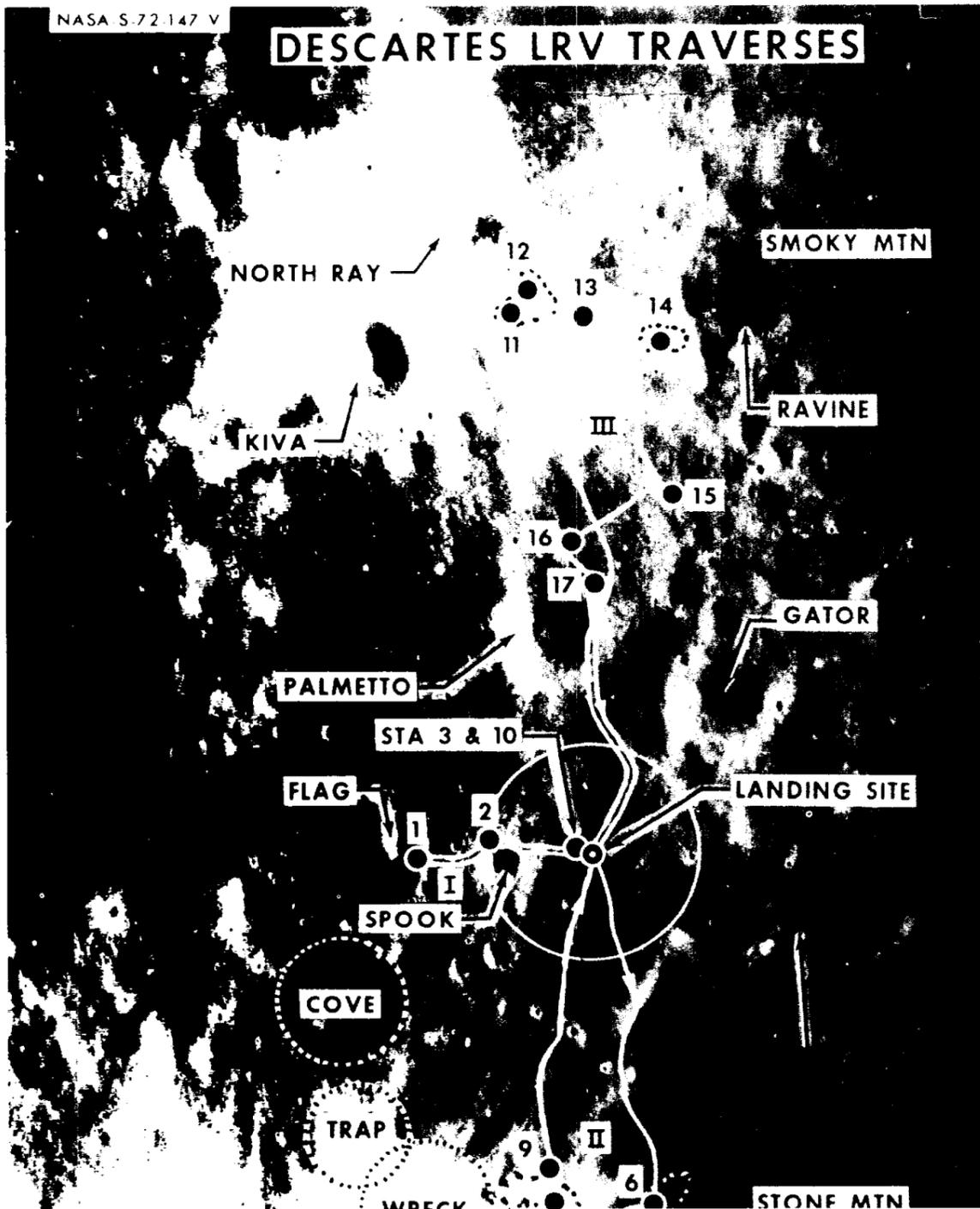
ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS



Vol. 11 No. 11

April 14, 1972



Apollo 16 events (above) and the Descartes lunar roving vehicle traverses (below) pretty well describe the activity of the upcoming two weeks. On the traverse map, the Roman numerals indicate the EVA, and the Arabic numbers designate the work station. The three exploratory journeys are scheduled for the late afternoon and early evening hours, Houston time, with television coverage scheduled for most of the action. The map should prove useful in following Young's and Duke's progress.

Young and Duke will make three forays over the surface, gathering samples and setting up scientific experiments.

Mattingly, orbiting in the command module "Casper," will carry out an equally impressive

Shirley Price Selected Handicapped Worker

Shirley Price of Planetary and Earth Sciences Division, Science and Applications, has won the "Fourth Outstanding Handicapped Federal Employee of the Year Award."

Among the recognition and honors accompanying the award is a tour of the White House, with Mrs. Nixon as hostess.

The award is made each year by the Civil Service Commission to recognize persons with "exceptional job performance . . . in spite of severely limiting physical factors."

Shirley is just under four feet tall and without arms, yet she controls a 10,000-item data library used in connection with an experiment designed to measure cosmic ray bombardment of the Earth's atmosphere.

She also uses and interprets UNIVAC 1108 computer runs. She types (with her toes) at 45-50 words per minute, files, and answers telephones.

Miss Price has received the Young Women's Association A-

ward of the Baptist Convention; the Peacock Record Company's Courage Award Trophy; and the Texas Governor's Citation as Handicapped Employee of the Year.

She has served as president of the Interdenominational "Celestial Chorus," and vice president of the Baptist Training Union.

Local Girl Earns Spot in Skylab Project Finals

Twenty-five national finalists in the Skylab Student Project have been selected and the daughter of an MSC man is one of them.

She is 16-year-old Kathy Jackson, daughter of John Jackson of Crew Systems Division, E&D.

Her proposal was "a quantitative measure of motor-sensory performance during prolonged in-flight zero-G."

(Continued On Page 2)

Life Sciences Replaces Medical Directorate

The Medical Research and Operations Directorate has been redesignated the Life Sciences Directorate.

In announcing the reorganization, Director Chris Kraft said "With the impending phaseout of the Apollo program and with Skylab nearing a flight operational phase . . . new emphasis must be placed on the bioengineering and biomedical aspects of long duration manned space flights.

"In the original concept of Medical Research and Operations Directorate, we were concerned with the ability of man to endure the environment of space.

"The Life Sciences program now is being expanded to include increased research work in developmental biology, plant and animal physiology, and bio-scientific program which potentially will benefit mankind."

The reorganization will not require an increase in personnel strength.

The reorganized directorate will have all biomedical research activities centralized into the Biomedical Research Division; all medical, operational, and environmental health activities will be consolidated into the Health Services Division; and all equipment development, testing and integration will be centralized within the Bioengineering Systems Division.

Richard S. Johnston, who has served as acting director of MR&OD, becomes director of Life Sciences. Dr. Lawrence R. Dietlein, who has served as MR&OD assistant director of Medical Research since 1967, will become deputy director of Life Sciences at MSC.

Dr. Willard R. Hawkins will be the Life Sciences Directorate's deputy director for Medical Operations. Dr. Hawkins has been chief of Medical Operations Division since 1967.

Chief of the Biomedical Research Division will be Ed Michel, who has been chief of the Biomedical Laboratories Division since 1969.

Dr. George G. Armstrong, Jr.

Miss Clear Lake Contest Coming

MSC lovelies interested in competing in the 1972 Miss Clear Lake Jaycees, host group for the prelude to the Miss Texas and Miss America pageants.

Entries chairman is George Holt, telephone 488-5188. Unmarried women from 18 to 28 are eligible.

Zero In On Safety

will be chief of the Health Services Division. He has been deputy chief of Medical Operations for the past three years.

John C. Stonesifer, who has been chief of MR&OD's Project Support Division for the past 18 months, becomes chief of the Bioengineering Systems Division.



AWARDS—Performance awards in Spacecraft Design Division of Engineering and Development Directorate and in the Safety, Reliability and Quality Assurance Office have been made to 26 employees. Pictured are Tony Giralda, a quality step increase, and Bob Bond and Bill Humphrey, sustained superior performances. In the bottom row are Bill Creasy and Will Taub, outstanding performance ratings, and Jack Kohanke, quality step increase. Kohanke is from SR&QA, the rest from E&D. Not pictured but also honored in Safety, Reliability and Quality Assurance Office were Jean Brown, Norm Schulze, Clarence Presswood and Placido Valdivio with OSIs, Jean Alexander, Dick Perry, Coy Martin, Ken Warren, Iris Falcone, Harold Albert, Kay Chapman, Herman Lauterbach, and Suzette Partin with SSPs. Terry Spence, Mac Fields, Patt Huber, Mary Lewis, Quint Ussery, Jim Chappee and William Fitzgerald earned OPRs.

New Shuttle Work Invited, Awarded

Ten aerospace industrial firms have been asked to submit bids for a television system to be used on a Shuttle orbiter to aid cargo handling in space.

The system bears the space age name of "Head-Aimed Foveal/Peripheral Television System;" acronym is HAFPTS.

HAFPTS is a part of a Remote Manipulator System, called RMS, which will accompany each orbiter into space.

NASA is awarding a 90-day

'Roses' is Subject At 3-C Theatre

"The Subject was Roses" is the subject of the Clear Creek Country Theatre's current production.

The award-winning comedy-drama stars Carol Stodghill, George Pheneger and George Joni Jr. Director is Harry Booker.

Reservations for the play, which opens tonight, can be made through 332-2931.

Tough-to-Tag Subject Could Mean Cash in Hand in Awards Program

A subject that's difficult to identify could be worth money.

The subject is "contributions."

It falls into the Inventions and Contributions Awards Program, where inventions and technical briefs are pretty easy to pin down.

Contributions, since they are not the subject of technology transfer and do not fall into a category for which patent applications can be filled, are not so

easy to describe.

They are innovative techniques for scientific or technical accomplishment which could be of true value to NASA's activities.

Contributions are evaluated and considered for monetary awards as inventions.

All MSC and contractor employees are eligible to submit any innovation they feel to be a scientific or technical contribution of value to NASA.

An abstract of the achievement should be sent to the MSC Awards Office for evaluation.

Local—

(Continued From Page 1)

That tongue-twister boils down to a maze drawn on something akin to pegboard. A crewman will trace the maze with a stylus.

The instrumented system feeds into a computer which will measure the astronaut's visual-manual coordination as he hits 119 eighth-inch holes along the maze's path.

Kathy is a junior at Clear Creek High School. Her sponsor in the nation-wide program is chemistry teacher Mrs. Mary Kimzey.

A limited number of these experiments and demonstrations proposed by high school students will be chosen for performance aboard the Earth orbital Skylab manned space station in 1973.

Selection of flight experiments and demonstrations will be completed by this June 1.

The 25 student finalists and their teacher-sponsors will be invited to attend the Skylab Student Education Conference at Kennedy Space Center at the time of the Skylab launch.

The national finalists and sponsors also will receive special medallions. Plaques will be presented to their schools.

Proposals by the 25 finalists were chosen from 3,409 submitted by U.S. secondary school students across the nation and overseas.

The Skylab Student Project is overseas.

The Skylab Student Project is designed to stimulate interest in science and technology by directly involving secondary school students in space research.

Skylab is an experimental space laboratory to conduct scientific, technological, and biomedical investigations from the vantage point of space. The first manned mission will last up to 28 days, the second and third 3-man missions are planned to last up to

Aero Club Offers Training Package To Non-Pilots

The Aero Club is offering a specially designed course for non-pilots who want to complete introduction to flying without excessive cost.

The \$160 package includes ten hours of flying time, all flight instructor charges through solo, and a session in ground school.

If time beyond ten hours is needed for solo, the only extra charge is \$11 per hour for the plane.

Enrollees become associate members of the Aero Club and thereby are covered by the club's insurance policy. After solo, the new pilot can apply for club membership without the usual \$50 initiation fee.

The offer is open to MSC and contractor personnel and their families.

Contacts are Jim McCoy, extension 5171, or Bob Moncsko, 4667.

Next Aero Club meeting is May 1 at 5 p.m. in Room 511 of Building 2. Ground school, without flight instruction, starts May 2 at a fee of \$20.

56 days.

The Skylab program will test equipment and techniques to gather information on Earth's ecology, oceanography, water management, agriculture, forestry, geology, and geography.

Astronomy experiments will substantially increase knowledge of the Sun which sustains life on Earth.

Habitability, biomedical, behavioral, and work effectiveness experiments will further evaluate man's capabilities in space flight.



HONORS — Three Future Programs Division personnel have been honored for the way they have done their jobs. They are Audrey V. Lemons of the Program Planning Office and Leonard S. Nicholson of the Project Definition Office, both with sustained superior performance awards, and John K. Hirasaki of Payloads Engineering Office, a quality step increase.

ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



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.

Photographer: A. "Pat" Patnesky

LC Jaycees Also Sponsor Pageant

Another opportunity for MSC beauties is the League City Jaycees-sponsored Miss Parada del Rodeos Pageant on May 13, a stepping-stone to Miss Texas World and \$15,000 in prizes.

Unmarried girls 17 to 25 from Galveston or Brazoria counties or the Clear Lake area of Harris County are eligible. Contacts are John Hollan, 554-5037, or Leo Waltz, 333-2286.

MSC Radio Club Gives Noon-Hour Code Classes

Interested in obtaining an amateur radio license or upgrading your present license?

The MSC Amateur Radio Club (MARC) is offering lunch-hour code classes for beginning, and advanced operators.

Classes are held Monday from 11:30 to 1 in Building 15, Room 125, and Friday from 11:30 to 1 in Building 15, Room 212.

The first half of each class is devoted to beginners with code speeds up to 13 words per minute. The last half of each class covers intermediate (13 to 16 wpm) and advanced (20 and up) code speeds.

All MSC Civil Service and contract employees and their families are eligible to join MARC. It is not necessary to be a member of the club to participate in code classes.

For further information on code classes contact Kent Castle, extension 3171. Anyone interested in joining MARC should contact Leroy Ruetz, extension 5381.

Secretaries Set Seminar April 22

The NASA Clear Lake Chapter of National Secretaries Association will kick off National Secretaries Week with its annual seminar "NSA: Try It, You'll Like It" on April 22 at the League City Civic Center from 8 until 2.



Keynote speaker will be Marvin Hurley, executive vice president of the Houston Chamber of Commerce. Other speakers will be featured.

The registration fee, which includes lunch, is reimbursible to MSC secretaries — Form 1164 and a signed receipt or cancelled check. Seminar chairman: Virginia Thompson, extension 5473.

Roundup Swap-Shop

Deadline for Swap-Shop classified ads is Thursday of the week preceding Roundup publication date. Ads are limited to MSC civil service employees and assigned military personnel. Maximum length is 20 words, including name, office code and home telephone number. Send ads, typed or legibly written, to Roundup Editor, AP3)

ACTIVITIES

Fly with the Aero Club, Cessna 150 \$8/hr. 172 \$10/hr plus \$10/month, IFR Bonanza \$18/hr plus \$25/mo, ground school \$20. EAA-sponsored McCoy, 944-5574.

PROPERTY & RENTALS

Large waterfront lot in Knights Forrest, pier, wooded, store, swimming pool and bathhouse in subdiv. 40 mi from Baytown, \$1895. Young, 427-2793.

2-bdr, bath, kitchen, fam rm, 3 1/2 mi E ski-run Cloudcroft, NM. Smith, 488-1111 after 5.

Clear Lake City 3-2-2 cedar fenced on cul-de-sac, 1550 sq ft, assume 6% at \$161/mo plus equity, or refinance. Keeton, 488-2613.

Xtra nice C 3-2-2 plus hobby room in Seabrook (Miramar), owner finance. Baker, 344-2192 after 5.

Home site, Longwood Pk, 3 1/2 acre, all util, blacktop, cul-de-sac, owner will finance, \$3900. Hoisington, 488-2520.

Rent 2 new twtns Clear Lake City, all elec, 2 bdrs 2 bath. Miller, 488-0621 after 4.

Lake Livingston lot (Lake Livingston Heights) many trees, water access, xint fishing. Prince, 649-7852.

Lake-front lot Lake Livingston 82 x 216, concrete bulkhead. Waters, 946-1818 after 6.

Half-acre lot Houston, 125' front on shell street, bank, school, 3 churches in 8 blocks, \$3500. Barr, 649-1751.

BOATS

16' Lone Star (Chrysler) sailboat, galv trailer, many extras, gd cndn, reasonable. Simon, 488-4043.

5hp Eska outbd, xint cndn. Lockard, 534-4714.

Luxurious 16' speedboat, 120hp ob, trailer & equip incl pro ski-tow bar, 71 model in mint cndn, \$3295. Bland, 333-4580.

71 tri-hull 17' fishing/ski boat w/canopy, controls & equip, 1970 120hp ob & trailer, xint cndn. \$2495. Bland, 333-4580.

Sunfish sailboat w/trailer. 488-0266.

Fishermen, Hunters, Summer Fun: 12' Ouachita alum boat, xint shape, no leaks, rough paint, cost \$129, must sell for \$75. 334-2360.

21' Southcoast sailboat w/working sails and 5hp obm, \$2000. Hill, 332-3838.

15' Helton, 35hp Evinrude, big whl trailer, good clean boat, \$350. Lowery, 482-1155.

Snipe sailboat & trailer, new cndn, was asking \$875 will take \$675. Holzaepfel, 427-1657.

20' plywood boat & trailer, fiberglass bottom, beaut cndn, lots of room, \$800 or consider trade for smaller boat & trailer. Holzaepfel, 427-1657.

Outboard engine, 5hp Eska, xint cndn, \$65. Lockard, 534-4714.

71 Phantom bass boat, 33hp elec start Evinrude, 6 gal tank, battery & tilt trailer, \$900. Alexander, 479-2521.

68 Evinrude ob, 9.5hp, no rust, runs lk new, \$285. Kleinknecht, 334-2454.

Lido 14 sailboats, info on prices & cndn used Lidos for sale by owners. Hoover, 334-2392.

12' Sears Fiberglass flat bottom, 1 yr old, xint cndn, \$75. Blilie, 944-3847.

10 1/2' dinghy w/slotted keel, oars, boat-hook & painter, takes 3 1/2hp, just refinished outside, outside, offers Brown, 471-0066.

MISCELLANEOUS

Fur coat, sheared raccoon looks like sheared beaver, xint cndn, perfect for northern college girl, make offer. Simon, 488-4043.

Telescope, Criterion 4 1/2", 3 eyepieces. Simon, 488-4043.

Camper mattress fits std size camper & trailer bunks, \$10. Guillory, 472-8208.

Small car luggage carrier, \$10. Burton, 481-0780.

Jacuzzi whirlpool bath, best offer. Kindness Clairf electric hair curler. Other items. Lai, 483-6461.

Sewing & needlepoint taught in my home. Franklin, 471-0235.

Johnson Viking Valient transmitter \$150.

225 W AM and 275 CW HO 110 Rcvr \$100. Patino, 944-5299 after 6.

Membership to Baywood Country Club \$200. Dyer, 333-4572.

ART-13 Collins Transmitter, ideal for AM-CW use on 80-20 meters, conversion details & complete schematic incl, \$25. Graves, 488-5641.

Complete 6 meter station, mint cndn, Knight TR-106 transceiver, Knight V-107 VFO for 6 & 2 meter operation, Cushcraft 6 meter Squalo antenna w/bumper & deck mount, cost \$120 new, make offer. Graves, 488-5641.

Mustang car top carrier, new, \$5. Miller, 488-0621 after 4.

7 new 18" x 6' arched-head leaded glass window units, complete. Holzaepfel, 427-1657.

VW parts, dune buggy AFX floor shift & trailer hitch, both \$25. Also 90hp Graymarine engine w/transmission, complete, good for parts, \$25. Holzaepfel, 427-1657.

2-sp vibrator belt \$35, doll cradle, Easy Bake oven \$3. Gerke, 333-2269.

Adding machine, Remington Rand 10-key w/paper tape printer \$40. 649-2569.

HAM-Drake 2B w/speaker & calibrator, gd cndn, \$150. Eggleston, 334-2897.

20-gal boat gas tank never used \$25. crushed colored glass many sizes & colors 25c a lb. Wood, 333-2373.

30-30 lever-action rifle, new cndn, fired 20 times, includes 4-pwr scope & case, \$70. Brandon, 944-0227.

Pentax Takumar telephoto lens 135mm f3.5 \$45, Keystone slide projector w/new projection lamp & 27 trays \$20. Jones, 488-3976.

Sofa, green Mediterranean style, \$50. Mason, 488-3514 after 5 April 18.

Avocado green vinyl-leather sofa \$75, early -Amer record cab, drop-leaf end table \$60 ea, xint cndn. Deans, 334-3015.

Dinette set w/42-in table, 6 chairs, 2 leaves, \$50. Bourgeois, 481-2233.

Full-size 6-in foam latex mattress, box spr, steel bed frame, vinyl mattress cover,

like new, \$100. Moore, 488-4089 after 5.

4-sp stereo phono & stereo AM-FM in attractive cocktail table, compact, beautiful tone. Simon, 488-4043.

Frigidaire front-proof refrig/freezer \$75, available May 26. Xenakis, 944-5284.

Whirlpool refrigerator \$200, C-M TV/stereo center \$185, Uher stereo tape recorder & accessories \$175. Baron, 333-2943.

Living room & bedroom furniture, fair cndn, incl lrg wall mirror, coffee table, hanging lamp, priced to move. Practice Piano \$125. Boynton, 667-4533.

Elegant Thomasville French Provincial dining room suite, solid pecan, oval table, 6 chairs, china breakfront, \$540 cash. McMullen, 333-3410.

Card table w/4 chairs \$20 or best offer. 36" round maple table w/4 chairs as game table \$50 or best offer. Goodman, 488-1458.

Beige sofa & end table, \$50 both. Gaffney, 483-4319.

Baby grand piano, xint cndn, 5 yrs old, \$1600, consider spint as trade. Martens, 474-3651 after 6.

Antique dining table, round oak pedestal, & six chairs, asking \$250, consider offer. McHenry, 944-7986.

WANTED

Photographic darkroom equipment, enlarger for 35mm & 126, reasonable and in gd cndn. Thompson, 332-2229.

Sometime to ride to Norfolk, Virginia, area leaving Apr 22 or 23. Ford, 333-2156.

Used b/w enlarger, 35mm. Graves, 488-5641.

Oxygen & acetylene bottles which can be refilled locally. Donahoo, 925-2139.

PETS

"Almost" puppies, elkhound-collie cross, 5 wks old, mother champion stock, father ?, pups look like mother. Bliss, 488-5755.

Nine puppies free, 5 female 4 male, half shepherl, white, black, black-and-white. Muhly, 471-3762.

30-gal aquarium w/fish and all equip. London, 626-0487 after 5.

AKC beagle puppies, proven hunting stock, sire bitch can be seen, \$50 ea. Boykin, 946-1794.

Free puppies and free kittens. Mabry, 941-1545, 944-7053.

Cocker spaniels, AKC, red & buff, male & females, \$75. Boin, 488-1244.

Big Reds: Irish setters born Mar 10, 2 pedigrees AKC & Field, national champ line. Morris, 333-2910.

VEHICLES

66 Pontiac GTO, air, pwr steering & brakes, 4-sp, AM-FM, rally gage cluster w/tach, many extras, gd cndn, one owner. Hill, 554-4754.

68 Cadillac Sedan DeVille, one owner, black gold, vinyl, air, all pwr, \$225 (under NADA retail). Fugman, 488-1380.

70 Cadillac Sedan DeVille, 30,000 mi, load-ed, xint cndn. Henderson, 427-2739.

71 Honda CT-70 trail bike, 4-sp manual shift, orange & white, like new, \$250. Craig, 422-6367.

68 Holiday Rambler trailer, 27-ft, air, extras Becker, 643-4151.

69 Plymouth Fury, air, pwr steering & brakes, xint cndn. Sjoberg, 334-3240.

Summer fun! 71's Suzuki 125 Duster eduro bike, absolutely pfct cndn, runs fantastic, beaut blue, cost \$580, must sell soon, getting car. 334-2360.

69 Mercury Monterey 4-dr hdt, auto, air, pwr steer, pwr disc brakes, AM/FM stereo, 33,000 mi. Voigt, 488-1931.

69 Corvette cpe, 427-390 eng w/4-sp trans, positraction, fctry air, pwr steer & brakes, AM-FM, LeMans Blue, \$3000 firm. Graves, 488-5641.

71 Pontiac Broughman 2-dr, low mi, new tires, exint cndn, must sell. Roach, 645-7932 after 6.

Rupp Roadster minibike, 4hp, 4 mo old, cost \$300, sell for \$150, new cndn. Briggs, 946-5849 after 5.

71 Kawasaki Mach III, 2000 mi, like new, \$800. Holzaepfel, 427-1657.

71 Chevy Open Road camper chassis mount, fully self contained, dual air, disc brakes auto, sleeps 8. Bliss, 488-5755.

65 Mercedes Benz 190 DC, air, new tires, gd cndn, \$1500. Ferguson, 482-7910.

65 Dodge Dart, std shift, air, gd mechanically, best offer takes. Boynton, 667-4533.

66 Ford sta wgn 8-pass, airt, pwr steer/brakes air, 390 V8, new tires, bargain, \$825. Humbert, 944-8753.

66 Pontiac Bonneville, fully equip, xint cndn, original owner, \$700. Alexander, 479-2521.

72 Honda SL 350, 2000 mi, \$795. Bills, 473-2802.

70 Plymouth Sport Satellite sta wgn, air, radio, 9-pass, pwr steer. Mabry, 944-7053.

64 Chevrolet, metallic gray, all new tires, radio, heater, new shocks & complete overhaul, gd cndn, \$550. Shumate, 944-4580 after 5.

68 Olds 88 4-dr hdt, white w/blue vinyl top, air, power, radial tires. Harris, 488-1003 6:30-7:30.



WINNERS — The Clear Lake Hospital Blazers, NASA employees softball team sponsored by the hospital, won the third-place trophy in the Pasadena Pre-season Tournament, the club's first outing of the year. The Blazers pictured are, in the back row from left to right, Joe Bell, Richard Kruse, Mike Collins, Nick Lance, and Mel Richmond. In front are John Kaderka, Bailey Corbett, Jim Larey, Ron Epps, hospital administrator and team sponsor David Rose, and Jack Boykin. Dale Frost and Vince Voytek made the tournament but missed the photo.

REGISTRATION FORM — SECOND ANNUAL SEMINAR FOR SECRETARIES

Name _____ Employed by _____
 Address _____ Address _____
 Phone _____ Preregistration \$8.00 (includes luncheon)
 Are you a memebr of NSA? _____ Registration at Door \$9.00
 If so, what chapter? _____ Student Registration \$4.00
 Make checks payable to: NASA Clear Lake Chapter, NSA
 Mail to: Mrs. Helen Weseman, P. O. Box 235, Friendswood, Texas 77546.

TO USE SPACE TECHNOLOGY ON EARTH

Urban Systems Project Office Set Up Here; Hays Heads It

An Urban Systems Project Office has been established at MSC to apply space technology and techniques to urban problems and systems.

The new organization is part of a cooperative effort between the Department of Housing and Urban Development, NASA and the Atomic Energy Commission to develop new methods of servicing urban areas.

The new effort, called Modular-

Sized Integrated Utility System (MIUS), is investigating and demonstrating the feasibility of servicing communities of limited size with utilities generated by a single processing plant.

MSC will furnish life support engineering expertise.

MSC will be the lead field center in performance of NASA responsibilities and with support from other NASA elements.

The MSC Urban System Proj-

ect Office-USPO will be responsible for the management of the design, development, verification, fabrication, installation, and evaluation of urban systems in support of this program.

Edward L. (Ted) Hays, 29-year veteran aerospace engineer and presently deputy chief of Crew Systems, will be project manager.

Approximately 35 NASA engineers and technicians will be transferred from within MSC and as-

signed to USPO.

At present the principle function of USPO's activity will be concentrated on an economically acceptable modular sized integrated utility system design definition.

In describing USPO's work, Project Manager Hays said, "Basic design criteria would emphasize economic practicality, environmental quality and energy and other natural resource conservation."

The Modular-Sized Integrated Utility System approach will include electricity, heat, air conditioning, waste water and solid waste treatment, and water supply.

These services appear to be applicable to apartment complexes, condominiums, shopping centers, urban development areas and new community developments.

Countdown

(Continued From Page 1)

roving vehicle.

In lunar orbit, Mattingly will operate experiments in the scientific instrument module (SIM) bay for measuring such things as the lunar surface chemical composition, and the composition of the lunar atmosphere.

A high resolution camera and a mapping camera in the SIM bay will add to the imagery and photogrammetry gathered by similar cameras flown on Apollo 15.

Mattingly will perform an in-flight EVA during transearth coast to retrieve film cassettes from these cameras.

Using hand-held cameras, Mattingly will photograph such phenomena in deep space as the Gegenschein and, looking Earthward, the ultraviolet spectra around Earth.

A second substatellite, similar to the one flown on Apollo 15, will be ejected into lunar orbit to measure the effect of the Earth's magnetosphere upon the Moon and to investigate the solar wind and the lunar gravity field.

The landing crew will remain at Descartes for 73 hours before returning to the orbiting command module on April 23.

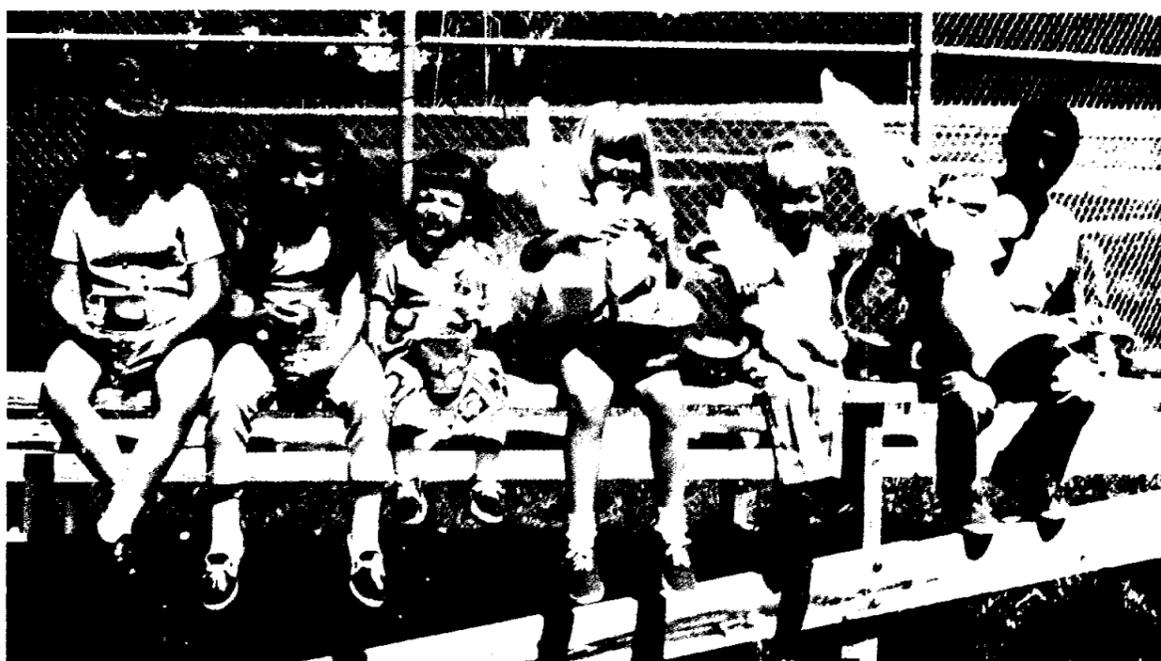
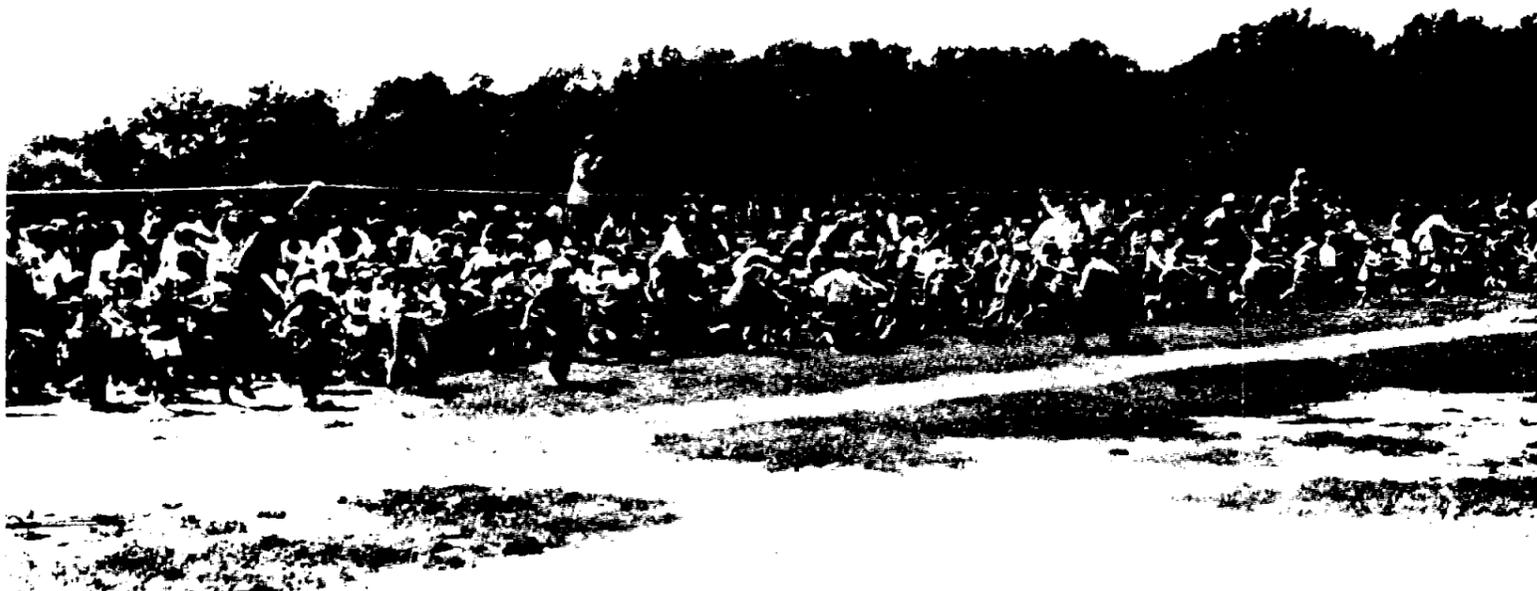
Earth splashdown will be April 28 at 2:30 p.m. CST. in the central Pacific just north of Christmas Island.

Airplane Sought To Match Shuttle Subsonic Flight

NASA has asked the aerospace industry to bid on proposals for a study of an airplane capable of simulating the subsonic flight characteristics of the Space Shuttle orbiter.

In this connection, the contractor will study aircraft handling qualities and flight control procedures with and without jet engines during flights from 35,000 feet altitude to landing.

The study is to "provide sufficient data to assure NASA that the proposed Shuttle Training Aircraft (STA) configuration is technically feasible and acceptable," and "that the recommended design can meet specified requirements."



GOOD EGGS — Saturday the First was Egg Hunt Day at MSC, thanks to the Employees Activities Association, and it was no April foolin' for the mob of youngsters who turned out on the bright, sunny day. When the rope was raised, it was every kid for himself, but—judging from the smiles on most of the faces — nobody seemed upset by the competition. When it was over, the winners collected their prizes, the parents collected their kids, and the EAA sponsors collected their wits and guessed the confusion was worthwhile after all.

Picnic: Sept. 23rd

Cost Reduction Corner

Skylab Operational Data Books, requiring almost daily updating, were distributed widely through the Skylab and Apollo offices until Connie Critzos of Skylab and Herbert Tash of Apollo suggested it might be easier for some of the offices to use either of the two constantly-updated copies on file in the Apollo Presentations and Data Management office rather than maintain their own copies.

Twenty-six offices agreed. At \$50 per volume per year plus \$8652 a year for the time needed to maintain the 26 volumes, the saving to John Q. Taxpayer came out to \$9952.

Nearly 100 Golfers Battle for Honors In Second MSC Tournament of '72

More than 90 MSC golfers wandered the bayous, fairways, sand traps, and woods of Brock Park Golf Course April 1 during the second tournament of the 1972 MSC Golf Association season.

Bill Nunnery and Tom Semenuk shared the low gross each carding 83 on the par 72 course. The MSC league, now divided into four flights—championship, first, second and 'new member'—had the following winners:

CHAMPIONSHIP: First - Pete Smetek 85 (72), Second-Bill Nunnery 83 (73), Third - Dave Chenault 89 (76), and two way tie for Fourth between Bill Shrop-

shire 86 (77) and Jay Harnage 88 (77).

FIRST: First-Harry Kolkhourst 87 (70), Second-Rowland Williams 86 (72), Third-Bob Gordon 92 (74), and two way tie for Fourth with Joe Siegfried 91 (75) and Gerry Kenney 91 (75).

SECOND: First Dick Redi 96 (73), Second-Bob Lacy 98 (75), and a two way tie for Third between Dave Harris 101 (78) and Jim Sanders 97 (78).

NEW MEMBER: First-John Lottinville 97 (70), Second-Tom Semenuk 83 (73), Third-Bill Keathley 96 (74) and Fourth-Don Blevins 104 (74).