

# Attention All Bosses ... April 21 Is The Day

"Better Secretaries Mean Better Business" is the theme of the 20th annual Secretaries Week to be observed April 18 through 24. Secretaries Day is Wednesday, April 21.

Secretaries Week is sponsored by the National Secretaries Association (International) (NSA), which invites all secretaries to share in its purpose of focusing attention on the role of professional secretaries as management's right arm in business, industry, education, government, and the professions.

Mrs. Phyllis Bauer, a Certified Professional Secretary (CPS) and NSA's International President, said that the Association plans to use the 1971 Secretaries Week as a springboard for suggesting ways to management of increasing the secretarial productivity of existing personnel. "A good secretary can perform many tasks that the executive may needlessly be doing himself. This frees his time to concentrate on productive and creative problem solving." Mrs. Bauer stated.

She further suggested that a "good first step toward getting the most from a secretary's abilities is for management to review NSA's definition of a secretary.

"A secretary shall be defined as an executive assistant who possesses a mastery of office skills, who demonstrates the ability to assume responsibility without supervision, who exercises initiative and judgment, and who makes decisions within the scope of assigned authority."

Three of NSA's many programs are of immediate benefit to management in its quest for qualified secretaries: the Certified Professional Secretary (CPS) program which expects to have the largest

number of candidates ever for the annual two-day examination to be administered May 7 and 8; the Future Secretaries Association (FSA), the NSA's fastest-growing program, which assists business educators to provide realistic training for students who will embark on a secretarial career, through FSA chapters in high schools, business schools, and colleges; and the NSA Research and Educational Foundation which, among other projects, is working with management on a research project to determine exactly what secretarial requirements will be in the future.

The NASA Clear Lake Chapter of NSA currently has thirty members from MSC and local industry. Regular dinner meetings are held on the fourth Tuesday of the month at the Sheraton Kings Inn. New members are always welcome.

The officers of the local chapter are Yvette Crane, president; Joanne Fischer, president-elect; Jimmie O'Hare, Virginia Thompson of MSC's Institutional Resources and Procurement Division, and Helen Weseman.

Jimmie O'Hare of Lockheed was recently selected by the NASA Clear Lake Chapter as their Secretary of the Year to represent the chapter in International Secretary of the Year competition. Two years ago Mrs. O'Hare became a Certified Professional Secretary. The CPS examination includes sections on Personal Adjustment and Human Relations, Business Law, Business Administration, Secretarial Accounting, Secretarial Skills, and Secretarial Procedures.

Seminars, workshops, and educational forums are frequently or-  
(See NATIONAL, Page 3)

# ROUNDUP

NASA MANNED SPACECRAFT CENTER

HOUSTON, TEXAS



VOL. 10 NO. 11

APRIL 9, 1971



**SIM MODULE**—Pictured here is the J-Series Apollo Scientific Instrument Module which occupies one bay or 1/6 of the 2TV-2 service module. This particular SIM is configured for Apollo 15. It contains a laser altimeter, subsatellite experiment to be placed in lunar orbit; mass, gamma ray, x-ray, and alpha particle spectrometers; and two cameras, one for mapping and one which will take panoramic "stereo" pictures of the lunar surface. The Command Module Pilot will perform extravehicular activity to retrieve the film cassettes.

## SESL Completes 2TV-2 Testing

Two for the price of one is considered a bargain anywhere, and MSC engineers recently bought a bargain for the Center by combining tests for two manned programs into one vehicle.

The tests were conducted in Chamber A of the Space Environment Simulation Laboratory (SESL) — acronymically called "Cecil" — and combined the long-duration version of the Skylab service module with the Apollo J Mission Scientific Instrument Module (SIM Bay). Both systems were housed in one Apollo service module test article, space-

craft 2TV-2. In 1968 this same spacecraft, in earlier configuration and then called 2TV-1, was used in a series of manned thermal-vacuum tests which supported the first manned Apollo missions.

The Space Environment Test Division conducted four tests, which lasted from 4 to 12 days, for the Apollo and Skylab Program Offices with direct support and participation of several MSC and contractor organizations. The Systems Engineering Division of the Apollo Spacecraft Program Office, represented by spacecraft systems support team leader Allan

Joslyn, defined the major test requirements and objectives and performed real-time evaluation for both Apollo and Skylab tests.

Other principals in the activity were ASPO's Test Division and CSM Project Engineering Division, and the Engineering and Development Directorate's Structures and Mechanics Division, Lunar Orbit Experiments Development Office, and Crew Systems Division.

Contractor support included the regular Brown & Root-Northrop,  
(See THERMAL, Page 4)

## Thank Goodness for Computers!

The Public Affairs Office recently received an inquiry on the number of man-years it would require to manually calculate the trajectory that was necessary for a safe return of the Apollo 13 crew in April 1970. The Mission Planning and Analysis Division came up with the answer. The figuring was based in part on an IBM study several years ago of the equivalency of IBM-7094 computer time to man-years of manual calculations.

Are you ready? Here we go!

Using the IBM-360 computer in the Mission Control Center Real Time Computer Complex, twelve six-minute computer runs were made toward determining the proper return trajectory for Apollo 13. Nine of these were transferred to the Return-To-Earth console for examination. From these, three were selected for return-to-earth candidates, and two additional computer runs of two minutes each were made on these three before the final return-

to-earth trajectory was chosen.

From the initial computer runs to the six two-minute runs on the final return-to-earth candidates, a total of 84 minutes of IBM-360 computer time was required to determine the initial return trajectory for Apollo 13.

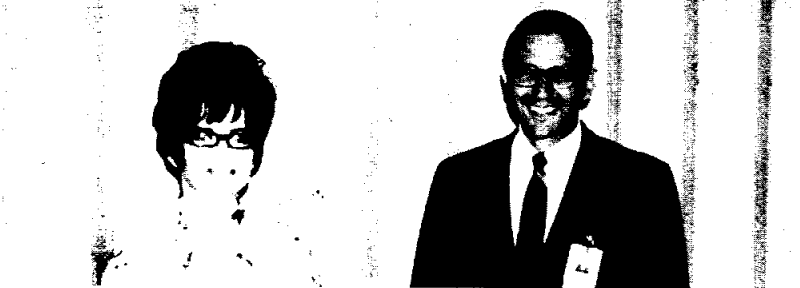
Previous calculations had determined that five seconds of IBM-7094 computer time was the equivalent of 86 man-years of manual calculations.

Projecting further, the UNIVAC-1108 is three times faster in computing than the IBM-7094, and the IBM-360 on which the computations were made for the Apollo 13 return trajectory is four times faster than the UNIVAC-1108.

Based on these calculations, 84 minutes of IBM-360 computer time is equal to 336 minutes of UNIVAC-1108 time. This is equivalent to 1,008 minutes of IBM-7094 computer time. Each minute of IBM-7094 time is the  
(See COMPUTER, Page 3)



**HOTPANTS**—But they are cool inside! Volunteers from the Houston Fire Department walk on the edge of a pit of burning JP-4 jet fuel during a recent test of firefighter garments made of nonflammable space-age fabrics. The garments, made by MSC's Crew Systems Division from fire-resistant fabrics developed for use in manned spacecraft where a 100% oxygen atmosphere increases the fire potential; are multilayer sandwiches of Durette, Fypro fabric, and Fypro batting. The firefighter on the far right is dressed in traditional firefighting garb, the jacket of cotton and the pants of rubberized material. Wearing that clothing, he is as close to the fire as he can comfortably or safely be. In the photo inset, the fireman was literally "on fire" for a moment and not aware of his condition at first. He sustained no injury, and the suit jacket was scorched only slightly around the hem. The slight charring was probably caused as a result of the adhesive used to bond the layers of fabric together flashing momentarily. "No structural firefighter's suit available today would allow such close exposure to an intense fire," said Captain Jon King of the Houston Fire Department. "The Durette structural suit is out of this world, and is just what we've been looking for." MSC is building similar suits for evaluation in various climates and firefighting conditions in 21 other cities across the Nation.



THE WINNERS—Madeline Messenger of the Financial Management Division and Christine Young, who works in the Institutional Resources and Procurement Division, were the winners of the Panasonic portable TV's made available through the MSC cafeterias. Madeline (top photo) is shown with Ron Hayes, president of the EAA, and Chris is with Don Gregory, Chairman of the MSC Exchange Council. Hayes and Gregory drew the names of the winners and presented the television sets to the lucky ladies.

## \$ Credit Union News & Notes \$

### DID YOU KNOW:

If you had a loan in 1970 with the MSC Federal Credit Union, you received a 5% interest refund—

The Credit Union is now paying a quarterly dividend, 5 1/2% current on an annual basis—

Savings accounts are now Federally insured up to \$20,000—

You have made it possible for the Credit Union to grow over 2 million dollars in 15 months.

### REMEMBER:

Reducing costs helps to increase dividends.

Some members use their credit union accounts as though they were bank checking accounts, making withdrawals almost weekly. Members should save and use their money as they see fit. But, withdrawals are expensive to process, and excessive withdrawals increase operating costs unnecessarily. A good rule of

thumb: if your credit union withdrawals occur more frequently than once a month, you should probably reduce your payroll deduction for savings and put more money in your checking account.

### CO-MAKER:

The Credit Union is frequently asked what is actually involved in being a co-maker or so-signer on someone else's loan. The answer is just this simple: Each co-maker is as liable as the borrower for the entire amount of the loan.

The promissory note reads, "We, jointly and severally, promise to pay . . ." and so on. Jointly and severally means that the loan may be prorated over the group (borrower and co-makers) or may be collected entirely from one co-maker at the Credit Union's discretion. So, before YOU sign as a co-maker, ascertain the extent of your liability. Call your Credit Union office, extension 2066.

## 60 Years Of Service



MSC Associate Director Lt. Gen. Frank A. Bogart recently presented 30-year Service Awards to Bertus E. Matthews (left) of the Technical Services Division and to Franklin B. Owens (right) of the Logistics Division.

# 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.

# 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)

### NOTE!

No ads will be accepted for the May 5th issue of the ROUNDUP. The deadline for ads for the April 23rd issue is Thursday, April 15th.

### MISCELLANEOUS

Royce Union boys bicycle 26" make offer. DeCorte, 944-4581.

Start the summer right—join Sunmeadow Golf Club, only \$150. Taylor, HU2-1023 after 6 pm. New cassette recorder and extra tapes \$29. Fisher monaural tuner, amplifiers, 15" speaker and enclosure \$59. Campbell, 591-3368.

410 ga. Mossberg bolt action shotgun with 4 bxs shells \$35. Spring mounted hobby horse \$8. Campbell, 591-3368.

11x14 light beige carpet \$40, sewing machine \$35, broiler \$5, tricycle \$5, crib mattress \$5. Monroe 932-3706.

Volkswagen trailer hitch with 1 1/4 ball, never used, \$20. Donnell, 877-1746.

Twin baby stroller, good cdtm \$15. Peterson car seat, xln cdtm, \$6. Kenyon, 932-5925.

Polaroid camera, auto tow bar and two double barreled shotguns, 1-20 gauge and 1-410 gauge. Davis, 932-6325.

Four new G78x15 Goodyear Polyglas black tires, load ranged, 8 ply, retail \$250, sell \$150. Donnell, 877-1746.

Covered car top luggage carrier \$7.50. Garrard Lab 80 auto/man turntable w/base and dust cover, Pickering AME cartridge, diamond elliptical \$70. Elliott, 483-2538.

Movie projector, GAF Anscovision 588 projector, has zoom lens, dual 8, forward, still, reverse, automatic threading \$55. Erickson HU-8-1901.

17" Zenith B/W portable TV, UHF/VHF \$50. Graham, 591-3778.

Sears Craftsman hand circular saw, xln cdtm \$20. Littleton, 474-3418.

Clarinet Bb Selmar soloist professional caliber instrument, used two years by high school band student, xln cdtm, original cost \$285, sale price is \$175. Rubenstein 877-3288.

Danish modern bedroom suite, twin beds, w/box springs and mattresses, night stand, triple dresser \$225. Rogers 488-4463.

Two brand new box spring units for king-size bed \$40. Complete full-size bed with headboard, used, good condition, cheap. Juday, 481-3946.

Sears stereo console, AM FM-FM stereo, walnut cabinet w/jacks for extra speaker and headphones, xln cdtm \$125. Hext, 941-2370 after 5 pm.

Circa 1890 "coin deposit bank", cast iron, nickel plated, front door w/combination lock \$35. Sturtevant, 591-3905.

Rent a Cessna 205, 6 seats, IFR equipped, 155 MPH cruise, \$23 per hr wet. Malone, 644-2441.

Unusual carved oriental teakwood screen, \$395. Oriental soapstone and pearl inlay desk, drop front, \$350. 649-2569.

Beautiful dining room suite, table, 3 leaves, 6 chairs, 18th century mahogany, perfect, \$250.

Antique German wall clock, \$150. 649-2569. Drake 2B receiver, \$150. TR switch, \$15. Eggleston, 877-1261.

Mink Stole, \$325, like new, will reline. Cozens, HA2-8724 or 645-2834.

Yashica 8 mm movie camera, zoom lens, automatic electric drive \$75. Cozens, 645-2834. Ward's Signature 15.5 cu. ft. refrigerator/freezer. Six months old, olive green, auto ice maker, frostless. Harris, 483-3791.

Convertible bicycle, 20 inch, \$8. Baird, 877-1419.

15-hp 2-cyl Michigan Marine, ideal sailboat aux engine, strtr & gen need repair, \$100. White, 932-4472.

### VEHICLES

64 Rambler American, 4 dr wagon, factory air, undercoating, radio, new paint, std trans, xln cdtm, \$400. Rippey, 877-1859.

67 Rebel wagon, 9 passenger, fully equipped, xln cdtm, \$1200. Mansfield 944-5473.

58 Mercedes Benz 220S, air, R&H, belts, extra parts, 21 MPG, \$295. Minar, 877-3028.

58 VW sedan, good engine, trans. and tires, body rusty, \$150. Huber, 877-1276.

68 Benelli 250 cc motorcycle, moving—must sell, only 2600 mi. includes helmet, manual, saddle bag, \$375. Durand, 488-2184.

69 Datsun, sports conv. model 2000, xln cdtm, \$1695, must sell. Neshyba, 534-4710.

69 Yamaha 250 cc Enduro, good condition, standard and oversize sprockets, new chain, \$450. Hutchins, 877-4604.

66 Chevrolet Impala, 4 dr, pwr steering, auto, air, radio. Wegener, 488-4117.

Jaguar XKE coupe, 1963 model with air, meticulously maintained with records of service since new until date. Hirasaki, 591-2297.

62 Comet, beige, exceptionally clean, 34,000 actual miles, 22 mi. per gal. 6 cylinders, 2 dr standard shift, \$300. Harrison, 944-5414.

64 Valiant V-8, A/C, radio, heater, auto shift, hard top, runs fine, \$250 or high bid. Zill, 932-4265.

70 VW Campmobile, several extras, in warranty, \$2900. Call 488-3797 after 4:30 Mon thru Thurs.

65 Honda, CB 160 street bike, electric start, xln cdtm, \$225. Allgeier, 591-4627.

68 Ford Galaxie fastback, \$300 and take up notes. Bolian, 966-9973 after 5:30 pm 966-1440.

60 Fiat, two cylinder, 50 plus MPG, bugeye lamps, canvas top, needs transaxle, \$50 or good cdtm boat trailer. Ritz, 591-2433.

64 Chev S.S., 327 HP, 4 spd, AC/htr, radio, good tires, very clean. Keller, 534-2789 after 5 pm.

70 Toronado, AM-FM stereo, A/C, extras, warranty, 21,000 miles, \$4290 Rainey, 483-7607.

66 Honda, 65 cc, helmet included, has 1971 tags, \$125. Penn, 483-4422.

65 Pontiac Cat., 4 dr HDTP, white w/ black top, A/C, PS, PB, good tires, runs wells, 15 MPG. Nancarrow, 946-5075.

63 Ford Econoline pickup, rebuilt starter, generator, engine, good tires. Rowell, 932-3188.

### BOATS

15 1/2' fiberglass runabout, 40 HP electric start Scott automatic bailer, tilt trailer, extras, never used in salt water, xln cdtm, \$550? Ward, 471-1052.

Demon class sloop 15 1/2ft fiberglass, 3 sails (main, jib and spinnaker) trailer \$800. Ward, 591-2182.

Sailboat, 13' Dolphin Junior, xln cdtm w/trailer \$350. Milam, 488-1874.

Sailboat, 10' board boat, brand new, \$200 includes trailer. Sail extra, \$95 or make your own. Larsen, 488-2893.

17' 1969 Fabuglas Trident 170 tri-hull, 85 hp Evinrude w/trailer and accessories, \$2400. Raines, 877-2871.

Sailboat, Arrowhead, 21', 3 sails, motor, galv. trailer, many extras, must sell, \$975. Larsen, 488-2893.

### PETS

Two female AKC tri-colored basset hound puppies, \$75/each. Law, 944-7596.

Beautiful silver grey registered Norwegian Elkhound pups from champion stock, 3 females, 2 males, \$125. Bliss, 488-5755 after 5 pm.

Miniature female black poodle, 18 months old. Needs a good home, \$25. Horton, 474-2102.

### REAL ESTATE AND RENTALS

Furnished cottage for rent, garage, storage bldg, convenient location, \$100, utilities except electricity, Dickinson. Wiseman, 534-3802.

Clear Lake City, 4-2-2, fireplace, one block to school, pool, park, \$4300 equity, \$220/mo. Mitchell, 488-5591.

Exit 13, Gulf Freeway, 3-1, pool, Pasadena School District, 6% loan, \$100/mo. Null, 645-7958.

Alameda Mall Area, 3-1 1/2-2, large yard with trees, convenient to schools, 5 1/4% loan. Chisholm, 944-2410.

Terramar Beach, 60'x100' corner lot, water, electricity, phone lines, excellent investment or resort home location. Heselmeyer, 591-4168.

El Cary, 1 mile to gate, 4-2-2 with rec. facility, and living rooms, fireplace, builtins, 1 1/2 story, large trees and fenced lot. Rippey, 877-1859.

El Cary Estates, beautiful wooded corner lot, 132'x180', reasonable, privileges to private park with waterfront on Clear Lake. Call WA-1-7212, 944-7632, or 644-2421. Giralda.

Seabrook (Miramar) 3-2-2 Custom home, fenced, new carpet, other extras. Littleton, 474-3418.

Deer Park, 1 1/2 story, 3-2-2, living, dining, screened patio, custom drapes. Equity, 6 3/4, \$152 payments, total \$23,000. Stokes, 479-4863.

3-1 1/2-2, central air & heat, \$18,500 new loan or my equity and assume 6% VA loan. South Houston. Dupee, 944-0971.

Nassau Bay contemporary 4-2 1/2-2, large wooded lot near lake. Hayes, 483-7341.

### WANTED

Frost-free refrigerator in good or xln cdtm for beach house, must be reasonable offer. Tindall, 482-7719.

Ride from South Park area to NASA Bldg 45, from 8 til 4:30, will pay, Beaudion, 748-0039.

12-ga. shot shell loader, Lausten, 482-1004. Coffee table, dining room table and chairs, for young couple, must be in good condition. Westbrook, 867-4181.

To trade my 8' O'Day, dinghy-type, fiberglass sailboat, even for Dolphin/Sunfish type. Munford, 483-3466.

## EAA NOTICE

Ronald N. Hayes, president of the Employees Activities Association, has left MSC to enter the practice of law with a firm in Baytown. The EAA Executive Board has elected Robert F. LaMere, a member of the EAA General Assembly, to serve as interim president. Bob is with the Institutional Resources and Procurement Division in Building 45. His extension is 6201.

## Frasier Selected for Grad Study

Cline W. Frasier, Assistant Chief for Project Management of the Guidance and Control Division, has been chosen as one of forty-six executives from industry, government, and the medical and health services who will participate as 1971-72 Alfred P. Sloan Fellows in a year of graduate study at the Sloan School of Management at Massachusetts Institute of Technology (M.I.T.). The graduate program is scheduled to begin on June 18.

The Sloan Fellows Program, which was begun in 1931, is the oldest executive development program in the nation and is designed to provide young executives at mid-career with twelve months of intensive advanced management study at the graduate level. The program leads to a Master of Science degree in management.

Take stock in America  
Buy U.S. Savings Bonds

## Gals' Softball Is Now Underway

The 1971 EAA softball season is now in progress. The eight teams comprising the women's league are from TRW, IBM, General Electric, Philco, Lockheed, Brown & Root/Northrup, and MSC.

The ladies' games, which start at 5:30 each Tuesday and Thursday, are played at the softball complex in the recreation area on the north side of the Center.

The MSC team, known as the Powder Puff Girls, is made up of employees' wives and Center secretaries. The MSC ladies won their opener against TRW by a score of 18 to 12.

The remainder of the schedule for the Powder Puff Girls is as follows:

5:30	April 13	IBM Blue
5:30	April 22	Philco
5:30	April 27	BR/N
5:30	May 6	GE
6:45	May 11	Lockheed
6:45	May 20	TRW
6:45	May 25	IBM Gold
5:30	June 1	GE

## NASA Develops Supercritical Wing; First Flight Is Labeled A Success

A new airfoil shape that may reduce significantly the cost of future travel was successfully flown recently at NASA's Flight Research Center at Edwards, California.

Called the NASA supercritical wing, it was flown on a modified F-8 jet fighter by Thomas McMurtry, a civilian research-pilot engineer for the Flight Research Center.

Because the upper surface of a conventional wing is curved, air flowing over it travels faster than the speed of the aircraft itself. When this airflow reaches supersonic speeds, shock waves cause an increase in drag and a loss in efficiency.

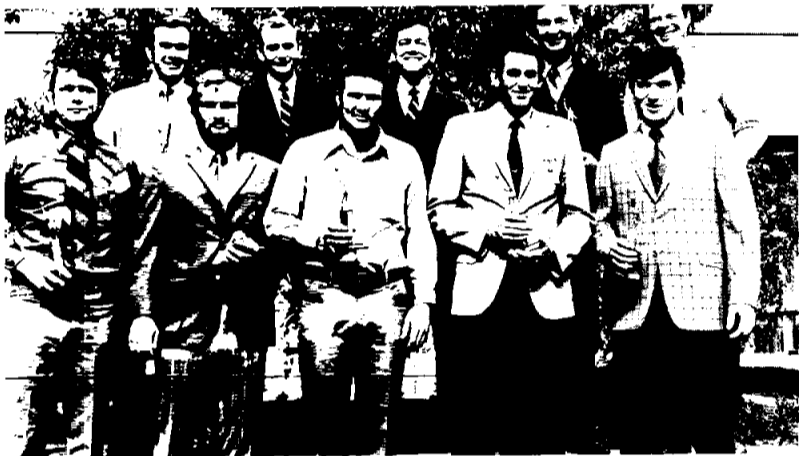
The supercritical wing is flattened on the top to slow down the speed of the airflow. This allows

the airplane to cruise at a higher speed before the wing airflow reaches the speed of sound and also should increase the overall efficiency of the wing in flight.

The NASA supercritical wing was developed in the wind tunnels at Langley Research Center under the direction of Dr. Richard Whitcomb. Tests there indicate that the new airfoil could allow highly efficient flight near the speed of sound.

If the performance measured in the wind tunnels can be achieved during flight, it should be possible for future jet transports to cruise at the higher speed with no increase in fuel consumption. This advantage can then be converted into lower operating costs per mile.

## 1970 - 71 Basketball Champs



THE ASSOCIATION won the post-season basketball tournament in which MSC, contractor, and Air Force teams competed. Front row (l. to r.), Larry Ratcliff, Gene Ricks, Larry Armstrong, Ken Young, Phil Shannahan. Back row (l. to r.), Al Morrey, Rich Kruse, Tom Keaton, Gid Weber, and Lee Norbraten.



THE BLUE DEVILS were champions of the MSC Competitive Basketball League. Front row, (l. to r.), Vernon Shields, T. Bruce, mascot Kathy Cannon, Glen Smith, Jim Pawlowski. Back row (l. to r.), Jared Woodfill, John Miller, and Wayne Whittington. Missing from the picture is Morris Lile.

## National Secretaries Week Is Set

(Continued from page 1)

ganized by the local chapter of NSA. For additional information on the requirements for membership in the local chapter and on Secretaries Week activities, contact Helon Crawford at extension 3809.

The president of the NSA, speaking on behalf of the 28,000 members, says, "When we state the purpose of Secretaries Week as focusing attention on professional secretaries, we don't mean in the form of flowers, lunches or an afternoon off. We do mean

recognition for the job we can do, are paid to do, and that we have elected as a service career."

## Griffey Retires

Gilbert W. Griffey, an employee in the Reliability and Quality Assurance Office at MSC-Downey, retired on April 2 after close to 31 years of government service.

He began his association with NASA in May 1963. Prior to that time, he was with the Air Force Systems Command.



LIGHTS, CAMERA, ACTION—Nyquist and Johnson, the moviemakers who shot the film of Dr. Craig Fischer (center, in white coat) and a group of Brown & Root/Northrup employees as they confer in one of the labs.

## USIA Film Will Depict The Work, Techniques, And Staff Efforts of MSC's Clinical Laboratories

"One Man: Craig Fischer" That is the title of a movie recently filmed under the auspices of the United States Information Agency (USIA) as part of its series of films attempting to show to millions of people throughout the world the lives of typical American citizens.

Dr. Craig Fischer is the pathologist and Chief of the Clinical Laboratories in the Lunar Receiving Laboratory. The labs are part of the Preventive Medicine Division headed by Dr. W. W. Kemmerer.

Dr. Fischer has been with MSC for seven years. He believes that he and the other people who staff the clinical laboratories were chosen as subjects by the USIA because the work they are doing is of great "human interest to the common man." Medicine is a field which affects everyone, in one way or another, in the course of a lifetime.

Part of the film was shot during the quarantine of the Apollo 14 crew—scenes showing Dr. Fischer's activities with the crew members and, in a lighter moment, celebration of his birthday. The movie crew shot from behind glass, and Terry Slezak, the photographer in quarantine with the astronauts, provided footage from within the quarantine area.

Though a portion of the 15-minute film is devoted to Dr. Fischer's activities, his wife Sandra, and their children Emil and Lisa, the majority features the work and workers of the clinical laboratories.

The efforts of the labs fall into three broad categories — service, investigative, and research.

Within the service category is included all human-oriented lab testing performed at MSC. Laboratory examinations of the astronauts and crewmen, medical care for dependents of crew members, laboratory support of the occupational medicine program for NASA employees, and the executive medical program constitute what is called the "service load."

The investigative aspect of the clinical laboratories program focuses on man's reactions and changes — adaptive and pathological — in an unusual environment. In pre- and post-flight physicals, astronauts are examined to determine the extent of change their bodies may have undergone in the space environment. Certain adaptive changes, which are considered normal, such as weight loss or re-adjustment in total body fluids, have been observed in the crews returning from space flights. However, no pathological or irreversible changes have occurred.

Dr. Fischer has also performed tests on aquanauts who have been subjected to stays of long duration in the underwater environment. The clinical laboratories have been involved with the Navy's Project Sealab III and more recently with the Tektite project, a joint effort of NASA, the Department of the Interior, and General Electric.

The third area of effort is research. The goals are to perfect and to put into general use ways to detect the development of disease before the disease actually afflicts an individual and to predict trends in health, not only for individuals, but for large segments of the population.

The executive and occupational physicals performed at MSC are examples of a multi-phasic health screening program which allows early detection of disease. Many phases of an individual's health are tested over a period of time. If certain deleterious trends are observed, remedial action may be taken before the disease, such as atherosclerosis or diabetes become advanced.

In line with research are educational activities. All professional members of the clinical laboratories staff hold faculty positions at either Baylor College of Medicine or the University of Texas Medical Center at Galveston. A number of National Research Council postdoctoral associates have performed research in

the laboratories for one to two year periods of time. In addition, the visiting faculty members and medical extern programs have brought professors and medical students from all over the United States to the Center for summer research sessions.

The data management system, a real-time on line computer system developed within the laboratories, is being studied by the Department of Community Medicine at Baylor. Dr. Fischer estimates that 33 to 40 percent of the time in a hospital lab is spent in book-keeping or records management. The computer can do this same work more quickly and cheaply, providing a "time-cost benefit."

Dr. Fischer expressed hope that the USIA film will show to the peoples of the world some of the exciting work in medicine being performed within the U. S. space program. He emphasized not only the benefits already obtained, but also the far-reaching benefits of early disease detection in the future.

## Computer vs. man

(Continued from page 1)

equivalent of 1,032 man-years of manual calculations. Then, multiplying 1,008 minutes by 1,032 man-years per minute brings the total man-years of manual calculation to 1,040,256. This is how long it would have taken one man to calculate the correct trajectory for the burn of the Lunar Module Descent Propulsion System engine, to place the Apollo 13 crew on a free return trajectory.

Had a desk calculator been used, the time to figure the correct trajectory would have been shortened to a mere 60,480 man-years. Had all the people in the Mission Planning and Analysis Division at that time (a total of 220) been assigned the task, it could have been manually computed in just under 4,730 years or by the year 6700.

As we said to begin with, thank goodness for computers!



THEY'RE OFF AND RUNNING—Eager youngsters (above) wait at the "starting line" before last Saturday's EAA Annual Easter Egg Hunt. None of the youngsters were stepped on, but the same cannot be said of more than a few of the 2500 colored eggs which were hidden around the recreation area on the north side of the Center. The bottom picture reflects the hurried searching of some of the more than 450 two through eight-year-olds who made this year's Egg Hunt the biggest to date.

## Earth Awareness group offers ways to show "I care"

The Earth Awareness Foundation, with its motto "Earth, I Care," grew initially out of the Space Center Rotary Club's study of the drug problem.

As this problem was analyzed, members of the Rotary Club composed of MSC and local aerospace industry employees, soon began to realize that drug abuse was symptomatic of many other problems, such as overpopulation, pollution of the environment, and an increasing variety of social pres-

ures. Out of this realization came the idea for the Earth Awareness organization.

Specifically, the Foundation came to life as a result of a meeting at Cape Kennedy on the eve of the Snoopy-Charlie Brown flight of Apollo 10.

The participants in the meeting and founders of the organization were MSC's Dr. Charles Berry, Director of Medical Research and Operations; Astronauts Russell Schweickart and Walter

Cunningham; and Eugene Horton, head of the Educational Programs Office. Jerome Lederer, NASA Director of Safety; Cartoonist John Hart, creator of "B.C." and "The Wizard of Id;" Dr. Preston Farish, Systems Safety Manager at Marshall; Robert Scott, Manager of Aerospace Corporation's Washington, D.C. office; Philip Bolger, Deputy Director for NASA's agency-wide safety program; and Albert Chop, Manager of the Manned Flight Awareness program, make up the remainder of the founding group.

Since its inception, the Foundation has developed programs and chapter organizations of school-age young people in several states and in Canada. Operating revenues are derived from the sale of products designed by cartoonist Hart and from donations and grants.

Currently the group is negotiating an \$80,000 program with community leaders and the Environmental Protection Agency to involve 80 high school students from the Houston area in an in-depth ecology study of this part of the Gulf Coast. The study, which will involve classroom instruction and ten weeks of summer field work under the guidance of the Foundation, the University of Houston, and Texas A&M, will teach young people how to take and interpret samples of air, water, and solids waste in order to better understand the interworking forces of nature and man in the Houston community.

Each student will be paid on the basis of full work weeks of environmental sampling, investigation, and report writing.

Currently, under the sponsorship of the Foundation, other students are involved in a host of activities to focus attention on problems and potential solutions



CLEANUP DAY—The Clear Creek High School chapter of the Earth Awareness Foundation, which includes many sons and daughters of MSC employees, recently sponsored a Saturday cleanup campaign along NASA Road 1. The top picture shows the group hard at work, and the bottom photo illustrates the results of their efforts.

## Thermal-Vacuum Tests for Skylab and J-Series Apollo Missions are successfully concluded in SESL

(Continued from page 1)  
General Electric, & Boeing SESL test team elements as well as a special task team from North American Rockwell which maintained and operated the spacecraft and participated in real-time analysis.

Most of the testing was concerned with new modifications to the service module. However, analysis of the command module under powered-down, low temperature conditions was carried out successfully as a follow-up study of those conditions which occurred during the emergency phases of the Apollo 13 mission. This analysis will also be useful in predicting conditions in the command module during the long powered-down earth orbit stay times of the Skylab mission.

Thermal-vacuum testing as performed on spacecraft 2TV-2 re-

quires that several very hostile, conflicting natural environments of space be simulated, so that their combined effects on spacecraft performance can be determined. These are hard vacuum, deep space heat sink (space functions to absorb heat from anything placed in it if the object is warmer than about minus 456 degrees Fahrenheit), solar radiation, reflected sunlight from the earth or moon (albedo), and heat emitted from the warm earth or moon (planetary emission).

Test manager Albert Branscomb, who represented the Space Environment Test Division which operates the SESL, said that the 65 foot diameter, 120 foot tall Chamber A is the largest known facility which simulates all of these conditions simultaneously with a high degree of precision. It, and its smaller companion, Chamber B, are also the only such facilities which are fully manned, though no human test subjects took part in the 2TV-2 test series.

During the tests, the chamber was required to produce, at different times, conditions existing in lunar orbit, transearth coast, and earth orbit at various orbital inclinations.

In the Apollo J-Series missions (15, 16, and 17) one bay of the service module will contain a lunar orbit experiments package. The door of the bay will be ejected prior to lunar orbit insertion, exposing the instruments for operation. The 2TV-2 tests proved that all of the instruments would stay within their temperature limits and that there would be no detrimental effects as a result of the open bay. The configuration, specifically designed for Apollo 15, is "thermally acceptable under both transearth and lunar orbit conditions," according to Joslyn and Branscomb, and the tests were also conclusive for the Apollo 16 and 17 SIM bays.

Whereas the Apollo spacecraft rotates on its longitudinal axis as it speeds through space and thereby has even exposure to the sun and space heat sink on all sides, Skylab will be essentially in a stationary position with relation to the sun. The lunar albedo and

planetary emission of the Apollo mission are also quite different from the earth albedo and planetary emission involved in Skylab operations. Changes made to the Skylab service module to account for these different conditions included new heaters for the reaction control system (RCS) and service propulsion system (SPS), revisions to the thermal insulation in several areas, and changes to some of the external paint which controls how much heat is reflected or absorbed by the spacecraft.

The first test of 2TV-2 showed that the new heater system on the Skylab RCS was not performing as expected, so design changes were made and successfully verified in a later test of the series. This is particularly important since the revised RCS on Skylab functions as a backup to the service propulsion system to de-orbit the spacecraft and return the crew to earth. The 2TV-2 test data, which are still undergoing analysis, have also disclosed several other areas where additional evaluation is required to assure Skylab design adequacy.

Al Joslyn, commenting on the importance of the 2TV-2 tests, stated, "Without these thermal-vacuum tests, the first Skylab mission would probably have had to be prematurely terminated."

The unique testing capability of chambers A and B keeps the SESL test team busy. As 2TV-2 was being moved out of Chamber A, final preparations were underway for manned qualification tests of the Apollo 15 extravehicular mobility unit in Chamber B. Other thermal-vacuum tests on this year's diverse schedule include manned operation of several Lunar Rover Vehicle sub-assemblies, a crew endurance test to be performed for the Medical Research and Operations Directorate, and tests of the Skylab Apollo Telescope Mount in support of the Marshall Space Flight Center.

The Space Environment Simulation Laboratory is featured on the weekday public guided tours of MSC conducted by the Public Affairs Office.

**10 YEARS AGO—**The Space Science Board of the National Academy of Sciences submitted to President John F. Kennedy its recommendation that "scientific exploration of the moon and planets should be clearly stated as the ultimate objective of the space program for the foreseeable future."

On April 12, the Soviet Union announced that Major Yuri A. Gagarin had successfully orbited the Earth in a 108-minute flight in a 5-ton Vostok (East), the first man to make a successful orbital flight through space.

in other areas of environmental concern. These activities include participating in radio "rap sessions" with representatives of local industry, setting up fundraising activities for the benefit of Foundation work, and publishing with the Earth Awareness founders a nationally-circulated monthly newsletter.

Headquarters for the Foundation are at 1730 NASA Boulevard, Suite 211. For additional information on the organization and its activities, call 591-3101 or visit the office on Saturdays from 10:00 a.m. to 2:00 p.m.