ROUNDUP

NASA MANNED SPACECRAFT CENTER HOUSTON, TEXAS

VOL. 11 NO. 4 January 7, 1972

IN TRAINING—Apollo 16 crewmen John Young, Charles Duke, and Thomas K. Mattingly are pictured here in two phases of their training for the Apollo 16 mission set for launch on March 17. On the left, Astronaut Charles Duke (left), MSC geologist Fredrich Horz (center), and Apollo 16 Commander John Young examine an Apollo 15 lunar rock sample in the Lunar Receiving Lab. At right, Ken Mattingly practices in the Building 5 water tank for his deep space EVA during which he will retrieve film from the SIM bay of the Apollo 16 service module.

Agency gets Go-ahead to Develop Shuttle

President Richard M. Nixon announced this week his decision to see the nation proceed with actual development of the Shuttle, a reusable space transportation system.

MSC has been named the lead center with responsibility for program management, overall engineering and systems integration, and basic performance requirments for the Shuttle.

This Center will also be responsible for development and testing of the orbiter stage of the Space Shuttle.

In a briefing to newsmen after the President's announcement, NASA Administrator Dr. James Fletcher outlined the Shuttle program structure.

"This decision by the President," Fletcher said, "is an historic step in the nation's space program—it will change the nature of what man can do in space. By the end of this decade, this nation will have the means of getting men and equipment to and from space routinely, on a moment's notice if necessary, at a small fraction of today's cost."

The decision to proceed, Fletcher stated, is consistent with the plans approved by Congress in NASA's Fiscal Year 1972 budget. The program will be carried out "within the framework of a useful total space program of science, exploration, and applications at approximately the present overall level of the space budget," he said.

The President will ask Congress for $5.5 billion in Shuttle program funding over a six-year period. This is approximately one-fourth the cost of the Apollo program.

MSC's role in the Shuttle program was announced by the Office of Manned Space Flight in June 1971. Marshall Space Flight Center has been given responsibility for the booster stage and Space Shuttle main engine. Kennedy Space Center will be responsible for design of launch and recovery facilities.

NASA will issue a request for prospective contractors in the spring. During the summer, the Agency will place the Shuttle under contract and development work will begin.

Costs per mission of the operational Shuttle are estimated to run about $10 million each, and the payload cost per pound will drop to about $100, compared to the present $600 to $700 per pound.

The Shuttle will be capable of carrying into space virtually all types of payloads—scientific and applications, civilian and military, and manned and unmanned.

Details set for NASA and Soviet Exchange of Medical information

NASA and the Society Academy of Sciences have agreed on the substance and mechanics for future exchanges of medical and biological data based on experiences in manned space flight.

Details of the agreement are contained in recommendations of a joint working group on space biology and medicine which met in Moscow during October. The group met pursuant to an agreement of January 21, 1971, between NASA and the USSR Academy of Sciences on space cooperation.

The Joint Working Group began examining selected bio-medical data and the results of manned flight programs and exchanged reports on the Soyuz and Apollo programs. The group focused particularly on biomedical results of manned flight pertaining to the cardiovascular system, metabolism, water-electrolyte exchange, and biological research, among other areas.

The working group recommended that meetings be held at least once a year or more often should the need arise. An additional recommendation was that working sessions be held to discuss such topics as:

- Methods of predicting the state of the human organism during and after space flights.
- Response of the cardiovascular, endocrine, fluid and electrolyte balance, and central nervous systems to the space flight environment.
- Techniques of dysbarism (condition following exposure of body to less than atmospheric pressure in air flight or altitude chamber) prevention in crew members.
- Methods of pre- and postflight medical observations of crew members.
- Objectives, methods, and results of biological experiments, including developmental and genetic research, with a view to coordinat- U.S. and Soviet programs.

The working group further recommended that the next meeting be held in May 1972 in the United States to consider methods of predicting the condition of the human organism during and after space flights, methods of pre- and post-flight medical observations of crew members, and recommendations to achieve the consistent use of terminology.

From the October meeting came the additional recommenda-

(See MEDICAL, Page 4)

Jack King named as PAO Chief

John W. (Jack) King, Chief of Public Information at Kennedy Space Center, has been named to the post of Public Affairs Officer at MSC.

Dr. Robert R. Gilruth announced the appointment late last month.

In his eleven years at Kennedy, King has been responsible for news media activities surrounding launch operations at the Kennedy Space Center and Cape Kennedy

(See KING, Page 2)

MSC enters into Water agreement

MSC and the Clear Lake City Water Authority have signed an agreement whereby the Water Authority will provide treatment of the Center's wastewater.

Located about 300 feet from the MSC boundary, the Water Authority's treatment facility will be connected by pipeline to the Center's facilities.

In August 1970, the Texas Water Quality Board ordered all Clear Lake waste dischargers to divert effluent from the lake or to upgrade treatment of the effluent by August 1972.

Earlier in 1970, the President had notified federal installations of a requirement to meet more stringent effluent standards.

As a result of these two actions, MSC had initiated plans to upgrade its sewage treatment facilities. However, in March last year, the Clear Lake City Water Authority proposed that it provide the advanced treatment of MSC wastewater.

Both federal and state pollution regulatory agencies have endorsed the Water Authority's proposal.

Though MSC must install a connecting pipeline, considerable money will be saved by not hav-

(See WATER, Page 4)

S. Claus pays holiday visit to Center

Santa Claus came to MSC the day before the Christmas holiday weekend.

An MSC employee who began making these visits at Langley and has continued each year at this Center, the gentleman refused politely but firmly to reveal his real identity. His visitor's badge affirmed that, at least for a day, he was indeed Santa Claus.

His wife made the handsome costume sixteen years ago. Only the fur trim has been replaced in all those years. He fashioned the brass belt buckle in the metal shop at Langley (hmmm . . . could that be a clue to his identity?).

Though he tries to reach every office, he finds it almost impossible to cover the entire Center in one day. If you didn't see him this year, it wasn't due to his lack of trying to get to where you were!

And, if you didn't receive a personal "Merry Christmas" from MSC's Santa this year, don't fret. He promises to make the rounds again next year. Be watching for him!

Afraid that Santa might miss Building 1 on his travels, someone in the Public Affairs Office put out an all points bulletin for the gentleman. Within minutes, he arrived on the scene, granted a brief interview, and agreed to pose for a picture or two. Gathered in front of the PAO Christmas/Chanukah decorations are (l. to r.) Sydni Shollenberger, Judie Boin, Gloria Martinez, Santa, Stella Luna, Judy Price, Jeannie Row, and Pauline Hammons. Terry White (right background) manned the phones while "Pat" Patnesky manned the camera.

THE MAGIC NUMBER—Mr. and Mrs. Willard Andrews and their family, from Iowa and Illinois, were the one millionth visitors to MSC in 1971. They were here on December 29. Bill Wicklund (left) of Visitor Services explains some features of the lunar module displayed in Building 1 to the group. This is the second year in a row that MSC has recorded in excess of one million visitors.

Navy to aid philatelists once again

The U. S. Navy's Manned Spacecraft Recovery forces in the Atlantic and Pacific will cachet and cancel philatelic mail for the March 17, 1972 launch of Apollo 16.

The special Apollo 16 covers will be processed through designated coordinators at Norfolk, Virginia, and Honolulu, Hawaii. From the Hawaii site, First Day covers will be forwarded to the recovery ship.

Atlantic covers sent to Norfolk will be processed through the local Post Office, which will use the standard "U. S. Postal Service" cancellation device. This cancellation will not contain the name of an Atlantic recovery ship.

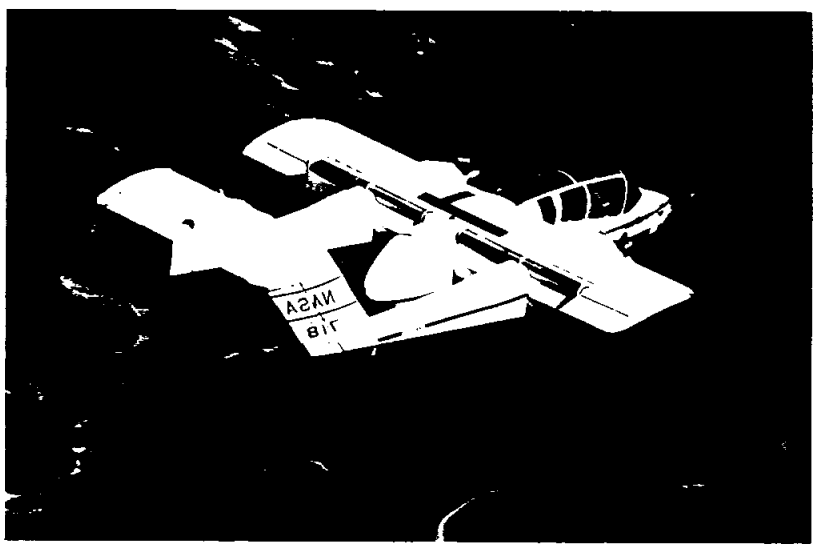
To insure adequate time for handling covers, collectors should send pre-stamped, self-addressed envelopes to the appropriate coordinator before Feb. 25.

Current U. S. Post Office regulations require that only United States postage may be used on covers. Cash, money orders or checks in lieu of postage cannot be accepted.

Collectors are requested to furnish standard-sized covers, 3⅝ inches by 6½ inches, to simplify handling. A three-inch square should be allowed on the left-hand side of envelopes so the cachet may be applied.

Each recovery force coordinator will accept only two covers per collector. When more than two are received, the extras will be returned unprocessed. Covers received too late for processing will also be returned.

Addresses for area coordinators are: *Atlantic*: Apollo 16 Covers, Task Force 140, Naval Air Station, Norfolk, Va. 23511; and for the *Pacific*: Chief - in - Charge (Apollo 16) Task Force 130, Navy Terminal Post Office, Fleet Post Office, San Francisco 96610.



BRONCO—This OV-10A Bronco aircraft is being used in NASA's Short Take-off and Landing (STOL) research program. The aircraft has been equipped with experimental rotating cylinder flaps, one of a number of STOL concepts being investigated for possible application to civil and military aircraft. It is now being flown at Ames Research Center in California.

ROUNDUP

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

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Photographer: A. "Pat" Patnesky

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)

MISCELLANEOUS

Exchange ticket for one day all lifts at Vail, valid all 1971-72 season, $7.50. Thomas, 333-3012.

Riding mower, Sears; 32" cut, 6 hp, good cndn, $75. Truman, 482-7042.

Blonde Dutch Boy wig, $10. Deans, 488-4009 after 5 p.m.

VEHICLES

67 Ford pickup, ½ ton F-100 w/camper topper. Duoto, 966-1612 after 6 p.m.

67 Pontiac, custom Tempest, A/C & power, one owner, xln cndn. Duoto, 966-1612 after 6 p.m.

70 VW, $1525. McClure, 481-4660.

67 Mustang 2+2, V8, 4-speed, air, power disks. Rainey, 488-4384 evenings.

Dune buggy, 67 VW engine, stick shift, metalflake peacock blue, sandtires, good cndn, $800. Hamilton, 472-2118.

63 Corvette coupe, 427-390, 4-speed, AM/FM, positraction, factory air, power steering brakes, LeMans blue. Graves, 488-5641.

Camping trailer, tent type, Wards Vacationer, sleeps four, $175. Brown, 482-1582.

63 Toyota, good cndn, $200 under book. SACRIFICE, MUST SELL! Fitzgerald, 482-7143.

70 model Henslee mobile home, 10'x48', 2 bedrooms, unfurnished except for appliances. Take over $85.93 payments. Owner will pay transfer tax. Ross, 941-8617.

65 Dodge Polara station wagon, automatic, factory air, radio, new tires, xln cndn, $800. Conger, 946-7793.

65 Chevy, V8, air, overdrive, radio, economical, $550 or make offer. Deiterich, 482-1859.

65 Pontiac Lemans, buckets console, air, automatic, extra clean inside and out, runs good, reasonable. Palazzola, 488-0125.

66 VW with air conditioner and radio, $775. Beerman, 944-1230 after 6 p.m. weekdays; all day weekends.

66 Pontiac Catalina, air, automatic, new tires, muffler, tail pipe & front end job. $600. Shearin, 946-5847.

65 Buick Sportswagon custom, air, radio, power, priced for quick sale, $650. Moore, 488-2204.

59 VW sedan, good transportation or dune-buggy material, $175. Moore, 488-2204.

69 Ford LTD; 63 Ford Falcon, both reasonably priced. Pearson, 877-2701.

Boys 5-speed bike, Sears delux model, xln cndn, $29. Vincze, 877-2237.

70½ Honda CL 450, 6000 mi., xln cndn, red, $800. Ardoin, 877-4960.

70 Buick Electra, loaded, xln cndn, in warranty. Dietz, 534-3665.

Boys 20-inch Schwinn bicycle, $10. Kosel, 534-5818.

HOUSEHOLD ARTICLES

Grandmother clock, solid walnut, 8-day full Westminster chime and hour strike, polished brass dial, pendulum & weights. Koepke, 488-2797.

Antique "S" roll top 44" desk, spinet desk, hi-back rocking chair, and hi-back hall chair. Fuller, 488-3985.

New mattress/springs/frame for dbl. bed, $75. Deans, 488-4009 after 5 p.m.

SOUND EQUIPMENT

Auto stereo cartridge tape player, Realistic Compact-8, complete, like new, paid $50, sell $30. Wardell, 333-3587.

Hi Fi old time quality: Mono EICO amplifiers, Fisher tuner, Webcor Regent Coronet stereo tape recorder. Jones, 471-3303.

BOATS

Gulf Coast 22 sailboat, all fiberglass, sleeps four, with Main, Lapper, and extra large winches, $2995. See at Seabrook Shipyard. Erickson, 488-1901.

12' semi-V fiberglass Sears Gamefisher boat, $140; 9½ hp Evinrude, $250; Shakesphere 101 electric troll motor, $25. All like new. Brown, 482-1582.

Luxurious 16' speedboat, 120 hp outboard engine, trailer, equipment, including professional ski-tow bar. 1971 models in mint condition, $3395. Bland, 333-4580.

MUSICAL INSTRUMENTS

Cornet, Old's, xln cndn with case and music stand, $95. Fuller, 488-3985.

CAMERAS

Bell & Howell 8mm projector and Rever 8mm mag. load camera with turret lens (wide angle, telephoto & stnd). Both for $25. Bullock, 483-5987.

REAL ESTATE & RENTALS

Lake Conroe, ½ area and larger heavily wooded lots, 3 minutes from lake, direct entrance from I45, $2500 up. Land, 782-6904.

Lease: Clear Lake City townhouse; 2 BR, 1½ bath, private patio, washer & dryer, carport, storeroom. All built-ins in kitchen, $210 bills paid. Mrs. Deans, 488-4009 after 5 p.m.

Alvin, 2 large residential area lots with tall pines Hillcrest addition, each lot is 80 x 120. Messer, 488-1175.

PETS

AKC Old English Sheepdogs, an outstanding litter of these exceptional dogs is due the first week of January. Make your reservations now. Patterson, 482-2011 or 333-3867.

Boxer puppies, AKC registered, xln pedigree. Davis, 946-2503.

AKC miniature schnauzer, male, 7 months, shots, ears cropped, $100. McAvoy, 488-4083 after 5 p.m. weekdays.

Toy poodle, male, shots, house-trained, 5 months old, $75. Ward, 481-2266.

WANTED

Used 3-speed motor for Kenmore washer (1966-67 vintage) in working condition. Sayers, 333-2395.

Metal exercise weights and/or dumbbell sets, will pay 15¢ lb., no plastic please. Kiehn, 483-5121.

Used motorbike, 5 hp or under for 15 yr. old. Philippi, 474-4826.

ACTIVITIES

Fly with the MSC Aero Club. Learn for less in our Cessna 150. Take your friends in our 172 or get there fast in one of our two transponder-equipped Bonanzas. Dave Friis, 488-2601.

Soccer coaches needed for a newly-formed Bay Area league for kids 8 to 18. Call Ray Posgay at 474-3579.

LOST AND FOUND

Found: Man's diamond wedding ring near Bldg. 35. Millican, 488-2384.

Found: Girl's identification bracelet in the parking lot in front of Bldg. 2. Sommer, 483-2397.

Lost: Single strand, graduated cultured pearls. Carlin, 483-2938. Reward.

Golfers organizing for 1972 season

"The MSC Golf Association is looking for new members," says Dave Dyer, MSCGA vice-president and membership chairman.

Those MSC and contractor employees interested in playing golf should contact Dyer at extension 4405 for membership applications.

The membership drive began on January 1, and the cut-off date for joining is February 15.

Eleven tournaments were played in 1971. At least an equal number are on tap for 1972.

The MSCGA officers for 1972 are Ernie Weeks, president; Jim White, trophy and rules chairman; Bill Dusenbury and Gerry Shinkle, tournament co-chairmen; John Jones, handicap chairman; and Bob Reaves, treasurer.

"Bold Ones" will air a NASA story

"Short Flight to a Distant Star" is the title of a "Bold Ones" show to be aired here on January 23 at 9:00 p.m. on KPRC-TV, Channel 2 in Houston.

The story, based on an actual case, revolves about a shooting victim who has a bullet lodged in his brain.

Fearing to operate because of the bullet's position, the doctors asked for assistance from personnel at the Ames Research Center in California.

In addition to the regular cast of the TV series, four Ames employees who took part in the real life drama will perform in the reenactment.

Center is honored by GIDEP

The Government-Industry Data Exchange Program (GIDEP) has presented its 1970 Achievement Award to MSC.

Martin L. Raines, Manager of MSC's Reliability, Quality Assurance, and Safety Office, accepted the award on behalf of Center Director Robert R. Gilruth at ceremonies during GIDEP's Ninth Annual Workshop in San Francisco.

GIDEP is an organization primarily concerned with reliability data in the development or operation testing of weapons and aerospace systems.

This Center was chosen for the award on the basis of a $1.2 million cost avoidance in parts and component testing, the quality of its test information releases, and cooperation in responding to inquiries by other GIDEP members.

H. W. Fritz of the Reliability Division is MSC's GIDEP representative.

Duke hospitalized

Apollo 16 Lunar Module Pilot Charles Duke was admitted to Patrick Air Force Base Hospital in Florida earlier this week for treatment of bacterial pneumonia.

Astronauts John Young and Thomas K. Mattingly, the other Apollo 16 crewmen, have shown no signs of illness.

Poetry group picks V. De Foy as V-P

Virginia DeFoy of the Photographic Technology Division was recently elected to the office of second vice-president, Houston Chapter of the Poetry Society of Texas. She will hold the office for a year.

A poet who has won local recognition for her work, Virginia would like to see other MSC employees who might have poetic inclination, join the Society.

John Boynton of the Mission Planning and Analysis Division, who has recently published his first book of poems, will judge the Society's January poetry contest.

For more information on Poetry Society activities, call Virginia at x6305.

King to head PAO

(Continued From Page 1)

Air Force Station.

During this period, he has taken part in more than 200 launches, including all the manned missions in the Mercury, Gemini, and Apollo Programs.

A native of Boston, King and his wife Evelyn have three children, Chip, 13; Elizabeth, 4½; and William, 2.

King will assume his duties at this Center late in January.

HIGH RANKING RECRUITER—General Leonard F. Chapman (left), Commandant, U.S. Marine Corps, visited MSC recently and took the opportunity to give Astronaut Fred Haise (right), a former Marine aviator, a recruiting speech. The bumper sticker Haise is holding reads "The Marines are looking for a few good men." Enjoying the good-natured kidding are Astronauts Jack Lousma (left center) and Gerald Carr (right center), both of whom are Marine officers. The Marine colonel behind Carr is one of the distinguished group who accompanied General Chapman during his tour of Center facilities.

Photos shed light on Solar phenomena

Apollo 15 photographs of the sun and of interplanetary dust showing features of the solar corona and zodiacal light never before observed by man were described by scientists during a recent conference at the Lunar Science Institute.

The pictures, taken by Apollo 15 Command Module Pilot Al Worden, include views in the darkest region of the solar system yet reached by man—the so-called double umbra region where the moon shadows the spacecraft from both direct sunlight and light reflected from Earth.

Robert D. Mercer of the Dudley Observatory in New York and Lawrence Dunkelmen of Goddard Space Flight Center, both members of the Apollo Photo Science Team, described the photos in a paper presented at an Apollo 15 investigators' symposium.

They said, "Preliminary examination of the Apollo 15 photographs shows we are seeing light levels less than can be seen by the best telescopes on earth."

Analysis of the photos will allow scientists to make direct, comparative measurements of the relative brightness of solar phenomena. This will provide information on the mechanisms by which energy leaves the sun and on the distribution of particles outward from the sun.

Worden took the pictures as part of low light level astronomy studies, which produced photos of the sun's corona and related zodiacal light, of a lunar eclipse, and of regions of interplanetary dust.

Win a Mini . . .

BIKE, that is!

You can be the lucky winner of a Honda minibike, the grand door prize to be given away at the MSC Federal Credit Union's annual meeting on Friday, January 28.

The time to be there is 7:00 p.m., and the place is the Building 1 Auditorium. To be eligible for the bike, $300 in cash prizes, and other valuable gifts being given, you must be a member of the Credit Union, and you must register at the door of the Auditorium on the 28th.

A 5¾ percent dividend has been declared for shares on deposit in the Credit Union for the last quarter of 1971. One-fourth percent of this is being paid as a bonus.

If you're not a member of the Credit Union, why not join today or at least in time to be eligible for winning a great prize at the annual meeting.

? SPACE QUIZ ?

On page 4, you'll find the correct answers to the following five questions.

1. Since the introduction of communication space satellites, the cost of a 3-minute phone call between Washington, D.C., and London, England, has been reduced by approximately (a) one-fourth (b) one-half (c) one-third.

2. Hospitals or medical schools that have installed new surgical facilities employing space-related "clean room" technology now total (a) seven (b) eighteen (c) twenty-four.

3. As compared with the number of United States' successful launches, Russia in 1970 achieved (a) less than half as many (b) about twice as many (c) almost three times as many.

4. The Soviet Union is estimated to be spending about two percent of its gross national product on space activities as compared with the U.S. figures of (a) less than half of one percent (b) three and a half percent (c) five percent.

5. The U.S. civilian space program this fiscal year will represent how much of the federal budget dollar? (a) 7.6 cents (b) 4.2 cents (c) 1.4 cents.

WHATS NEW IN THE LIBRARY?

Kepler Predicted Landing on Moon

The MSC Technical Library has recently acquired a book entitled *Johannes Kepler, 1571/1971.* It was a gift to the Library from the German Embassy.

Albert Bradley, who heads the Library, has read the book and found it fascinating. He believes that many MSC-ers would find the book interesting, too. Here is his review.

The book points out that Kepler was the first scientist to recognize space flight as a physical problem, and to discuss it in this sense.

In 1609, Kepler wrote a book entitled *Lunar Astronomy* in which he correctly estimated the destructive effects of the sun outside the protective atmosphere of Earth.

In *Lunar Astronomy,* Kepler predicted some of the problems of a voyage to the moon. He realized that owing to the movement of the moon around the Earth, the astronauts' flight-path must represent a line stretching from the Earth to a point in the universe on which the moon and spaceship converged simultaneously.

He urged his readers to imagine the thrust which the astronauts would have to withstand if they were to leave the Earth with the necessary acceleration to complete the journey *in 4 hours!*

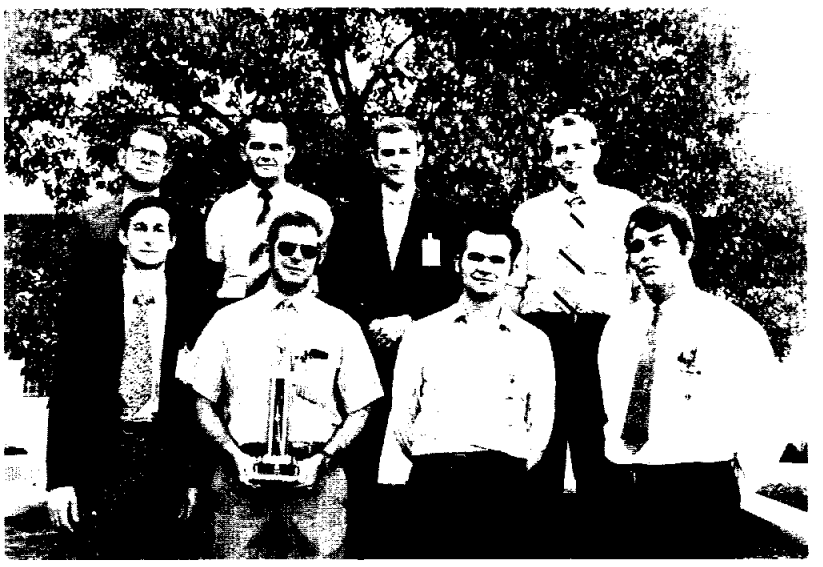
Kepler wrote that once the spaceship is beyond the attraction of the Earth, no further propulsion would be needed. Rather, the astronauts would spend the greater part of their time in a weightless condition.

He warned that at the end of the moon trip, powerful brakes would be needed in order not to crash onto the moon's surface—a problem which the Apollo program had to overcome.

Kepler also predicted bitterly cold lunar nights, high mountains, and deep valleys. Men who wished to travel to the moon, Kepler warned, must risk their lives and survive many hardships. "Only those who have spent their lives on horseback," have made many ocean voyages and are accustomed to eating dried fish, garlic, "and other unappetizing food" would be capable of survival, Kepler suggested.

Johannes Kepler, 1571/1971 was published by Inter Nationes, Bonn-Bad Godesberg, Germany. It contains contributions by Wernher von Braun and Friedrich Abel which had not been published prior to this work.

You'll find the publication on the new book shelf in the Library—if someone else hasn't beaten you to it, that is!



PASADENA CHAMPIONS—A softball team called the "Blazers," composed of MSC employees, has won the Pasadena Fall League City Softball Championship. The Blazers played five games and were undefeated in the series. The players were (front row, l. to r.) Nick Lance, Mel Richmond, Jack Boykin, and Ivan Johnson; (back row, l. to r.) Billy Chase, Millard Pettit, Richard Kruse, and Bailey Corbett. Teammates missing from the picture are Joe Bell, Dale Frost, Tommy McNamara, and Ron Epps.

Keglers reveal mid-year standings

The Jimmy Warren Memorial Bowling League mid-season standings find the Chokers out in front by five games. The entire roster follows:

Chokers, 37-19; Alley Oops, 32-24; Bit Pickers, 32-24; Ball Busters, 31½-24½; Pin Pounders, 30-26; Hexes, 30-26; Team No. 14, 29½-26½; Spoilers, 29-27; Mixers, 27½-28½; Achievers, 26-30; Hertz, 25½-30½; Fabricators, 25-31; Splitters, 24-32, and Leftovers, 13-43.

The high team set in the first half of the season belonged to the Pin Pounders (3215). The Spoilers came through with the high team game (1158).

Clarence Council (Achievers) has taken the honors for the high individual set to date (720). Dick Burghduff (Hertz) is the first-half high individual game winner (288).

League Secretary Charles Skillman presented Burghduff with the American Bowling Congress Century Award in December. The award goes to the person who has bowled 100 points over his current average.

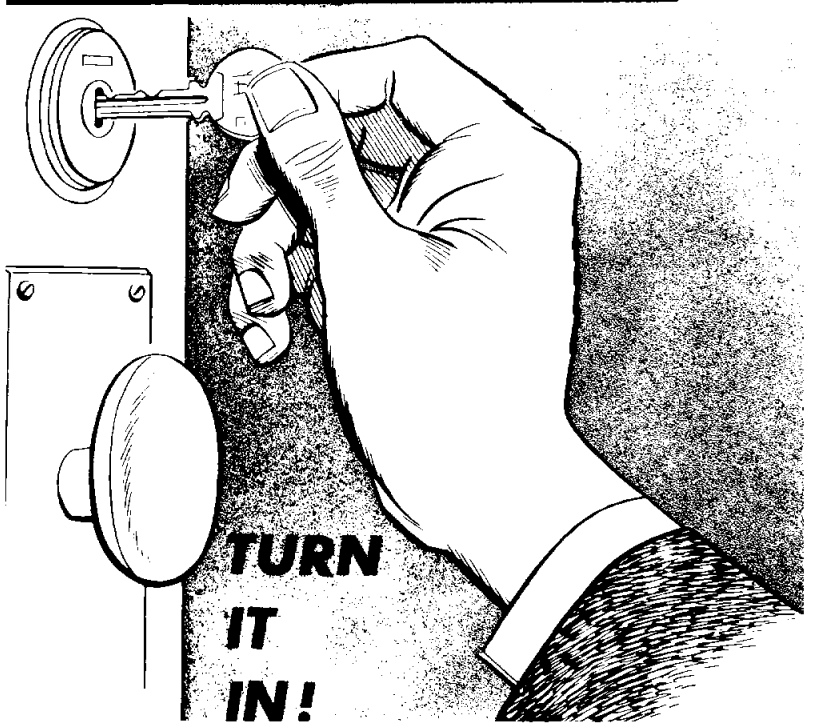
Tom Brahm had the high individual set on the last bowling night (673), and Vito Pagano had the high game honors (276).

EAA-Sponsored Clubs For 1972

Below is a list of the currently-active EAA-sponsored clubs for MSC and contractor employees and families. Perhaps in this new year you will find time and inclination to join one or more of these clubs. If you're interested in what the clubs are planning in the way of activities for 1972, call any of the contacts listed here.

Club	Contact		Meeting Time/Place
ANTIQUE/SPORTS AIRPLANE CLUB	Larry B. York Jack Joerns	X6234 X4171	As announced.
ASTRONOMICAL SOCIETY	William Chanis	X3048	Last Thur. each month Philco Ford Bldg. 7:30pm
BARBER SHOP QUARTET	Bill Drewes	X4386	As announced.
BOWHUNTERS	John Trebes	X2415	As announced.
BRIDGE	Jim Raney	X3281	Each Tues. 7:30pm Bldg. 336, EAFB
CHESS	Ken Pierce	X4704	Thur. 7:00pm EAFB Bldg. 336
FLYING	Howard Kyle	X2872	First Mon. 5:15pm Bldg. 2 Rm. 517
HOUSTON FREE FLIGHT CLUB	George Xenakis James McPherson	X2766 X4366	2nd Tues. 8:00pm 223 Viceroy, Houston
JUDO	Dale Moore Tom Murtagh	X2621 X3946	Thu. 6-9pm, Sat. 10-12am Clear Lake City Rec. Center
ORGAN CLUB	Laverne Hansen	X5421	As announced.
RADIO CONTROL AIRPLANE CLUB	Mike Gaudiano	X2297	As announced.
SCUBA DIVING "LUNAFINS"	Fred Toole Bill Moran	X2731 X2041	3rd Wed. 7:30pm Bldg 336 EAFB
SPANISH	R. Eckelkamp	X4346	As announced.
TOASTMASTERS	Al Menchacha	X4147	EAFB Officers' Club Each Tues. 6:15pm
INTERNATIONAL FOLK DANCE	Max Krchnak	X3218	As announced.
MSC STAMP CLUB	Mrs. Matt Radnofsky	877-2967	2nd & 4th Mon. 7:30pm Webster Civic Center
GOLF	Milt Heflin Bob Reaves	X4851 X2001	As announced.

YOUR IDEA MAY UNLOCK A PROBLEM



The Meaning of Christmas was giving

Motivated by the theme, "It's a Family Affair," the first Black Christmas Project, sponsored by MSC and contractor employees, collected $594.05 to purchase food and toys for 22 needy Black families.

Exceeding its original goal of $500 enabled the project to supply food and toys to two more families than initially planned. Also, the extra money allowed the group to donate $50 to an established family center in Houston for the purchase of shoes for needy children.

Contributors to the fund may be especially proud of the Christmas menu and the number of people it reached. The meal centered around a large ham and included all necessary items for completing the menu (even a decorated Christmas cake).

Though there were as many as 13 children in one family, the average family had seven children, generally fatherless, and faced a somewhat bleak and uncertain Christmas. Since each child received a toy and the parent a food package, more than 175 people enjoyed a merrier Christmas than would otherwise have been possible.

Officials who organized the project were Joseph Fuller, Howard Renfro, Quarance Patin, Joan Jackson, and Linda Williams. They hope that longer planning periods plus added experience from the 1971 operation will help future projects reach higher goals.

BAYOU BEND, the antique-filled former home of Miss Ima Hogg, will be open this Sunday, January 9, from 1 to 5 p.m., free of charge with no reservations required. Call the Museum of Fine Arts, 529-8773, for more information.

AWARDS CEREMONY—Some of those employees being honored for their individual or group outstanding achievements during the past year are pictured in the front rows of the Building 1 Auditorium during the 1971 MSC Awards Ceremony in December. Deputy Director Christopher C. Kraft, Jr. is at the podium. The names of all award recipients were listed in the December 17 issue of the **Roundup.**

HEAO's unique look at the Stars may reveal origins of the Universe

(Reprinted from the TRW *Sentinel*).

In 1054 A.D., man recorded his amazement at sighting a supernova explosion. Beginning in 1975, man will "look" at the result of this explosion, the Crab Nebula, closer than he ever has before.

The Crab Nebula is just one of many star phenomena that has fascinated man since his very beginning. Curiosity about the roof over our world has led to the development of highly sophisticated instruments for watching and listening to the activities of the stars. NASA's High Energy Astronomical Observatory (HEAO) is probably the most sophisticated in this evolution of development.

To understand what the HEAO does, it's necessary to get some understanding of what it's "looking at"—the stars. A star is actually a huge chemical factory. The raw materials are the nuclei of light elements like hydrogen, which under the great temperatures and pressure found inside stars, are driven together to form heavier elements.

The sun, for example, fuses four hydrogen nuclei together and makes helium. Later it will begin building other elements from the helium, like carbon, oxygen and neon. Eventually, it will make magnesium, silicon and finally, iron. At this stage most stars end their lives and become "white dwarfs." The "white dwarf" state is the star graveyard.

However, some stars continue the process making even heavier elements. Eventually these erupt in gigantic explosions called supernovae and hurl out the matter they have made in great clouds or nebulae.

As the nuclei of the elements are driven together in thermonuclear reactions, a small fraction of their mass is converted to energy. Part of this energy comes forth as visible light, making the stars shine. Other parts are in the form of x-rays, gamma rays, radio waves, etc. Study of these energy by-products tells us what the stars are making, how old they are, how far away they are, and a number of other things.

The HEAO will carry advanced types of instrumentation to study this high energy output of stars and the nuclei and electrons they sometimes eject (cosmic rays). It will give us fundamental information on some very important questions such as how matter is made, how old and how big the universe is and the origin of our planet.

Opening the x-ray and gamma ray regions for observation can lead to important discoveries regarding quasars (proto galaxies), pulsars (supernova remnants) and the background temperature measurements of remnants of the initial "Big Bang."

In addition to observing x-rays and gamma rays, HEAO will follow the Russian Proton satellites in investigating primary galactic cosmic rays. These high-energy cosmic rays carry information associated with the most energetic processes occurring in nature.

The origin of cosmic rays has been the subject of much theoretical and experimental activity and the mechanism responsible for their acceleration is not known. Their origin is expected to be closely connected to the recently discovered pulsars or neutron stars. HEAO offers the first opportunity to probe this energy range with good statistical accuracy.

Another experiment will concentrate on the extremely heavy, very high charge component of cosmic rays. These results will have astrophysical implications regarding the origin of cosmic rays, the nature of interstellar medium and what occurs in supernovae and nucleosynthesis.

These experiments among others that will be aboard the HEAO missions may well give us the chance to see where we came from and how our solar system was created.

The opportunity to study the Crab Nebula, the result of the 1054 A.D. supernova will give us clues to the ancient supernova which may have created the Earth, the planets, you and me.

Answers To "SPACE QUIZ"

1. (b) The cost has gone from $12 to $5.40.
2. (c) Twenty-four, and an equal number are planned or under construction.
3. (c) 81 launches for the USSR; 28 for the U.S.
4. (a)
5. (c)

Water agreement

(Continued From Page 1)

ing to improve existing MSC treatment facilities.

Also, because of a higher processing volume, the operating costs for jointly processing MSC and Clear Lake City wastewater should be much less than if each proceeded independently.

The new water treatment process will be operational by August 1972, the deadline imposed by the Texas Water Quality Board.

Medical Exchange

(Continued From Page 1)

tion that the Joint Working Group co-chairmen explore the possibility of exchanging one or two specialists to work in laboratories doing similar biomedical research in space prgrams of both nations.

The co-chairmen are Dr. Charles A. Berry, Director of Life Sciences, and Dr. N. N. Gurovskiy of the USSR Ministry of Health and the Academy of Sciences.

Courtesy of Oneil McCaffety, MPAD