

SPACE TRIO—Apollo 9 astronauts Russell Schweickart, left, Jim McDivitt, and Dave Scott will be welcomed back by employees in ceremonies planned for next Thursday at both Downey and Seal Beach facilities. This will be first visit to division for trio since their milestone flight.

NASA Awards Design Contract for Lunar Vehicle

NASA's Langley Research Center has awarded the Space Division a 10-month, \$155,000 feasibility study contract to design a two-man "lunar emergency escape-to-orbit vehicle."

The proposed vehicle could be carried aboard the lunar module and would be used by the two LM astronauts to return to the orbiting command/service module in case of LM failure on the lunar surface.

The escape vehicle is being designed as a "light, empty-weight, minimum-complexity two-man lunar escape system utilizing unsophisticated guidance and control techniques and simplified propulsion and stabilization and control concepts."

Remmert-Werner, Cleveland Field Office Join Casnet System

Executive Offices' Cleveland Field Office has become an "on-net" CASNET location. To call this facility, dial access code 8, followed by facility code 531-1008.

Also, CPG's Remmert-Werner Division, Lambert Field, St. Louis, Mo., has become an "on-net" CASNET location. To call this facility, dial access code 8, followed by facility code 439-5030.

The current spring issue of the Communications Directory does not reflect these additions.

EASTER EGG HUNT SET FOR TOMORROW

Candy by the box, fun, and a host of prizes are awaiting youngsters taking part in the division's Sixth Annual Easter Egg Hunt tomorrow at the Downey Recreation Center at 10 a.m.

The event is for employees' children two through seven years of age, with the children participating by age group. Refreshments will be available and a special prize drawing for youngster's will cap the event. Tickets may be obtained at the entrance.

Full-Scale Mockup of Apollo Will Be On Exhibit at Paris Air Show

For the first time, a full-scale mockup of the complete Apollo spacecraft and lunar module adapter (SLA) will be displayed to the public when the gates to the Paris Air Show open May 29 through June 8.

The 82-foot spacecraft and SLA mockups, built by Space Division for inclusion in the U.S. Department of Commerce exhibit, will be shipped to Europe this week.

Nearly will be another full-scale mockup of the command module.

It was constructed with a large plastic window to give the public a chance to see more of its interior and the many instruments, switches and controls used by Apollo astronauts.

They also will see actual F-1 and J-2 Rocketdyne engines in the same area. These engines are of the type that propel the huge Saturn V rocket into space.

The company is furnishing

mockups of the five F-1 engines that will be installed in a full-scale model of the 33-foot diameter "boat tail" of Saturn V. The huge tail will be mounted above the entrance to the U.S.A. outdoor exhibit.

Inside the pavilion, the company will illustrate some of the benefits the space program has handed to mankind. Such things as fast breeder nuclear reactors, new fireproof materials and earth resources sensors will be explained.

On the flight line, the OV-10A Bronco counterinsurgency aircraft will be shown and flight-demonstrated, this versatile new airplane has already proven its value with the military forces in Southeast Asia. Built by the Columbus Division, the Bronco was the first military aircraft specifically designed for counter-insurgency and limited war applications.

(Continued on Page 3, Column 1)

Deadline Set for April 15 on AIAA Abstracts

Division authors planning to submit abstracts for the American Institute of Aeronautics and Astronautics' 1970 Launch Operations Meeting have until April 15, it was announced this week.

Themed "Planning and Executing Successful Economical Launch Operations," the meeting will be held in Cocoa Beach, Fla., Feb. 2-4, 1970. Abstracts of 500 to 1,000 words should be received no later than April 15 by Harold G. Behl, A2-935, McDonnell Douglas Astronautics Co., 3000 Ocean Park Blvd., Santa Monica, 90406.

Objective of the meeting will be to take an in-depth look at the techniques, procedures, and operations required during the receipt of hardware at the launch area up to orbital insertion. Only papers on items during that time which actually affect the launch process will be considered.

SPACE DIVISION

Skywriter

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'Welcome Back' Planned for 'Gum Drop' Crew

Ceremonies Scheduled Thursday to Salute McDivitt, Scott and Schweickart

A special Space Division "Welcome Back" is planned next week for Apollo 9 astronauts Jim McDivitt, Dave Scott and Russell Schweickart who will be returning to the division for the first time since their milestone 10-day mission.

The gala event is scheduled for next Thursday. Flying in from New York, the trio plan to arrive at Seal Beach at noontime. They will arrive by company helicopter.

Following these ceremonies, the trio will be whisked to Downey and saluted in ceremonies held on the flight line area just east of the Bldg. 1 Manufacturing area.

The events at both facilities are being arranged to enable as many employees as possible to greet the space travellers. Full details of the plans will be relayed to employees through sound system announcements and posters.

Astronauts' Request

The visit is being arranged at the request of the astronauts, who expressed the desire to give their personal thanks to the persons who built their "Gum Drop" spacecraft and the second stage of their Saturn V launch vehicle.

McDivitt, Scott and Schweickart were hailed for having performed the most complicated and complex mission yet attempted in the U.S. space program. During their 241-hour, 53-second flight, the trio travelled a total of more than 4,000,000 miles.

The combined vehicle that they flew into space initially—

(Continued on Page 3, Column 4)

JULY 16 LAUNCH

Day on Lunar Surface Set for Apollo 11 Mission

The first Americans on the moon will spend almost a day on the lunar surface, exploring, taking photographs, setting out experiments and gathering 50 pounds of moon rock for return to the Earth.

George Low, Apollo program manager for NASA's Manned Spacecraft Center, said the space agency is aiming for a July 16 launch date for Apollo 11, the flight now scheduled for the historic moon landing. Final decision on the mission will depend on the Apollo 10 moon orbiting flight planned for May 18.

Apollo 11 astronauts Neil Armstrong, Edwin Aldrin and Michael Collins will lift off from Kennedy Space Center and head some 250,000 miles into space for Apollo Site 2, a five-mile oval on the southwestern edge of the moon's Sea of Tranquility.

More than three days later they will go into orbit about 69 miles above the moon. They will spend more than a day checking

(Continued on Page 2, Column 1)



PARIS-BOUND—Space Division President William Bergen, left; B. J. Long, and Al Schmidt, Marketing, admire full-scale mockups of Apollo spacecraft built by division for U. S. Department of Commerce display at Paris Air Show, May 29-June 8. Mockups will support the exhibit's "Countdown Apollo" theme and focus on the nation's program to land men on the moon.



TOP TEAMS — Charles Allen, division Mississippi Test Operations director, left in left photo, presents MTO Director's Trophy to Bob Henderson, manager of Engineering, on behalf of his organization's being named top department of past six months in Workmanship Effectiveness Program. In right photo,



Allen, right, stands with members of Facilities group, judged most effective unit on the Saturn S-II-6 stage. From left are Gerry Wilson, manager of Test Operations organization; Jim Bunch, chief of Mechanical Group, who formerly served as head of Facilities and Dick Werth, chief of Facilities.

Solid Mass Spectrometer In Use at Science Center

The Science Center has recently extended corporate analytical chemistry capabilities with the installation of a new solid mass spectrometer.

This powerful analytical tool is a high resolution double focusing mass spectrometer, which is used for detection of trace elements in metals, semi-conductors and powders. The ions are generated from the sample by a 40 kilovolt radio frequency spark. The ion beam emitted from the source is accelerated by slits and passed through an electrostatic field where the ion energy width is restricted by means of an energy defining slit.

After entering a magnetic

field the ions are dispersed and then focused at the magnetic field exit in accordance with the mass-to-charge (m/e) ratio. The focusing points are aligned in the order of increasing m/e on a single plane. When a special photographic plate is placed in this plane, all the emitted ions are photographed in spectral form with a single exposure. Since ions accumulate with time, the instrument is capable of detecting sample component elements.

The performance qualification tests of this spark source instrument included detection of 0.2 parts per billion of uranium in a zirconium sample.



SCOUTING HONOR — Bill Parker, second from right, Saturn S-II deputy program manager, accepts plaque of appreciation from Scouting official Gerald Pierson, left, of Orange Empire Council. Taking part in event at which Seal Beach facility was commended for contributions to Scouting were A. C. Van Leuven, second from left, director of S-II Manufacturing, and John Healey, vice president of Manufacturing and Facilities. Facility sponsors Explorer Post, among other contributions.

IDENTIFYING HEART TROUBLE

Treadmill Stress Test Best for EKGs

by
Richard H. Morrison, M.D.
Space Division Medical Director

How the heart reacts to stress is the most reliable indication of its condition. Consequently, the best way to identify heart trouble is to take an electrocardiogram before, during, and after exertion.

There are several ways to exercise the heart for electrocardiographic testing, but the treadmill stress test is the only method in which the doctor takes an EKG at the time the heart is exerting. Moreover, the amount of exertion is closely controlled, enabling the doctor to obtain tracings for various levels of stress.

For these reasons, the treadmill test is much more revealing than are the Master's and double Master's tests. In the latter two, the patient walks up and down two or four steps for several minutes. He is then hooked up to the electrocardiography.

By the time the hookup is completed, however, his heart's reaction to the exercise may have changed, and the tracing may not reflect the worst cardiac condition. In the treadmill test, the patient is monitored by the electrocardiograph throughout the examination.

This is not to say the Master's tests are invalid. On the contrary, they have proved very valuable for illuminating

abnormal heart conditions. In fact, anyone over 40 who is about to embark on an exercise or running program should have both a resting EKG and a double Master's test.

Another technique on which doctors rely — particularly if the EKG is not conclusive — is a series of enzyme tests. When the heart muscle (or any muscle) is injured, it releases enzymes into the bloodstream. These substances can be detected in a blood sample, and their presence helps to confirm cardiac infarction (damage) that may not be apparent in the EKG.

The coronary angiogram (angiocardigram) is another excellent way of diagnosing heart trouble. It is an X-ray film of the coronary arteries, taken after they have been filled with an opaque dye. The dye is squeezed into the coronary arteries through a catheter that has been inserted in an arm artery and carefully pushed into the heart.

Except for several disadvantages (the procedure is expensive and subjects the patient to risk), the angiogram would probably be the best diagnostic tool of all. It permits the doctor to inspect the coronary arteries and to see, among other things, whether they have been narrowed by the accumulation of cholesterol and other fatty deposits. It will also show up an aneurysm (ballooning of artery

wall).

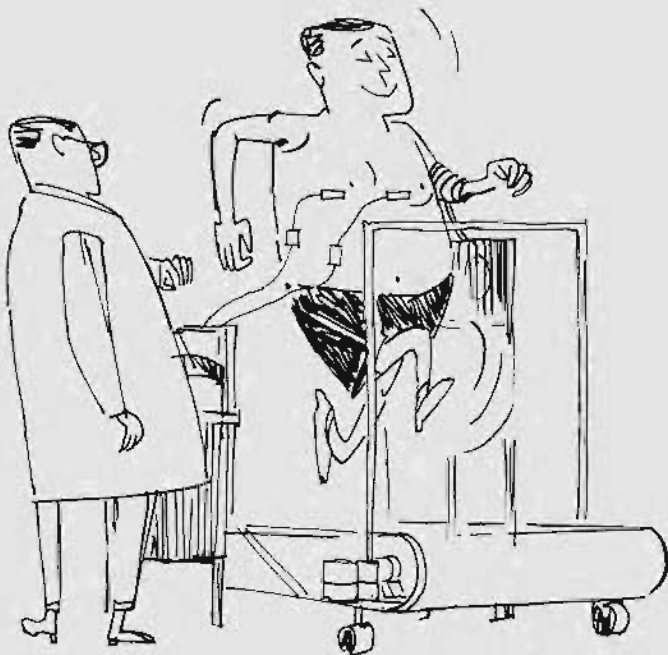
Depending on the case, any or all of the foregoing techniques may be used with the EKG to diagnose the condition of a patient's heart.

The EKG is indispensable to the treatment of heart disease. Its imperfection notwithstanding, it is still one of the most reliable diagnostic techniques ever devised. The public would do medicine and itself a disservice should it lose faith in the EKG's vital contributions by failing to recognize its limitations.

EQUALIZERS CLUB SLATED APRIL 20

The Equalizers, an educational and recreational club formed for all deaf employees in the corporation's Southern California divisions, will hold a meeting Sunday, April 20, to plan a program of activities for 1969.

Deaf employees from all divisions are welcome to attend the meeting, to be held at 2 p.m. in Room C of the Autonetics Employees' Recreation Center, according to William Uren, Autonetics, president.



The treadmill stress test is the only method in which the doctor takes an EKG at the time the heart is exerting.

George Phelps Named to S-II Post

George Phelps, formerly manager of Saturn S-II Change Management, has been named director of S-II Configuration Management.

Phelps joined the company as a junior engineer in 1955 and worked on the design of ground support equipment for the Navajo missile. He later was appointed engineering supervisor on Minuteman missile, A3J, and Vigilante ground support equipment at Autonetics in 1961.

Division Transfer

He transferred to Space Division in 1964 as supervisor of S-II GSE Design and held that post until being named assistant project manager in the same organization in 1966. He subsequently became senior project engineer for S-II Off-Site Projects.

Arizona High School To Be Named 'Apollo'

A planned school in the Glendale, Ariz., High School District will be named Apollo in honor of Col. Frank Borman, commander of the division-built Apollo 8 spacecraft that orbited the moon, and a native of the area.

Apollo 10...

(Continued from Page 1, Column 4) flights, will be the countdown demonstration test (CDDT). This check, involving the complete vehicle, is a run-through of all prelaunch operations, including fueling, and includes a thorough check of all associated ground equipment.

At the same time, the Apollo 11 launch vehicle, with the fifth Saturn S-II flight stage, is undergoing checkout in KSC's Vertical Assembly Bldg., and its division-built Spacecraft 107 payload was moved to the VAB for mating with the Saturn V lunar mission launch vehicle.

Dr. Paine...

(Continued from Page 1, Column 1) ings of the Board were unanimous as to the degree to which NR is considered to have attained the management objectives stated above. As you know, the Board's decisions were quantified in the dollar amounts of \$1,100,000 and \$270,000 of award fees authorized for the CSM and S-II contracts, respectively.

"I am delighted with North American Rockwell's achievements which have contributed so substantially to the success of the recent Apollo missions, and I would like to add to the recognition implicit in these award fees my own personal commendations and congratulations for a job well done. As the Apollo Program continues, I know we can count on you and your associates for continued excellence in performance."

/S/ T. O. Paine

In a letter of reply to Paine, Atwood pointed out, in part:

"Your personal commendation is very gratifying to me as it will be to all our people.

"You have my assurance that we remain dedicated to the goal of outstanding performance on the Apollo Program and on other NASA programs in which we may participate."



MOON BOUND — Division-built Apollo command and service modules scheduled for manned landings on moon cross paths in the Manned Spacecraft Operations Bldg. at NASA's Kennedy Space Center. In foreground are Spacecraft

108 command and service modules, which recently arrived at KSC and are planned for Apollo 12 mission. In background is Spacecraft 107, being hoisted out of test chamber. Craft will be payload for scheduled July lunar landing.

Underwater Satellite Activity Outlined at Petroleum Meeting

A broad look at the future of undersea activity and a detailed outline of the hardware which will assist in making it possible was given recently to the Los Angeles Assn. of Petroleum Landsmen.

Ocean Systems Operation's John Adams, program manager of the North American Rockwell-Mobil Oil joint venture to build a sea-floor oil and gas production system, spoke before the group at the Long Beach Petroleum Club. Adams traced the design steps already completed which call for construction of underwater satellites that will house production recovery equipment and serve as collection points for individual groups of wells.

Equipment Service

"Each of the satellites," Adams explained, "will have a varying number of well heads on its perimeter. This underwater water structure is divided into three major sections . . . a control area which primarily houses automation equipment, a service section which contains well controls, and an equipment section.

"The satellite," he continued, "provides a dry and atmospheric environment enabling technicians to service the sea-floor equipment through means of a dry-transfer from the Beaver Mark IV submersible into the satellite which could be located in depths 2,000 feet underwater."

Construction is already under way on the prototype satellite and the computerized supervisory control system, Adams added.

The OSO program manager also discussed details of the Beaver and its capabilities. "The Beaver," Adams ex-

claimed, "is presently undergoing extensive sea trials at Catalina Island which should be completed early this spring. With its manipulator arms, its diver lockout, tremendous visibility and maneuverability, the 24 foot-long Beaver is truly an underwater work-boat and the first of its type."

SUMMER BOWLING LEAGUES SLATED

Registrations for summer bowling, one of the most popular of the division-sponsored sports, are being taken at Recreation and Welfare, it was announced this week.

Employees planning to take part in league play may register at the Recreation and Welfare offices at Downey and Seal Beach, at the Downey Recreation Center, and with members of the division Bowling Committee.

Committee members are Bud Schulhof, Ext. 5367; Vern Rose, Ext. 5287; Frank Fong, Ext. 3851, and Mike Rodriguez, Ext. 1574, all at Downey, and Ruth Beller, Ext. 5226; Shirley Reagan, Ext. 5931, and Ed Westbrook, Ext. 3155, all at Seal Beach.

Littman Appointed to Nuclear Committee

T. M. Littman of Advanced Systems has been appointed to the American Institute of Aeronautics and Astronautics' Technical Committee on Nuclear Propulsion. Littman is a project manager responsible for nuclear rocket activities in the Launch Systems group of his organization.

NAVAN NOW PRODUCING NEW TYPE OF DIAMOND SAW BLADE

Production of diamond saw blades by a new plating process has been announced by Navan Incorporated, the Special Products subsidiary of North American Rockwell Corporation.

The plating process, developed by the subsidiary's engineers during a 20-month program that included extensive study of aerospace plating technology, locks diamond particles in the crystalline structure — or lattice — of a deposited metallic compound. Hence, Navan describes its new diamond blades

as "lattice-bonded."

The process distributes diamond particles in a uniform density not achieved with conventional methods, and is covered by a pending patent. Wafer finish, flatness and parallelism are significantly improved.

Navan's lattice-bonded blades are produced in the "I.D." configuration — the diamond cutting edge is on the inside circumference of a flat, donut-like metal disc and the blades are held in place for cutting along their outer circumference.

Accuracy . . .

(Continued from Page 1, Column 5) corrections were not needed at all. Correction No. 4 was used to provide a trivial change of two feet per second, though officials said it, too, could have been dispensed with.

The spacecraft's service propulsion system was fired three times around the moon — first to get into lunar orbit, then to circularize the orbit, and finally to get out again — and each burn was accurate to the second. The latter two of the three planned homebound midcourse corrections were not needed at all; re-entry speed was precisely as planned.



READY TO GO — Employees in Apollo Structures Assembly carefully lower forward heat shield section for Apollo Spacecraft 118 onto dolly for shipment to Avco Corp. where ablative material will be added. Department Heat Shield team reduced fabrication time on heat shield section by one-half over time taken on same component at start of Apollo Block II program.

500 POUNDS OF EASTER EGGS? SMALL HANDS FOUND THEM ALL



INNERSPACE PROBE — Youngsters held the center of attention last Saturday as more than 3,000 employees and their children took part in the division's Sixth Annual Easter Egg Hunt. Children, bringing paper bags, curiosity and a ready-to-go-ness not all parents could match, handled more than a quarter of a ton of Easter eggs and other prizes at the Hunt.

FORTE IS CREATIVE DRAWING

Delen Thomas: Man of Varied Interests

A man of varied talents and many interests is Delen Thomas, a plastics fabricator in Plastics and Advanced Projects.

Delen particularly likes creative endeavors and things he can do with his hands.

He has always been interested in drawing, which he studied in high school and in a correspondence course, and all types of art-connected

work from drafting to painting. His particular forte, though, is creative drawing, "where one can do what he wants."

His drawings range from interior designs to landscapes, portraits and "mood" drawings, which reflect his thoughts at particular times. One drawing has an anti-smoking theme — showing a man equipped with a cancer con-

trol unit, smoke purifier and filter chamber and tagged "Why Bother," and was submitted by Delen as an idea to the American Cancer Society.

He also writes song lyrics and sings with a seven-man band he is forming. The group, "The Soul Crusaders," already has appeared at the Light House in Hermosa Beach and at the Shrine Exposition Hall in the annual Battle of Bands.

In addition, Delen worked as an extra in two as yet unreleased movies, "Gaily, Gaily," and another on the life of Malcolm X. And when he doesn't have anything else to do, he enjoys woodworking, renewing furniture and jewelry-making.

Delen has a simple, but forthright, philosophy . . . "I like all the things I do and try to be good at them."

Aero Commander Plant Joins Casnet System

Effective Monday, the Aero Commander facility, Albany, Georgia, becomes an "on-net" CASNET location. To call this CPG facility, dial CASNET access Code "8," followed by 531-1014. The CPG matrix shown on the inside rear cover of the Communications Directory indicates facility code 538-4XXX, which will not be applicable until August. Directories should be corrected.



MANY TALENTS—Delen Thomas, man of many interests and talents, shows off some of his drawings, including portrait of fiancée. Thomas, of Plastics and Advanced Projects, also sings in band he is forming, worked as movie extra, and spends time in woodworking, renewing furniture and in jewelry-making.

Division Slates Champions Golf Tournament for June 28, 29

Space Division's annual Tournament of Champions highlights a full slate of action for participants in the division monthly golf tournaments.

This year's tournament is scheduled for June 28-29. It will pit monthly tourney winners of the past year against each other in a match to determine the division kingpin.

The tournament for January, held at Mountain View, opened 1969 competition. Rounding out the schedule for the remainder of the year are tournaments at:

April — Cottonwood (Partner's Best Ball), Saturday; May — Ojai, May 3-4; June — Quail Lake, June 7; Tournament of Champions, June 28-29, site

to be announced; July — Rancho San Joaquin, July 20; August — Lake San Marcos, Aug. 16; Whispering Palms, Aug. 17; September — San Clemente, Sept. 27; October — Singing Hills (Willow Glen), best ball, Oct. 11; Singing Hills (Oak Glen), best ball, Oct. 12; November — San Luis Rey, Nov. 15; San Luis Rey (36-hole Turkey Shoot), Nov. 16; Los Serranos, Dec. 7.

Registration for the tournaments are accepted at the Downey and Seal Beach Recreation and Welfare offices on Tuesdays, at least 10 days in advance of the event. Starting sheets are available on the Monday before each tournament.



DRIVERS OF YEAR — Traffic and Transportation's Drivers of Year for past 12 months proudly hold trophies presented by Steve Nelson, left, division director of Material. From left are Ray Elliott, top man for second shift; Al Giglio, honoree for External Transportation and Fletcher Williams, top employee in In-Plant Material Handling, both on the first shift.