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ADCSP PRE-CDP ENDS TODAY. The six companies that have been studying the **ADCSP** (Advanced Defense Communications Satellite Project) for the DOD's Defense Communications Agency (SPACE Daily, Dec. 10 & June 16) will submit their preliminary design reports today, and the DCA has said it will now make a lengthy evaluation to "synthesize" from the proposed satellite systems the optimum system that will be the subject of the CDP (Contract Definition Phase), which will begin officially "in the latter half of next year" but which may come sooner if the evaluation turns out to be less lengthy than expected. Aerospace Corp. will aid the evaluation.

The six organizations are ComSat, GE, Hughes, Philco, RCA, and TRW Systems. The DOD wants the establishment of the **ADCSP** "as soon as possible," but it will not likely be implemented until the 1970s, or late this decade at the earliest. This is one reason the **IDCSP** (Initial Defense Communications Satellite Project) is being enacted. It will have a 24-satellite system with a variety of supporting ground terminals and will see its first launch early next year--probably February.

SATURN APPLICATIONS NEW AA OFFICE. The former **SATURN IB-CENTAUR** office, originally established to manage the development of the transportation vehicle for the original **VOYAGER**, prior to **MARINER IV** success, has been changed to the **SATURN** Applications office of the AA (**APOLLO** Applications) program. Its task is to now manage the changes necessary in the **SATURN V** to accommodate the dual-**VOYAGER** payloads and to manage the integration of the **SATURN IB** and **SATURN V** into the AA program which will be first concerned with a series of space station experiments (SPACE Daily, March 10 & Aug. 30).

The office will have the special assignment of managing whatever changes will be necessary for converting the **SATURN V** to a communications satellite launcher. NASA has plans to use both the **SATURN IB** and the **SATURN V** for the establishment of a communications satellite relay for use by the manned space flight network operations (SPACE Daily, Aug. 31). The **SATURN IB** would first experiment with the erection of large antenna structures at 200 miles in extravehicular operations during a 14-day mission possibly in 1969. This work would be expanded toward an operational capability with a **SATURN V** payload in a synchronous orbit mission of 45 days around 1970.

Dr. Robert Seamans, still awaiting a worked-over NASA budget request by the Bureau of the Budget, is withholding approval of funding for new AA studies by Marshall and Houston (SPACE Daily, Oct. 25). Spacecraft modifications of the AA program are still the responsibility of NASA-Houston. Marshall is still responsible for AA launch

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MORE

vehicle modifications and while still undecided, Marshall is expected to be responsible for payload integration. ✓

NORTHROP TO PLAN NIKE-X PRODUCTION DEPLOYMENT. Northrop has been asked to submit a proposal for a 12-month study program for the evaluation of the production deployment task for the NIKE-X anti-missile missile system. The request was made by the NIKE-X project office at Redstone Arsenal.

RAYTHEON AWARDED \$15 MILLION FOR NIKE-X RADAR. Bell Telephone Labs has awarded Raytheon \$15 million in additional funding for continued development of the Missile Site Radar (MSR) for the NIKE-X missile defense program. This brings Raytheon's total funding on this portion of the program to more than \$45 million.

The MSR, which is one of two NIKE-X radars, is designed to handle a number of interceptor missiles simultaneously. In the event of multiple ICBM attack, the radars will provide a ground-to-air link between the missile's ground-based equipment and its interceptor missiles while they are in flight. The other radar system, the multi-function array radar (MAR), will make the initial detection of oncoming ICBMs.

NIKE-X SPRINT MISSILE FLIGHT GUIDED SUCCESSFULLY. After pressure ejection from its underground silo at White Sands a NIKE-X SPRINT high-acceleration, low-altitude, anti-missile missile has been successfully guided in flight.

SEA-LAUNCHED BALLISTIC MISSILE DISPLAYS TO BE PROCURED. The Air Force plans to install the detection and warning information system for the 416N Sea Launched Ballistic Missile Detection System at the Strategic Air Command at Offut AFB. The display system, which will provide the defense monitors and dispatch operations, will be procured in the near future by a two-step formal advertised solicitation. Three large display panels with a special warning device for detection alert and a modification to the basic BMEWS decoder latching relay system will be a part of the hardware to be fabricated. Letter requests for technical proposals are expected to be issued soon from the Electronic Systems Division at Hanscom AFB.

FRENCH TRACKING NETWORKS ALMOST COMPLETE. The French space agency, CNES, hopes to have both its tracking networks, DIANE and IRIS, fully operational by the end of the year. DIANE embraces two ground stations--one at Hammaguir, Algeria, and one near Pretoria, South Africa--both of which began service early last April, although Pretoria was just officially inaugurated last week. IRIS includes four operational stations--Hammaguir (began service in mid-October); Pretoria (early October); Ouagadougou, Upper Volta (last week); and Bretigny, France (early June)--and two stations to begin service next month in Africa. When the launch range at Hammaguir is closed, the stations there will be moved, in part at least, to the Canary Islands. IRIS is primarily for telemetry.

NAA RECORDS SECOND HIGHEST SALES/EARNINGS

North American's sales for the fiscal year ended September 30 were \$2,012,792,000, down slightly from last year's record high of \$2,189,594,000. Earnings were down eight per cent from \$49,334,000 to \$45,811,000. It was the second time that North American had sales of more than \$2 billion in a fiscal year and was the second highest year of record in both sales and earnings.

The 1965 backlog of \$996 million, which excludes an estimated \$2.083 billion for orders not yet funded but which are either negotiated or currently under negotiation, was up from the \$942 million recorded a year ago. Including the unfunded orders, the total backlog of unfilled orders was \$3.079 billion.

FIRST TVC 156 TEST SET

Lockheed will fire for demonstration the first flight configuration 156 solid booster on Wednesday, Dec. 1 (SPACE Daily, Nov. 19). It will be the fifth firing of the 156 in the Air Force program. The Dec. 1 test date is dependent upon the successful accomplishment of a hydro-testing of the booster's thrust vector control (TVC) tanks.

The 156 will be equipped with an omni-directional secondary fluid injection TVC system. Twelve tanks, 8 containing nitrogen tetroxide injection fluid and 4 containing pressurized nitrogen for forcing the nitrogen tetroxide into the system, are located around the motor nozzle. The nitrogen tetroxide is injected into the rocket exhaust stream through 24 injectors located near the throat of the nozzle. The liquid is injected in various quantities and combinations to provide a highly precise, omni-directional thrust vector control capability.

The motor will be 75 feet long and designed to develop three million pounds of thrust for 60 seconds. Although fired in a nose-down position, the motor will be a flight-weight prototype, as are the TVC system and a programmer which will be tested at the same time.

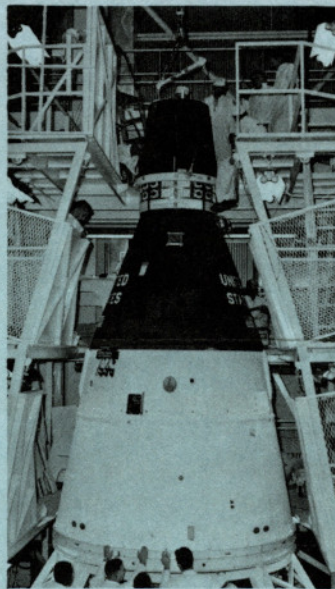
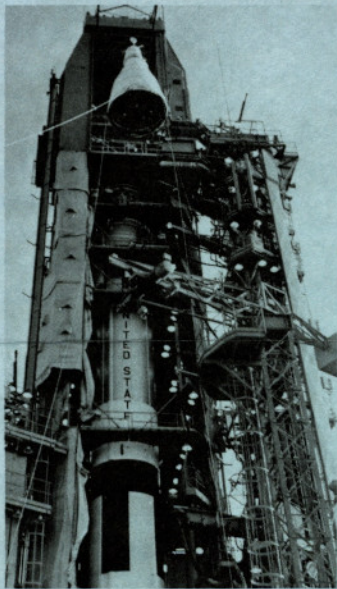
APOLLO TEST ONLY PARTIALLY SUCCESSFUL

The first test of the APOLLO/SA-201 Service Module propulsion system (SPACE Daily, Nov. 18) at NASA-Kennedy resulted in only a partial success. The propulsion engine ignited and burned for 15 seconds as planned but a failure of a timing device prevented a test of the gimbaling engine to demonstrate its maneuverability.

APOLLO COMMUNICATIONS CONTRACT TO AVCO

A \$99,000 contract to test the reliability of the radio communication systems which will link the APOLLO spacecraft with Earth stations during the cislunar flight and re-entry has been awarded to Avco's Research and Advanced Development Division by NASA-Houston. Avco, during the 13-month program, will investigate the effects of the APOLLO heat shield on antenna performance during re-entry heating and post re-entry phases as well as the deep space phases of the flight.

GEMINI FLIGHT PREPARATIONS DELAYED



The **GEMINI VII TITAN II** launch vehicle and spacecraft are shown at Cape Kennedy during the mechanical mating of the two vehicles. Later, a malfunction in the **GEMINI** fuel cell was discovered, caused by overpressurization due to a procedural error in checkout. The fuel cell was replaced, but testing of the new component was held up on Friday because of the striking McDonnell workers.

The present plan to launch the **GEMINI VII** mission on the fourth of December followed by **GEMINI**

VI on the 13th is subject to a number of critical factors and the only time anything like this has been attempted is when two **TITAN II** ICBMs were launched within 12 days of each other from the same pad. The plan to launch the **GEMINI VI** by the ninth day of the **GEMINI VII** mission has resulted in a number of special preparations: the Systems Command is moving critical spares for the launch pad and erector from storage areas to Complex 19; the Air Force is providing jet aircraft to airlift spares for the launch vehicle and spacecraft from anywhere in the U.S.; subcontractors have been put on 24-hour alert status if any critical spares are needed; Martin Company personnel at the Cape will work 12 hours a day, seven days a week between the two launches; the normal preventive maintenance on the launch pad will be deferred until after the **GEMINI VI** launch.

MCDONNELL STRIKE THREATENS GEMINI FLIGHTS

"It looks like it may be a long strike," Robert Krone of the McDonnell Aircraft Corporation said as talks got under way last week sponsored by the Federal Mediation and Conciliation Service to try to settle the labor dispute between McDonnell and the some 17,000 International Association of Machinists (IAM) workers.

The strike will affect two **GEMINI** spacecraft under fabrication in the St. Louis McDonnell plant as well as some 50 Phantom jet fighters destined for Vietnam. The 200 IAM-McDonnell workers at Cape Kennedy joined the strikers, thereby threatening the launch schedule for the forthcoming dual-**GEMINI** launch. The Cape Kennedy workers walked out on Friday and NASA program officials revised the schedule to work around the missing technicians. A NASA official admitted, however, that "by Monday, and possibly by Saturday," these technicians would be needed if the December 4 launch date is to be maintained.

McDonnell was considering flying some "free enterprise" technicians from St. Louis to the Cape to perform the work. Some reports already indicated that the launch date had slipped from December 4 to December 6, or would do so if the strike did not end immediately.

14 INVITED TO BID ON SPACEBORNE MULTIPROCESSING STUDY

NASA-Cambridge has invited the following companies to submit proposals for a contract to develop new concepts of multiprocessing oriented to the diverse computational requirements of future long-range manned space missions: Adaptronics Inc. (Alexandria, Va.); Autonetics; Burroughs Defense, Space & Special Systems Group; GE; General Precision; Goodyear; Honeywell; Hughes Aerospace Group; RCA; Raytheon; Stanford Research Institute; Teledyne Systems Co. (Hawthorne, Calif.); UNIVAC/Defense Systems; and Westinghouse. Results of the study (ERC/R&D 66-92) are expected to provide a sound technological base for further development of a general-purpose multiprocessing spaceborne computer system.

MORE UPRATED DELTA MOTORS ORDERED

The eight improved propulsion systems Aerojet-General built for the second stages of the Douglas **DELTA** vehicle (SPACE Daily, Aug. 9) have been delivered, and a new order of 15 more motors is now being produced, with delivery to begin in January with one motor coming off the production line about every three weeks. The first **DELTA** with the uprated second stage was used earlier this month to help orbit NASA's **GEOS** satellite (SPACE Daily, Nov. 9). The value of the new order is \$4.9 million. **PIONEER** and **BIOSATELLITE** are among the future payloads for the improved vehicle, which Douglas is supplying to NASA-Goddard.

BUTCHER JOINS NORTHROP WASHINGTON SPACE OFFICE

Robert R. Butcher, previously chief of systems engineering on the **OV2** satellite series for Northrop, has been appointed senior regional representative for the Washington office of Northrop Space Laboratories. Butcher will report to John D. Movius, eastern regional director for the division.

ARMY PURCHASES MORE PERSHING

The Army has awarded a \$4,750,000 contract to Martin for additional **PERSHING** tactical missiles to replace missiles fired by troops in proficiency and practice tests at White Sands and to build up authorized **PERSHING** battalions to full strength.

ATS STATION SET FOR TOOWOOMBA

NASA in cooperation with the Australian Ministry of Supply will establish a tracking and telemetry station for the **ATS** (Applications Technology Satellite) at Toowoomba, Australia. The \$6 million facility, consisting of several trailers and a 40-foot parabolic dish antenna, will be staffed by a private contractor under the direction of a Ministry of Supply official.

Toowoomba is located near Cooby Creek, in the Darling Downs, Queensland.

FORMER BOB DIRECTOR FORESEES POSSIBLE RECESSION

Maurice Stans, former director of the budget and chairman of the Republican Coordinating Committee Task Force on Federal Fiscal and Monetary Policies, charges that "The Administration is continuing its five-year failure to deal realistically with our international balance of payments deficits and the gold drain. The result is likely to be either an increased rate of inflation, a recession or both."

Stans' allegation followed on the heels of the announcement of a \$485 million deficit in the balance of payments during the third quarter of this year (Friday's SPACE Daily). It also followed a request by the National Foreign Trade Convention that the Administration's voluntary curbs on foreign loans and investments be terminated. A convention resolution maintained that in the long run these curbs would tend to increase rather than lessen the country's deficit in payments. Stans, in agreeing with the Convention's position, said that "All this (the voluntary program to restrict U.S. investment and lending abroad) does is to guarantee future worsening of the problem by cutting down the return export trade, dividends and interest that are generated in a relatively short time by such investments."

Finally, Stans contends that the adverse effects will not be felt just by business, but also by its employees--clerical workers, white-collar people and factory workers--who will be deprived of the benefits of increased international activity of U.S. business.

NORTHROP SALES/EARNINGS/BACKLOG DOWN

Northrop's sales for the first quarter of the current fiscal year were \$70,439,000, down from last year's \$72,433,000 while earnings dropped 18 per cent from \$2,007,000 to \$1,691,000. The company's backlog as of October 24 was also down compared with the previous three-months figure--\$285 million compared with \$288 million. President and chairman of the board Thomas V. Jones points out that the current backlog still does not include approximately \$100 million of contracts already in work which have not been finally negotiated.

CONDEC EARNINGS UP 30 PER CENT

Condec Corp. of Stamford, Conn., had sales of \$9,349,000 for the first three months of the fiscal year, compared with last year's \$7,650,000. Earnings rose 30 per cent from \$217,000 to \$281,000.

President Norman I. Schafler says that he expects all of Condec's divisions and subsidiaries to be contributing to increased profits this year. The manufacturer of military and industrial products including high-temperature materials in the field of thermionics and other space devices, has eight plants located throughout the United States.

ELECTRO-OPTICAL DIVIDES ION PHYSICS DEPARTMENT

Electro-Optical Systems has divided its Ion Physics Department into two separate units--Ion Technology with Dr. Marshall P. Ernstene as manager, and the Gaseous Electronics Department with Robert C. Speiser as manager. Ernstene was previously associate manager of the Ion Physics Department.

AIR FORCE REVISES OV SATELLITE SCHEDULE

This is the latest flight plan for the Air Force Office of Aerospace Research's three **OV** (Orbital Vehicle) satellite programs. Although the earlier plan (SPACE Daily, Aug. 6) envisioned the programs' completion by the end of next year, one **OV** shot is now set for early '67 and two others are contemplated for that year.

OV -4/-5 To Be Launched Jan. 13

The **OV1** program, its first two orbital attempts unsuccessful, finally launched an operational payload early last month when **OV1-2** (the third satellite) achieved a good orbit (SPACE Daily, Oct. 6). That shot, involving a dummy **OV1** in a compartment next to -2, confirmed the feasibility of launching two **OV1s** together and thus cleared the way for the mission of -4/-5, which are now scheduled to be carried aloft January 13.

There are ten **OV1s**, with -6 as the backup model. The twin-package launch of -7 and -8, originally set for next April, has now slipped to June, and the -9/-10 shot, planned for next October, is now being considered for scheduling in the previous month, although October is still a possible period. The three dual-satellite payloads will ride **ATLAS Ds** from Vandenberg. General Dynamics/Convair is the prime **OV1** contractor. Additional **OV1s**--possibly an odd number to permit dual-launch use of -6--are being considered.

OV2 May Be Extended Into 1967

OV2, a three-satellite program that lost the first payload and had to cancel the second, is now hanging by the thread of the next, and thus far last, launch, which is presently expected December 21 when the third **TITAN III-C** leaves Cape Kennedy with **OV2-3** aboard (SPACE Daily, Nov. 4 and yesterday). Whatever the fate of -3, though, at least one later **OV2** is in the works, assuming a **III-C** ride can be secured in 1967. Since the -4 configuration was abandoned on the drawing boards, the '67 satellite will be **OV2-5**. Northrop built the three **OV2s**.

OV3 Schedule Runs Into 1967

The six **OV3** satellites now in existence were initially planned for launch next year, but the last one is now scheduled for liftoff the following year. The first four (numerically) were built by Space General and the last two by OAR's Cambridge Research Labs. **SCOUT** vehicles will be used, and all launches save the first will be from Vandenberg. The present schedule has this order: **OV3-4**, March; -1, April; -5, June; -3, August; -2, October; and -6, January ('67).

MARSHALL PRESENTS SATURN AWARDS

Dr. Wernher von Braun, the director of NASA-Marshall, has awarded Special Superior Achievement Awards to some 350 employees of Research and Development Operations for their participation in the completion of the **SATURN I** program, the **PEGASUS** project, the **S-IC-T** assembly and first phase static test, the roll out of the **S-IC-1** and the **S-IVB** battleship static test. The awards, in the amount of \$50, \$100, and \$200, total over \$50,000.

Future Space Business

PARACHUTE MATERIALS ENVIRONMENT/RE-ENTRY TESTING

NASA-Houston has issued requests for proposals for a study of the effects of a space environment and re-entry conditions on parachute materials.

Contact: NASA, Manned Spacecraft Center, **GEMINI** Spacecraft Procurement Section, Houston, Tex. 77058, Attn: BG2/H. T. Christman, Ext. 4511. Reference: RFP BG631-M10-6-2-P. Due date: Dec. 3.

METEOROLOGICAL SATELLITE LOW-POWER FM RECEIVERS

NASA-Goddard is planning to fund the design, development, fabrication and testing of two low power FM receivers to be used on the Interrogation Recording and Location Subsystem (IRLS) for the meteorological satellite program.

Firms on the original invitation list include: TRW Systems Group; Sylvania Electronic Systems Division; American Electronic Laboratories (Lanesdale, Pa.); Philco; Hughes; General Dynamics/Electronics; Sanders Associates; RF Communications (Rochester, N.Y.); Simmonds Precision Products (Tarrytown, N.Y.); Resdal Engineering Corp. (Pasadena, Calif.); GE; HRD-Singer; Motorola; Dynatronics Inc. (Orlando, Fla.); The Bendix Corp., Radio Division; Melabs (Palo Alto, Calif.); Astro Communication Labs (Gaithersburg, Md.); RCA; Control Science Corp.; Space Avionics; and Avco Corp., Electronics Division.

Contact: NASA, Goddard Space Flight Center, Greenbelt, Md. 20771, Attn: J. C. Swindle, Code 247 (210). Reference: RFP 731-84664(210). Due date: Dec. 10.

LEX TO DEVELOP DOD TECHNICAL THESAURUS

In order to broaden effective exchange of technical information among Department of Defense activities, Dr. John S. Foster Jr., Director of Defense R&E, has ordered creation of a DOD technical thesaurus.

A 14-man task force under the Office of Naval Research will undertake the 15-month project, known as Project LEX, in December. J. Heston Heald, of Dr. Foster's Office of Technical Information, is project director. Publication of the thesaurus is expected before the close of fiscal 1967.

ARC AWARDED ARCAS CONTRACT

Atlantic Research has received a \$3,042,000 contract for the **ARCAS** high-altitude weather sounding rockets from the Ogden Air Materiel Area. The work will be performed at ARC's Gainesville, Virginia, facility.

AEROSPACE EXPORTS UP 22.6 PER CENT FOR FIRST NINE MONTHS. Preliminary figures indicate that overall aerospace exports for the first nine months of 1965 totaled \$1.135 billion, up 22.6 per cent from last year's \$926 million. These figures are based on data compiled by the AIA and the Bureau of the Census.

DOD NEGOTIATIONS

TRW Systems Group--with Air Force Ballistic Systems Division for an expansion to the current requirements for the advanced targeting study.

ITT Federal Laboratories--with Army Electronics Command to continue research work in connection with satellite communications.

General Dynamics/Pomona--with Bureau of Naval Weapons for research and development effort associated with **TERRIER** and **TARTAR** guidance control and airframes improvement.

Kollsman Instrument Corp.--with Bureau of Naval Weapons to conduct a study program for a secure air-to-underwater optical communications system.

General Electric Co., Technical Military Planning Operation--with **NIKE-X** Project Office for research and development study on strategic implication of hardsite defense in support of the **NIKE-X** system development.

Northrop Corp., Norair Division--with Air Force Ballistic Systems Division for a study of the feasibility of delaying the transition of flow over a body traveling at hypersonic speed from laminar to turbulent.

Shell Development Co., Emeryville, Calif.--with Air Force Flight Test Center for storable concentrated hydrogen peroxide.

Goodyear Aerospace Corp.--with Naval Ordnance Laboratory for services to inspect and checkout missile components.

NASA NEGOTIATIONS

LTV Aerospace Corp.--with Langley for **SCOUT** systems management supplemental field support efforts at Air Force Western Test Range.

Bioresearch Inc., Orangeburg, N.Y.--with Washington for continuation of experimental chemical diet studies for development of superior diet for man in space.

Astro Research Corp., Santa Barbara, Calif.--with Western Operations Office for a study of advanced structural concepts for space application.

Allied Research Associates, Concord, Mass.--with Marshall for photomechanical investigations of structural behavior of gyroscope components.

Cornell Aeronautical Laboratory--with Marshall for research and development program on **SATURN V** shroud and fin interference, a free static aerodynamic investigation.

Lockheed Missiles and Space Co.--with Langley for a research and experimental study of the absorption of trace contaminants and the regeneration of adsorption beds used in spacecraft atmospheric control for extended missions.

MORE

NASA NEGOTIATIONS - Contd.

Chrysler Corp., Space Division--with Marshall for various tasks of **SATURN IB** vehicle systems integration and aeroballistic assistance.

DOD CONTRACTS

Army

Raytheon Co.--\$1.4 million for selected items of ground support equipment for the **HAWK** missile system.

Air Force

Lear Siegler--\$2.5 million order for flight control components for the **FIREBEE** target missile.

Northrop Corp., Nortronics Division--\$245,000 for increase in funds as a result of modification to basic contract for radiation effects on microelectronics.

Natman M. Newmark, Consulting Engineering Service, Urbana, Ill.--\$25,410 for development of design procedures for hardened reinforced concrete silos.

The Boeing Co.--\$285,383 for application of prediction techniques, circuit design, and TREE research to system hardening.

NASA CONTRACTS

Kennedy

Arrowsmith Tool and Manufacturing Co., Los Angeles, Calif.--\$96,190 for miscellaneous handling, servicing, access and erection equipment for use at launch complex 37.

Lewis

General Dynamics/Convair--\$300,000 for incremental funding for contract (NAS3-3807, CO 54, 10-26-65).

Edwards

Systems Engineering Laboratories, Fort Lauderdale, Fla.--\$435,000 for data acquisition system.

ISIS-X LAUNCH SCRUBBED. The **ISIS-X** project, originally scheduled for launch tomorrow, has been postponed due to a malfunction in the radio telemetry transmitter of the **DME-A** satellite. The **ISIS-X** project (International Satellites for Ionospheric Studies) consisted of the launch, aboard a **THOR-AGENA B** vehicle, of two satellites into a close proximity, 80-degree inclination, 270/1620-mile orbit.