

# SPACE BUSINESS



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## KARTH ASKS FOR IMMEDIATE VOYAGER CONTRACTS.

Rep. Joseph E. Karth (D-Minn.), chairman of the House Space Sciences and Applications Subcommittee, has proposed that NASA should "select **VOYAGER** contractors now and provide enough funds for the work in the 'bottleneck areas'" instead of putting off the initiation of work and awarding of contracts for a year, as is NASA's present plan.

Edgar M. Cortright, NASA deputy associate administrator for OSSA explains that NASA intends to provide \$250,000 per year for each of the three present contractors. These funds will provide for advanced work on the **VOYAGER** by one contractor for systems design, interface and trajectory work. A second contractor will study the impact of radioisotopic power supplies on the **VOYAGER** capsule and the impact of decontamination on the orbiter. The third contractor will study advanced management techniques and techniques of total control of the planned program. The results of these three studies will be made available to all three contractors and any additional contractors when the Phase C is re-opened next year. Cortright confirmed that the Phase C RFPs will not be restricted to the three present contractors. He added that the major advances in the state-of-the-art required for the **VOYAGER** project will lie in the areas of sterilization and long lifetime and reliability of components.

## VOYAGER Phase B RFPs Out In October.

The RFPs for Phase B contracts for the capsule portion of the **VOYAGER** will be sent out by NASA in October. NASA plans to provide approximately \$2 million in FY '67 and \$9 million in FY '68 for the early phase of the **VOYAGER** capsule contracts. Fiscal year 1966 expenditures for the **VOYAGER** spacecraft are estimated at around \$3.5 million; the plan for FY '67 provides approximately \$0.5 million and plans called for expenditures of about \$7 million in FY '68 for the spacecraft contracts. Both Cortright and the committee members expressed dissatisfaction with the projected **VOYAGER** expenditures for FY '68 and indicated that to get the project "off the ground" these figures would need to be larger.

## NASA "Too Optimistic" On SURVEYOR.

Addressing the subject of continuing stretch out and delays on the **SURVEYOR** program, Robert Garbarini, OSSA's chief of engineering, who has been assigned to full time duty on the **SURVEYOR** project (SPACE Daily, Feb. 18), explained to the subcommittee that "we were not allowed enough time on this program to assure that the equipment will do what it is required. We were just too optimistic." Garbarini said that several state-of-the-art developments had been necessary during the **SURVEYOR** project, such as midcourse correction instrumentation and the radar approach system which had caused delays.

Cortright said that NASA will spend \$27 or \$28 million more in FY 1966 than the original \$84 million apportioned for it last year. He explained that this is due to two reasons:

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1) Hughes, **SURVEYOR** prime contractor, "had to go" to a personnel level of around 2500 or 2600 and JPL, NASA manager for the project, had to go to a personnel level of over 450 persons in order to solve a number of difficult technical problems; 2) the over-run was due in part to changes which NASA had proposed in the **SURVEYOR** system in order to improve "marginal areas" in the spacecraft systems such as the transmitter, power tubes, telemetry calibration, tape reader reliability, and electronic parts qualification testing.

**SURVEYOR Launch Dates Classified.** The subcommittee expressed considerable surprise at testimony by Cortright that the actual launch dates for **SURVEYOR** shots are classified. Cortright explained that this policy is "in the national interest," admitting that this might be "a debatable point." He explained that NASA regulations under the authority of administrator James E. Webb required him not to reveal projected launch dates for programs connected with a manned lunar landing, i.e., **APOLLO**, **SURVEYOR**, and **LUNAR ORBITER**. Karth stated that these matters have been subject to a great deal of speculation but he had never before been informed that these dates were classified and had not previously discovered any reluctance on the part of NASA and JPL officials to discuss these matters because of "security" classifications.

**NASA Disturbed By LUNA IX Data.** NASA officials say **LUNA IX** data confirm their previous assumptions on the nature and bearing strength of the lunar surface, but expressed concern over two problems which might be inferred from the data. Photographs received from the Soviets, under analysis, indicate that **LUNA IX** had rotated, or shifted, "about 8 degrees" sometime during the picture taking sequence. This raises a number of questions about the nature of the lurain which could be explained by a rolling or shifting of the spacecraft after it had begun taking pictures. The agency is also disturbed by hints from Russian statements that the terminal descent radar on **LUNA IX** may have been "fooled" by unusual radar reflection from the lurain.

**OART SUBCOMMITTEE CALLS FOR NASA LONG-RANGE GOALS.** Rep. Ken Hechler (D-W.Va.), chairman of the Subcommittee on Advanced Research and Technology of the House Space Committee, set the tone of yesterday's opening hearing on NASA's FY '67 advanced research and technology budget request by saying: "Personally, I am not satisfied with the depth of NASA's thinking on future goals . . . If we're going to continue to spend five per cent of our national budget on space, NASA has to come up with a national goal to follow the manned lunar landing."

Dr. Robert C. Seamans Jr., NASA deputy administrator, listed possible future missions such as a manned space station or a manned lunar base but the subcommittee remained dissatisfied. Rep. George E. Brown Jr. (D-Calif.) called for a NASA goal which will catch the imagination and enthusiasm of the country in the same manner as President Kennedy's 1961 Space Mandate. The members agreed that the **APOLLO** program must be a springboard to future programs, not an ultimate goal in itself. In this context, Seamans said that as far as NASA future planning goes there are two possible alternatives: 1) Leftover **SATURN-APOLLO** hardware might be used (possibility of six **SATURN IBs** and three **SATURN Vs**) in alternate missions after a successful lunar landing and 2) Follow-on program modifications to **SATURN-APOLLO** hardware in order to allow longer stay times in orbit (manned space stations).

**FY '68 Budget May Drop Below \$5 Billion.** In his prepared statement, Seamans said that "This budget level (\$5.012 billion) must be viewed in the context of a total national



budget balanced between our major commitments abroad and our domestic needs. Within this framework, and at this level, NASA has hammered out a balanced program for FY 1967. We have deferred very desirable increases in levels of effort as well as major new projects such as **VOYAGER**, **AOSO**, and **APOLLO** Applications missions. We are continuing our manned flight effort toward the objective of manned lunar exploration within this decade, but with no margins of time or resources to counter the effects of setbacks or failures." Seamans went on to tell the subcommittee that the total NASA budget request could decline to less than \$5 billion in FY 1968 if this pattern continues to be followed.

**260 Development Should Be Emphasized.** Hechler told Seamans that the committee was disturbed by NASA's failure to program the extra money which had been authorized for development of the 260-inch solid-propellant-rocket motors during FY '66. Seamans assured the subcommittee that those funds are being used and have made possible an extra half-length motor firing by Aerojet-General. In reply to questions about whether NASA would welcome additional 260 funding for FY '67 and whether the program would be pursued "enthusiastically" Seamans said that "in an extremely stringent budget year (such as FY '67) . . . the fact that we are pressing forward with half-length funding shows enthusiasm."

**SEVEN U.S./NO FOREIGN BIDS IN ON COMSAT MULTIPURPOSE SATELLITE.** The five American companies reported here last week as bidders for ComSat's multipurpose satellite (SPACE Daily, Feb. 16) have been joined by two more domestic firms but, contrary to expectations, not by any foreign firms. The seven companies are Boeing, GE, Hughes, Lockheed, Philco, RCA, and TRW. (ITT, listed last week as a bidder, is actually a subcontractor with TRW in the bidding.)

**FCC "INTERFACE" DECISION MADE/ABC DECISION POSTPONED.** The FCC has settled the question of who shall own and operate the interface facilities for ComSat ground stations and where the facilities shall be located (SPACE Daily, Feb. 7), but it has put off again rendering the ABC satellite decision until next week. The "interface" ruling allows ComSat to retain ownership and control of the interface equipment but requires that equipment to be located at the station site rather than in a nearby "gateway" city as ComSat had envisioned (SPACE Daily, July 14, p. 58, and Jan. 5).

**PLANS FOR GEMINI LAND RECOVERY CANCELLED.** Tentative plans for recovering manned **GEMINI** spacecraft on solid ground have been discarded by NASA. **GEMINI** program manager Charles Mathews said the planned land recovery operation has been scrapped due to the "development time-constraint."

**SATURN IB LAUNCH RESET FOR TODAY.** NASA postponed yesterday's scheduled launch of the first **SATURN IB** Tuesday night because of heavy cloud cover that would interfere with camera coverage of the flight. The suborbital flight has been tentatively reset for 7:45 a.m. today, but uncertain weather conditions make the launch unlikely. The **ESSA II** weather satellite awaiting go-signal at Cape Kennedy may be launched instead. Only one launch can be made today.

**\$16 MILLION PHOENIX CONTRACT MODIFICATION.** BuWeps has awarded a \$16 million modification to Hughes' existing contract for additional FY '66 funding of the **PHOENIX** air-to-air missile to be used on the F-111 fighter (SPACE Daily, Jan. 5 & Feb. 14).



**COSMOS 110 MAY BE CIRCUMLUNAR FORERUNNER** (An Analysis). COSMOS 110, with its canine test subjects, the first of the COSMOS series to attain its orbit parameters (115.94/561.72 miles, 51.54 degrees, and 96.3 minutes), presents evidence of an identification with the Soviet lunar exploration program and may be a forerunner testbed for eventual circumlunar flights.

Dogs have always preceded man in the Soviet manned space program when a major project was scheduled and each time the dog flights have demonstrated the almost exact parameters of the subsequent manned flight. (In fact, two successful dog flights were necessary (KORABL SPUTNIK IV and V (SPUTNIK IX and X)) to convince the Soviets that the VOSTOK spacecraft was safe after an earlier re-entry test had incinerated the two dog passengers (KORABL SPUTNIK III) (SPACE Daily, Dec. 6, '60).

COSMOS 110 is closest to the recent LUNA soft-lander missions in parking orbit attainment. It has no similarity to Soviet manned Earth orbit missions. However, if the spacecraft is a forerunner of an early manned space station then the Soviets plan to completely deviate from the past manned spacecraft orbit experience in perigee/apogee and inclination. It is also a stranger to the PROTON orbit identification which the Soviets have admitted is a forerunner of their space station development program.

There is little doubt that this spring of 1966 is the prime period for the initiation of the Soviet space station development program, the integral part of their manned lunar landing plan. However, COSMOS 110 samples a part of the radiation belts during much of its flight and this is a near-Earth area which any sensible space station plan would stay away from but which a lunar trajectory must contend with during the outgoing and incoming phases of the mission. Further, one must question the need for preliminary dog flights for a space station program plan when long duration flights are not considered to be a threat to manned intentions. Rather, the Soviets in the past have used dogs for life test of spacecraft equipment and modes of operation to be employed for manned flights.

Also, while the dogs could have been sent into orbit for radiation tests, it is not at all necessary to either measure radiation or measure protection from radiation with live subjects. The United States and the Soviets have been doing this very effectively for a number of years with unmanned spacecraft.

The Soviets have already declared that they will use dogs again to precede man in the lunar landing program (SPACE Daily, Feb. 7) and it might be expected that this will include the spacecraft tests for circumlunar flights. How soon the Soviets have deemed it necessary to begin the preliminary unmanned and/or dog flights as a prelude to manned circumlunar flights which can be expected in 1968 may soon be revealed in the Soviet lunar activity over the next few months. The next opportunity, if utilized, is next Wednesday.

**THREE SUBMIT BIDS FOR GELLED STORABLE ENGINE.** Thiokol-Reaction, Martin-Denver, and Aerojet-General have submitted proposals to NASA-Western Operations Office for a project to define and establish the systems aspects necessary for the employment of gelled space storable propellants in spacecraft engine systems. Eight firms were invited to bid on the program (SPACE Daily, Jan. 10).



**ELDO/EUROPEAN SPACE BOOSTER BUSINESS AT THE CROSSROADS** (A Special Report). A major part of the crucial decision on the fate of the European Launcher Development Organization (ELDO)--and consequently for the future of European development and production of space boosters--will be made at the March 29 meeting of the ELDO representatives (SPACE Daily, Feb. 10).

Britain, as reported (SPACE Daily, Jan. 21 and Feb. 18), is not optimistic about the future possibilities of ELDO's program. However, Prime Minister Wilson's Government has not (as yet) made a final decision to withdraw. This is what Britain said in a note to ELDO. We have re-examined ELDO's initial program (**ELDO-A**), and we are anxious about cost and delay of the program. We wonder further whether the initial program should be continued; we have doubts about future programs and possible users. In summation, we do not believe in the viability of the program and we ask you (ELDO) to re-examine the whole thing before the Inter-Ministerial Conference on March 29.

**Satellite Programs Planned for ELDO Booster.** ELDO will not accede to Britain's contention. They will point out that rising costs are always associated with new programs and that while the program has been admittedly delayed, it is moving smoother and faster now. (F-4, the first **EUROPA I** test flight--with dummy second and third stages--is to be launched next month.) The Organization will explain to Britain: That ELDO's future program is entirely based, as currently planned, on the initial program, and that abandonment of the initial program will probably mean abandonment of the future program and dissolution of ELDO. And, this will be the punch line, programs have been lined up for the ELDO booster and include:

1) Though not made public yet, the European Space Research Organization (ESRO) has decided to adopt **ELDO-A (EUROPA-1)** if performance and delivery date meet needs. ESRO is planning to use **EUROPA-1** for launch of **SP** (Sounde Spatiale--Space Probe) craft in 1969, 1970 and 1971. Another **EUROPA-1** would be used for launch of **LAS** (Large Astronomical Satellites--**OAO**-type), also called **GSA** (Grand Satellite Astronomique) in 1972. Use of four other **EUROPA-1s** is envisioned for launch of **GSS** (Grandes Sondes Spatiales) and **LSP** (Large Space Probes) in 1972 and 1973.

2) **CETS** (Conference Europeenne des Telecommunications par Satellites), a group of 18 European country members of Intelsat, is planning to use **ELDO-As** and **B-1** for communications satellite experiments. Their target is to have a ComSat in orbit by 1969 or 1970, in order to tell the United States before final agreement on a worldwide communications satellite network: We are able to build boosters and satellites and we want our part in the program. CETS has tentatively scheduled utilization of **ELDO** vehicles to launch its experimental communications satellite. However, the group also plans to use American boosters for some launches. Overall the plan is to use three **ELDO-As**, then two Improved **DELTA**s for twin launches (or three Improved **DELTA**s for single launches), then later B-1s. Before that, experimental telecommunications black boxes will be placed aboard **ELDO-As** F-9 and F-10.

The outlook will be clear at the Minister's Conference March 29. ELDO will tell Britain, its major dissenting member, that Europe either develops its own launchers or tie itself and sell itself to the United States. The question is now nearly entirely a political affair.



## BRITISH NAVY SHIFTING TO MISSILE POWER

The British white paper on defense spending (yesterday's SPACE Daily) describes the Royal Navy of the 1970s as exploiting "the most modern technologies, particularly nuclear propulsion and guided missiles." It says Britain will develop "a small surface-to-surface guided weapon for use against missile-firing ships" and will "shortly order the first of a new, more powerful class of guided missile ship--the type 82 destroyer--to be equipped with the surface-to-air...**SEADART**, the **IKARA** antisubmarine weapon, and the new Anglo-Dutch radar."

The British further say that late this decade, the Royal Navy will assume full operational control of the British share of the **POLARIS**-armed NATO submarine force, with the cost of that share to run under two per cent of the total defense budget. In addition, "by the early 1970s, we reckon to have in service...four nuclear-propelled hunter-killer submarines, which with their long endurance and immunity to detection, will be a formidable part of our antisubmarine defenses." Also, "we shall complete the conversion of the Tiger class cruisers to carry antisubmarine helicopters, and we are planning a new type of ship to succeed them."

Although they do not discuss it, Britain has been considering purchase of the **LANCE** missile (yesterday's SPACE Daily) to replace the **CORPORALS** its Rhine Army has deployed in West Germany, and the **LANCE** is being studied by the United States for possible shipboard employment (SPACE Daily, Oct. 12, '64 and Jan. 25).

F-111 Purchase Confirmed

As expected (yesterday's SPACE Daily), the white paper reports Britain's intention to buy 50 F-111A aircraft from the United States to provide a reconnaissance and strike capability during the first half of the next decade. Ten of those 50 will be ordered immediately, and the other 40 will be sought in April of next year. Britain says it is "guaranteed full delivery of the 50 F-111As not later than January 1970." The option to procure these planes was entered into last April by the two governments.

The decision to exercise that option was made after the Mirage IV and the Buccaneer 2 aircraft were found unsuitable for the job the F-111A will fill. "No other aircraft can be available by 1970 which can match the performance of the F-111A," says the paper. (The paper notes, however, that Buccaneer 2 will be developed to carry the AJ.168 air-to-surface missile.) The ceiling price for each F-111A has been agreed upon as \$5,950,000, which covers in part research and development and in toto production but not modifications the RAF may require later.

The F-111As are needed to plug the hole created by the planned discontinuance of the Canberra aircraft at the close of this decade and the employment of the Anglo-French variable-geometry plane in the mid '70s. This latter "is the core of our long-term aircraft program." The former, in use since the early '50s, "cannot safely continue after 1970."

In its strike operations, the F-111A will be aided by "V-bombers," which will be withdrawn from NATO participation once the British **POLARIS** submarines are in service.

The British add that steps have been taken "to ensure that the foreign exchange cost of the F-111A will be fully offset by sales of British equipment. Arrangements have been made for British firms to compete without discrimination for U.S. contracts for items of equipment and supply jointly identified by the two governments, and for target totals for the U. K. Progress in meeting these targets will be reviewed annually. As a first step, the U. S. Government will extend to Britain the opportunity to tender for the construction of naval auxiliaries to the value of some \$50 million."



### ESSA II LAUNCH SET FOR TOMORROW

The second operational weather satellite will assume orbit tomorrow if present plans are realized. **ESSA II** (named after the Environmental Science Services Administration of the Commerce Department but defined as the Environmental Survey Satellite) will lift off Pad B at Cape Kennedy's Complex 17 at about 9 AM EST on a Thrust-Augmented Improved **DELTA**. The intended orbit is 865 miles circular at 78.6 degrees, with a period of 113.5 minutes. **ESSA II** is the second **TOS (TIROS Operational Satellite)** and the twelfth **TIROS (Television InfraRed Observation Satellite)**.

### ARC FORMS ORDNANCE DIVISION

Atlantic Research has established an Ordnance Division, incorporating the Saugus, Calif., Flare-Northern plant, the West Hanover, Mass., Flare-Northern plant, the Limited Warfare Group, and the Systems Development Group. In forming the new division, the company is bringing under single management activities supporting tactical warfare and is providing an organizational structure to facilitate its participation in the manufacture and development of advanced weapons, ordnance devices, and ordnance dispensing systems. The Flare-Northern plants will comprise the main ordnance production facilities of the company. Dan McBride, an ARC vice president, who has managed the two Flare-Northern plants, has been appointed general manager of the new division, which will be located near the company's Principal Laboratories.

### COLLINS EARNINGS UP 105 PER CENT

Collins Radio had sales of \$175 million for the six months ended January 28, up from the \$129 million reported for the comparable period last year. Earnings rose 105 per cent from \$1,599,000 or 72 cents per share to \$3,283,000 or \$1.44 per share. Backlog as of January 28 was \$320 million, up from \$288 million at the beginning of this fiscal year. President Arthur Collins says, "It now appears that sales for fiscal year 1966 will approach \$370 million with earnings in the \$3.10 to \$3.35 per share range on the number of shares presently outstanding."

### CSC SALES TO REACH \$24 MILLION

Computer Sciences Corp.'s sales from all sources for the year ending April 1 will reach approximately \$24 million with net earnings of around \$2.7 million. The company expects sales of approximately \$30 million for FY '67 and a significant increase in net income.

### SPAIN AWARDS TWO CONTRACTS TO PAGE

The Spanish Air Ministry has awarded two contracts totaling more than \$1 million to Wat S. A. of Madrid in association with Page Communications Engineers. The two companies recently formed Page Iberica, a jointly owned corporation in Madrid, to provide design-through-management service for telecommunications projects in Spain.



### NRC TO PRODUCE LUNAR DUST FOR NASA

The National Research Corp. will receive \$50,000 from NASA-Langley to produce simulated lunar dust in an ultrahigh vacuum to help study the dust's bearing capacity. Materials being considered for grinding into the dust are pumice, basalt, olivine, and olivine basalt. The dust will be analyzed for particle size and shape, density, compressive strength, and shear strength. The one-year study "presupposes that the lunar surface consists of a layer of dust caused by the constant bombardment of meteorites."

### SECOND S-IC-1 TEST SET FOR TOMORROW

The second and last of the test firings of the **S-IC-1** at NASA-Marshall (SPACE Daily, Dec. 16 and Jan. 31) is planned for tomorrow, the 25th, with an 85-second burn. The first test was performed last week (SPACE Daily, Feb. 18). **S-IC-1** is the first flight model of the **SATURN V**'s first stage.

### MACARTHUR NAMED TO NEW DR&E POST

The first deputy director of defense research and engineering for chemistry and materials is Dr. Donald MacArthur, former manager of Melpar's Chemistry and Life Sciences Center. In his new position, he will supervise the technical review and evaluation of all DOD R&D relating to chemistry and materials. This responsibility previously belonged to the deputy DR&E director for research and technology, Chalmer Sherwin, who retains control of in-house laboratories and research programs. MacArthur joined Melpar in 1958.

### SIKORSKY AFA "MAN OF THE YEAR"

Igor Sikorsky, developer of the helicopter, has been named "Man of the Year" by the Air Force Association. Sikorsky was presented with a bronze eagle by the Iron Gate Chapter at the third annual Air Force Salute in New York City.

### TWO OV LAUNCHES RESCHEDULED

The launch of the twin satellites **OV1-4** and **OV1-5**, most recently set for March 3 (SPACE Daily, Feb. 11), is now scheduled for the 18th, although possible conflict with the eighth **GEMINI** mission may put it off until the 19th or 20th. Also, the tentative April-19 launch date for **OV3-1** (SPACE Daily, Feb. 21) has been firmed, and the satellite will be rolled out a week from today at the Space General plant in El Monte, Calif. The experiment problems that have been hampering the -4/-5 shot have been cleared up.

Raymond R. Corey has joined NASA-Cambridge as assistant educational programs officer. Corey has been a space science lecturer representing NASA since 1963.