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ELDO FAILS TO AGREE 1969 BUDGET

The 34th session of the ELDO Council at its meeting on Decern her 19 and 20 failed to reach any agreement on the 1969 budget. The principal cause of dissention was the impasse which has been reached as a result of Britain's refusal to pay the additional ML!50 million (I MU = 1 US dollar) over the basic MU626 million necessary to complete the agreed programme.
Britain's stand and the "package deal" which she presented to the European Space Conference last year were described in Flight for November 28, and this position was maintained at the December meeting. A number of options were discussed, among which were that Britain's share in ELDO be reduced immediately to a figure consistent with MU626 million, and that she continue at the present estimate (i.e., MU675 million) but terminate her payments earlier. In any case a decision is now urgently required so that the industrial position may be clarified.

VENUS 5 LAUNCHED

Venus 5, an unmanned planetary probe, was launched from the Soviet Union on January 5 with the object of making a soft landing on Venus in mid-May. The probe weight 2,4941b, slightly less than its predecessor Venus 4 (2,5501b) which, launched from Russia on June 12, 1967, soft-landed on the planet on October 18 of that year. Venus 5 made one Earth-orbit to check systems before insertion into a Venus trajectory.

FIRST INTELSAT 3 LAUNCH

The second of the third-generation Intelsat 3 communication satellites was launched by Delta rocket from the Kennedy Space Center on December 18, ten years to the day after the launch of the first "talking" satellite—Project Score—which transmitted taped signals for 13 days. The first Intelsat 3, launched on September 18 last, was destroyed along with its launch vehicle after an autopilot caused the latter to go out of control shortly after lift-off. The Delta launch vehicles are bought from NASA by Comsat for about $5 million each.
The satellite was initially placed in an elliptical transfer orbit of 22,700/165 miles radius. This was adjusted over a period of several days after which the apogee motor mounted in the spacecraft was fired to circularise the orbit. This solid-propellant motor provides the 6,060ft/sec necessary to circular-ise the orbit. Further refinements are being made to the orbit, after which the satellite will be available for commercial use.

The spin-stabilised Intelsat 3 is a plain cylinder, 41in high (78in over the aerial system) and 56in in diameter. The weight at launch is 6321b, decreasing to 3221b in orbit when the fuel has been expended. The satellite receives transmissions (the up-link.) in the range 5,920MHz-6,420MHz and relays these (the down link) between 3,695MHz and 4,195MHz. Signals are received and transmitted by means of a directional antenna which is mechanically de-spun, while housekeeping and tele-metry commands and data employ an omni-directional antenna.

The prime contractor for Intelsat 3 is TRW Systems, and the total value of the contract (to launch four satellites) is $32 million. Four other American firms, and nine European manufacturers provide the subsystems; among the latter HSD provide the spacecraft structures.

ELDO "SATISFIED" WITH F.7 LAUNCH

A preliminary assessment of the Europa F.7 launch ort November 30 has confirmed the initial impressions of an overall-successful flight, notwithstanding its premature termina-tion. The ELDO Scientific and Technical Committee, which comprises representatives of all the member countries, stated unanimously during its meeting at Paris on December 10 and

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II that "the F.7 test represented a considerable step forward and gives confidence in the successful completion of the curren ELDO programme."
Both first and second stages functioned within specification limits. Following separation of the second and third stages ignition of the vernier engines and the main propulsion engine of the third stage was satisfactorily achieved, together with partial flight-qualification of some third-stage systems such as the sequencer, power supply and transponder. The fairings wer correctly jettisoned and all the satellite systems operated reliably. The attitude-reference and programme unit equipmen functioned correctly and no problems were encountered with either range-tracking or the in-flight safety system.
The reason for the termination of third-stage thrust has not yet been ascertained. Fuel is pressure fed into the combustio chamber and one likely cause is loss of pressurisation in th gas system. As a result of the thrust failure no test of the overall radio-guidance system was possible, separation of th third stage and satellite test vehicle did not take place, and the latter did not achieve orbital flight.
The telemetry data acquired should prove adequate for
full assessment of the flight, however, and ELDO is confident that the F.8 launch next May/June will take place as planned

X-15 PROGRAMME ENDS

The NASA/USAF/USN X-15 research programme has ended after 9\ years and 199 flights. The final mission was flown on October 24 by William Dana. The 200th flight, planned for December 20, was cancelled owing to bad weather and -wil not now be re-scheduled.

Three X-I5s were built for NASA by North American Rock-Well, the first aircraft flying on June 8, 1965. Simce then a peak altitude of 354v200ft (over 67 miles) and a maximum speed of 4,520 m.p.h. (Mach 6.7) have been attained, and a total flight time of 82min at Mach 5 has been accumulated The three X-15s between them were airborne for a tota of 30hr.

Only 12 pilots have flown X-I5s. They are:—A. Scott Crossfield, NAR; Joseph A. Walker, NASA; Col Robert M. White, USAF; Captain Forrest S. Petersen, USN; John B McKay, NASA; Col Robert A. Rushworth, USAF; Neil A. Armstrong, NASA; Maj Joe H. Engle, USAF; Milton O. Thompson, NASA; Maj William J. Knight, USAF; William H. Dana, NASA; Maj Michael J. Adams, USAF.
Despite the special nature of these rocket-powered aircraft only one was lost (No. 2, with its pilot, in November 1967) and they fully deserve the attribute 'bestowed on them by the late NASA Deputy Administrator Dr Hugh L. Dryden, "The most successful research aircraft ever built."

MAKING A START WITH THE LUNAR ROVER

NASA has for some time been planning advanced lunar missions to follow on the early Apollo landings. An essential requirement in wide-seale exploration of the Moon is the ability for astronauts to be able to explore areas at some distance from the landing site. To do this a specially designed transporter is necessary and NASA has recently asked 11 companies to submit, by January 6, studies of such vehicles. Known as LRVs (lunar roving vehicles) these devices will be suitable for either manual or automatic operation, and will be compatible (according to NASA) with "several spacecraft delivery systems under construction." The vehicle would be deployed and operated by one astronaut and would enabl manned sorties of up to six miles from the point of departure to be made, at a speed of about 9 m.p.h.
This versatile vehicle could operate in several other modes for example, it could be deployed automatically from an unmanned Moon-lander, and commanded to rendezvous with astronauts at a predetermined location on the Moon, collecting soil samples on the way; or it could operate in an entirely

automatic mode, collecting and analysing samples and transmitting data back to Earth.
Two sizes of vehicle are being studied. The first will weigh 7501b (including 1001b scientific equipment) when used in the automatic mode, or 1,1501b when manually operated. The second will weigh 1,2501b (including 2501b science equipment).