• Nasa has awarded a $15-2 million contract to RCA for the supply of two more Itos satellites and parts for a third. The satellites will become Itos-H and -I in the series and the first is to be delivered for launch next year.

LEARJET SPACELAB SIMULATION

Two Nasa scientists, Leon B. Weaver of the Spacelab Programme Office and scientist-astronaut Karl G. Henize, earlier this month completed the fourth of a series of simulated Spacelab missions using an Ames Research Centre Learjet. The mission was a part of the Airborne Science Spacelab Experiment Simulation System (Assess, see Flight for October 10, page 477) and lasted for five days. Known as Lear 4, the mission was the first on which experiments were managed by substitute operators. Their performance was monitored and is now being compared with that of the principal scientific investigator and his team during previous missions.
When not airborne the two crewmen were confined to an isolated trailer in which they lived and worked for the duration of the mission. They were solely responsible for the maintenance and repair of the scientific equipment aboard the aircraft and remained in touch with the prin-cipal investigator's team, which was present at Ames to review data from each flight and to assist in the planning of the mission, by the use of telephone and remote copier only.
The mission included ten night flights, each of which afforded about l^hr of data from the principal scientific payload, a 0-3m infra-red telescope. It was directed at infra-red sources which appear to be new-born stars. Observation of such objects from the ground is precluded by the absorption of infra-red waves by moisture in the: lower atmosphere.
Assess missions are also being flown on C-141s as well as the Learjet and GV990 and are supplying data that will be used to determine Spacelab payloads and operating pro-cedures.

NASA PROPOSES MOON-ORBITING SATELLITE

More than five years after the first manned landing on the Moon, the scientific fraternity is seeking support for a mission that will take Nasa back to the lunar environ-ment. A plan now being devised calls for a satellite to be launched from the Kennedy Space Centre, to journey to the Moon and enter polar orbit around it. From a vantage point high above the surface, instruments will measure the chemical composition of the surface soil and directly supplement information returned by the last three Apollo flights in 1971-72.

Recognising the limitations imposed by concentrated analyses of specific landing sites, the Apollo science team developed an experiment package designed for command and service modules left in Moon ofbit when the lunar modules descended to the surface. Operated by the com-mand module pilot, it was carried in the scientific instru-ment bay of the service module. It comprised a gamma-ray spectrometer, an X-ray fluorescence pack and an alpha-particle spectrometer for Apollo 15 and 16 and an infra-red radiometer for Apollo 17. All three missions used the high-resolution panoramic and mapping cameras to provide detailed views of the ground track. The information returned from these remote sensors helped scientists to map the lunar surface in great detail and investigate the

The second Westar satellite for America's first domestic communications satellite system was launched on October 9 from Cape Kennedy. It is understood to be in good condition and will be allowed to drift at a
rate of several degrees per day until it arrives at the desired location over the USA at the end of the month

chemical composition and thermal profile of the surface layers on both the near and the far sides of the Moon. But severe limitations were imposed by the low inclina-tion of the Apollo orbit and very little information was obtained from latitudes exceeding 25° north or south of the Moon's equator. Information from the remote sensors proved so valuable that consideration was given to flying Apollo 17 on a polar-orbiting mission. With the Moon slowly revolving beneath the spacecraft it would scan the entire surface in 27 days, the time taken for one lunar revolution. But the energy required to reach polar orbit was so great that the lunar module could not have been carried, and the greater benefits of a surface landing prevailed.

Now that information from Apollo has whetted the appetite of scientists around the world, the need for a polar-orbiting satellite has assumed importance once again. As proposed, the unmanned satellite will be launched in 1979 and carry gamma-ray and X-ray experiments to Moon orbit. With the lunar sphere turning slowly on its axis, successive orbits of the satellite would move east at less than 2° per revolution. Thus, in about 200 orbits of the satellite, all areas would be scanned several times to provide an opportunity for multi-orbit analysis of particular areas of interest on the surface. Although this project has not yet received official approval, the requirement for such a satellite was seen in full at the fifth annual Lunar Science Conference last March and Nasa is expected to ask for money in next year's budget. As currently envisaged the spacecraft will weigh 1,0001b, measure about 5ft diameter x 5ft in length and, in addition to the X-ray and gamma-ray spectrometers, will also carry a magnetometer, plus a small sub-satellite which will be released from the orbiter proper at an altitude of 60 n.m.

Nasa has secured increasing appropriations from the budget for the continued monitoring of lunar-surface conditions by means of the landing-silte research stations set up by Apollo. Now that Russia has demonstrated its interest in a continuing programme of lunar research, and Western scientists have had an opportunity to determine the best avenues for future study, it would be difficult to see Nasa rejecting the idea of a relatively inexpensive, polar-orbiting satellite. D. B.