

er 400yd pointing north. Each aerial, 30ft high and weighing 6 tons, is placed to an accuracy of 0.2mm. This accuracy is needed to ensure reliable readings of information transmitted from the space vehicle.

Data sent from the vehicle on angular rates, acceleration, height and distance is fed into the computer. It compares the data against planned trajectory and generates any correcting signals necessary to ensure that flight is normal.

When the computer decides that all required conditions have been met, it initiates a command to put the space vehicle into polar orbit. Equipment at Gove is regularly under calibration test by an aircraft carrying equipment identical to that of the space vehicle.

Shortly before launching, all aerials are pointing in the direction of the satellite's approach. The vehicle is on the third-stage rocket when the guidance system takes over, about 4min after firing. Any variations to the planned programme at this stage are relayed by data link from Woomera and appropriate instructions inserted manually into the computer. When the computer is receiving the vehicle's signals, a button is pressed and the operation becomes "real-time" control.

LUNAR RECEIVING LABORATORY

so that there can be no possibility of US astronauts returning from the Moon bringing with them unheard-of diseases which might spread disastrously through mankind, the astronauts will spend their first 18 days back on Earth in a hermetically sealed, super-sterile building called the Lunar Receiving Laboratory (see photograph in *Flight* for December 14, page 810) at the Manned Spacecraft Centre, Houston, Texas. This building is so designed that no single germ can escape once the Apollo astronauts have been sealed inside.

US public health authorities have imposed a 21-day quarantine on astronauts returning from Moon flights, and a special group of doctors, biologists and agricultural experts known as the Inter-agency Back-up Committee on Contamination has been set up to work out foolproof measures to prevent mishap from occurring.

The quarantine period will not be as arduous for the astronauts as it sounds, for the Lunar Receiving Laboratory is equipped to give them all the comforts of a luxurious setting; and in one wall is a thick plate-glass window through which the astronauts will be able to talk to their wives and children. But every molecule of air leaving the white three-storey building will first be incinerated and passed through ultra-fine filters. All other waste will be stored in leakproof containers before being strongly disinfected then burned.

Dr Walter Kemmerer, chief of MSC's Biochemical Specialties Branch, says that "the probability of life existing on the lunar surface is extremely small. The environment there, the temperature, the absence of free water, the radiation—all of these things make us believe that life is unlikely to exist on the Moon.

"But we cannot definitely or with absolute certainty say that does not. So we must take precautions."

ALOUETTE 2 ANNIVERSARY

In two years, the Canadian ionosphere sounding satellite Alouette 2 has completed 8,658 Earth orbits, travelling 272 million miles. This was announced by the Defence Research Board Telecommunications Establishment in Ottawa just before the second anniversary (November 28) of the satellite's launching.

Alouette 2 is in an elliptical orbit (apogee, 1,850 s.m.; perigee, 311 s.m.) and during its time in space has executed 22,500 commands, resulting in the production of 650,000 ionograms for analyses and study. The satellite controller has reported that "all five experiments have been fully operational since launch" and that "spare equipments have not been put into operation, except for performance checks."

The previous DRB satellite, Alouette 1, completed five years in space on September 29 (*Flight*, October 19, page 661) and all systems continue to be operational.

ESTAC Opening It has been announced from The Hague that Crown Princess Beatrix and her husband Prince Claus will open the new building of ESRO's European Space Research and Technology Centre (ESTAC) at Noordwijk, near The Hague, on April 3 next year.

ESRO Campaign Closes The European Space Research Organisation has announced the successful close, with the second launching of payload C31 on December 6, of its latest launching campaign in Lapland. This payload was described in *Flight* for November 23, page 888. The experiments sent up on December 6, intended for the study of auroral phenomena, came from Danish and German laboratories.

Aid to Astronauts Reported agreement between the US and USSR at the United Nations, on a convention covering the protection and repatriation of distressed astronauts and the liability for damages in case of space accidents, has been depicted as the first major breakthrough in space co-operation since the treaty on the peaceful uses of outer space was concluded last January. Terms of the convention were to be considered by the legal sub-committee of the General Assembly's Committee on Outer Space.

USSR Pacific Tests End On December 13 a Tass news agency statement said that "in view of the successful completion of the launchings of carrier rockets, the area in the Pacific with a radius of 40 n.m. from a centre at 32° 15' North and 173° 42' E—notified on November 27—is free for navigation and aircraft flights from today." There was a second area of the Pacific where the Soviet Union has been sending up carrier rockets. This was 18° 25' N, 178° 30' W, again an area of 40 n.m. radius (*Flight*, December 14, page 1012), and launches continued in that area until December 15.

Dish of the antenna (right, below) used in deep space probes by the DSIF (Deep Space Instrumentation Facility) at Woomera, South Australia. At left below, a section of the control facilities at Island Lagoon Tracking Station, Woomera

