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The photographs on the page are among the first to show the internal details of the lunar module ascent stage. This illustration on the left show the lunar module pilot's position at the left-hand side of the spacecraft, with his triangular viewing window. The optical-alignment sight extends vertically down from above the window The left-hand panel contains circuit breakers, the right-hand panel engine controls, with below them an attitude indicator. Right, interior of the ascent stage, looking aft. At the top is the docking and entry hatch used by astronauts for internal access to the command module.

APOLLO 9 LAUNCHED

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HAT WOULD HAVE BEEN America's heaviest-ever week

for space activity was downgraded by the postpone-
ment of the Apollo 9 flight from Friday, February 28
to Monday, March 3. The week began with the smooth launch on February 25 of America's most complex interplanetary spacecraft to date, Mariner 6, followed by that of the less spectacular but equally important ESSA 9 weather satellite a day later. This was also successful and, meanwhile, the initial countdown for America's most complex manned space enter-prise so far, Apollo 9, continued without a hitch. The omens were good for launch at 1600OMT (11.00 local time) at Cape Kennedy: on February 25 supercritical helium was loaded into the lunar module fuel-pressurisation tanks and on the following day the fuel cells were brought into operation.

Following the illness experienced by the Apollo 8 astronauts last December, the Apollo 9 crew (consisting of James A. McDivitt, David R. Scott and Russell L. Shweickart) was isolated from humanity as much as possible. As late as February 24 a 4hr medical check had given a clean bill of health to each. But the following day all three crewmen reported sore throats and nose congestion, and on February 27 the launch was rescheduled for 1600GMT on March 3, following a medical report by the chief astronaut physician Mr. Charles Berry. In the event, the launch was successfully made on schedule shortly before this page went to press.
.By February 27 the discomfort had 'begun to clear up, but
it was decided that the probable degradation of performance in the face of such an exacting mission could not be enter-tained, particularly since the first five days would be particularly demanding.
Apollo 9 is the first manned flight involving the lunar module. This was due to have been flown last year, but continuing problems forced a postponement and, in the event, last December's brilliantly successful Apollo 8 flight took its place. In order to qualify for the Apollo 11 manned lunar landing next July, the LM trials involving Apollo 9 and 10

must now be reasonably trouble-free.
The Earth-orbital flight is scheduled to include extensive performance tests of the lunar module, a rendezvous of the LM with the mated command and service modules, and 2hr of extra-vehicular activity by the LM pilot, Russell Schweickart. The rendezvous is designed to duplicate to the maximum degree possible the manoeuvre which will take place in lunar orbit following the Moon landing.
While the LM has been previously flown (on the unmanned Apollo 5 flight of January 22 last year) the tests achieved were not extensive (and neither were they designed to be). Con-sequently, with time running short for the Moon landing, the entire behaviour of the LM, together with its compatibility with the CSM (command and service module) needs to be assessed as far as possible in one flight. Many of the tests will exceed in severity the conditions applicable to the actual landing mission.
The top priorities are to confirm the rendezvous and docking manoeuvres. Two dockings were scheduled: once with the LM still attached to the S-1VB stage, and again following the rendezvous-manoeuvre sequence. Next in order of importance are special tests of the LM systems, such as the performance of the descent and ascent engines in various guidance control modes, and the LM environment control and electrical power systems which can be realistically assessed only in true space conditions.

Although Apollo 9 will be followed by a lunar-orbit mission
in which the LM will descend to 50,000ft of the Moon's surface (but not land), it will be the only opportunity before the Moon-landing flight to exercise the descent engine in a long-duration burn.

Also of high priority are preparations in the LM for EVA (extra-vehicular activity, or spacewalking). This is necessary to provide a realistic dress-rehersal of the part of the Moon-landing flight when the astronauts climb down from the LM to the surface.