MOON-LANDERS THEN AND NOW

Almost exactly a year ago, on July 20, 1969, the three American astronauts Neil Armstrong, Edwin Aldrin and Michael Collins were engaging in the greatest of all technological ventures—the first landing on the Moon. A year later the team has split up, only one member remaining on the "flight line."

Neil Armstrong, commander of the Apollo 11 flight and first man on the Moon, became Deputy Associate Administrator for Aeronautics at Nasa from July 1 this year. At a time when both public opinion against high-cost projects and a mutually regressive financial situation militate against aerospace, the move is clearly aimed at promoting aviation (and particular commercial-aircraft research) to Congress and the American public. Armstrong will oversee advanced research into projects such as quiet, smokeless engines, VTO aircraft and the space shuttle.

Edwin Aldrin continues has career at the Manned Spacecraft Centre as a first-line Apollo crewman in the corps of astronauts.

Michael Collins, who kept watch over the landing from his station in orbit around the Moon, is now Assistant Secretary of State for Public Affairs; he was appointed to this State Department post, with effect from January 6, last, by President Nixon.

APOLLO 14 GOES BACK

Spacecraft changes to overcome the faults which nearly cost the lives of the Apollo 13 crew last April have forced a postponement of America's next Moon landing flight to January 31 at the very earliest. In a recent statement the Nasa Administrator, Dr Thomas Paine, said that the command and service module systems will be changed to eliminate the potential combustion hazards in high-pressure oxygen equipment revealed during the investigation of the Apollo 13 accident. In addition a third oxygen tank will be added to the service module so as to avoid operating at low oxygen levels, and making possible the removal of unsealed fan motors in the tanks.

Other changes include the stainless-steel sheathing of electrical wiring, and the use of Teflon and aluminium will be kept to a minimum. Warning systems on the spacecraft and at the Mission Control, Houston, are to be modified in accordance with the recommendations of the Review Board to provide more immediate and visible warnings of fault conditions.

A copy of the Apollo 13 Review Board Report has been sent to Academician M. V. Keldysh of the Soviet Academy of Sciences.

Dr Paine said that the proposed changes will cost between $10 million and $15 million, but bluntly reminded the Senate Space Committee that fuel tank problems would not remove all hazards from the project.

Apollo 14 will land in the Fra Mauro region, the objective selected for the near-catastrophic mission last April. Its crew will be Capt Alan B. Shepard USN Commander, Maj Stuart A. Roosa, USAF Command module pilot, and Cmdr Edgar D. Mitchell, USN lunar module pilot.

Postponement of Apollo 14 will also affect the flight date for Apollo 15, which goes back to July or August next year, so as to maintain an approximately six-month interval between flights.

DEEP SPACE NETWORK EXTENDED

Construction has begun in Spain of a 210ft antenna which will form the third and final link in the Nasa Deep Space Network's chain of powerful trackers. The new antenna is sited 40 miles west of Madrid, where three 85ft dishes are already operated jointly by the Space Agency and the Institute Nacional de Technica Aeroespacial. Another 210ft dish is at present under construction at Tidbinbilla, near Canberra.

Beginning in 1973, the new antenna will, together with the two other dishes, enable the DSN to maintain a 24 hour communication with unmanned spacecraft as far out as the boundaries of the solar system. At the present time very careful flight planning is necessary to ensure that crucial events (such the flypast of Mars by the two Mariner spacecraft last year) occur when the spacecraft is accessible to the 210ft dish at Goldstone, and this can impose quite severe constraints.

The extension of the DSN is a significant pointer to the increased importance and frequency of planetary exploration. Next year sees the flight of the two Mars-orbiting Mariners, while the first of two Pioneer Jupiter probes will be launched in 1972.

In the following year a flight to Mercury, using (for the first time) the gravitational attraction of outer planets to reduce launch power demands, will put unmanned probes nearer the Sun than any previously. In 1975 a major project, Viking, will soft-land instrument payloads on Mars, while in 1977-78 it is expected that the Grand Tour Spacecraft will make the first reconnaissance of the solar system, taking in Jupiter, Saturn, Uranus, Neptune and possibly Pluto. But Nasa is not the only customer for deep-space tracking services. Germany has for long been known for its close interests in these, literally, far-out missions, and one of them—the solar probe Helios—is in the firm planning stage. It is also possible that this ambitious country will develop a Jupiter spacecraft.

In addition to their main task, the "210s" will be used in future manned missions; the Goldstone dish was used to relay TV from the first Moon landing, and vital communications during the Apollo 13 emergency.

POLLUTION SENSOR

As part of the national attack on the problem of atmosphere pollution Nasa's Langley Research Centre has begun development of a satellite-borne sensor to measure the concentration of carbon monoxide in the Earth's atmosphere. It is estimated that about 500 million tons of this poisonous gas exists in the atmosphere, while industrial activities (and particularly motoring) add a further 200 million tons per year. But the concentration of the gas, measured over a period of years, has apparently not increased so that some form of mechanism must exist for the removal of most or all of this annual generation.

The Langley sponsored experiment—the research is actually being made by General Electric under a $1,077,000, 30-month contract—is designed to map the distribution of carbon monoxide over a period of one year. In this way it is hoped to identify the "sink" into which, presumably, the gas is converted into another compound. Unless the mechanism can be identified, there is no way of predicting whether the concentration of carbon monoxide will increase in the future, or by how much.

LONG-LIFE BALLOON

A balloon released on May 26, 1969, during an experimental CNES (the French national space establishment) venture was still operational and transmitting signals on May 28 last. The aim of the programme was to check the life of balloons which are under development in support of Eole, the French project to map the wind circulation in the southern hemisphere by monitoring the drift of 500 balloons over a long period. Each balloon will carry a tracking beacon, and data will be collected and relayed to Earth by an Eole satellite beginning next year.

The balloon was inflated to about 200mb, was designed to operate at levels of between 39,000ft and 45,000ft and was 13ft in diameter. It was the first time that a long-duration balloon released with a pressure of less than 200mb has existed for over a year.