

APOLLO PROJECT

AN ARIA BUT NO OPERA

The atmosphere at O.T.C's Paddington Terminal was tense in the early hours of Saturday, October 12, 1968. Everyone was waiting for the ARIA program to get under way, but this ARIA had nothing to do with opera. ARIA stands for **Apollo Range Instrumented Aircraft**, and these played a vital part in the recent U.S. Apollo 7 three-man space flight—a forerunner to the man-on-the-moon project.

O.T.C, through its Paddington Terminal and radio stations at Doonside and Bringelly, was a major participant in the ARIA network. The ARIA aircraft, modified Boeing 707's fitted with extensive radio, tracking and telemetry equipment, were designed to fill in the gaps in global communications coverage both to and from the Apollo satellite and its three astronauts, Walter Schirra, Donn Eisele and Walter Cunningham.

One of the most significant of these gaps—areas where the spacecraft is out of range of fixed ground and shipboard tracking stations—occurs over the Western Pacific Ocean, north-east of Australia. This is beyond the area scanned by the U.S. National Aeronautics and Space Administration installations at Honeysuckle Creek, Canberra, and Carnarvon, Western Australia.

Another "blind spot" area occurs south-west of Australia beyond the range of the tracking station at Carnarvon. Four ARIA aircraft, with several support aircraft, were brought to Australia for the October flight. Two were stationed at Townsville and two at Darwin. Two were moved to Perth during the latter stages of the 11-day space mission.

The ARIA aircraft, cruising at about 510 m.p.h. at 35,000 to 40,000 feet, acted as relay stations between the Apollo capsule and the ground stations, picking up, through a seven-foot parabolic dish-type antenna in the nose, the micro-wave voice transmissions from the spacecraft and re-transmitting them earthwards via HF radio. The process was reversed for transmitting messages and commands to the astronauts. Telemetry transmissions were also relayed through the aircraft. The O.T.C. Terminal at Paddington was directly in contact with transmitting and receiving stations at Doonside and Bringelly, and with a similar operations centre at Guam in the Marianas Islands.



Messrs. A.H. Griffiths (front), B.W. Collett (centre) and J.N. Hodgson manning the ARIA console at Paddington.

It was linked to the Pacific Sector Control Center at Hawaii, indirectly to a station at Eniwetok in the Marshall Islands and through to Cape Kennedy, Florida and the NASA Manned Spaceflight Control Center at Houston, Texas. Recalling the hectic morning of October 12, Sectional Engineer {Satellites} Mr. M. Crisp, who co-ordinated O.T.C.'s contribution to ARIA, said wryly, "There were a lot of cups of coffee being drunk at Paddington just before 1:00 a.m. The tension was pretty obvious throughout the whole of the centre," he said. "In the ARIA section, a small glassed-off room crammed with equipment, personnel and maps, the constant flow of countdown and special ARIA information from all over the world built up as zero hour approached.

"The launch took place just before 1:03 a.m. (A.E.S.T.) and then things really started to get busy. They were at their most hectic during the capsule's second orbit when we were handling data from all four aircraft, double our quota, because of poor reception at other stations." The Paddington ARIA complex provided a circuit to the space capsule on the second, third and fourth orbits during the first morning and then every day until October 20, when it was closed down.

Each orbit took about 90 minutes. U.S. Department of Defense Communications representative Mr. J. Nordbusch came to Sydney to oversee the Paddington operation. The Paddington ARIA complex was not required for the re-entry operation, when the spacecraft returned through the earth's atmosphere and plunged into the sea, as this took place over the Atlantic Ocean.

Those directly concerned with the ARIA project at Paddington include Supervising Technicians. Messrs J.N. Hodgson, B.W. Collett, J. Neylon, A.H. Griffiths and J.A. Rodda. Installation of the special equipment, some of which was supplied by the U.S. Government, was organised by Engineer Mr. G. Nichols. Also closely involved with the project were the technical staff at Bringelly and Doonside receiving and transmitting stations and the Paddington Terminal.

After the mission Mr. Lacey E. Nunn of the U.S. Air Force Eastern Test Range Communications Division congratulated all those who took part in the Pacific Sector of the ARIA program. He said that the results had been much better than could possibly have been expected. Singling them out for special mention, he said that the O.T.C. staff at Sydney had done "a real fine job", particularly considering their comparative lack of practice in this type of exercise.

