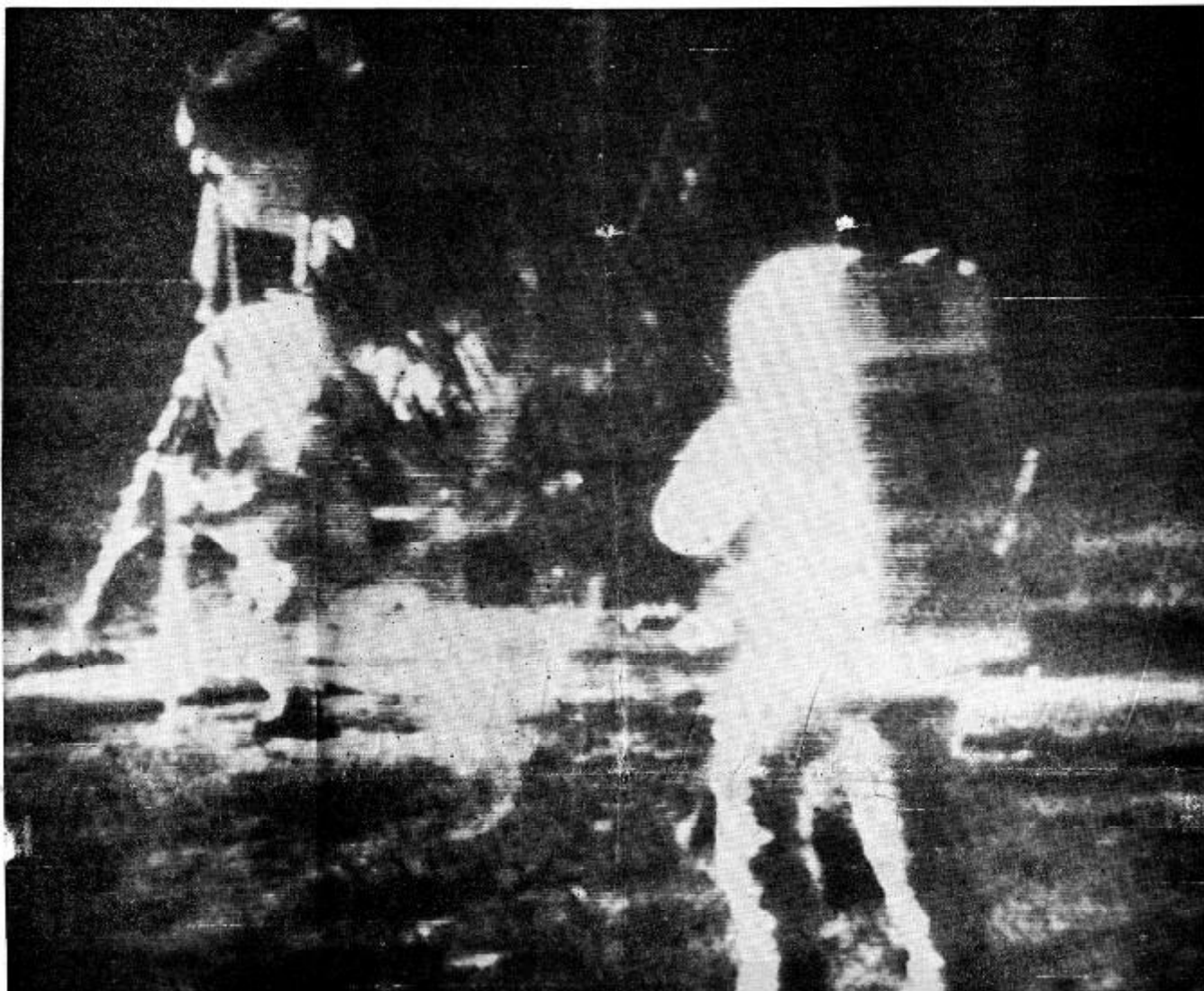
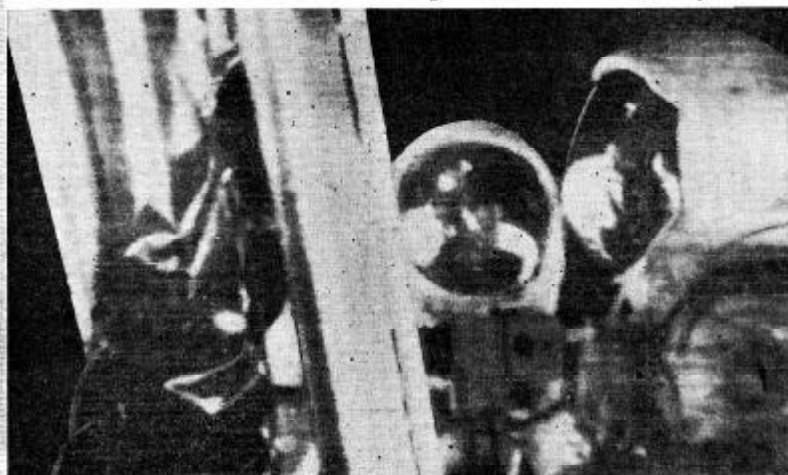


Man on the moon

A four-page souvenir of
The Canberra Times
to mark man's arrival
on the moon.



Astronauts Neil Armstrong and Edwin Aldrin take their first steps on the moon. — Radio pictures via satellite.



Astronaut Neil Armstrong, right, reads the inscription on the plaque unveiled on the lunar module while Edwin Aldrin sets on. This picture was received by Goldstone tracking station in California.



The US flag is raised on the moon in a ceremony watched by millions of people on earth at a range of nearly a quarter of a million miles.

Man has walked on the moon. Around the world millions of people watched the first faltering steps that established human sovereignty over soil beyond our planet. Who were the men involved in this venture into the universe? Who and what made their feat possible?

Today The Canberra Times publishes

a four-page souvenir to mark the landing and subsequent walk on the moon by Americans Neil Armstrong and Edwin Aldrin.

Inside are published profiles of the astronauts manning the Apollo-11 mission. The major events in man's recent efforts to explore space are listed together with an article tracing man's con-

stant quest from the dawn of history to unlock the secrets of the universe.

Australia's part in space exploration has been significant. Much of the tracking has been done by the space stations just south of Canberra. Australia's contribution towards bridging space is the subject of another article in this moon-walk souvenir.



Australia

PLAYING A MAJOR ROLE IN MAN'S GREATEST ADVENTURE

By FRANK CRANSTON

NESTLED in the quiet outback valleys of the ACT, about 12 miles from Canberra, are two huge Jules Verne type gadgets which yesterday became the most important of their kind in the world.

Another on the rolling plain near Parkes, New South Wales, was equally critical.

Staffing at the sky with their huge parabolic-like antennas, the two huge 210 ft dishes at Heerensville Creek and Tidbinbala in the ACT and the gargantuan 250ft dish at Parkes anchored man's first foraging steps beyond his terrestrial environment. They were the vital links in a worldwide network of communication which made the mission possible.

Those were the installations which kept contact with Neil Armstrong and Edwin Aldrin as they stepped on the moon and with Michael Collins as he orbited the moon in the earth-orbiting orbit.

AUSTRALIA was in the forefront of early aeronautical development when Hargrave unlocked the secret of the aérofoil and demonstrated its lifting capacity. Australia just about across the world bank of early long-distance flying and Australia was present in any long-distance attempt made by the aerial pioneers. It was a matter of fact that Australia — more than 800 of them — should have played a leading role in aeronautical navigation. It will have a continuing role in space exploration and in the design of the universe.

Space exploration is a quality business involving the National Aeronautics and Space Administration of the United States is far in an estimated \$7,100 million of one of the biggest single-purpose investments in history. Only investment in war has been greater. More than 100,000 people were involved in the US alone in the design and construction of the launch vehicle and its payload. Some argue the money could have been spent better on earth's own problems.

For Australia too the exploration of space has been a large business. It was the National Aeronautics and Space Administration of the United States has more than \$71 million invested in space tracking stations and auxiliary equipment in Australia. This will grow to more than \$90 million by 1972 and the management of this now being planned for Tidbinbala is afloat.

More than 800 Australians are currently on NASA's payroll and the figure seems likely to increase as further preparations come on the line.

Space, through NASA, is the PMG's biggest single industrial customer and for the biggest customer of the Australian Telecommunications Commission. Last year, between them, the two Australian instrumentalities received more than \$5 million from NASA.

Sophisticated technology for which we might otherwise have had no and have been passed on to Australians who have already begun to spin off into other fields than providing the basis of high-technology industrial capacity which are themselves self-regenerating.

And there is an sign of it stopping. After Apollo-11 there are already scheduled a whole range of new lunar operations which will not only stand larger on the alien surface and beyond.

In all of this, Australia has a part, much of it based just over the Murrumbidgee River and north of Clark Creek.

Political stability, geographical position and technical ability have made Australia the only small nation in the world to be deeply involved in almost every aspect of space exploration. Come back to the short 12 years to its beginning.

During the International Geophysical Year in 1957-58 the United States sought Australian permission to launch satellite tracking facilities at Woomera which was already a substantial missile tracking capacity.

The "Minitrack" missile satellite tracking equipment then established on the first Australian participation in what was supposed to be a limited space experiment.

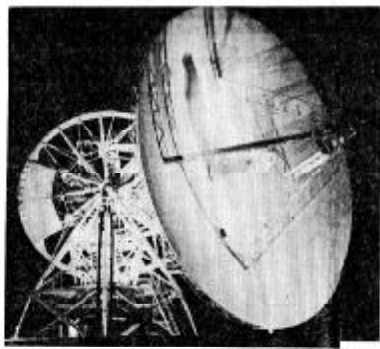
AFTER two failures to launch in the face of two Soviet Sputnik stations, the US in space appeared little and Australia's part in it is almost. The two "Minitracks" as they were dubbed by some newspapers were finally launched on January 31, 1958 (February 1 is Australia's day of independence). It was tracked from Woomera as it sailed at 14,000mph on 118-minute orbits.

The success of the Explorer entered US confidence in its ability to carry out its own program of satellite launch and tracking stations and establish the status of the inter-continental network.

In February, 1960, a formal agreement was signed between Australia and the United States for co-operation in US space programs. Australia undertook to provide and man a number of tracking stations which would form part of NASA's world-wide network. The US would provide the money.



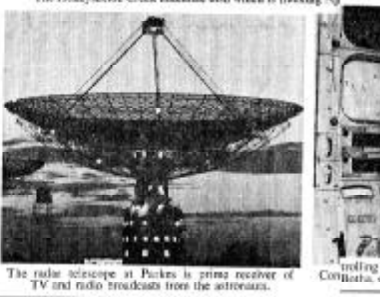
Deputy station directors at Heerensville Creek Mr Ian Grant and Mr Mike Dixon check with Houston and the tracking network.



The Heerensville Creek antenna dish which is tracking Apollo 11.



Mr B. Schwenker, station officer at Heerensville Creek.



The radio telescope at Parkes is being receiver of TV and radio broadcasts from the astronauts.



The big dish at Tidbinbala is Mr David Cornish, chosen tracking an earlier space probe.

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Right and scientific satellites. Neil van Tubberville in March 1960 for several flights and deep space instrument stationing. Overall Value, ACT for scientific earth orbital satellites in February, 1966. Cudby Creek, near Woomera, Queensland, is

over more making in 1960 and 1961 when the manned Mercury flights showed that the US as well as the Soviet could launch man beyond the immediate immediate orbit of the earth and bring them safely back again. Then in 1965 and 1966 10 Soviet cosmonauts visited the earth and the same could be set up to two weeks in the weightless environment of space exploration to get to the moon and back, that they could work the systems in that a 210-ft antenna and a 250-ft antenna and other personnel and half way of the launch required for a lunar mission.

The Ranger series of 2000 high resolution cameras in the moon and sent back pictures of its surface before crashing into it. Surveyor spacecraft landed softly and sent back more pictures and details of surface composition, temperature, the mechanical about soil sands and a line of color detail and it was over to permit itself and hope to survive.

In all of this the ACT dishes in Australia played their roles as they sent commands and received information from the 200,000 mile away.

But more than the moon is involved. Major space projects, like instrument packages, parabolic dishes and return information about their environment, Venus and Mars have already been made. More is planned. Pioneer mission probe interplanetary space information on such phenomena as cosmic rays, dust, meteoroids and a dozen other charged phenomena which are not understood and seem to occur if it is given to become familiar with its details.

In cold, down-to-earth fact it means paid salaries, especially for a country like Australia where we are not leaving the bill to our neighbors. The benefits of the investment.

New techniques in communications, satellite, remote-sensing of earth, meteorological and hydro-meteorological and other weather forecasting has begun to particularly change our lives.

Astronomy, planetary science and earth science is the knowledge of the meteorological conditions made possible by the high-lying photographic facilities which send back details of the cloud and surface features from the earth and the moon.

The nuclear power plants are made with great plants. These are some of the most significant developments. There are the ordinary old there have been benefits — before coming on the scene. While the US has been exploring the moon, Australia participation in

space off. Australia has shared in all of this.

By the time the three Apollo flights, which have now completed the major part of the moon's moonshot journey in history, return to earth, a Thursday they will have completed the lunar orbiting program. Australia will have put in the world-wide support system.

At Parkes the CERES moon-rocket has been directed from its primary scientific mission of mapping deep space to give to the NASA own big 2100 ft dish at Canberra, Canberra, to send 100 per cent of its monitoring the moon's movements on the moon itself as well as the low frequency but wide spread role of receiving and forwarding the live television and radio transmission of the lunar landing and walk.

HUNDREDS of PMG research projects have been long been at the station keeping open the radio network. Its space vehicles and the lunar control centre at Houston, Texas. They have been in 200,000 mile away. The Australian stations on the east coast and at Canberra, Western Australia, which is also playing a part.

Due to the progress of the moonshot, however, has been provided to the moon through the big dishes down PMG dishes, the other OTC units to Texas for evaluation. Respiratory rates, temperature and observation processes have been reported.

The PMG landing system has indeed captured and sent back scientific information to the moon in the form of an alternative system. The moonshot has been the only in the space mission and has also provided tremendous assistance in the world's communications system.

As the moon mission becomes more frequent and complex, the development of the world's communications system, which includes the moonshot, will become available to Australia and research.

It is not beyond the bounds of possibility that based on it is the ACT, the radio station off from the Australian space program participation in the development of the world's communications system. Some scientists believe that the moonshot is a field in which no country has been.

Australia's investment in space is making the US the most heavily. For Australia scientists working for development.

THE first men have landed on a new continent equal in area to Africa. What will they find there to make their journey worthwhile?

In Africa, it was ivory, spices, and slaves at first, and later gold and diamonds. We can discover them from our wilderness places, since the possibility of life is infinitesimal while an ounce of gold on the moon's surface is worth more than a ton of gold on earth.

Oddly enough, not from genes of scientific information which will thrill a few hundred scientists, the most important discovery on the moon could be water. Its importance lies not in its drinking-water properties but in its chemical uses, as an essential life processes and as a source of hydrogen and oxygen.

There are no rivers or lakes on the moon, and the man on the moon will be parched. Some of the geologically-located Lunar Orbiter photographs show almost green in the lunar surface which have ever appearance of dry river beds. However, these "waning dunes" as the scientists and moon-observers call them, may be evidence that liquid water did at one time exist on the moon's surface.

There are theoretical reasons why it may still be on

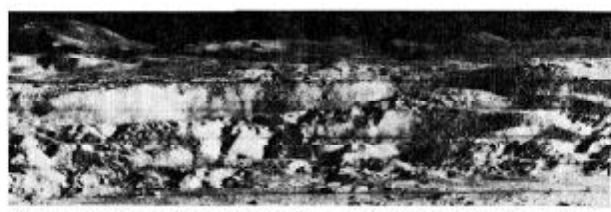
the moon, in the form of a layer of ice or permafrost, perhaps a few hundred feet below the surface. This is a serious question when we consider that the moon has no atmosphere and that liquid water placed in a vacuum boils rapidly to vapor, but it is thought that water produced by volcanic processes could be preserved, and that the water, like which would rapidly form on its surface, and later by the melting properties of layers of volcanic dust and debris.

Lunar bases of the future might be situated around a drill site, made like an oil well, where a precious water fountain is positioned at depth, reached by elevating fluid in the drill pipe, and pumped to non-saturated reservoirs, to be used under an insulating layer of rock to protect it from the searing heat of the lunar day.

Self-contained reservoirs would produce electricity, electrolysis by the water, like hydrogen and oxygen, then use a variety of these products for fuel. Centrifugal force is powered by this system, and also a Satura pump as well as beneficial oxygen for the respiration.

New kind of colonisation

BY A SPECIAL CORRESPONDENT



The crater Copernicus, one of the most prominent features on the moon, showing the 1,000ft cliffs lining the crater.

For fun or for profit?

power. Stellar cells could provide power for the base during the moon-rocket launch. The size of local water would ease the lignin problem of maintaining a lunar base, but it would still be far from self-sufficient. This problem would be eased by the discovery of carbon compounds, which would provide an important raw material for plant growth. Growing plants about carbon dioxide from the phytochemical, contact carbon dioxide as carbohydrates through it.

With water, carbon, oxygen, and suitable minerals, a complete food chain could be set up to make the base able to feed itself. The plant process would be large potential glaucous with provision for artificial lighting during the lunar night. The power to run the station would come from solar batteries and some limited power usage system for the station was never for the station. The plant process would be large

Some scientists believe that the moonshot will be the beginning of a new era in space exploration, up to 50 miles in diameter, which will add to the moon's surface in a new era in space exploration.

But what if there are deposits of minerals on the moon? It is thought that there will be in the moon's surface, which will add to the moon's surface in a new era in space exploration.

It is a tough job to think that about 10 years after the moonshot, the moon will be a new world. The moonshot will be a new world. The moonshot will be a new world.

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Apollo 11 has the world agog

A massive radio and television audience gave up sleep and work to watch astronauts Neil Armstrong and Edwin Aldrin become the first men on the moon. The picture shows crowds thronging Trafalgar

Square, London, to watch a television monitor display the historic moment as the lunar module made a touchdown on the surface of the moon.

AAP-AP PHOTO COURTESY BY AGENCY



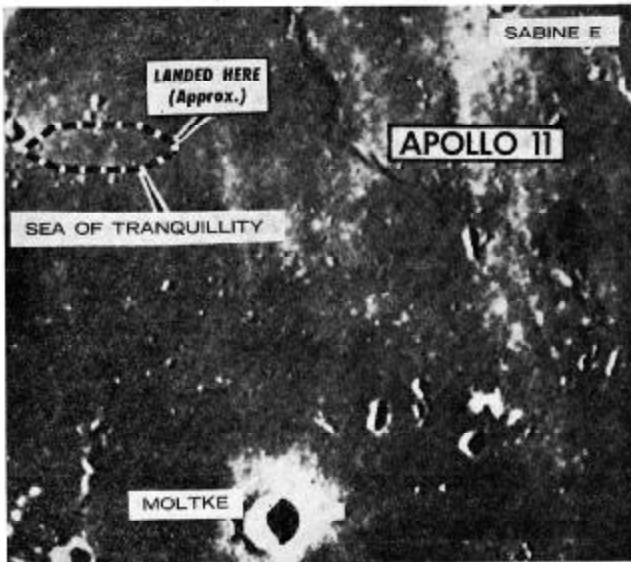
The Pope peers at the moon through a powerful telescope in the pontifical observatory at his summer retreat. — AAP-AP picture.



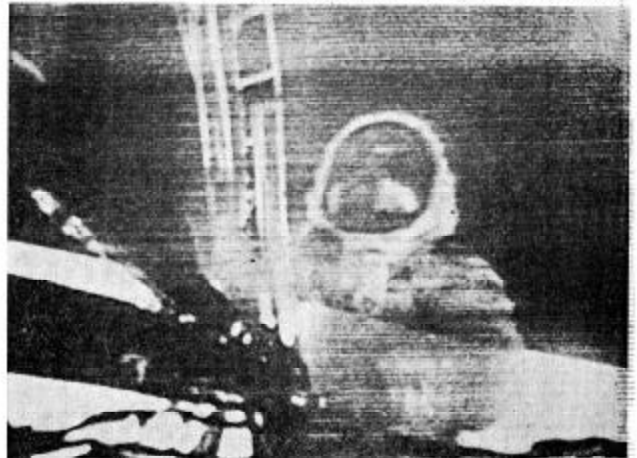
Astronaut Charles Conrad, centre, flight commander for the Apollo-12 mission sits at the flight commander's console at the Houston Space Centre.



"Thank God they have landed safely" . . . Mrs. Stephen Armstrong, mother of the astronaut.



This map shows the Sea of Tranquility where Apollo-11 landed.



A close-up photograph of Astronaut Neil Armstrong — the first man to walk on the moon.