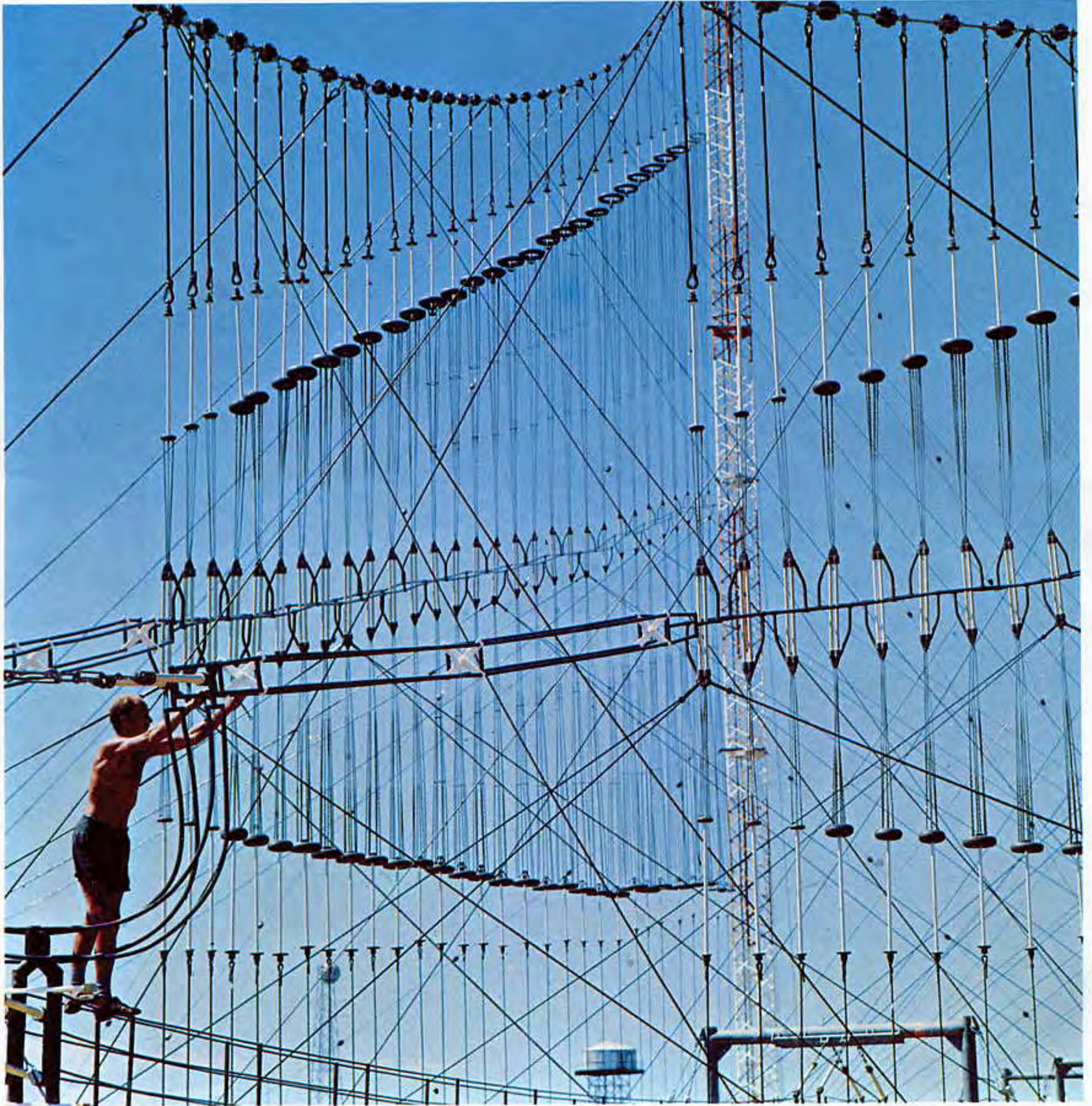


BROADCASTING
AND THE
AUSTRALIAN POST OFFICE
1923-1973





Antenna array at Radio Australia booster on Cox Peninsula

BROADCASTING AND THE AUSTRALIAN POST OFFICE 1923-1973

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COVER

Front: National television transmitter tower on Mount Coot-tha, near Brisbane.

Back: National radio transmitter at Sydenham, near Melbourne.

23 NOVEMBER 1923

CHILDREN today would find it hard to imagine that there was ever a world without satellites and spacemen; and harder still to imagine a world without radio and television.

Yet 30-year-olds can well remember the coming of television with the excitement of the Olympic Games, not to mention the first singers, dancers—and advertisers—brought live into the family lounge-room.

And 60-year-olds have hazy recollections of the first radio broadcasts. Tease their memory, and they will probably tell you how they sat night after night with headphones plugged into a crystal set, or around an ornate flute-edged loud speaker, enthralled with the music and comic songs that came with crackle and static into the living-room of the 1920s.

Yes, these fantastic changes in home entertainment, and the far-reaching influence on human habits and human thoughts that they have brought with them, have all occurred within living memory.

The spring-board of this great communications revolution was in Sydney. The date was 23 November 1923, the time 8 p.m.

On that night, radio station 2SB (later 2BL) broadcast a program of light entertainment. It was Australia's first regular radio broadcast.

It was an exciting night for the elite band of people who had receivers sealed to station 2SB. The receivers of those very early days (actually for a few months only) were sealed to obtain programs from only one station. And the people who had bought sets sealed to 2SB were the fortunate ones that night.

Imagine the home parties that were held, the friends and neighbours invited in to hear a segment or two of the new wonder entertainment which surely would replace the gramophone and the pianola.

What did they hear? The program lists Miss D. Deering, soprano; Mr. Sydney Pick, bass; the St. Andrew's Quartet; Miss Thelma Druitt, contralto; Mr. George Saunders, baritone; and Mr. Thorp, cellist.

There are no world renowned names here. Nor does there appear, by present-day standards at any rate, to be any great show stopper. But to the small band of pioneer listeners it seemed like the ultimate in communications miracles.

A newspaper of the day hailed the occasion with banner headlines such as Free Broadcasting, and News and Entertainment for Nothing. An editorial pointed out the potentialities of broadcasting.

It wasn't exactly for nothing, of course. The owners of the sealed sets paid a licence fee direct to the company operating the service, this being its sole revenue.

Broadcasting has gone a long way since the night of 23 November 1923. It was not long before it became Australia-wide, and then world-wide. It is commonplace now for conversations between people in separate continents to be part of a broadcast program.

Television came in the late 1950s, and, with the advent of satellites, it too is now world-wide.

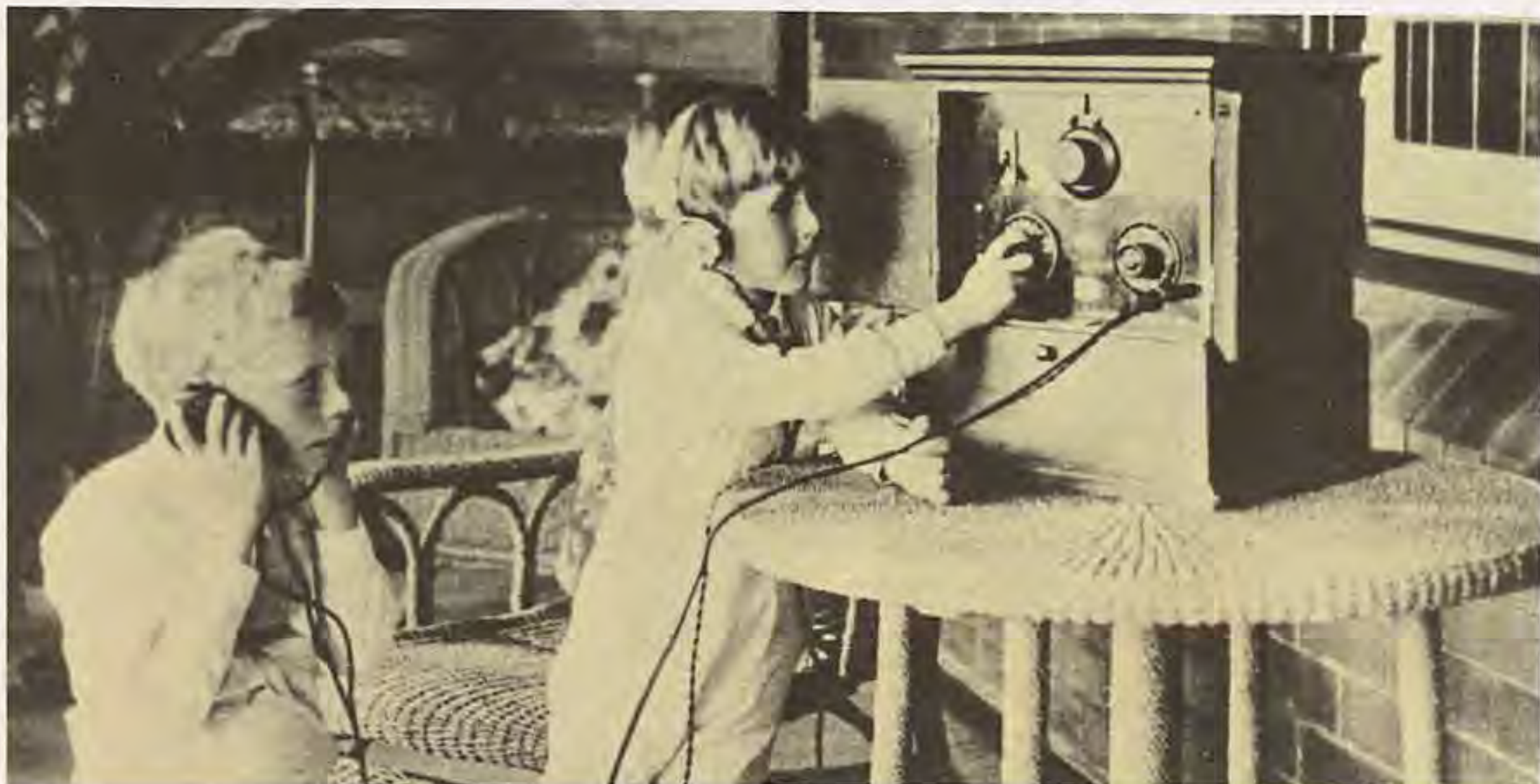
Indeed, both radio and television are more than world-wide. The marvels of the moon exploration by American astronauts, brought live to television screens the world over, showed that the space possibilities of broadcasting are virtually limitless.

Throughout the 50 years of broadcasting, the Australian Post Office has been deeply involved with every stage of development.

The concert of 23 November 1923 was broadcast under conditions laid down by the Post Office. Transmitting stations, once a government service was established, were provided by the Post Office. So too were the landlines needed by all stations for outside broadcasts and for inter-station links. And when the historic transmissions were made from the moon, Post Office lines played an integral part in the success of the mighty space project.

The Post Office, in short, has played a versatile and varied role and has been a distinguished partner in every phase of broadcasting development.

Typical receiving set and typical listeners of 1923



THE POST OFFICE ROLE TODAY

BROADCAST listeners' and television viewers' licences in Australia now number about 3 million.

To serve the program needs of the people involved, which, with only one licence required for a complete household, means nearly everybody in Australia, there are 202 radio transmitting stations (78 national, 118 commercial and 6 short-wave) and 103 television stations (55 national and 48 commercial). Some are in the big cities, others in country areas.

In the operation of these stations the Post Office has clearly defined and important responsibilities.

Indeed, so important is the Post Office role that every time you tune your radio or your television set to one of the national stations, and quite often when you tune to a commercial station, the Post Office is essentially involved in bringing you your program.

On the national side, the Post Office owns and operates all transmitting stations. This means that once a program, radio or television, leaves an Australian Broadcasting Commission studio, it becomes the responsibility of the Post Office.

Technically, quite a lot happens to a program between the studio and your set tuned to receive it. First it travels by cable or radio to the transmitter, which may be some kilometres away. There it goes through certain amplifying processes before leaving via the station's high aerials at sufficient strength to bring the music to your radio or the picture to your screen.

And all along the way the program is under the care of highly skilled Post Office technical staff.

The 78 national radio transmitters, which operate on medium wave, provide good reception for 95 per cent of the population of Australia.

For the remainder—those living in the far outback—and also for countries overseas, the short-wave stations give a similar service. They too are owned and operated by the Post Office.

One of the stations, the big Radio Australia booster, situated on Cox Peninsula near Darwin, is among the

most modern and most powerful short-wave transmitters in the world.

But this is by no means all that the Post Office provides for Australian broadcasting. There are also the lines by which programs are carried from one place to another. This concerns the commercial as well as the national stations.

Most times when you hear a direct broadcast from outside the studio—whether it is just from a local cricket ground, from the other side of Australia, or even from another continent or from outer space—or see on your screen a live telecast away from the studio, it is carried on Post Office lines made available for the occasion.

By lines we mean circuits from the extensive communications network that carries Australia's busy telephone and telegraph traffic, as well as the broadcast programs.

Nearly all these circuits come from the large capacity coaxial cable and microwave radio trunk systems, composing the national broadband network which reaches today to most centres of population in Australia.

Although sound radio can be carried on the older type cables and overhead wires, broadband links are necessary for television.

It takes the equivalent of at least 600 telephone channels to carry one television program.

This then is the Post Office role in broadcasting today. It is mainly a technical role, requiring complex and costly equipment and highly trained men to design and operate it.

Below left: Programs are monitored by the Post Office at Television Operations Centre, Sydney. One of these screens shows an astronaut on the moon; another has a commercial program.

Below: Panel lights at ABV2 transmitter at Mount Dandenong show which transmission line is fully operative and which on stand-by for emergency.



HOW IT ALL BEGAN

RADIO was one of many inventions developed when the world was on the brink of the modern technical age.

Many discoveries took place simultaneously, and the world was staggered by them, even though many people were sceptical about their possibilities.

Few could have foreseen the extent of their development, and fewer still the effect they would have on the commerce, industry and social habits of mankind.

So swift has been the march of technology that we now take its effects on modern life completely for granted.

For example, we dial a telephone number on the other side of Australia as nonchalantly as we dial the butcher two streets away. We post an air mail letter to the other side of the world and know that it will reach its destination in a couple of days. Along with 85 per cent of other Australian households, we tune in regularly to take our nightly quota of television.

The possibilities of science have almost ceased to amaze us.

Yet it is only ninety years since an Englishman, David Hughes, developed the first microphone, the forerunner of various types of carbon transmitter without which broadcasting would have been impossible. At the same time electric light was introduced.

The marvellous telephone was still a recent invention, found only in the homes of the rich or prominent.

By the turn of the century the Wright brothers, in the United States, were experimenting with flight. Other inventors were busying themselves with the new "horseless carriage".

Meanwhile scientists in several countries were conducting experiments in wireless telegraphy. Of them all, Guglielmo Marconi has perhaps the best claim to be considered the inventor of wireless.

Marconi, an Italian, who patented his apparatus in London, formed there the Wireless Telegraph and Signal Company (later Marconi Wireless Telegraph Company).

He and his team were assisted by the British Post Office and the Royal Navy, both of whom realised the immense possibilities of wireless telegraphy.

The big break-through came on 12 December 1901 when wireless telegraph signals were sent across the Atlantic from Cornwall to Newfoundland.

Marconi himself was in Newfoundland and successfully read the signals transmitted from the other side of the ocean.

This message was the inspiration for professional and amateur experimenters the world over, including Australia.

The first recorded wireless experiments in Australia had been conducted as early as 27 September 1897 by Charles Todd, of overland telegraph line fame, and his son-in-law, Professor William Bragg, of Adelaide university. Although successful, their signals did not cover a great distance.

Then, when the Duke of York (later King George V) visited Australia to open the first Federal Parliament in 1901, signals were exchanged between shore stations at both Melbourne and Hobart with naval ships escorting the royal vessel. A Post Office engineer, H. W. Jenvey, took part in these exchanges at the shore end.

This was actually several months before Marconi's



Top left: Prime Minister Alfred Deakin who, as early as 1906, predicted the future importance of wireless.

Top right: Guglielmo Marconi, the most illustrious of wireless pioneers.

Lower: Charles Todd, of telegraph fame, who was also one of Australia's first wireless experimenters.

message across the Atlantic but, considering comparative distances, it was not nearly so dramatic.

Experimentation progressed to the point where, in July 1906, the first wireless communication between land stations was made at Point Lonsdale in southern Victoria and Devonport in northern Tasmania, a distance of 288 kilometres.

These stations were established by the Marconi Company, which had become the major operator in the world and had a virtual monopoly in the United Kingdom and the Americas.

The occasion of the 1906 experiment was a formal luncheon for 200 politicians and other dignitaries. Marconi himself was there to take part in the historic exchange of messages.

Prime Minister Alfred Deakin was loudly cheered when he said, "Wireless telegraphy seems likely to transform the future economic, political and warlike proceedings all over the world."

How right he was!

About the same time came first official association between the Post Office and wireless. The Wireless Telegraphy Act, passed to bring order and control into this new communications wonder, required all stations to be licensed. The Post Office was made responsible for administration of the act.

In 1910, the Wireless Institute of Australia was founded in Sydney. Things were really moving.

Next, a licence was granted to the Australian Wireless Company for a station on the roof of the Hotel Australia in Sydney to exchange messages with three ships fitted with wireless equipment.

In 1912, the government appointed its own wireless engineer, who was responsible for the erection of coastal stations.

In the same year, a government tender was let to build a wireless station at Pennant Hills, near Sydney. This was the first government radio station to provide ship-to-shore communication.

By the outbreak of war in 1914, 19 such stations were operating around the Australian coast.

Wireless telegraphy was already a glamour profession. Tales of heroic operators sending out last messages as ships were sunk by enemy action fired the imagination of every schoolboy.

In 1917, a German wireless message was intercepted at the Applecross (WA) station. This was eavesdropping on a grand scale.

For the duration of the war, administration of the Wireless Telegraphy Act passed to the Navy, but the Post Office resumed responsibility when the war ended.

Throughout this period developments were continually afoot.

The first direct transmission between the United Kingdom and Australia was sent by the Marconi Company from Caernarvon in Wales and received in the Sydney suburb of Wahroonga in September 1918.

By 1919 the human voice was challenging morse code as the medium for transmitting messages by sound. Wireless telephony was on the way. The first public demonstration was given by the Royal Society of New South Wales on 13 August 1919.

Accustomed as we are to world-wide radio and television communications, the distance involved in that demonstration—just a few city blocks—seems almost absurd. Yet the people of the day were amazed and

continued to be enthralled by further public demonstrations in the next few years.

The human voice "without wires" really showed its potentiality in a series of experimental weekly concerts broadcast in Melbourne in 1921.

It was all very exciting. Wireless telephony was now the biggest thing since the invention of the flying machine.



A cairn at Point Lonsdale marking the spot where messages were sent across Bass Strait by Marconi and others, including Prime Minister Alfred Deakin and Postmaster-General A. Chapman, in 1906.

RADIO GETS A VOICE

WITH the potentialities of radio broadcasting now clearly demonstrated, it was only a matter of time before some enterprising organisation began to exploit its commercial possibilities.

The first proposal for systematic broadcasting in Australia was made to the Post Office by Amalgamated Wireless (A'sia) Ltd.

AWA had been formed in 1913 as a merger between the Australian Marconi Company and the Australasian Wireless Company. It was destined to play a leading part in the industry, as indeed it still does.

It was, in fact, AWA's first managing director, Ernest Fisk, who had received the message sent from Wales in 1918.

Later on, AWA scored several other firsts in broadcasting. It was the first to broadcast from Australia to the UK (1924); it established beam wireless (1927) and radio telephone service (1930) between Australia and the UK; and it began an experimental short-wave service (1927), known as the Voice of Australia.

It was on 1 November 1922 that AWA applied for a licence to broadcast in all States. But before details were worked out, several other companies had made similar applications.

The Postmaster-General called a conference, indicating that the government would introduce regulations permitting a broadcast service if the parties could agree on a single scheme. The conference met in Melbourne on 24 May 1923.

It decided on the sealed-set system, even though the Post Office expressed doubts about its effectiveness. Regulations to cover its operation were issued on 1 August.

The regulations provided for the stations to be financed by subscriptions from listeners, who would use receiving sets capable of operating only on the frequency of the station to which the fee was paid. The

The original transmitting station of 3LO, in the Melbourne suburb of Essendon.



receivers were to be sealed by the Post Office so that no alteration could be made and, in consequence, no other station received.

It was under this system that the first broadcasts from 2SB were made. The owners of this station were a group of radio retailers, and they deliberately set a low fee (\$1 a year), hoping to cover operating costs by the sale of receiving sets.

Other stations which started shortly afterwards charged much higher fees. Station 6WF, with a fee of \$8.40, was the highest.

As well as the fee to the station, those early listeners had to pay a government licence of \$1 a year for single-station listening, \$2 if they wanted more than one station.

But the sealed-set system did not last long. It was not popular, because people wanted freedom of choice in their radio listening. As well, they disliked the two-fee system.

So another conference was called, and new regulations were issued in July 1924, that is less than 12 months after regular broadcasting started.

The new regulations provided for the abolition of the sealed-set system. Instead, broadcasting stations were to be divided into two classes, A and B, A to be financed by listeners' fees and B by advertising.

This set the pattern for the development of the system we have today, with national and commercial stations.

The Post Office role in these first few years was an administrative one, its main responsibilities being the licensing of stations, collection of fees, and control of technical standards.

But with the scope of broadcasting widening and the pattern established for the development of a national system, the Post Office was soon to become fundamental to Australian broadcasting.

The control room at 3LO in 1925. The station opened in October 1924.



NATIONAL PATTERN DEVELOPS

FIVE years were to pass after the 1924 regulations before a national service began.

They were formative years, during which the number of stations increased and radio broadcasting became established as a popular form of entertainment.

Between 1924 and 1929, eight A class and 12 B class stations were licensed.

The A class stations — 2BL, 2FC, 3AR, 3LO, 4QG, 5CL, 6WF and 7ZL — were the forerunners of today's ABC giants. Ten of the original B class stations — 2GB, 2KY, 2UE, 2UW, 2HD, 3DB, 3UZ, 4GR, 5DN and 5KA — are still operating as commercial stations.

The 1920s — the Roaring Twenties as they were called — were a gay, frivolous period. Radio listening became a new craze, along with the charleston, pole-sitting, midget golf and marathon dancing.

Radio created new public figures and personalities — as television did 30 years later. It provided new topics of conversation. Whole families would sit around their valve sets on Saturday nights to listen to wrestling. The men who described the wrestling bouts became glamour figures in their own right.

There was news too, and on-the-spot reporting of events of special interest. Radio was rivalling the press as a medium of mass information.

But there was some discontent, and it grew as the industry grew. It came mostly from the country, which was not catered for by either A or B class stations.

Why should all the stations be in the cities? Why should country people be deprived of the benefits of this new communications medium, which was becoming more interesting all the time?

The more the scope of broadcasting increased, the more these questions were asked.

So, in 1928, the government decided on a new organisation. As the licences of the A class stations expired (all between July 1929 and December 1930), all these stations would be acquired for a national system. The B class stations would continue to operate as before, obtaining their revenue from advertising.

An important feature in the new arrangement was that all the technical equipment of the former A class stations would be owned and operated by the Post Office.

Control of technical services by the Post Office was a natural consequence of the establishment of a national broadcasting system. Communications, after all, are Post Office business.

Already during the 1924-29 period there had been some technical contact, in which the Post Office had demonstrated its competence to meet the requirements of the new medium.

Landlines were used, of course, for outside broadcasts. But the most spectacular Post Office success story was in 1925 when the first simultaneous interstate broadcast was carried over the trunk network. It linked six stations — 2BL, 2FC, 3AR, 3LO, 4QG and 5CL — thus covering four States.

The occasion was a speech by the Treasurer to promote a Commonwealth conversion loan. Conversion of the loan within a few hours was a clear indication of the impact of broadcasting and its value for propaganda.

A similar link was arranged in 1927 when Parliament House, Canberra, was opened by the Duke of York (later King George VI).

These early interstate radio relays were organised by Post Office research engineers who, by this time, were looking ahead and experimenting so that they would be equipped to meet the demands likely to be made on them by further developments in broadcasting.

With the acquisition of the A class stations in 1929, they obtained full technical responsibility as well as administrative responsibility.

First below: The original broadcasting studio at 2FC Sydney, opened in December 1923.

Second below: Post Office engineering research team monitoring the landline connection during the historic first broadcast to four States over the trunk network in 1925.

Third below: The studio scene at 3LO during the 1925 interstate broadcast.



THE NATIONAL BROADCASTING SERVICE

ACTION to implement the new system was taken immediately.

A top-level committee formed to advise the government on organisational details was headed by Mr. H. P. Brown (Director-General, Posts and Telegraphs). This was a clear early indication of the important part the Post Office was to play in national broadcasting.

The committee recommended the establishment of a national service in which the Post Office would provide and maintain all technical services of the transmitting stations, studios and relaying circuits. Tenders would be called for a commercial company to supply programs.

Tenders were called in May 1929. The contract to provide programs for three years was won by a combined group of entrepreneurs known as the Australian Broadcasting Company.

The Post Office, on its side, went ahead with the acquisition of the equipment of the various A class stations, modernising it and greatly improving transmission standards.

There was another task too. There had been considerable discontent in country districts, remember, because it seemed to the people there that the benefits of broadcasting were being given to the big cities only. So part of the Post Office responsibility under the new system was to build regional stations in country areas.

In anticipation of the establishment of a national broadcasting system, Post Office engineers had been carrying out radio transmission research since about 1925.

In 1927, a small group was assigned to plan a

national network that would give reliable reception to at least 90 per cent of the population.

Following the planning phase, which lasted several years, the group was closely involved with implementing the plan, designing broadcast transmitting equipment and antenna systems, and evaluating studio equipment.

The first of the regional stations was at Newcastle (2NC) in 1930. Rockhampton (4RK) and Corowa (2CO) followed in 1931, and Crystal Brook (5CK) in 1932. Today there are over 60 regional stations.

The period of the Australian Broadcasting Company was one of movement towards centralisation of organisation and program planning. With the better technical resources of the Post Office now available, more relays could be arranged and programs could be developed, therefore, on a national rather than local basis.

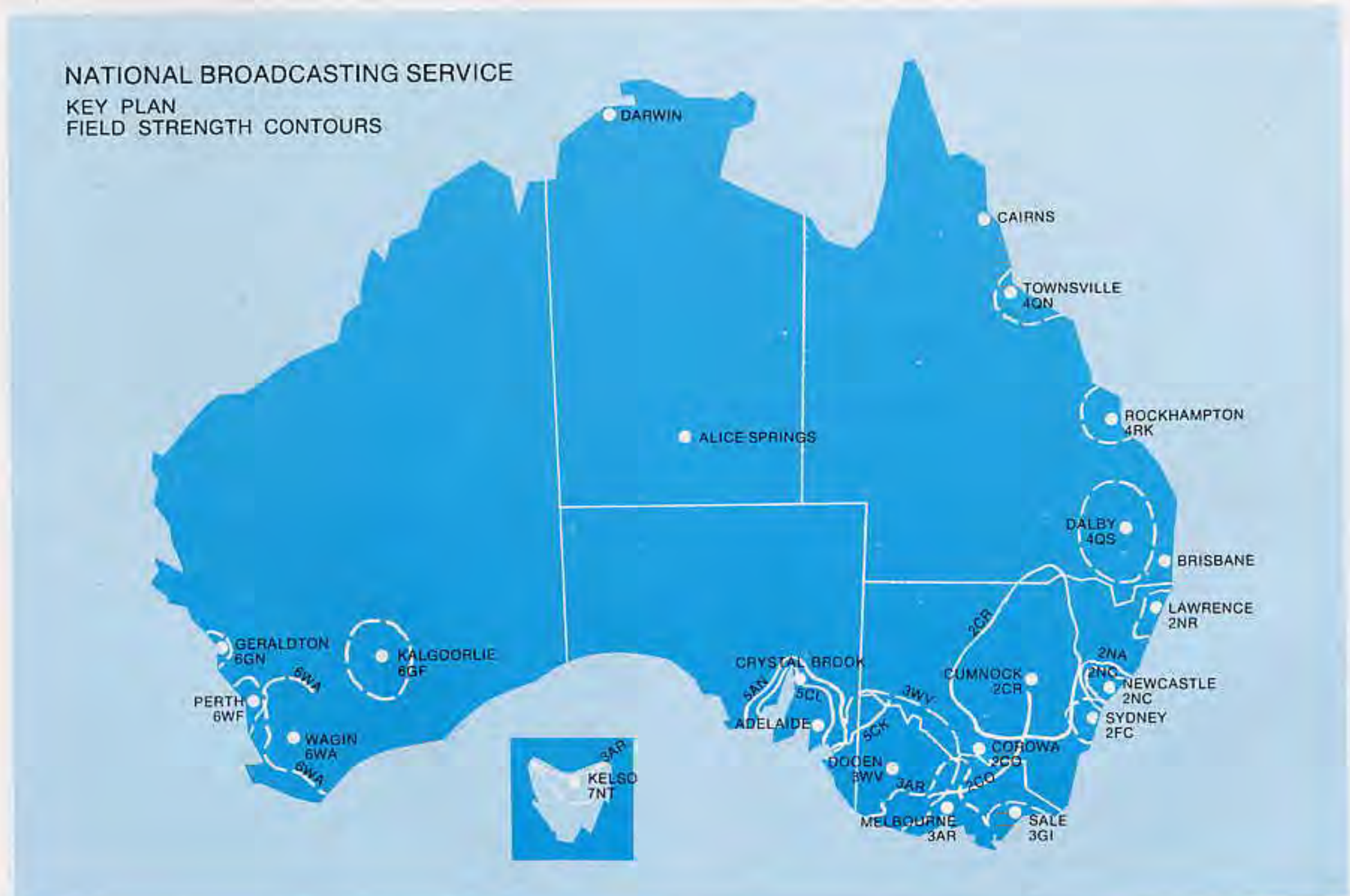
There were 288 interstate relays during the first year of the Australian Broadcasting Company's operation.

But progress was still not fast enough for the radio-hungry country people. There was pressure on the government to do more and move faster.

So, when the three-year contract of the Australian Broadcasting Company was drawing to a close, the Australian Broadcasting Act was passed, creating a commission to take over the program side of national broadcasting.

This was the third reorganisation during the nine years of Australian broadcasting.

The Post Office role, however, remained unchanged with the new arrangements. It was still responsible for all technical equipment, operation and planning.

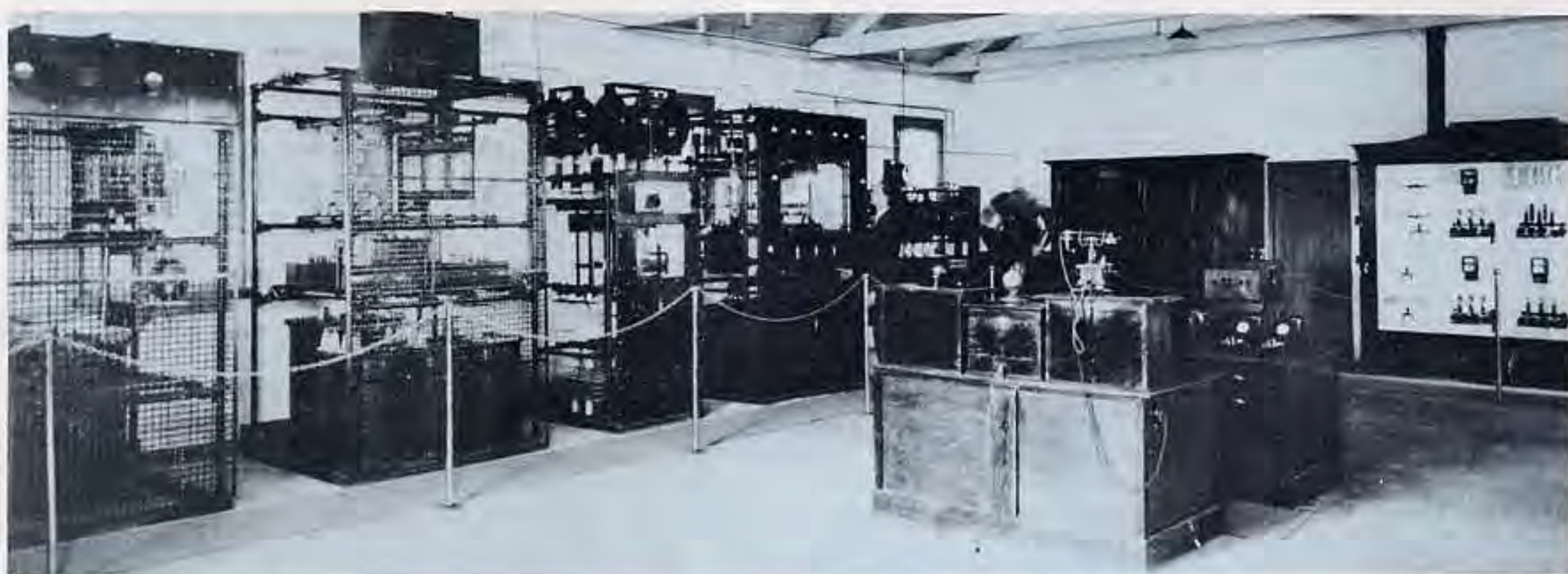


THE ABC



Stephanie Deste, an early ABC broadcaster.

Early broadcast transmission plant, station 3LO.



BROADCASTING was flourishing when the Australian Broadcasting Commission began operations on 1 July 1932.

Thanks to the foresight and competence of the Post Office during the preceding years, the ABC was able to operate immediately on a network comprising eight main and four regional stations.

And there were plans for more regional stations in the very near future.

The Australian Broadcasting Commission Act provided that the whole of the technical services would remain the responsibility of the Post Office and that Post Office transmission lines would be made available without cost for program relays.

The continuity of technical responsibility was undoubtedly a wise decision. It put the ABC in the fortunate position of having a ready-made, efficient and expanding network.

The new program administration was free to concentrate on its own specialised area of entertainment, news, sport and other general features, with the knowledge that there was good technical back-up for whatever plans it might develop.

Listeners' licence fees were shared between the two authorities. Of the \$2.10 then paid for a licence, \$1.20 went to the ABC and 90c to the Post Office. The number of licensed listeners when the ABC took over was 370,000.

With a charter to develop a truly national system, the ABC designed its programs to use landlines to the

maximum extent possible. In its first year, there were 2,118 separate relays between stations. All, of course, were set up and serviced by Post Office technicians.

As well, the Post Office progressively implemented the national plan, drawn up earlier by its research engineers, to extend reception areas in the country by building regional transmission stations.

Five years after the ABC started, its original 12 stations had grown to 20. The new ones were at Kelso (7NT), Sale (3GI), Grafton (2NR), Townsville (4QN), Wagin (6WA), Kalgoorlie (6GF), Dooen (3WV) and Cumnock (2CR).

In the following year (1938), when four more stations were opened, the number of licensed listeners passed the 1,000,000 mark.

Choice of locations for regional stations was no haphazard pick from the map. It was the result of scientific investigation into radio propagation qualities, fading and distortion, and geographical features of the country. It also had to take into account possible future population growth.

For 41 years now the partnership of ABC programs and Post Office transmitters and relays has brought entertainment, news, education and information into Australian homes.

News carried on the network has ranged from the drama of events of war to the excitement of Melbourne Cup descriptions. And a list of names of world concert celebrities brought here by the ABC would read like an international Who's Who.

THE COMMERCIAL STATIONS

COMPETING with the ABC for listening audience, and indeed surpassing it in popular entertainment appeal, the commercial stations made rapid progress through the 1930s.

When the ABC began operations in 1932, there were already 43 commercial stations to compete with it, and with each other, for the 370,000 licensed listeners.

They were in all capital cities and at such provincial centres as Newcastle, Albury and Gunnedah (NSW), Ballarat, Geelong and Swan Hill (Victoria), Toowoomba, Mackay and Townsville (Queensland), Crystal Brook (SA), Kalgoorlie (WA) and Launceston (Tasmania).

By 1940, when there were 26 national stations, the number of commercial stations had reached 100. At this time there were 1,212,000 licensed listeners.

The status of the commercial stations had remained unchanged in 1932. They continued as private enterprise organisations, deriving their revenue from advertising. They received nothing from listeners' licence fees.

Transmitting licences were issued to commercial broadcasters initially by the Post Office. This is now a function of the Australian Broadcasting Control Board.

The commercial stations, which varied in wealth, resources and transmitting power, formed the Federation of Commercial Broadcasting Stations. This meant that they could speak with one voice in negotiations with the government. It also facilitated the grouping of stations and sharing of programs, which came to be a feature of Australian commercial broadcasting.

Naturally enough the commercial stations operated their own transmitters, but their relays to the various transmitters would not have been possible without the Post Office landlines. Unlike the ABC, the commercial stations had to pay for the use of the lines.

From the mid 1930s it was not uncommon for up to 20 stations to make simultaneous broadcast of a popular program. This involved extensive use of landlines, even greater than that made by the ABC.

In 1934, for example, the Post Office arranged 3,090 relays for the ABC, and 4,589 for the commercial stations.

Commercial radio, with its more down-to-earth, popular-appeal style than the national stations, had a huge listening audience. Serials, comedians, talent quests and sports broadcasts became daily topics of conversation. Personalities achieved a popularity and fan following comparable with that of film stars. And the advertising that went with it was accepted as part of the deal.

Some early commercial radio identities —

Left: Norman Banks, photographed in 1935. Still a prominent broadcaster, Mr Banks has worked for 42 years in commercial radio.

*Centre: Bob Dyer. Originally billed as *The Last of the Hillbillies*, he is one of the few entertainers who made a successful transition from radio to television.*

Right: Jack Davey, one of the top entertainers of early commercial radio.



SYNTHETIC CRICKET

ONE side of broadcasting in which the ABC showed early initiative was sport.

And in the 1930s there was no more popular sport than cricket.

So, when the Australian team was in England for the 1934 Test series, the ABC devised an ingenious method of satisfying the public appetite for cricket news, and gaining for itself a large listening audience.

This was the broadcasting of synthetic cricket, which, night after night, kept large numbers of Australians from their beds.

And the Post Office was again an indispensable partner in the whole undertaking.

Briefly, synthetic cricket was the broadcasting of ball-by-ball descriptions of the matches within minutes of actual play. This, remember, was before the days of direct short-wave broadcasting, so the broadcasts were actually made from the Sydney ABC studios. The information for the broadcasters was supplied by Post Office telegraphists.

What actually happened was that reporters in the press box in England typed their stories simultaneously with play. The stories were telephoned by direct line to the cable office for dispatch to Australia at the end of each over, or earlier if a wicket fell.

The messages were received in morse at the GPO in Sydney. From there they were relayed by direct telephone line to the broadcast studio.

So expert were the operators that the service developed a remarkable smoothness and efficiency. Infor-

mation reached the studio from the field in England in the amazing time of 45 seconds.

At the studio, ABC staff quickly amplified the messages to recreate a description of play and handed them to the broadcaster. Listeners then heard a ball-by-ball account of the game just as if the broadcaster were actually seeing it.

The atmosphere of the game was expertly created by sound effects men, who followed a carbon copy of the broadcaster's material and brought in applause and other crowd noises as required.

The broadcaster also contributed to the atmosphere. By tapping a pencil against half a coconut shell, he simulated the sound of bat meeting ball.

There was nothing secret about the synthetic cricket broadcasts. No attempt was made to hide the fact that the descriptions actually came from the ABC studios. So good was the illusion, however, that many people refused to believe that they did not come from the ground where the match was being played.

By 1938, when the next series of Tests in England was played, direct short-wave broadcasting had become practicable. Reception, however, was still unreliable, so the organisation for simulated descriptions was retained on stand-by for use in emergency. In actual fact, a great deal of the broadcast of the 1938 Tests was by the synthetic method.

Part of the synthetic cricket broadcasting team. The autographs include some famous cricketing names.



COVERAGE AREAS OF INLAND SHORTWAVE SERVICES

These service areas of the various high frequency transmitters are not precisely delineated and reception quality falls off only gradually outside the aerial beams shown. Within the dotted sectors reception is generally poor owing to the skip effect.



REACHING THE 5 PER CENT

FOLLOWING the master plan designed by Post Office research engineers of the 1920s, the national medium-wave transmitters reached out progressively during the 1940s and 1950s and gave good radio reception to 95 per cent of the population of Australia.

What of the remaining 5 per cent?

They too were people. They too had need for human contact; for a little entertainment and diversion now and then.

This thought had possibly occurred to the Post Office engineers, along with their technical speculations, when they turned their attention as early as 1928 to short-wave broadcasting.

In that year, they built a low-power (2-kilowatt) experimental transmitter at Lyndhurst, Victoria.

This, of course, was before the ABC was formed. It again shows how the Post Office research team was planning ahead and doing valuable pioneering work for the development of broadcasting.

The purpose of the Lyndhurst experiments was to test the suitability of short wave for broadcast reception in the remote, isolated corners of the outback, particularly in northern Australia.

The tests were successful, and regular short-wave service began.

From 1934, the Lyndhurst transmitters were carrying the ABC programs to listeners in outback areas not reached by the medium-wave service.

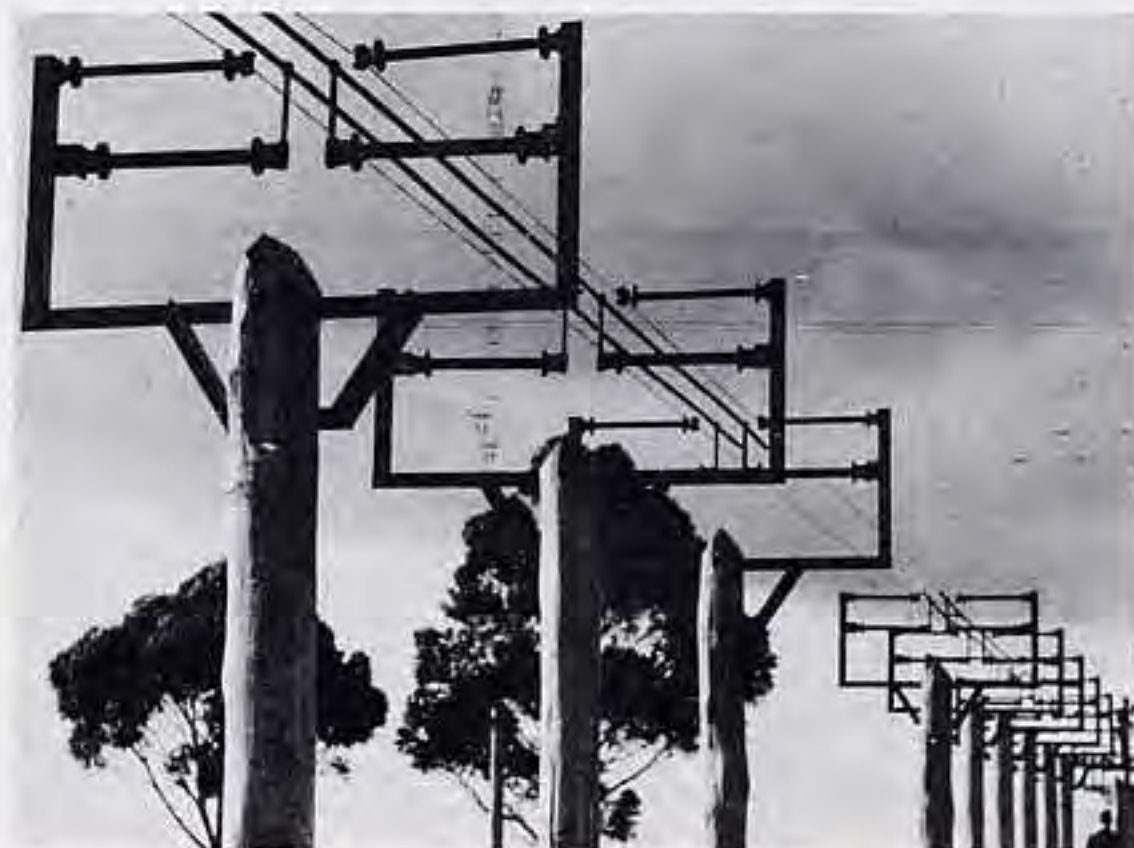
The broadcasts were also directed to Pacific islands, and occasionally they were picked up in other overseas countries.

But they were intended simply as an extension of the national service and were, in fact, called the inland service.

The inland service still operates today. ABC programs are broadcast to distant areas—to the distant 5 per cent—as a normal Post Office short-wave transmitting service from VLI (Sydney), VLR and VLH (Melbourne), VLM and VLQ (Brisbane) and VLW (Perth).

First below: The first experimental transmitting station established at Lyndhurst in 1928

Second below: Transmission lines at Lyndhurst



RADIO AUSTRALIA

WITH the establishment of short-wave broadcasting from Lyndhurst, it was only a matter of time before Australian radio went international.

For radio waves, backed by sufficient power, are not restrained by man-made boundaries. They need no passport to travel oceans and continents, to pass freely from nation to nation.

For this reason, the outbreak of war in 1939 gave impetus to short-wave broadcasting all over the world. Warring nations used radio to get at the people of enemy countries with information (from their point of view) on how the war was going and, more insidiously, to broadcast propaganda which would undermine morale.

So it was that, late in 1939, Australia entered the field of regular international broadcasting. The service was opened by the Prime Minister (Rt. Hon. R. G. Menzies) who said, "The time has come to speak for ourselves."

Although the service was initially called Australia Calling, this broadcast of 20 December 1939 was, in fact, the genesis of Radio Australia.

Within a few weeks, regular daily transmissions were being made in several languages.

Although Australia Calling was a new service from a program point of view, it was transmitted initially from existing transmitters — from Lyndhurst and from two equally low-power AWA stations near Sydney. In 1940, the Post Office built a 10-kilowatt transmitter at Perth and, in 1941, another 10-kilowatt transmitter to add to its Lyndhurst establishment.

Post Office engineers were well aware that, if the overseas service were to do the job for which it was intended, transmitters of much greater power than 10 kilowatts would be necessary.

And, as the war extended and the Battle for Britain increased in intensity, the British and Australian governments, fearing damage to the BBC's transmitters, decided that the establishment of an alternative high-power station was an urgent necessity.

The war in the Pacific gave spur to the project, and southern Australia was surveyed for suitable locations for a new transmitter more powerful than the ones operating at Lyndhurst.

The site chosen for the new station was 250 hectares of grassland in the fertile fruit-growing area of the Goulburn Valley, Victoria. It was just a few minutes' drive from the town of Shepparton, 192 kilometres north of Melbourne.

The Shepparton district had many advantages. It was relatively close to Canberra, Sydney and Melbourne. Staff housing, power and water were available nearby.

Before the war ended, three transmitters were built on the Shepparton site — two working on 100 kilowatts and one on 50 kilowatts. They were housed in a thick-walled, windowless, blast-proof building.

During the war and immediate post-war years, program control alternated between the ABC and the Department of Information. In 1950, it finally reverted to the ABC, which has had program responsibility ever since.

The name was changed from Australia Calling to Radio Australia in 1945.

The Post Office wartime installations at Shepparton have been added to over the years. There are now 10 high-frequency transmitters — four of 100 kilowatts, three of 50 kilowatts and three of 10 kilowatts.

The station is equipped with a comprehensive radiating system, comprising 24 aerials supported on 15 steel towers each 64 metres high. There are also four stand-

Transmitters at Lyndhurst



by rhombic aerials, whose diamond shapes point in the main direction of the transmission.

One group of aerials is directed to Europe across Asia and may be reversed towards South America. Others are directed towards North America and may be reversed to Africa. A third group, directed towards the North Pacific, serves eastern Asia, including Japan.

An efficient switching system enables any transmitter to be connected to the appropriate aerials to suit the frequency and direction desired.

The Shepparton transmitters were designed and built by the Post Office. They represent an original capital investment of \$3 million.

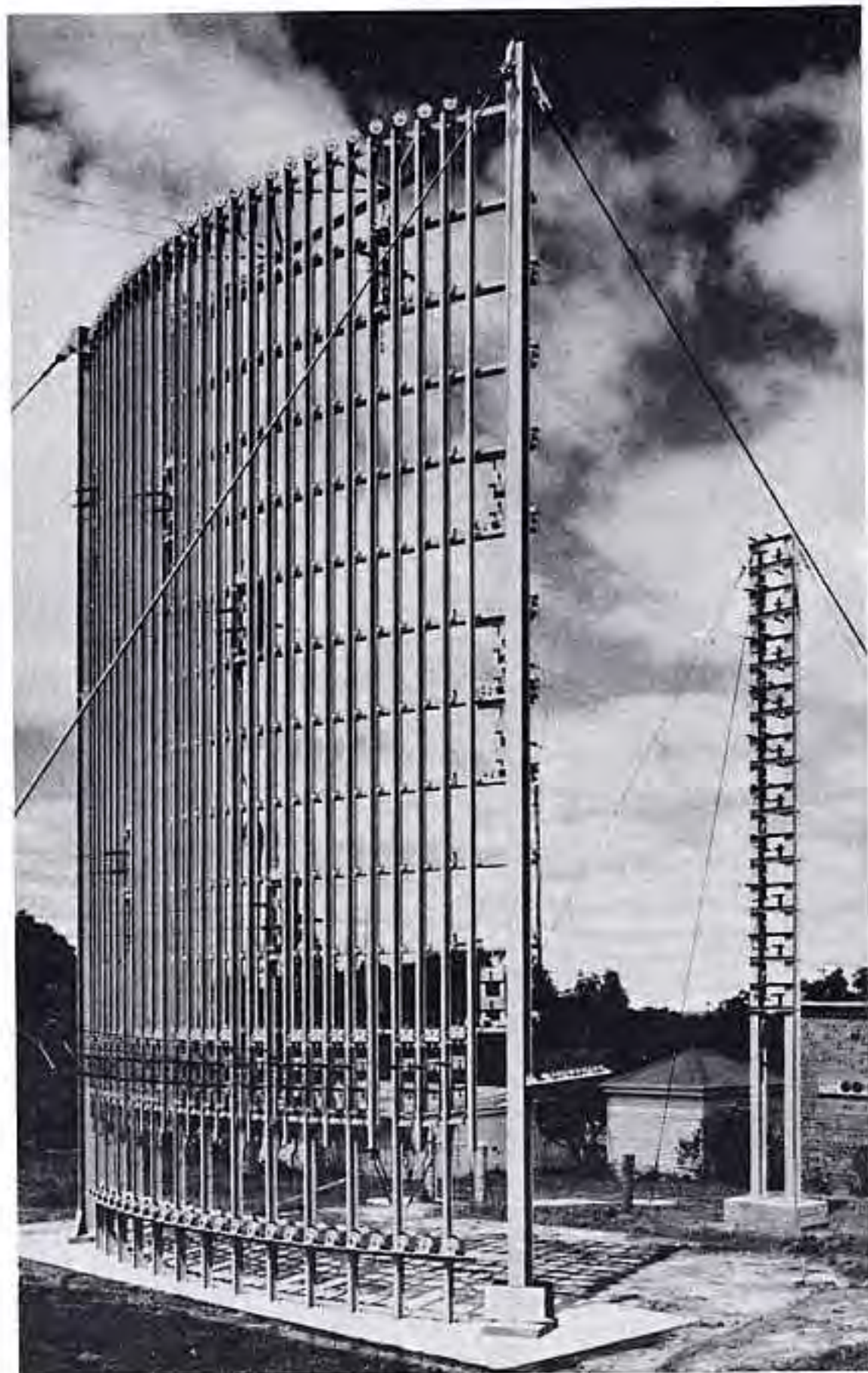
Through the 1950s and 1960s, the program side of Radio Australia developed extensively. Music, talks, general entertainment and education programs and, above all, news are now constantly on the air.

The service is popular, particularly in Asia to which the greatest amount of time and effort is directed. The Australian news service is respected as reliable and, on the whole, impartial.

But Australia is not the only country trying to catch the ear of Asia. The world's major powers all have the same idea. And they all broadcast on powerful transmitters which can stifle out a station of lesser strength.

It became apparent in the 1960s that, if Radio Australia were to retain its large listening audience, it would have to step up the strength of its transmission. In the high-powered competition of international broadcasting today, 100-kilowatt transmission is just not good enough.

So the Post Office planned its next step — construction of a high-power booster station at Cox Peninsula, near Darwin.



Aerial switching system at Lyndhurst



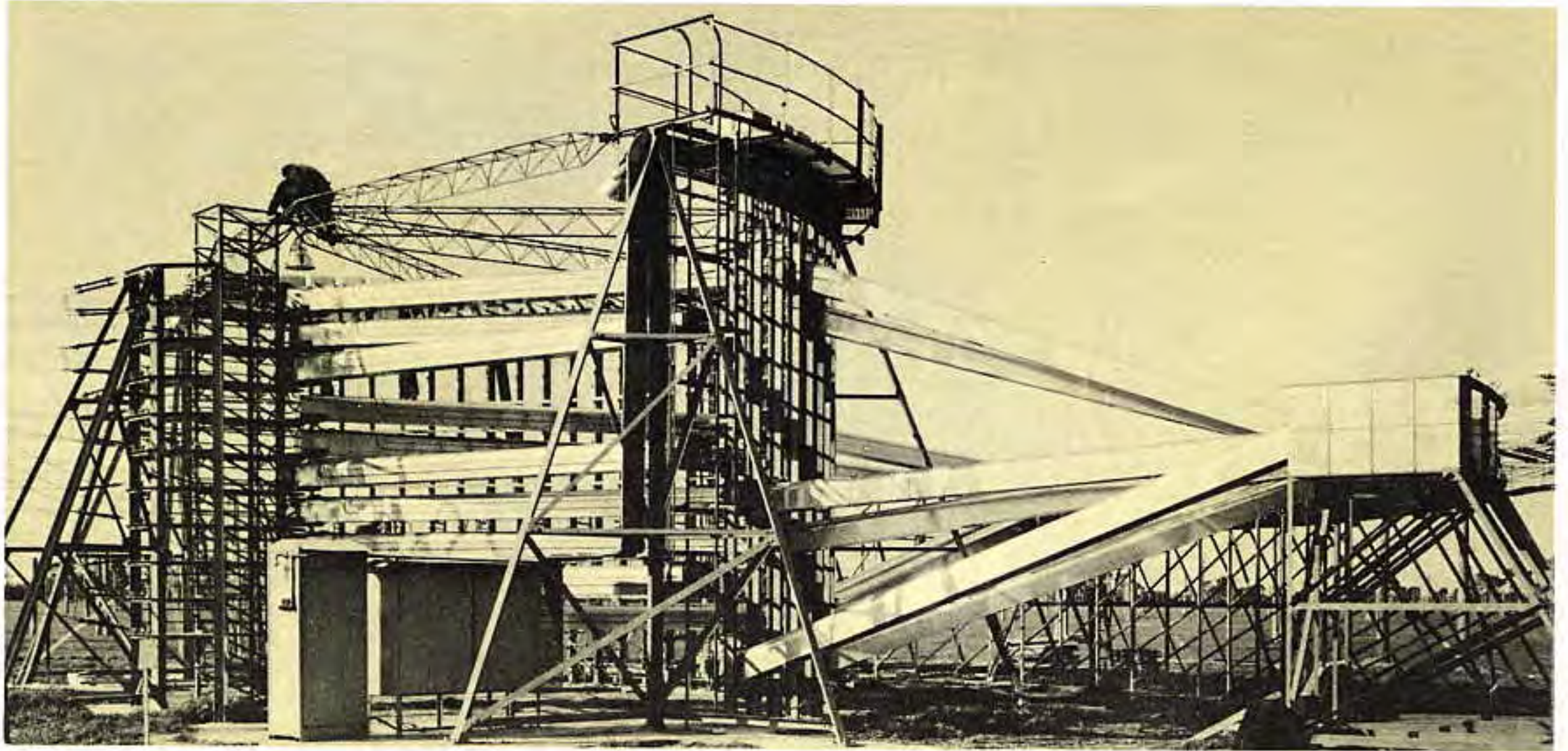
Transmitter building at Lyndhurst



*First below: The aerial switching system
at Shepparton*

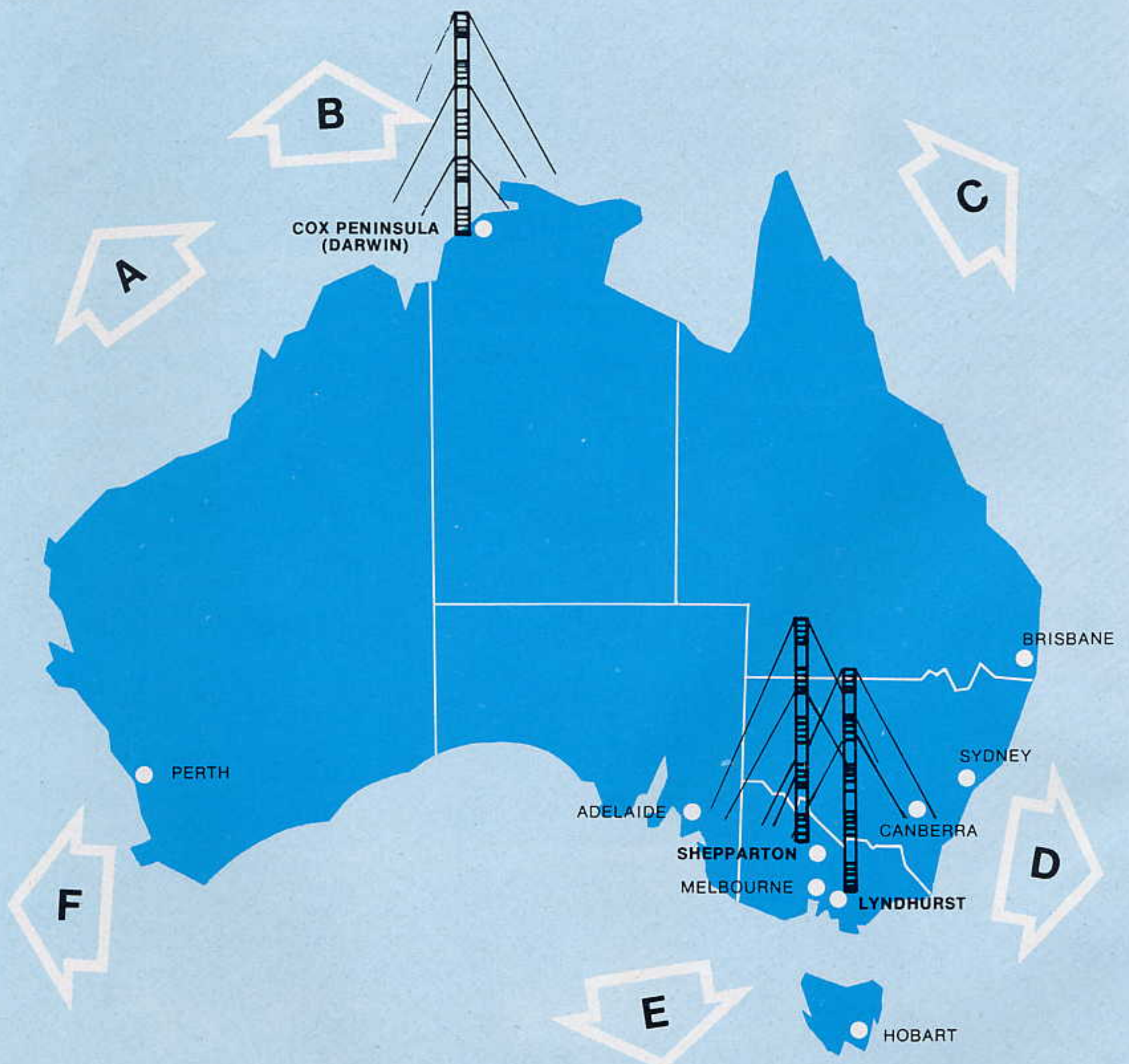
*Second below: 100-kilowatt transmitters in the
Shepparton main transmitting hall*

Third below: The radio control desk at Lyndhurst



- A** The general South Asian area including Malaysia and India. To Europe via the short path.
- B** The general Asian area including Indonesia, Japan, Vietnam, Laos, Thailand, Cambodia, China, Singapore and the West Pacific.
- C** North America and the Central Pacific Islands.
- D** New Zealand, the South Pacific area, South America and Europe, via the long path.
- E** Antarctica.
- F** Africa.

RADIO AUSTRALIA'S THREE TRANSMITTERS



Main target areas for Radio Australia's three transmitters at Cox Peninsula (Darwin), Shepparton and Lyndhurst are arrowed.

THE DARWIN BOOSTER

MATCHING its competitors in strength and clarity, Radio Australia now speaks to Asiatic countries from transmitters which are reputed to be the most powerful in the southern hemisphere.

They are situated on Cox Peninsula, right on the north-west tip of the Northern Territory. Apart from being more powerful, they are 3,200 kilometres closer to the target area than the Shepparton station.

Cox Peninsula was a logical choice for the site of the big booster. Apart from its proximity to Asia, it was on the direct path of transmissions beamed northwards from Shepparton. Ample space was available to construct a big transmitting complex, and it was close enough (10 kilometres by sea) to Darwin to be able to use the facilities of the northern capital.

The whole project posed tough problems in engineering and logistics, but it was completed in 1969. The cost was about \$9 million.

The site occupies an area of 3,000 hectares right on the tip of the peninsula. Power for its three mighty 250-kilowatt transmitters is supplied at 66,000 volts by two submarine cables from Darwin.

The programs are still transmitted from Shepparton on 100-kilowatt power, but they are directed to a receiv-

ing station on Cox Peninsula. This station is about 13 kilometres east of the transmitters.

From the receiver, the programs are passed by microwave to the transmitting complex where they receive their big boost for final beaming to target countries.

The transmitter building houses an electronic brain which controls the actual process of broadcasting from the five huge aerials which hang like giant curtains in vertical planes from masts 45 metres high.

Quite unlike the Lyndhurst and Shepparton aerials in appearance, these curtain-like arrays are called log periodic aerials.

Each array consists of a pair of vertical log periodic aerials, and each pair is arranged in the form of a V, pointing like an arrow at the target area.

The three transmitters are joined to the five aerials by open-wire transmission lines through a matrix switching system which enables each transmitter to be connected directly with any one of the five aerials.

The computers inside the transmitter building log and digest information supplied by instruments which measure the quality of the incoming and outgoing signals. They correct small functional faults. They operate an alarm system and provide teleprinter diagnosis if

Aerial view of transmitter complex in its cleared area in scrubby jungle at Cox Peninsula



major breakdowns occur. They are programmed to shut down the whole installation if damage to its delicate complex is threatened.

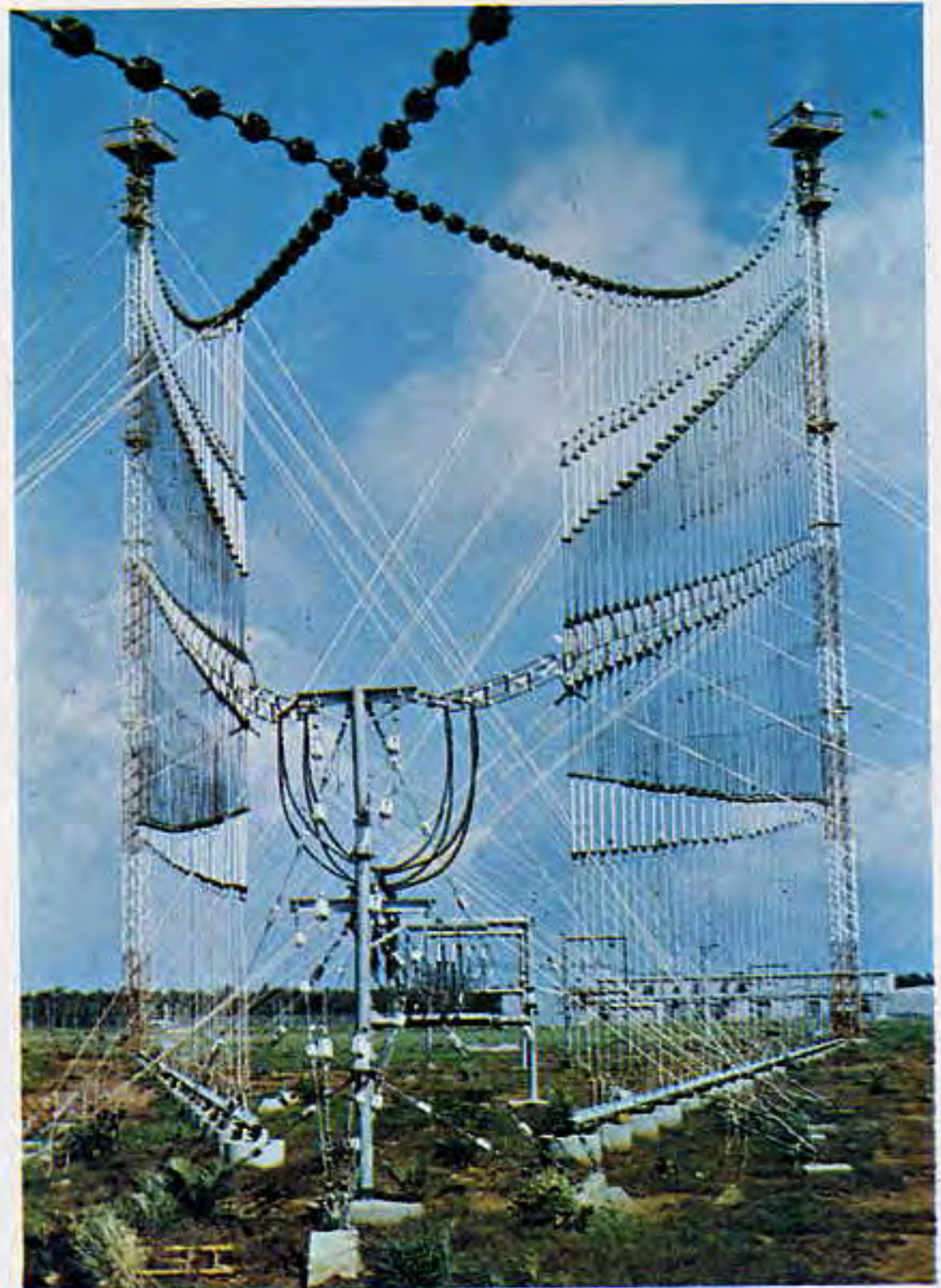
The computer stores the day's program of frequency changes and automatically, on the appointed hour, selects the frequency programmed for a new transmission and directs the transmitter to tune up automatically to the new frequency.

The Cox Peninsula transmitters were the first in the world to be fully controlled by computers.

Streamlined and efficient, this mass of electronic power, remote in the humid, scrubby jungles west of Darwin, boosts the voice of Australia loud and clear 21 hours a day.

Developments planned for the Darwin station will improve the capacity to penetrate increasing interference and provide higher quality transmission to listeners in the South-East Asia area.

And to prove the popularity and good reception of its programs, Radio Australia can quote receipt of a quarter of a million letters annually from its listeners; and it can point to being three times the winner of triennial polls for the most popular short-wave broadcasting service in the world.



Curtain-like array of the log periodic aeriels



THE COMING OF TELEVISION

TELEVISION, a new wonder to Australia in 1956, brought more responsibilities for the Post Office.

With the same general division into commercial and government stations as with sound broadcasting, the Post Office fitted into the organisation in the same way.

ABV2 transmitter station at Mount Dandenong



It was responsible for the provision, operation and maintenance of all stations transmitting ABC programs.

Television came later to Australia than to other technically advanced countries. It was well established in Europe and America before the first receiving sets were on sale here and the first transmissions made.

This delay was not popular. People, especially those who had travelled overseas and seen television in other countries, wanted it here. The manufacturing industry, for quite obvious reasons, also wanted it.

But the delay was calculated and, in the long run, in the best interests of Australian viewers. It gave time for study of the various systems being used overseas and their strength and weaknesses assessed. When a choice was eventually made, it was the best that was chosen. Other countries, which began with other systems, have since changed to the 625-line system adopted in Australia on the recommendation of Post Office engineers who had conducted extensive feasibility studies in the intervening years.

A commercial channel, TCN9 of Sydney, made the first Australian public telecast on 16 September 1956. In November, two national stations, ABN2 in Sydney and ABV2 in Melbourne, and a Melbourne commercial station, HSV7, went on air.

National and commercial stations followed in quick succession in the smaller State capitals and larger pro-

Technician at Mount Dandenong transmitter adjusting an oscilloscope to ensure that frequency modulation is functioning correctly.



vincial centres. Within three years there were 1,000,000 licensed viewers.

Television in Australia started on a high note with pictures direct from the Olympic Games main stadium in Melbourne.

Throughout Melbourne, television sets in shop windows gave people in the streets a view of Olympic events as they were happening. Films of main events were flown to Sydney where they were telecast a few hours later.

On the opening nights of stations in Sydney and Melbourne, hundreds of people watched the programs in public halls or the homes of people who already had sets of their own. It was the atmosphere of radio in the 1920s all over again.

And, as with radio, it was from Post Office transmitters that all the ABC programs came.

In the early days of television, the range of transmission was at first relatively short. There was no transmission from one State capital to another.

Again it was the Post Office that made such transmissions possible.

The advent of television coincided with the initial stages of the great broadband project which now links, by either coaxial cable or microwave radio, all capital cities and extends northwards to Cairns on one side of the continent and Port Hedland on the other.

The broadband links increased trunk capacity so much that, as well as giving many extra telephone channels, they also made long-distance television transmission possible.

The first broadband system was the Sydney-Canberra-Melbourne coaxial cable, completed in 1962. Direct inter-city telecasts followed, and their scope increased as the broadband system was extended.

There were occasions, notably the Queen's visit to Australia in 1963, when the Post Office used an aeroplane to extend existing broadband links. The aeroplane, circling around one spot, picked up transmissions from Bendigo, which already had a microwave link with Melbourne, and repeated them to Mount Lofty for transmission to viewers in the Adelaide area.

And what of the more distant places? Those country people who, in the 1920s, had clamoured for radio broadcasting now clamoured for television. And they got it.

They got it by means of transmitters built in provincial centres and, in more remote places, by stations,

One of television's biggest moments—the landing of American astronauts on the moon in 1969. The Post Office played a vital part in this historic event.



called translators, which pick up programs from the nearest master transmitter and repeat them into the more distant areas.

Many country transmitters and translators, sited where possible on high ground to increase their coverage, are located in remote, rough terrain. Their construction sometimes involves major engineering.

The big transmitter on the summit of Mount Belenden Ker (1,525 metres), near Cairns, is a noteworthy example. It is on a precipitous, jungle-smothered ridge, so inaccessible that all plans to take in a road were abandoned as too difficult and expensive.

Helicopters were used to freight in building materials and equipment and to transport construction workers and technicians to and from the job. An aerial cableway, called a ropeway, now carries routine maintenance staff the five and a half kilometres from the road to the top.

Other remote sites have presented similar problems, all of which have been successfully overcome by Post Office engineering staff.

Service for these isolated communities has become practicable because the Post Office coaxial cable and microwave links can carry whole programs in bulk from the major stations and pass them on to the lower-powered regionals.

By the mid 1960s, with the problems of internal television well on the way to being solved, Australia was ready for the next big break-through. This was international television.

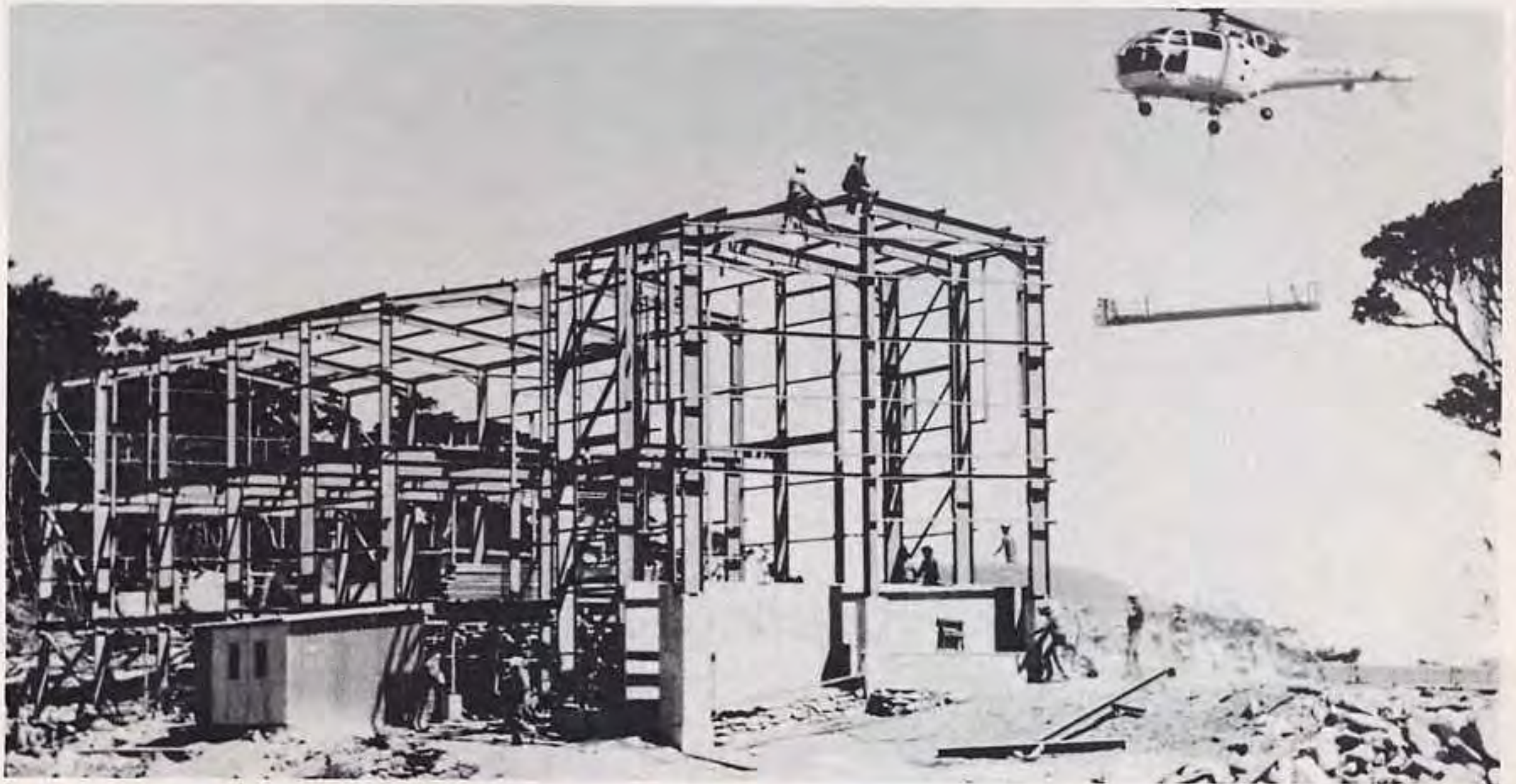
It was a job for satellites.

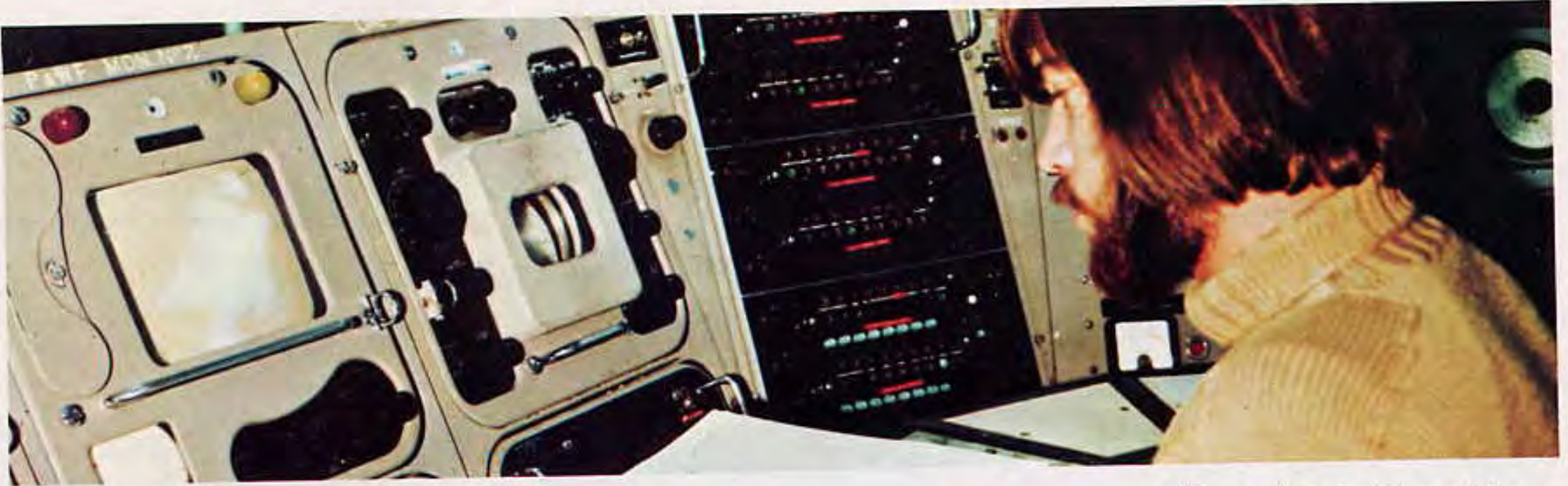
A microwave repeater station tower. Towers like this can be seen every 30 or 40 kilometres on a microwave broadband route.



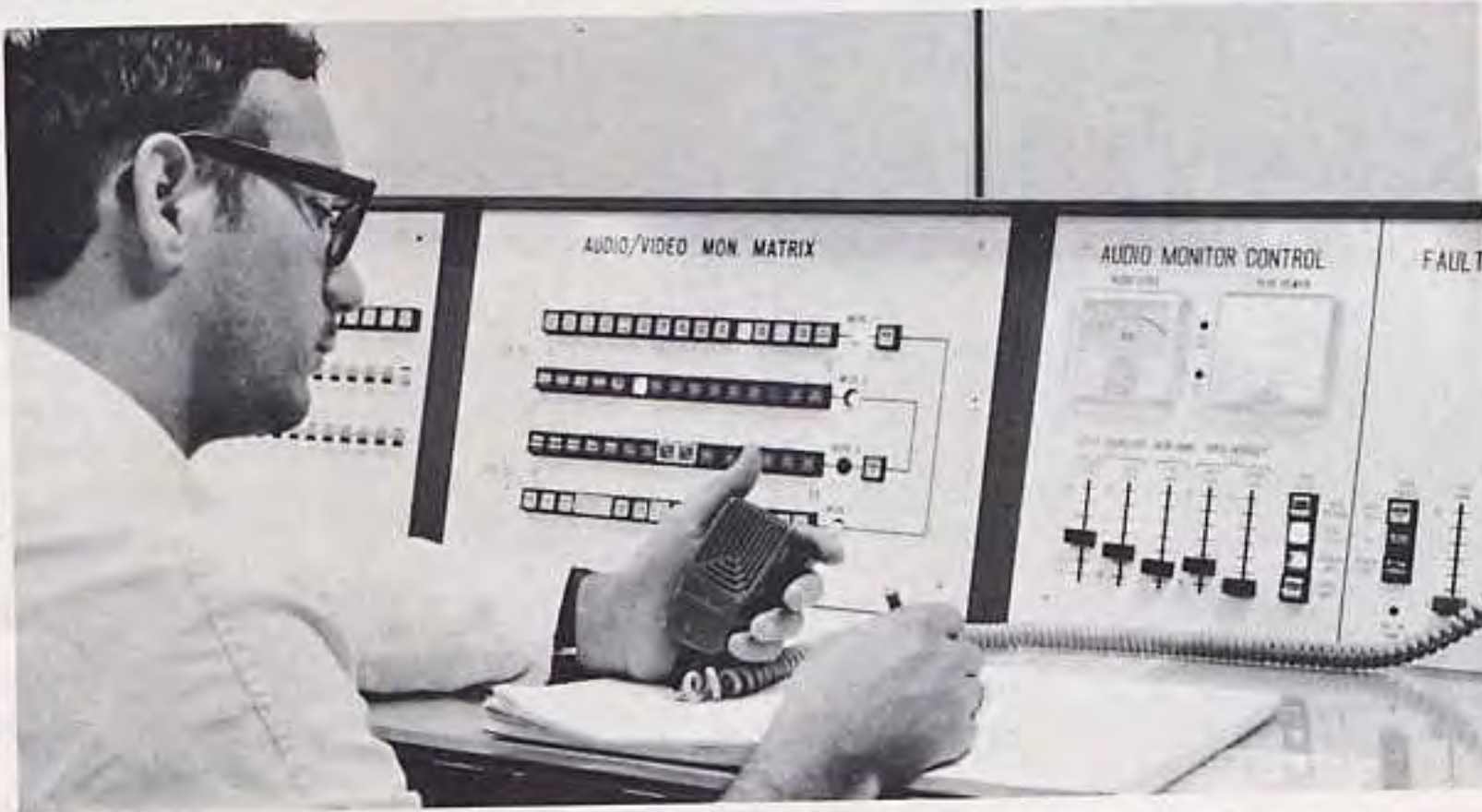
First below: A helicopter brings in building materials for the television transmitter on Mount Bellenden Ker. This station was built in rugged, inaccessible country to give improved television in the Cairns area.

Second below: A cable-laying machine laying coaxial cable on the Perth to Port Hedland broadband trunk route.





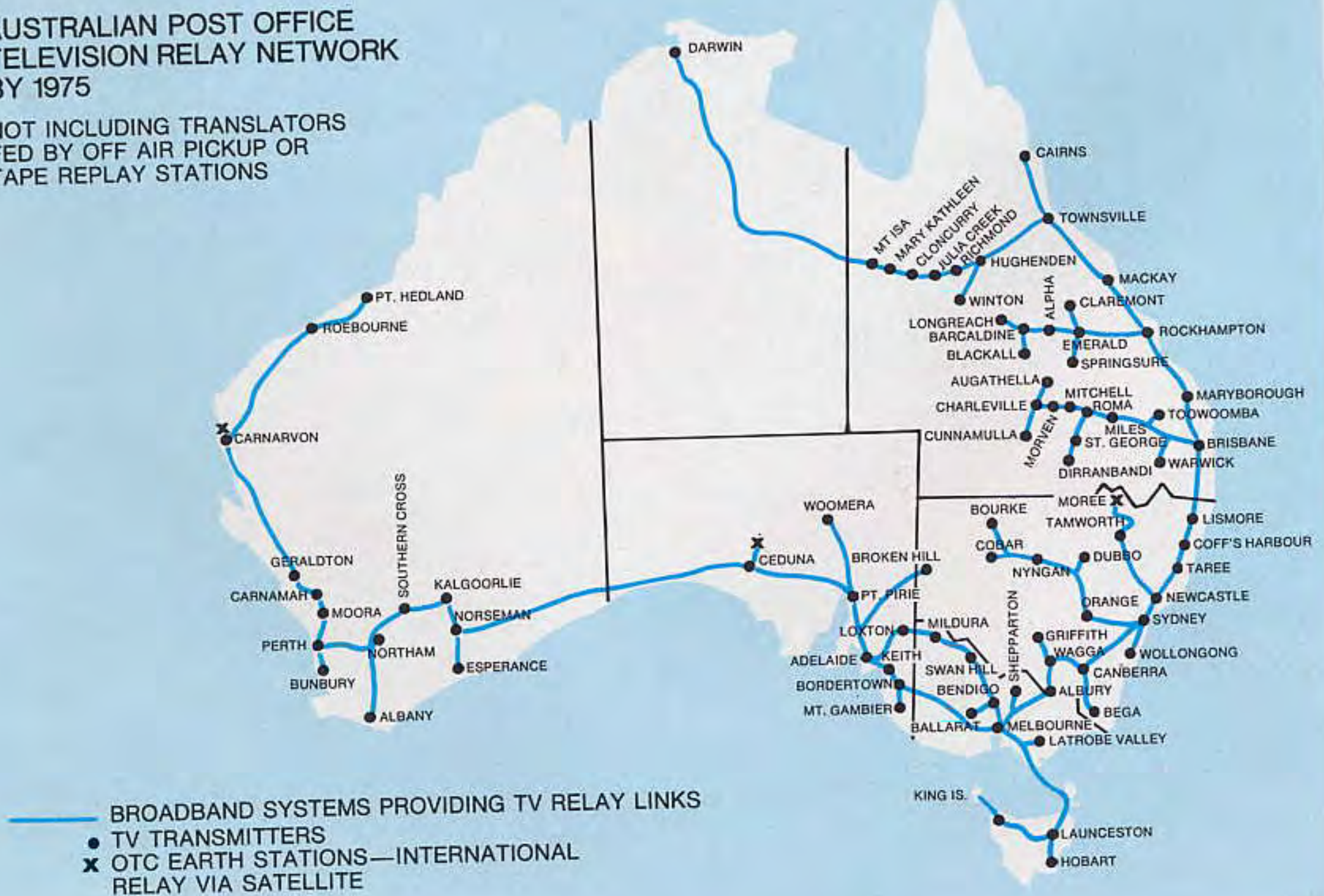
Above: A technician at the ABV2 control desk. Frequent checks are made on all visual transmissions.



Left: A section of the console, 8½ metres long, at Television Operations Control in Sydney.

AUSTRALIAN POST OFFICE TELEVISION RELAY NETWORK BY 1975

NOT INCLUDING TRANSLATORS FED BY OFF AIR PICKUP OR TAPE REPLAY STATIONS



VIA SATELLITE

INTERNATIONAL television has become a practical proposition only since satellites went aloft.

The first transmission in which Australia participated was made on 24 November 1966 when ABC and BBC test patterns were exchanged.

They travelled via the Pacific satellite of the Intelsat II series between earth stations at Carnarvon (WA) and Cornwall (UK), and thence by landline (either coaxial cable or microwave radio) to the respective transmitters.

The following afternoon live ABC and BBC television programs were exchanged.

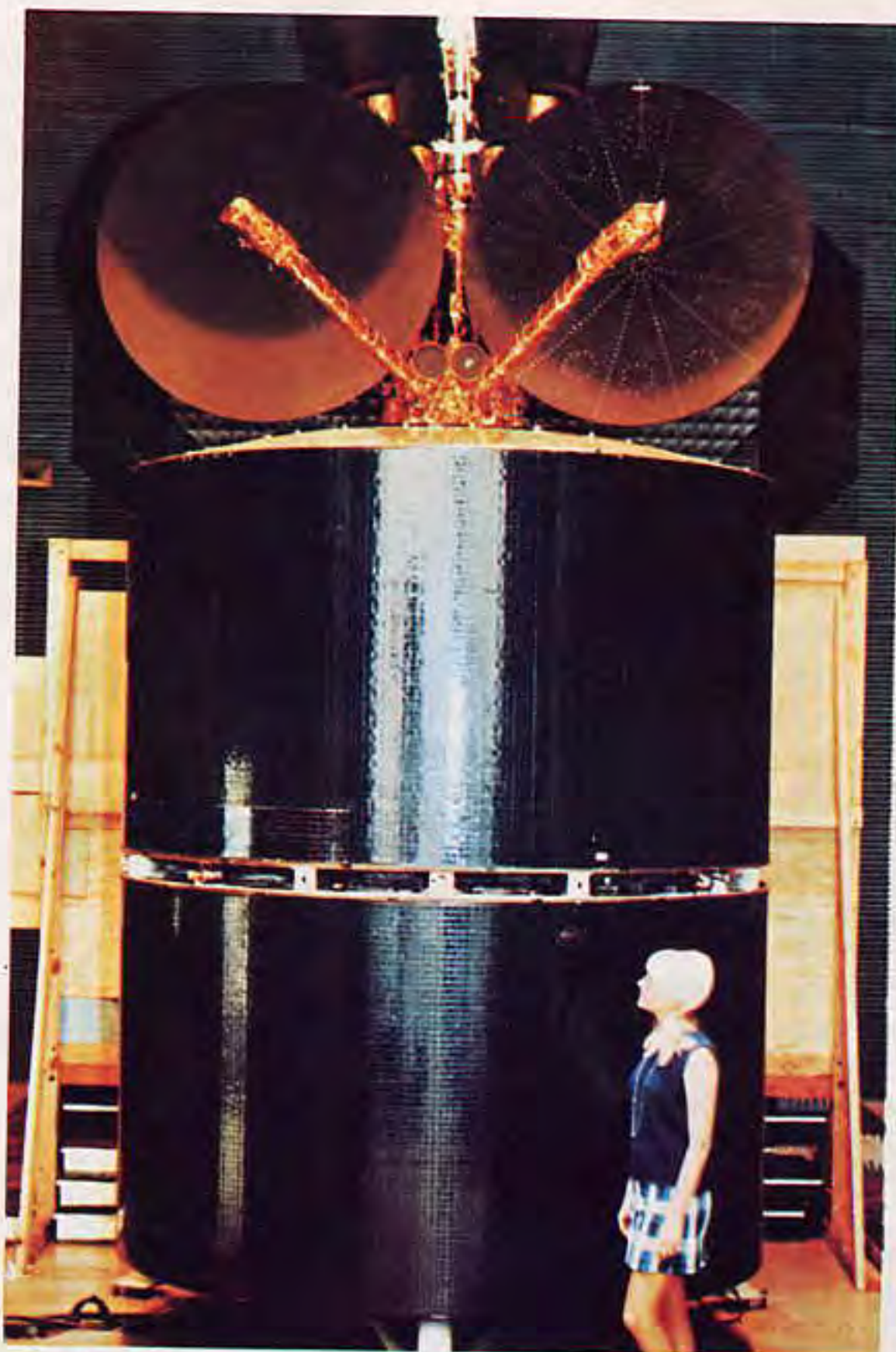
Although it was a novelty in 1966, the sub-title Via Satellite is now almost commonplace. Test cricket, Wimbledon tennis, meetings of international statesmen and other events of world interest appear on our screens without causing undue excitement.

Such is the speed of scientific and technical development nowadays.

The satellites now in use are the Intelsat IV series, launched in 1971. They weigh 636 kilograms in orbit, have a girth of 244 centimetres and a height of 5½ metres. They have a capacity of between 5,000 and 6,000 voice channels, or 12 simultaneous television channels. Their life expectancy is seven years.

The complex electronic equipment inside the satellites enables signals to be picked up, amplified and retransmitted to some other place on earth.

Once again the Post Office has a vital role. It supplies high-quality coaxial cable and microwave radio links that carry the programs from the earth stations which receive them from the satellites. And, of course, it transmits them in the normal way to the home television receiver.



Intelsat IV

Earth station at Moree. Signals from satellites are received here before passing into the broadband network.



THE FUTURE

NOBODY knows for certain what will happen even tomorrow. So how can one possibly forecast ten, twenty or more years ahead?

How, for instance, could anybody have predicted that, within 50 years of the first crackles coming out of the crystal set, it would be possible to watch men travelling to the moon, to see them landing there, and to listen to their comments as they cautiously explored the dusty lunar surface?

Only the most imaginative forecaster would have dared to predict such weird science fiction.

Yet the trends were there. And there are trends today too.

One of the earliest of future innovations will be colour television. This is already scheduled for introduction in Australia in 1975.

Once again, as with the introduction of black-and-white television in 1956, Australia wisely held back, waiting to assess the performance of colour systems overseas. There was no rush to be among the world's innovators in a project involving complex and expensive electronic equipment at both the transmitting and receiving ends.

Plans have also been announced for the early introduction of high-quality stereophonic sound broadcasting services using frequency modulation and operating on ultra high frequencies.

The future will probably also see big developments in cable television and CATV (community antenna television).

Community antennas were developed originally for use in remote areas where poor reception made it necessary for every individual to build his own very high and expensive receiving antenna.

The Post Office granted permits to private companies to establish one huge antenna for an area. These antennas snatch television signals out of the air and direct them through cables into individual homes.

In the USA, community antennas are used extensively in cities where high-rise buildings interfere with reception.

Cable television is an important new study in broadcasting. It could result in sound and vision being connected to the home like gas, electricity and telephone lines. This has already been successfully attempted in an experimental town in England.

One of the present problems affecting domestic television is that there are no channels left except those reserved for future educational needs in the cities. But with cables it is possible to have hundreds of channels operating, leaving free the precious radio frequencies.

It is through cable television that the videophone and conference television would become possible.

They are in fact both technically possible now but prohibitive for general use because of high costs.

Conference television will certainly precede the videophone. By this means a conference may be held with people in two or more geographically separated places taking part. A loudspeaking telephone system is used in conjunction with the television screen to bring the participants together in a closed circuit.

The Post Office is now operating a trial closed circuit television conference set-up connecting rooms in two buildings in Melbourne and one in Sydney.

Cable television would also make available a wide range of new services. Library information, legal refer-

ence, stock exchange reports, weather forecasts and other such data could become available at keyboard request. There could also be facsimile printing of daily newspapers.

The future will almost certainly bring more frequent international television programs transmitted via satellite. It is quite likely too that Australia will have its own domestic satellite so that television (and telephone service too) can be taken to the two per cent of population living in areas which cannot be reached by so-called conventional methods.

Mobile radio communication is another sphere in which further refinements can be expected. Radio communication between police cars and their base has a history going back to 1922, and the Royal Flying Doctor Service to 1927. These and the various other services now operating — taxis, ambulance and fishing fleets for example — are another Post Office responsibility.

They all operate only under licence from the Post Office, on frequencies allocated by the Post Office, and with equipment authorised by the Post Office. There are now approximately 185,000 of these stations (fixed and mobile) operating in Australia.

Future developments in the mobile field would most likely be concerned with telephones in motor vehicles. A limited service of this type is already available, but shortage of frequency space precludes any great development at present.

The trends of today point to the world of tomorrow being a computerised, push-button world with instant communications, audio and visual, available on fingertip demand.

All this is a far cry from the concert of 23 November 1923.

Yet communication satellites, remember, as late as the 1930s belonged only in the comic strips. By 1962 they were real enough.

And in 1906, Prime Minister Deakin, listening to the first radio link between Victoria and Tasmania, laughingly suggested an attempt at contacting Mars. Who would dare laugh at such a suggestion today?

Whatever the future holds in the field of advanced communications, one thing is certain. The Post Office will continue to play its traditionally vital role in innovation and development.

A television conference



