



When I Think Back...

by Neville Williams

Sydney Newman: pioneer radio amateur-turned-engineer

Every whit a typical wireless enthusiast and amateur operator, Sydney Newman nevertheless helped to shape the history of commercial radio in Australia. He was the first person to bridge the Tasman with radiotelephony, fitted out Australia's first radio-equipped police patrol car and supervised the installation of several early medium- and short-wave broadcast stations.

Sydney M. Newman was born in Waverley, Sydney, in 1898 but moved with the family to Melbourne shortly afterwards, being educated at Melbourne Grammar School.

Unwittingly, the school helped shape his career when it awarded him, as a prize for winning a race, a cash voucher redeemable at any shop in the City. With it, young Syd bought an assortment of second-hand telephone bits and pieces, and set up a private line on which he could talk to the kids next door.

His next step was to build a simple wireless set, using a crystal and 'cat's whisker' to listen to code transmissions from ships in and around Port Melbourne.

In the process, he became proficient at Morse and managed to qualify for an amateur station licence in 1912 at age 14. For him, the highlight of those early days was reception on a crystal set from Melbourne in 1914 of a signal from the German liner 'Scharnhorst' when it was still one day west of Perth. Syd recalls that the signal from the Telefunken 'singing arc' transmitter was particularly clean and readable.

All this makes him a close contemporary of Raymond Allsop in Sydney (EA, January '90) — also born in 1898, and a licenced amateur at 13.

Unlike Ray Allsop, however, Syd did not have Father Shaw as a technical mentor and had to be a good deal more self-reliant.

He recalls that, in those days, technical literature to do with wireless was in very short supply.

He nevertheless managed to assemble a spark transmitter using an interrupter and induction coil, and made his presence



Sydney M. Newman in the mid '20's aged about 28. The skills he had learnt as an amateur radio operator were by now being put to good use at an engineering level for AWA.

felt on the air using the callsign (as he remembers) POZ.

Joins AWA

In 1920 Syd Newman joined AWA, taking up his duties at the Melbourne branch under L.A. Hooke - a group that was destined to play a vital role in the development of wireless in south-eastern Australia. He was also issued with a commercial operator's licence, on the

strength of the skills acquired as a licensed amateur.

In the following year, on behalf of AWA, Syd Newman organised a demonstration of wireless telephony at the Melbourne Town Hall to an Old Melbourne 'smoke concert' - an audience comprised predominantly of former students of his old school.

To a quite different audience, during a visit to Sydney in 1921, he delivered a lecture to members of the NSW Division of the WIA (Wireless Institute of Australia), of which Ernest Fisk was a member and office bearer. His subject 'European Signals Amplified by Twenty Valves' must have sounded somewhat mind-boggling, at a time when valves were more commonly used in ones and twos.

When I said as much to Syd, in a recent phone conversation, he tended to pass it off as more a gimmick than a serious technical exercise. AWA, it seems, had imported a number of Marconi 'Seven' long-wave communication receivers which used six RF amplifier stages ahead of a detector. He had simply borrowed three of the receivers from stock and connected them in tandem, such that the incoming signal had to negotiate 18 RF amplifier stages before finally reaching a detector!

If that hasn't made the Guinness book of records, maybe it should have...

1921 was also notable as the year when, in early November, US president Harding broadcast a message to listeners around the globe to mark the opening of New York Radio Central, claimed to be the most powerful wireless station in the world. The subject of an 8-page article in the *Australian Sea*,

Land and Air magazine for February 1, 1922, the project highlighted in no uncertain manner the logistics involved in the construction of a high power long-wave station. (See panels).

Inaugural broadcast

In the context of modern radio and TV services, the pronouncements of people from other countries are everyday fare; but they were certainly not so at a time when international communication depended mainly on undersea cables.

Advised of the pending transmission, AWA managing director E.T. Fisk arranged for the steamships *Riverina*, *Ulimaroa* and *Mataram*, at anchor in Sydney Harbour, to intercept the message, while C.D. Maclurcan was also alerted so that it could be received at his experimental broadcast station at Strathfield, in Sydney's inner west. The information was sent also to Australian and New Zealand coastal wireless stations.

Syd Newman was involved in making similar arrangements in Melbourne, including the Marconi/AWA experimental long-wave station at Kooweerup. P&O's *RMS Narkundo*, en route from Melbourne to Adelaide, was also alerted.

The direct broadcast, reaching Australia 'within one-eighteenth part of a second' prompted considerable comment from the press. Said *Sea, Land and Air* (Dec. 1, 1921):

'It was received simultaneously at all points as loud and distinct as if it had come only a few hundred miles instead of ten thousand miles, the distance from New York City to Australia'.

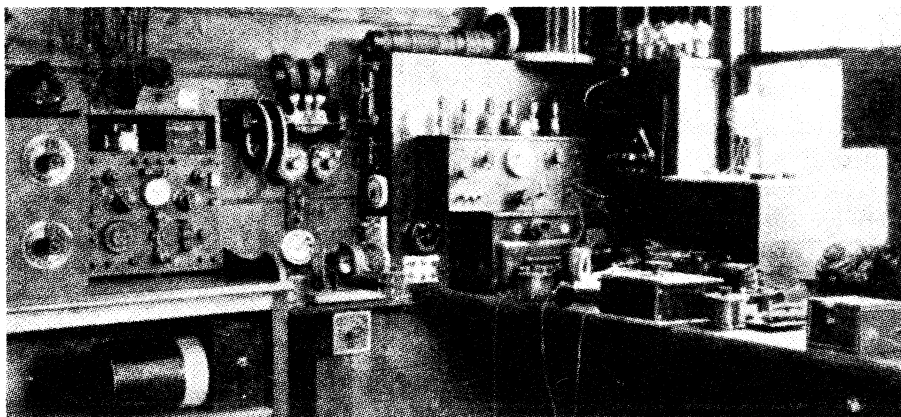
Contrasting this with the existing tedious facilities, the writer added: 'A message from Sydney to London has to be relayed five times to reach Vancouver, and it is then only half way! From Vancouver, it is sent over Canadian landlines to Halifax, thence across one of the Atlantic cables to a point in England, where it is transmitted over the landlines to its destination - London'.

Communications problem

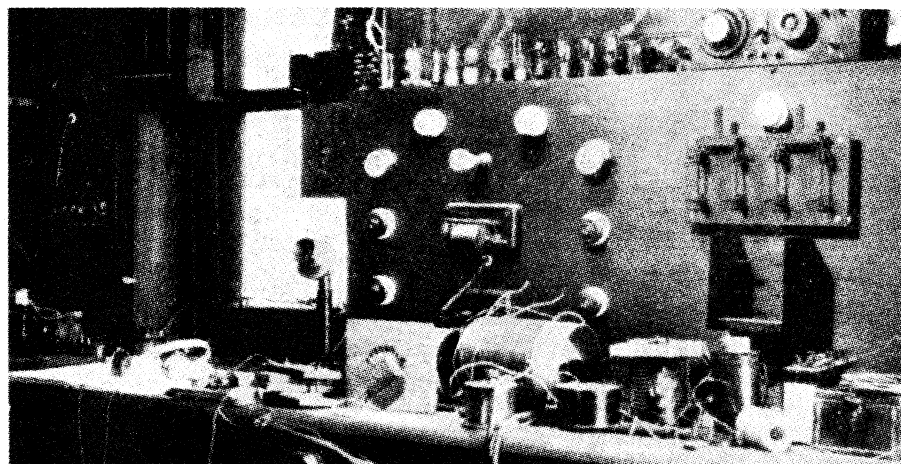
As a result, the magazine explained, 'Our press is insufficiently supplied with international news and Australia is not so well known overseas as might be the case ...

'Another point of view is defence. Quick and reliable communication is absolutely essential. With only two cables linking this country to the outside world, there is nothing to prevent the enemy at sea from cutting the cables and isolating us altogether. With wireless, such a position could not arise....

'The Commonwealth Parliament will



Reproduced from 'Radio in Australia & New Zealand' in 1923, these pictures show (above) the receiving equipment at Syd Newman's own amateur station and (below) the transmitter.



shortly deal with the matter of Australia's overseas communications - a right retained by Mr Hughes at the recent Imperial Conference.

'A thoroughly complete and modern long distance wireless service and organisation - that will save 60,000 pounds per annum is what Australia needs. When that is in operation, both internal and external isolation will be overcome.

'Then, like New York Radio Central, Australia's Radio Central will be able to communicate to any country in the world'.

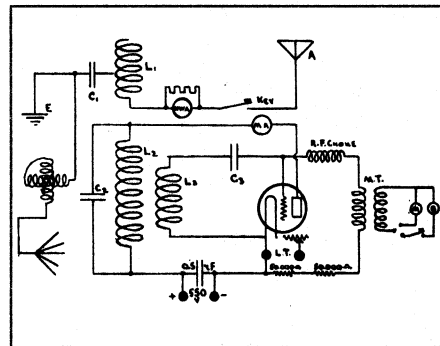
Harding's broadcast could not have come at a more opportune time for AWA, who were perceived as the logical organisation to meet Australia's communications needs.

Ernest Fisk had returned to Australia only a few weeks previously on the *RMS Narkunda*, following a visit to Britain. AWA was ready, he said, to set up a worldwide wireless network based on Sydney or Melbourne which would be able to provide a link between state capitals and overseas nations, first with telegraphic message handling but readily adaptable for telephony.

AWA held rights and options from the

Marconi Company of England, the Radio Corporation of America, the General Wireless Company of France and the Telefunken Company of Germany.

As a result, said Mr Fisk, "The Australian service will be able to reap full and continuous benefit from the research work conducted by the great wireless companies and the best scientific and technical brains in the world".



Designed around a single Marconi R-type receiving type valve, Syd Newman's amateur transmitter helped re-write the record books for low-power equipment, for both telegraphy and telephony.

A word to the PM

Making very sure that the Prime Minister 'got the message', Messrs Fisk and Hooke provided an appropriate technical diversion for Mr (Billy) Hughes when he was booked to travel from Melbourne to Sydney on the *SS Karoola*. They installed Sydney Newman aboard, complete with an appropriate receiver. Then, as the *Karoola* headed down the Bay, the PM was able to hear farewells from his wife and daughter Helen, relayed to him via coast radio station VIM.

In the same year, 1922, Syd Newman was given the task of broadcasting over the same station a speech by Prime Minister Hughes delivered in the Bendigo Town Hall. In the absence of suitable microphone and landline equipment to convey the signal to Melbourne, a stand-by transmitter was installed on the site!

This was only part of the job because, for this novel OB (outside broadcast) Syd also had to erect an appropriate transmitting antenna between the Town Hall spires. And, to put a finishing touch to it, the most effective microphone for the occasion turned out to be a Brown brand horn loudspeaker used in reverse: talk into the horn and a signal would be produced across the drive coil!

For me, that stirred a chord of memory in that one of the earliest wireless transmissions I ever heard, and certainly the first on a loudspeaker, was on a Brown's horn - often described in those days as a Brown's 'Table Talker'.

Table listener!

In fact, I was told, a similar microphone and transmitter set-up was used for an ambitious demonstration broadcast from Her Majesty's Theatre in Melbourne, as reported in the Melbourne Herald for 31/3/1922. AWA historian Philip Geeves also refers to it on page 53 of *EA* for April 1989. Backed by AWA Melbourne Manager Lionel Hooke, the concert was expressly intended to entertain convalescent ex-servicemen.

On the occasion, Syd Newman used two Brown loudspeakers, one at each front corner of the stage, facing obliquely inwards.

By way of interest, a 3-page article in *Wireless Weekly* for August 13, 1926 explained the then problems of 'Transmissions Over Land Lines'. While the telephone network in the early '20s was able to meet normal requirements reasonably well, the procedures necessary to set aside a good quality path from



Old and faded, this picture nevertheless gives some idea of the 'outhouse' short-wave test centre at Willoughby in 1924/5. More like a makeshift 'ham' rig, the 20-60 metre transmitter was used for scheduled tests with distant centres like Melbourne (600km direct line) and Rabaul (2700km).

point A to point B for broadcasting purposes had not been established.

Featured in the article was a two-event broadcast organised by 2FC from the Hotel Kosciuszko on the occasion of a winter games weekend.

Typically, the path from the Hotel to the transmitter at Pennant Hills involved a half dozen-odd switching centres, to each of which a special PMG technician had to be assigned. In some cases, the line needed for the broadcast was the only one available so that, once the program started, the technicians were isolated, having to rely on their own initiative and what they could or could not hear - on headphones - coming down the line.

Only in 1926, with 2FC, 2BL and 3LO in particular competing for novelty broadcasts, did on-demand landline working begin to develop its own routines for radio stations, the PMG department and their respective technicians.

Incidentally, if you're puzzled by the above reference to the 2FC transmitter being located at Pennant Hills, Syd Newman was able to confirm that it had been

moved from the original Willoughby site to Pennant Hills, where it remained for several years until transferred to the present site near Liverpool, south-west of Sydney. But, back to the original theme:

A busy year

1922 seems to have been a memorable year for Syd Newman, heralding an event which seems to have brought him more satisfaction, long term, than most others.

One evening in November, using a 6-watt transmitter based on an ordinary French-made receiving valve, he had been 'chewing the rag' with fellow amateurs in Melbourne and Sydney. This was from his home at Canterbury, Victoria, on 400 metres. In due course, he switched off and went to bed.

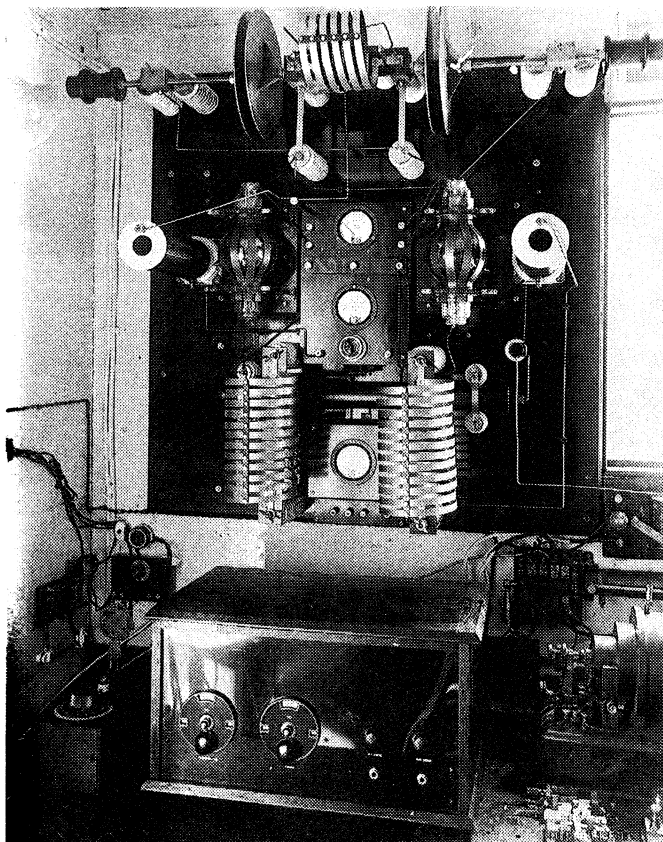
That was not the end of it, however, because he received a cable shortly afterwards from amateur operator Frank Bell (Z4AA) in Waihemo, New Zealand, reporting reception of his transmissions and suggesting a 2-way 'sched' for the following day. As noted in the *Evening Sun* for 16/4/22 and *Radio in Australia*

President Harding's Message to the World:

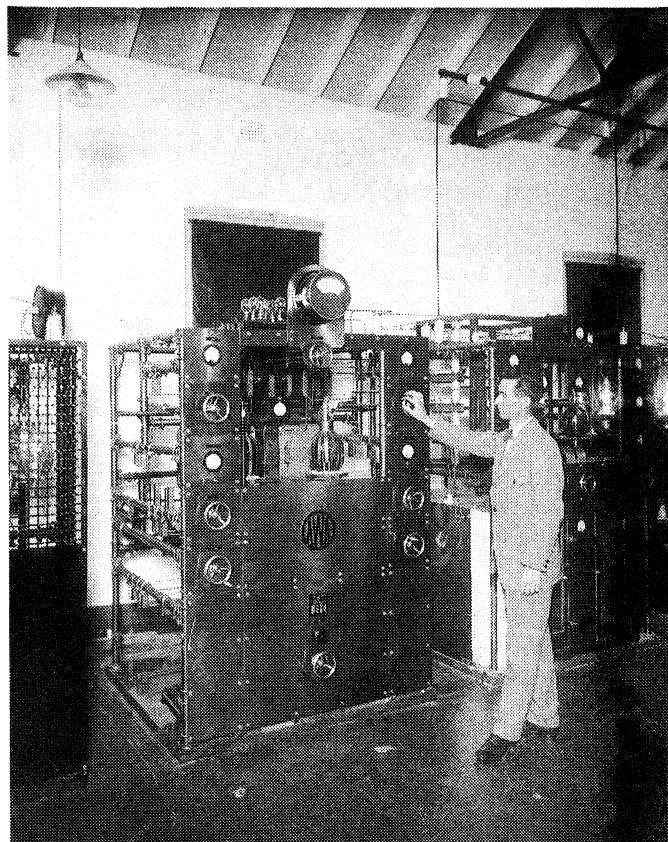
"To be able to transmit a message by radio in expectation that it may reach every radio station in the world, is so marvellous a scientific and technical achievement as to justify special recognition. It affords peculiar gratification that the chief executive of the United States of America may be received in every land, in every sky, by peoples with whom our nation is at peace and amity. That this happy situation may ever continue, and the peace that blesses our land may presently become the fortune of all lands and peoples, is the earnest hope of the American nation."

- Warren G. Harding

(Broadcast from New York Radio Central, November 4, 1921.)



Designed by Syd Newman for AWA, this short-wave equipment was installed aboard the steamships 'Jervis Bay' and 'Niagara' and demonstrated its ability to contact Australia from across the world.



Syd Newman and the 20kW short-wave transmitter he developed for use at the Pennant Hills Centre in the late '20s. Used to research international short-wave communication, it also carried short-wave broadcasts under callsign 2ME.

& New Zealand magazine for 27/6/23, this was the first confirmed record of a contact by wireless telephony across the Tasman.

That it was accomplished with such low power was surprising until one reads about the antenna system at the Newman residence, as described in a lecture on his 'rig' to the Melbourne Division of the WIA in early 1923 (ref. *Radio in Aust. & NZ*, 27/6/23).

The antenna comprised two parallel 14-gauge wires, separated by 4m spreaders and supported by two 19m-tall masts 67m apart. Beneath it, as a counterpoise, two wires 10m apart were supported 3m above ground and extending 13m beyond each end. The earth cable attached to a 7 square metre zinc plate, buried and bonded to the water and gas mains and to 150m of buried copper cable radiating under the antenna and terminated by copper plates.

Not to be outdone, a picture of Frank Bell's set-up at Wiahemo shows a large lattice steel tower, three times the height of the household chimneys, supporting a festoon of aerials — one of which stretches horizontally out of the picture to some other unseen support!

The same article mentions that Syd

Newman's amateur transmitter was powered by a war surplus aircraft wireless generator, obtained from the UK. Fitted with a small propeller, it had once been bracketed to the side of a WW1 aircraft and driven by the slipstream. Produced by BTH, it originally delivered 600V DC at 3000rpm and 8V for the filament circuit.

In his 'shack', Syd Newman had the option of driving it with an electric motor and pulleys or using it as a stand-alone converter by feeding DC to the low voltage winding.

Police radio

Another first for Syd Newman in 1922 was the fitting out of a police patrol car in Melbourne with 2-way wireless equipment. In conversation, he mentioned that it was an American Hudson — a relatively large car, noted for its power and speed.

Mention of fast cars brought the admission from the now venerable wireless pioneer that, in his younger days, he had been a motorbike enthusiast.

Later, when he moved to Sydney, he had switched his interest to cars, his particular love having been a French de-Large. Shades of 'Braith Hull and John

Moyle, former editors of this journal, who also seemed equally at home with a hot soldering iron or a hot exhaust!

Long way around

Back to wireless/radio, Syd Newman's career notes contain two other interesting entries for 1922. First off, using a direction finding loop at his home at Canterbury (Vic) he noted that long-wave signals from Europe and America seemed to follow the longer darkness path (typically 14,000 miles) rather than the shorter daylight path (typically 10,000 miles).

Unsure whether it was a purely chance observation, he said nothing about it until he was able to compare notes with one of two Marconi research engineers, whom he knew to have been using similar equipment aboard ship en route from New Zealand to Australia. One of them, Tremellyn by name, confirmed that they had reached the same conclusion.

The other 1922 entry had to do with regular hour-long Monday night broadcasts of phonograph records, which Syd Newman provided from his Canterbury home on behalf of AWA for listeners in the Melbourne area. The transmissions

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were originally on about 1100 metres but were subsequently transferred to the medium wave band around 400 metres.

In his article on page 51 of *EA* for April '89, Philip Geeves adds that this AWA 'Concert Service' involved playing 78rpm records on a regular wind-up phonograph, and picking up the sound from its acoustic horn on a carbon microphone. While a dubious procedure in terms of sound quality, it was rivetting to the listeners of the period.

Although supported by AWA using a 500-watt Marconi transmitter, Syd Newman took his place, in these activities with a group of amateur station operators who also provided 'wireless entertainment' in the Melbourne area in the pre-broadcasting era. Notable among them were Max Howden, C.Hiam, Ross Hull and Kingsley Love. The AWA/Newman broadcasts, by the way, were under the callsign 3ME.

In 1923, Syd Newman was despatched to the British Marconi laboratory at Chelmsford for best part of a year, to study their technology at first hand. On his way back, he visited RCA and had discussions with their general manager David Samoff and other RCA notables. Predictably, he was also shown over New York Radio Central on Long Island.

Short-wave bands

He recalls that, ironically, the emphasis during this whole exercise was on established long-wave technology,

whereas evidence was accumulating to suggest that more effective communication would be possible on the true short-wave bands — 'below' or shorter than about 100 metres. Atmospheric interference would be less of a problem and less expensive valve-type transmitters would suffice, along with much less ponderous aerial systems.

With Marconi and his research engineer Franklin pressuring Fisk, Syd Newman found himself installed in a vacant outbuilding at the rear of a block of land at Willoughly, Sydney, on which AWA had already erected the pioneer broadcast station 2FC. (See the article on George Cookson, *EA* September 1990). His brief was to investigate and develop communications equipment for use on the short-wave band - a classic case of being paid to work at one's hobby!

Underneath transmitter

Even so, I could not but wonder how anyone could carry out meaningful experiments within the literal shadow of a 5kW broadcast transmitter. Having in mind Syd's background as a 'professional' amateur, I should have known better than ask. Much of the work was done late at night, after 2FC had closed down!

Some of the equipment ended up in Ernest Fisk's home at Vacluse, Sydney, in 1924, where it was used to receive a test transmission from Poldhu (UK) on 92 metres. Subsequently further test transmissions were intercepted at Turramurra on 52 metres.

Thus encouraged, a series of messages was transmitted in code and satisfactorily received and verified. The exercise

confirmed that short-wave transmissions to Australia were not only practicable, but at much lower cost than either cable or the long-wave relay system which the British Post Office wanted to install.

Looking back on those days, Syd recalls that short-wave receivers were set up at three different locations, manned by AWA engineers Burbury, Lamb and himself. It was not unusual for them to monitor the signals from Poldhu (UK) from 2 to 5am and then report for work at 9.00am as usual - without overtime!

Shortwave operation

The merit of short-wave working was confirmed when a transmitter developed by Syd Newman was installed at the AWA centre at Pennant Hills (Sydney) in late 1924. At the time, it was the most powerful short-wave transmitter in the southern hemisphere, and satisfactory reception was reported from the Marconi receiving station at Hendon (UK) and from other overseas locations.

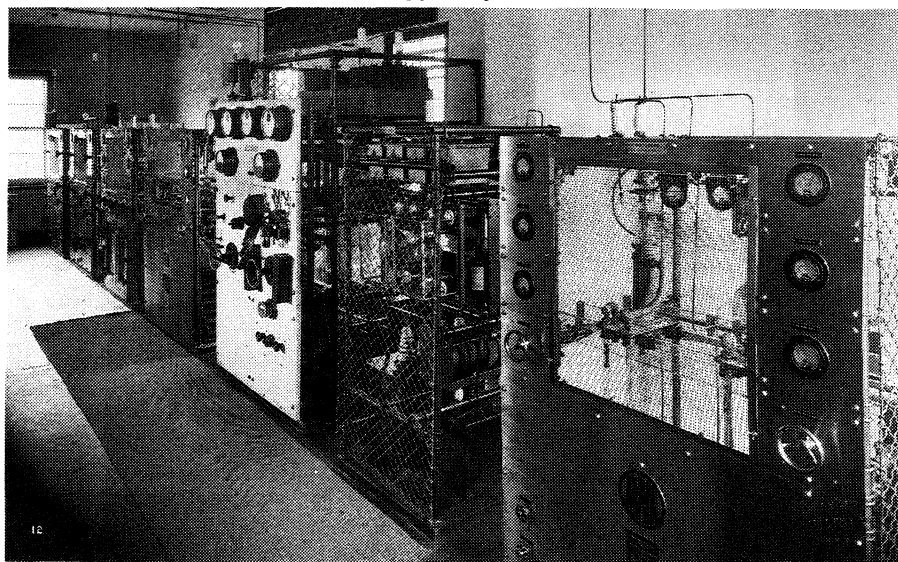
Give or take a few modifications along the way, this was the same historic 2ME transmitter which carried the Voice of Australia to the BBC on 28.5 metres, for re-transmission throughout the UK in 1927. (See George Cookson, *EA* September 1990). In the following year, along with an up-graded antenna system, it played a vital role in establishing basic communication links between the Australian Post Office and equivalent organisations in other countries.

In the meantime, in another 'first' Syd Newman developed 500W maritime short-wave transmitters and receivers and installed them on the *SS Niagara* and *SS Jervis Bay*. Scheduled tests indicated continuous telegraphic communication all the way from Sydney to Vancouver and to London. The stage had been set for the establishment of short-wave 'beam' wireless, for a fraction of the outlay that would have been involved by long-wave technology.

Broadcast transmitters

Oh yes — and this emerged only from sudden recollection, as we talked. Along the way, he supervised the installation of 4QG Brisbane, for the Queensland Government — who were most perturbed when they discovered that he did not, at the time, hold a regular electrician's licence. Then 7LA, Launceston, to a schedule so tight that he commenced installation of the transmitter before the roof was on! He had re-equipped 3LO in the early '30s and set up 3SR Shepparton, studios and all.

That's about where Syd Newman's



The short-wave transmitter at Pennant Hills NSW circa 1930, as expanded to cope with a more elaborate antenna system. It broadcast a musical program to a GE station in New York in 1928 and kept in touch with the 'Southern Cross' on its first trans Pacific flight. It was also used to establish the first radio telephone service between Australia and England, in 1930.

Word picture of a giant long-wave station

In the immediate post-WW1 years, the US administration was concerned that, because of its geographical position, London had become the hub of cable-based international communication. Cost what it may, they were determined to secure that role for New York in terms of the new medium: international wireless.

To better mobilise the country's technical resources, the US government encouraged major companies with a potential interest in the project to pool their patents and skills for a 20-year period, and to back a joint effort under the guidance of the Radio Corporation of America (RCA). The organisations directly involved were General Electric Co, American Telephone and Telegraph Co, Western Electric Co, United Fruit Co, Westinghouse Electrical & Mfg Co, and RCA.

The long-term aim was not only to set up Radio Central in New York but to enlist overseas companies to secure cooperative expansion of the 'RCA System' of wireless communication into other countries, including those in South America.

The transmitting site, 112km from New York city was on the northern shore of Long Island, covering an area of about 15 square kilometres or 2600 hectares. On this, twelve 150-ton aerial support towers were to be erected forthwith, each about 125m tall, with a horizontal cross-arm at the top about 45m long. The foundations were to be set some 3 metres into the ground, each foundation requiring just on 700 tons of concrete.

380m apart and strung out over a distance of nearly 5km, the towers would support 16 parallel conductors (or 80km total) of 10mm diameter silicon bronze cable at a nominal 125m above ground. An earth mat underneath called for 720km of copper wire buried underground in a geometric pattern.

The ultimate plan envisaged a total of 72 towers, supporting a much more extensive antenna system in a spoked-wheel pattern to ensure maximum coverage.

To provide the source signals, the first of a planned ten 'power houses' (20m x 40m) would accommodate two 200kW high frequency alternators and their drive motors, together with ancillary RF equipment. An adjacent cooling pond would provide sufficient circulation through the alternators to permit continuous operation. Covering wavelengths between 20,000 and 15,000 metres (15 — 18.9kHz) each alternator system would have a potential sending rate of 100 words per minute.

Power for the station would be provided by an 11km 23kV supply line direct from a Long Island power station.

To permit multiplex operation, a complementary receiving centre would be set up 25km away at Riverhead, Long Island. Maintenance staff only were to be based at the transmitting and receiving centres. All operators would be based in a centralised control building in New York city, with permanent landlines to handle remote control functions, along with incoming and outgoing signals.

Construction commenced in July 1920, involving a workforce of 100-250 men. The first signals were radiated in October 1921 - one month ahead of the official opening.

technical tales came to an end. "Why so?" I asked.

The answer was perhaps predictable. With all that background knowledge and experience, AWA management had decided that the time had come for him to exchange his soldering iron and slide rule for a Parker pen and a pin-striped business suit. He was assigned to the commercial engineering section at Head Office, finding himself in due course at 45-47 York St, Sydney, sorting out problems and tenders for professional broadcasters and communicators.

As such, our paths must unknowingly have crossed many times when I worked in the same building as a very young

man, scarcely noticed amongst more mature and experienced engineers.

Syd retired in 1961 but, at age 91 he has seen one whole generation of technology more than most of his contemporaries - these days strictly as an observer. He plays bowls three afternoons a week and, for good measure, is a life member of Avondale Golf Club and the Lindfield Bridge Club.

It's a long time since he contrived his first 'electric' soldering iron. Tired of fiddling with a blowlamp, he recalls having contrived an electric oven from a discarded toaster, with an asbestos slider to control the temperature. I don't really recommend the idea!