

History of Telephone Exchanges in Australia

In 1880, the first telephone exchanges opened in Australia.

It's hard for us today, more than a century later, to appreciate the impact that the new invention of the telephone had on our young country. Today, we tend to take the telephone for granted. But once Alexander Graham Bell had demonstrated a practical telephone, in 1876, the impact on society was swift and enormous.

The fact that it was only four years from the initial invention to the establishment of commercial exchanges in a country so far from the rest of civilisation as Australia speaks for itself. The new "scientific wonder" was greeted with a great deal of eagerness in Australia by both the business community and the public. Part of the reason for that eagerness might have been the fact that for so long the colonies had been isolated from Europe and America. This isolation — "the tyranny of distance" — had only recently been broken, in 1872, by the construction of the Overland Telegraph Line, linking Australian cities with a submarine cable to Java and from there through to London and Europe.

For the first time, telegraphs could pass in a matter of minutes between England and her antipodean colonies. Then came the telephone, promising swift communication by speech over long distances. Moreover, such communication could be carried out by anyone with an instrument — the messages did not have to pass through an operator trained in Morse code but were as easy and simple as normal conversation. Small wonder that the idea caught on so rapidly!

The nineteenth century was in many ways the era of the amateur inventor. The body of knowledge that was science and technology in the latter part of the last century was not so extensive and specialised as it is today, and many part-time experimenters made significant contributions. A teacher of the deaf (Alexander Graham Bell), an undertaker (Almon Strowger) and a clergyman (The Reverend Henry Hunnings) all contributed in very important ways to the development of telephony. Alexander Graham Bell published details of his telephone in the "Scientific American" on 6 October 1877, and enthusiasts in many countries made their own versions of the instrument from the description in this article. This was the case in Australia.

TASMANIA

One such enthusiast was Alfred B. Biggs, a self-educated man and a noted amateur astronomer. And while only an amateur, he did have several papers on scientific topics accepted by the Royal Society in London. He was head teacher of Campbell Town Public School in Tasmania from 1864 to 1874. Guided by Bell's plans, he made several hand-type-telephones from Huon Pine on his workshop lathe. He positioned them in Launceston and Campbell Town railway stations and transmitted the 80 km distance between these two points along the telegraph line which ran beside the railway.

His experiment was a complete success. It has been claimed by some to be the first occasion on which a telephone was actually used in Australia, although there is no conclusive evidence of this. The original sets are on display in the Queen Victoria Museum, Launceston. The Cornwall Chronicle of April 1878 reported an experiment conducted in February of that year between the Launceston Telegraph Office and Low Head, using instruments made by Robert Henry, who later became the Superintendent

of Telegraphs. His elegantly phrased telegram to Launceston gives a clear indication of the form the experiment took:

"The Song — 'Rocked in the Cradle of the Deep' — splendid most perfect; comet quite distinct, heard everything more or less. Altogether the experiment very successful"

"This system will bring the entire community of business and professional men together. Subscribers can sit in their offices and transact business, buy and sell goods, give and receive orders etc. in every quarter of the city"

VICTORIA

As early as 1877, W. J. Thomas of the Geelong Customs House experimented with home-made telephones and successfully linked houses in his locality. By means of his telephones and wire, Thomas arranged for the transmission from one house to another of music as well as conversation. Social gatherings were arranged to try the telephone, which helped in testing and also provided a novel form of entertainment. Later, Thomas transmitted over longer distances, using a telegraph line between Geelong and Melbourne and between Geelong and Queenscliff.

The first test between Geelong and Queenscliff took place on the evening of 9 January 1878. Some of the contributions were heard clearly, notably a vocal rendition of "Yankee Doodle" at the Geelong end of the line, and "Genevieve" at the Queenscliff end. What appears to have been the first installation of a regular commercial telephone service in Australia came into operation on 2 January 1878. This was in Melbourne. It linked the head office of hardware importers Messrs McLean Bros. & Rigg in Elizabeth Street with their Spencer Street store — about 1.2 km away. The telephones used were made by a local man — J. S. Edwards.

In February 1878, successful experiments were carried out between Melbourne and Ballarat (115 km) using telephones made by a Mr Challon of the Central Telegraph Office, Melbourne.

The Victorian Post Office report for 1878 had this to say about the exciting developments in local telephony:

"The branch establishments of several business places in Melbourne and the suburbs are now connected with their head offices by means of telephones. The great drawback to the utility of these instruments when first introduced was the difficulty of calling the attention of the person desired to be spoken to. This has been overcome by the attachment of signal bells to the wire, and the use of the telephones for business purposes has proved to be a great convenience. The greatest length of wire on which telephones are at present regularly employed is about 5 miles (8 km)".

NEW SOUTH WALES

E. C. Cracknell, Superintendent, Electric Telegraphs, in New South Wales was another to experiment. He was on an official visit to West Maitland in December 1877, and while in the area he successfully transmitted songs and music over the 224 km distance between West Maitland and Sydney using telegraph wires. G. A. Kopsch, of the Telegraph Department, who had the grand title of Chief Mechanician, was at the Sydney end. The instruments used were made after reading Bell's article.

SOUTH AUSTRALIA

Overland Telegraph Line, said in a report to Parliament:

"We tried it here at an early date . . . and with telephones of the Bell type made in our own workshop, effected communication, first between Semaphore, Adelaide and Kapunda, in January 1878, and subsequently between Semaphore and Port Augusta, a distance of wire of 240 miles (385 km). It was also tried most successfully on the Port Darwin line . . .

We also made several loud speaking Gower Telephones which worked admirably over long distances of line . . ." It was C. A. Unbehaum, Electrical Engineer for South Australia, who carried out the actual technical work and the experiments.

WESTERN AUSTRALIA

The Superintendent of Telegraphs in Western Australia, J. C. Fleming, reported to the Parliament of that State on 5 April 1882:

"When first introduced in the form of a wooden hand-telephone (such as imported here about four years ago), the instrument could not be used with any beneficial result. It was more a pretty scientific toy, which exercised the imagination almost as much as the ear. It is now, however, and has been for some time, a reliable and practical instrument especially when from the hands of Manufacturers of Reputation

. . its success is unparalleled".

QUEENSLAND

It appears that the first experiments with telephones in Queensland were conducted at the Brisbane General Post Office on 26 January 1878 by W. J. Cracknell, Superintendent, Telegraphs, and brother of E. C. Cracknell of New South Wales. He used roughly fashioned telephones for the experiments. However, he said they were not well adapted for the purpose, even though fair results were obtained. He had evidently corresponded with Bell. In his report to Parliament on 11 March 1878, Cracknell said: "Professor Bell, the inventor of the Telephone, is sending me two of his improved instruments, and on their arrival further experiments with this scientific wonder will be made".

The Brisbane Courier of February 1878 reported that on 28 January 1878, a Dr Severn successfully experimented with telephones over a mile of telegraph wire beginning at the Electric Telegraph Office at the Brisbane GPO. The same day a call was made via Ipswich and return using 80 km of wire. Motivated by this success, circuits were set up to Toowoomba and even to Rockhampton. In February 1878, the inland route was combined with the coastal route to make up 1600 km of telegraph lines and speech was transmitted successfully. "Social gatherings were held to try the telephone."

These early telephones were used for communication between two fixed points - for example, in a business between its warehouse and its factory. The instrument generally consisted of two Bell telephones - one receiving and the other transmitting. But January 1878 saw another big advance in the technology of the telephone system. This was the opening of the first commercial telephone exchange in Connecticut in the United States. The development of the exchange was a logical step. If the existing point-to-point connections had just been extended, then it would mean that each user would need lines running from his telephone directly to those of all other users he wanted to be able to talk to. Such a system would rapidly become unworkable. Instead, the exchange enabled a 'subscriber' to replace these many wires with a single set of connections between his instrument and

the exchange a central switching office through which his line could be connected with that of any other 'subscriber' to that exchange.

Contact with the exchange was made when the caller lifted the receiver from its hook and operated a signalling device to alert the operator at the exchange that he wanted to make a call. He would then tell the operator the number of the person to whom he wanted to speak, and the operator would make the appropriate connection between the two lines, after first contacting the person being called. Electric current to make contact with the exchange was provided by a hand-wound magneto which was part of the telephone instrument.

AUSTRALIA'S FIRST EXCHANGES

Australia's first telephone exchange was opened in Melbourne in August 1880. It was operated by the Melbourne Telephone Exchange Company. Owned by W. H. Masters and T. T. Draper, the Manager of the Company was H. Byron Moore.

"The Australasian Sketcher", January 1881 wrote of the new Melbourne Telephone Exchange:
... of its utility there can be no two opinions. As an invention which will enable a man sitting in his own office to ask his bank manager for an overdraft, order a coat from his tailor, and send his wife any reasonable excuse for his non-appearance at home at the usual hour.

"An early telephone directory. "The Sketcher" referred to the Melbourne Telephone Exchange as "The Palace of Winged Words"
Melbourne Telephone Exchange Company,

... at present over 70 subscribers have sent in their names to the Melbourne Exchange list ... each subscriber has in his office or house, fitted against the wall on the mantel piece or in any convenient place, a small box containing the wire, attached to which are two wires ending severally in an ear and mouth piece, while on the board in the central office are a button or peg and a little brass plate like the outside of a Brahmah lock, with his number attached It is at this board, presided over at present by two young ladies, that the important operation of 'switching' or connecting the two persons desirous of talking, is conducted"

This was only two years after the world's first exchange in the United States, and just four years after Bell first spoke on a telephone. The exchange was in the old Stock Exchange building at 367 Collins Street, a site now occupied by the Commonwealth Bank. In 1884, the operations of the Company, by then known as the Victorian Telephone Exchange Company, had grown considerably, and were transferred to Wills Street, Melbourne. Private ownership of this company continued until 1887, when it was bought out by the Victorian Colonial Government. Other colonial governments followed this example.

Byron Moore commented:

"The Government, which had looked on us as idle dreamers, soon became jealous of our success and seven years later, most unworthily squeezed us out ..."

At the time of the Government take-over in September 1887, there were 887 subscribers and the Company had 21 employees. The following year the number of subscribers was 1,462.

The "Town and Country Journal", of 10 September 1887, commented on the Wills Street Exchange:

'The operators stand up when attending to subscribers' calls, chairs being, however, provided for the leisure moments of the fair and nimble-fingered battalion of operators. There are in all twenty-four lady operators employed in the Exchange, the timetable being so arranged as to provide eleven always in attendance at the switchboard . . ."

"Place yourself in the middle of the room and gaze upon the delicate hands in magic confusion playing as it were upon metal switches, plugs and switching cords. There is no shouting or even excitement — no apoplectic strain into the machine's mouth. The young ladies rarely turn their heads. There is a soft sighing murmur in the room: and one could easily imagine the spare forms to be automatic figures; and yet that little pouting delicate mouth is wrestling with the pangs, groans and tempers of 100 subscribers, that number being attended to by one lady operator . . ."

By 1910, the growth in telephone services made additional accommodation necessary. This could not be provided in the existing building in Wills Street and arrangements were made for a new exchange in Lonsdale Street. Alexander Graham Bell made a visit to Australia in 1910 in order to advise the Federal Government's Postal Commission and a reception was held for him at the new Lonsdale Street Exchange. The Lonsdale Street Exchange was changed over in August 1911 to the Central Battery system, follow-premises. Instead, power was provided by a powerful set of batteries at each exchange.

In New South Wales the directors of the Royal Exchange were responsible for the establishment of the first permanent telephone connection and the first Sydney telephone exchange.

The Royal Exchange was a group of merchants and businessmen who gave Sydney many of its business institutions and innovations, such as the Stock Exchange. It had also established the first telegraph link in New South Wales back in the 1850s.

the GPO in George Street to give Sydney businessmen a chance to try out the telephone for themselves. To set up this trial line, the directors of the Royal Exchange needed the co-operation of the Superintendent of Telegraphs, E. C. Cracknell, since the telegraph poles would be needed to run the telephone line.

While Cracknell had been one of the first to experiment with telephones in New South Wales, according to reports he was not entirely co-operative with these early attempts to establish a commercial telephone system in Sydney. He is quoted as calling Bell's telephone a "Yankee Toy". However, in the end, after some pressure the Superintendent of Telegraphs was won over and a trial line was set up between the Exchange and the GPO on 6 August 1880.

The Sydney Morning Herald reported how it happened:

"Mr F. R. Wells, the local agent for the invention, fitted up one of the Edison-Bell telephones yesterday at the Sydney Exchange and a fellow one at Mr Cracknell's room at the General Post Office . . . During the day almost everyone who entered the Exchange touched the communicator so that Mr Cracknell, Mr McGuire and Mr Wells, who relieved each other at the other end were kept employed answering queries, many of which were of a rather silly nature."

The newspaper went on to say that the telephone "offers great convenience to businessmen and the project is likely to be taken up."

It was taken up. On 1 November 1880 the telephone officially arrived in Sydney when the first permanent telephone line was installed from the Darling

There were soon several telephone connections into the Royal Exchange but there wasn't yet a switchboard or exchange as we know it today. But in 1881 a switchboard arrived from America and from that point the subscribers could talk to each other as well as to the Royal Exchange.

Early telephone subscribers to the Royal Exchange had to pay for all the installation charges for their telephone services, including putting up the pole line and the cost of the receiver. They also had to pay 5 pounds a year for line maintenance, at the time an enormous sum of money. But once the telephone subscriber had paid these bills then he owned both the line and the telephone and could make as many calls as he wished without any charge.

In 1882 the Postmaster-General's Department opened its own telephone exchange in the GPO. So, for a short time in Sydney there were two separate telephone exchanges operating.

Percy Howe was the first switch attendant in the PMG exchange. He recalled that there were only ten subscribers when it opened, and on that first day there was only one telephone call. It was from a subscriber asking the switch attendant how he was getting on!

In 1883 the Postmaster-General's Department took over the Royal Exchange telephone exchange after several troubles there including a fire in the switchboard.

In Brisbane, Government offices were given telephone links in October 1880, through a central exchange at the GPO. By 1881 there were 36 telephones connected to the exchange, including a number of private ones. The Mechanician was a Mr Starke. He tested the privately-owned telephones before installation — they cost 10 pounds each.

The exchange operator was Fred Watson, who later became Manager of Telephones. He provided service between 9 am and 6 pm. By 1883, continuous service was being provided and 175 telephones had been connected to the exchange.

In 1889, building alterations were made to provide for the introduction of female telephonists. A Mrs Dick was appointed Supervisor over 13 girls. They worked from 8 am to 6 pm — then male operators worked the night shift.

In 1882, the telephone system moved inland and the first country exchange in Australia was opened at Maryborough, Queensland, with 32 subscribers.

The following year telephone exchanges were established in Adelaide (48 subscribers), Hobart (10 subscribers) and Launceston (35 subscribers).

The first exchange in Western Australia, established in 1887, was located in a small three-room cottage in Wellington Street, Perth with 17 subscribers. The year 1888 marked the opening of the Fremantle exchange in a small room at the rear of the Town Hall. There were nine subscribers.

Around this time Mark Twain, the American humourist, evidently having had trouble with inconvenient telephone calls, said of the new-fangled invention:

"It is my heart-warm and world-embracing Christmas hope and aspiration that all of us — the high, the low, the poor, the rich, the admired the despised — may eventually be gathered together in a heaven of everlasting rest and peace and bliss — except the inventor of the telephone."

For the late 19th century telephone system to take on the features by which, more or less, we know it today, one more stride forward in technology was needed. The system had to go 'automatic' — otherwise an enormous workforce would have been needed to switch a multitude of calls manually.

The man to make this revolutionary advance in telephony was a Kansas undertaker, Almon B. Strowger. In 1889, he filed a patent for a method of automatic switching; one more example of a contribution to the technology of the telephone by a gifted outsider.

Legend has it that he was concerned to eliminate manual exchanges because he believed that the operators on the city switchboard had been diverting calls from next-of-kin about deaths to his business rivals, who were able to get in ahead of him with their sales talk.

Whether Strowger was justified in his suspicions is not known. But he was obviously an ingenious man. He is said to have sat down with a cardboard collar box, some matches, a row of pins, and worked out the theory of an automatic switching system. The system involved electrical contacts leading to other telephone subscribers on the inner surface of a cylinder. An arm on a central shaft was set so that it could be moved step-by-step up the inner side of the cylinder and then step-by-step across it until it reached the correct contact. After some years, Strowger was able to perfect a piece of electro-mechanical technology which eventually made it possible for modern telephone systems to cope with millions of subscribers, few of whom would ever be able to talk to one another if they had to wait for operators to connect their instruments manually. But automatic switching, at first, was by no means accepted speedily or with enthusiasm. For the introduction of the automatic exchange dispensed with the services of many telephone operators and threw the burden of selecting the line required onto the user. In other words, the user now had to select the required number himself, by using a dial or other mechanism.

Apparently, the experts of the time had no great confidence in the capabilities of the telephone user. One" E. Kingsbury wrote in 1915:

"The supervision of a telephonic connection has been regarded since 1887 as the essential duty of operating staff at the central office. In the automatic system supervision finds no place. The connecting mechanism is an automaton and the 'working of the figure' is dependent on the 'pulling of the wires'. Can the subscriber be depended upon always to pull the wires correctly . . ' The obvious limitations of the automatic system show that the operators are not to be extinguished . . "

Although the initial progress of automatic exchanges was slow, it was steady and relentless. Eventually, automatic switching was seen as inevitable, and growth became rapid. Strowger's step-by-step system was adopted around the world and refined over the years. His system held its own against other forms of switching until the middle of our century, when advances in electronics meant it would be replaced by faster and more compact equipment.