

THE POST OFFICE SPEAKING CLOCK

by the ATCS NSW Group



Prior to 1954, telephone subscribers in Sydney were able to obtain the time of day by dialling B074 and in Melbourne by dialling M074, one local call fee being charged. When calls were received a telephonist announced the time correct to the ½ minute by reference to a mains driven synchronous clock. In other areas the telephonist gave the time from a clock on the wall in the switchboard room.

The Post Office also provided other time services including, in Melbourne, a six pip signal once every minute to the Railways Department, a special signal called the XNG that was broadcast over coastal radio station VIM for the correction of ship's chronometers as well as a time signal given over the telephone network at one o'clock every day for subscribers who paid for the service. This latter signal was also sent by telegraph from the Chief Telegraph Office to all Post Offices for correction of Post Office Clocks.

The Post Office had been looking for some time to find automatic equipment to provide a time service. The potential cost saving in telegraphist's time justified the effort put into this search. It was found that a number of automatic time services were in use in other parts of the world.

One of the earliest speaking clocks was installed in Rome in 1931 using a magnetised wire recorder. This was followed in Paris in 1933 where a cylindrical drum was employed rotating at controlled speed and having a sound track printed on paper strips fixed to the cylinder, the light reflected off the strips actuated photocells which provided the electrical input to the amplifiers. By 1934 a European firm had designed a talking clock using glass discs carrying sound tracks for use with lamps and photocells to provide signals to the amplifiers. This type of equipment was in use in Norway, Denmark, Sweden, Finland, Turkey and Poland.

Speaking clock service opened in London in July 1936 with equipment to a British Post Office

design using glass discs carrying the sound tracks similar to the European design. The service went by the name of "Tim". Control of the rate of rotation was obtained from a pendulum which was corrected every hour from the Greenwich Observatory.

THE SPEAKING CLOCK

THE CORRECT TIME BY

If you want the correct time at any hour during the day or night, you can get in touch with the Post Office Speaking Clock, in a few moments, by telephone. The Speaking Clock is an electro-mechanical device which announces the time correct to one-tenth of a second at ten-second intervals.

Simply dial TIM. If a coin box is rented, dial "0" and ask the operator for "The Speaking Clock."

The charge for the service is the same as for a call to Central London.

GPO

Publicity for the British Post Office
Time Service "TIM".

New York and other American cities had speaking clocks mostly using the magnetic tape principle. The American machines were arranged so that short advertisements could be sandwiched in between time announcements.

As a result of the Australian Post Office search, it was decided on a system similar to the British

Speaking Clock and arrangements were made for the design and manufacture in the UK of suitable equipment for installation in Sydney and Melbourne. A synchronous clock, driven by a high stability quartz crystal oscillator together with frequency dividers and other apparatus, was to be used in place of the pendulum as a time keeping element. This together with additional time signal generators to supply the six pip per hour and XNG signals constituted the major differences between the equipment ordered and the original British equipment. The resulting equipment was to be known as "The British Post Office Speaking Clock Mark II".

Each speaking clock installation consisted of two complete clocks (one working and one standby). On each motor shaft were mounted three discs carrying the sound tracks from which the announcements were made. The motor was driven at a constant speed of 30 revolutions per minute derived from the quartz controlled oscillator. Automatic changeover to the standby machine was effected should the duty machine fail. Further protection against failure was obtained by running one machine from the AC mains and the other from the exchange batteries. During extended mains failures, both machines could be run from exchange batteries.

Regarding the recording of the announcements – the form of the announcements had to be repeated every 12 hours so that a different announcement every 10 seconds resulted in 4,320 different combinations. To record each announcement separately would take up far too much space so the announcements were broken up with different parts on each of the three discs. The result was that one disc carried the minutes announcements, the second carried the hour announcements whilst the third carried the seconds announcements and the three pulses of tone thus requiring only 94 tracks.



Technician Arthur Midgley checking on the Speaking Clock at the Sydney GPO.



The Sydney Speaking Clock

The speaking clock provided, at 10 second intervals, announcements such as....

“At the third stroke it will be ten, twenty three and thirty seconds.”

Followed by three pulses of 1000 cycles per second tone, one-tenth of a second long, spaced at one second intervals. The commencement of the third pulse marked the time stated in the announcement.

Before the British Post Office Speaking Clock service was introduced in Great Britain, a search was conducted to find the “Girl with the Golden Voice”. From among 15,000 telephonists, Miss Jane Gain was chosen as the voice of the clock. However, due to poor frequency response over some circuits, there were problems with understanding in a few cases. As a result of this, it was decided that a man's voice would provide greater intelligibility in the Australian application. The voice

selected was that of Gordon Gow, an Australian working on BBC radio in London in 1954.

To provide for the expected popularity of the automatic time service, facilities were provided for up to 100 simultaneous connections. Those connected to the service could not hear or speak to other connections and an automatic

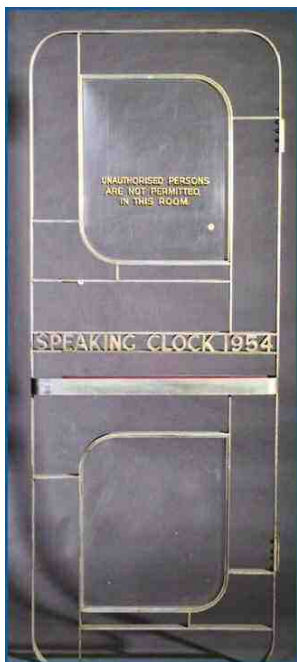


The voice of the Sydney and Melbourne Speaking Clock - Gordon Gow.



disconnection occurred after 90 seconds. Of course, calls from public telephones were free as callers could hear the announcement without inserting coins and had no need to speak.

The Speaking Clock was replaced some time later by computer based equipment with voice synthesis as technology and digitisation of the network progressed.



Door to the Speaking Clocks from the 3rd Floor of the Sydney GPO, now in the Powerhouse Museum

The speaking clocks adjusted themselves to synchronise with signals from the PMG Research Laboratories every 24 hours. In consequence, the Australian Post Office Speaking Clocks were accurate to within 1/100th of a second making it the most accurate clock of its type in the world at the time.

The Speaking Clock service was brought into service in Sydney on 13th November 1954 being installed on the 3rd floor of the GPO in Sydney and accessed through Strowger step by step equipment in City North Exchange. By 1981 the technology was considered obsolete although effective and was still in use being available by dialling the National code 1194. In Sydney, from this time, it was accessed through "11" crossbar equipment installed in the new extension of the Haymarket Exchange following the closure of the Step-by-step equipment at City North.

from Telecommunication Society of Australia, NSW Branch, Monograph No 6, 1981 which cites original text from 1954.



Computerised equipment incorporating voice synthesis that finally replaced the 1954 Speaking Clocks

