

**“Omnibus circuits,” teleprinters, teletypes,  
multiplex machines, picturegrams . . .**

# Amazing Advance In Telegraphy

by **ALBERT E. FARRELL**

**O**F all the inventions mankind has wrought, the telegraph stands supreme in its ability to span the whole gamut of human emotions. The receipt of a telegram has raised countless millions to the very zenith of joy and happiness . . . and plunged others to the very depths of sorrow and despair.

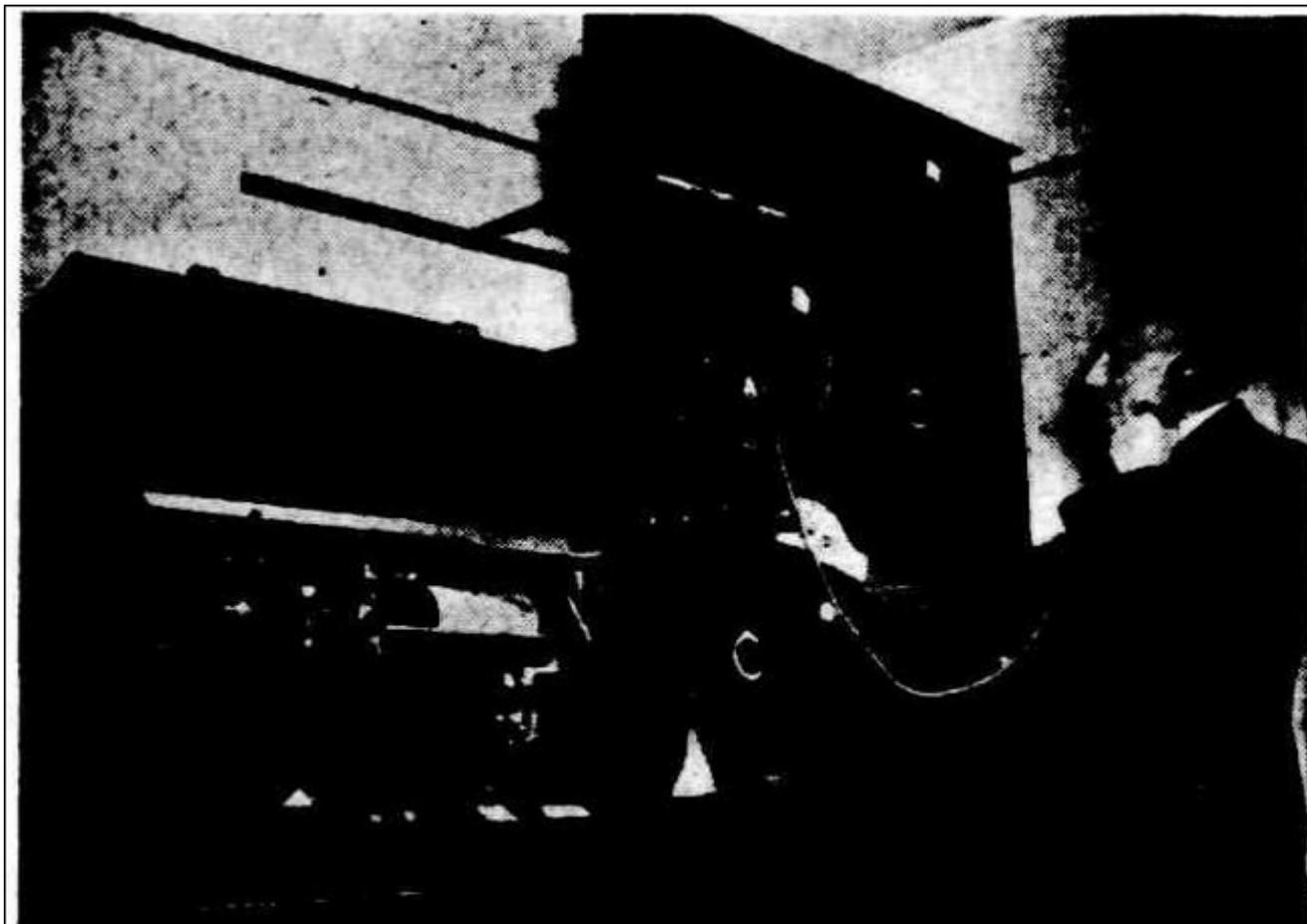
How does our telegraph service function? What happens after our message has been accepted for transmission?

The word “telegraph” is derived from the Greek word meaning “distance-writing” (singularly appropriate to our Australian aboriginal smoke signals). In modern telegraphy time is the essence of the contract and the Telegraph Department of the GPO amply provides its exemplification.

Entering the operating room one is assailed by an intense atmosphere of urgency underlined by the “click-clacking” of teleprinters and teletype machines, the swish of “flick” overhead carriers, the hum of conveyor belts, human voices

Telegrams handed in over the counter at the GPO are, first of all, serial numbered (a fresh series starting at midnight each night) and registered. Then, by pneumatic

tube, up to the operating room, where they are sorted into suburban post offices, country and interstate. City and suburban messages are distributed to operators assigned by roster to cover the various districts. Country and interstate messages are shot across the room by “flick” carrier, which automatically and instantaneously releases its load into celluloid containers for allocation to the operators.



Mr. A. F. Hall, supervisor of the GPO telegraph operating room, with the Muirhead-Jervis picturegram unit. He is balancing the equipment with Sydney before transmission.

Original message form the outward operator.

handed in at Grenfell Street. Similarly, a message for Port  
and the Stock Exchange Post Office, handed in at Angaston,  
Offices, messages from the G.P.O., would be received at the G.P.O.,  
Eastern Exchange Cable Company, recorded, sorted and dispatched  
"The Advertiser" and the "Country towns that are in a  
"News" offices, are dispatched reasonably direct route with  
by underground pneumatic tubes each other and Adelaide are  
to the sorting table at the G.P.O. connected by "omnibus-circuit."  
and distributed to the various operators. This permits a maximum number  
of messages to be serviced  
on a minimum of wires.

The nine main suburban offices are now linked to head office by teleprinter machine. Once a message has been dispatched, the form is scrutinised change-over effected immediately by the Checking Department to ensure that it contains all relevant information concerning receipt and dispatch necessary for record purpose. It is then sorted into office of origin, passed to the Account Department and stored for two years. These message forms now constitute a legal document in the eyes of the law. The Postmaster-General, through his

At the remaining suburban offices are transmitted by key to the GPO and typed on the official telegraph form by the operator. Fast-moving conveyor belts carry them to the sorting table, and from there to the outward operator.

master-General, through his numerous subordinates, can be subpoenaed to produce any telegram that may be required by law. But, should suspicion exist that its production is not in the best interests of justice, he can refuse.

To expedite the delivery of code addressed messages a small printing plate, bearing the code address and full postal address, plus any special instructions concerning delivery after office hours, is fitted into a small hand printing machine and the delivery envelope printed.

Maintenance of the numerous teleprinter, teletype and the Murray Multiplex machines

keeps 40 highly trained mechanics and technicians fully occupied. These machines, that do everything except compose a telegram, are a mass of complex machinery that can only bewilder a layman. But there is a place for everything, and in knowing the answers these backroom boys ensure the speedy service usually associated with our telegraph system.

Phonograms are handled by two or three dozen operators working through a special switchboard in a soundproof room. Once received, the message follows a similar routine to that of other messages except in the case of a subscriber who has

given instructions for such messages to be telephoned through. It then becomes the responsibility of the receiving operator to have this done.

As could be expected, all airline messages for capital cities receive high priority. All airlines are in direct communication with the operating room by teletype machine. To expedite their messages to the utmost these machines are placed alongside the transmission machines for the various capital cities, thus providing direct contact for two-way traffic and effecting considerable saving of valuable time. Messages for Perth received in Adelaide from Darwin—connected direct by teletype—are received in Perth

Darwin—connected direct by teletype—are received in Perth within three minutes.

This provides a violent contrast to the days when the manual repeater station at Eucla received messages from Adelaide. In its heyday fifty operators were needed, half of them South Australians, half Western Australian. Messages transmitted by Morse key from Adelaide or the eastern States via Adelaide were received by the South Australians, handed to the Western Australian operators for onward transmission, and vice-versa.

The Wheatstone machine used in those days stepped up transmission from 30-35 words a minutes to 100-150 words. This method was known to the old operators as receiving "on the blue," because of the blue colored tape, chosen to relieve eye-strain during transcription. The lack of dyes during the 1914-18 war brought about a compulsory change-over to white.

Although still used, the Wheatstone has been outmoded by the Murray Multiplex transmitter. In this machine a keyboard operation perforates a tape for transmission impulses. In turn, these impulses actuate the corresponding letter on the receiving machine, which operates like an ordinary typewriter.

In other words, the Murray Multiplex codes and de-codes its own messages. Under good conditions the combined intake and output of a four-arm Murray Multiplex set is about 800 telegrams an hour.

In the more modern teleprinter and teletype machines the tape has been dispensed with, so greatly speeding up the receipt of messages. These machines are used between Adelaide and Perth, Adelaide and Brisbane direct, as well to Port Lincoln, Port Augusta, Port Pirie, Whyalla and Mt. Gambier.

The ever-increasing demand for speed brought about the adaptation of the carrier-current of the telephone service. This made possible the simultaneous transmission of 72 dif-

simultaneous transmission of 72 different messages over a single pair of telephone wires without interference or distortion of any kind.

Vital meteorological reports from all over Australia are received through the type machines and re-transmitted seven times daily, with additional supplementary reports, to the meteorological office, Parafield, Woomera, Alice Springs and Darwin.



One of the most fascinating aspects of the telegraph service is the recently installed Muirhead-Jarvis picturegram equipment, which has placed Adelaide abreast of the latest trends in modern telegraphy.

Picturegrams are received direct from the eastern States, and preparations are well in hand for an early start in the reception of and transmission of overseas pictures. The ultimate goal in the picturegram service will include all the capital cities, together with Darwin and Newcastle. This network will give a thirty minute service between any State from time of lodgement.

The picture for transmission is wrapped around a drum, four or five inches in diameter. This drum is then revolved in front of a lens at a speed of one revolution a second. A hundred revolutions are required to traverse an inch. Concentrated on a point exactly in line with the lens centre are two powerful beams of light. During each single revolution this beam of light is bisected more than 7,000 times, so providing a finer gradation of light.

The reflections offered from the varying shades of black and white are carried to a photoelectric cell, where changes in light values on the reflection are transformed into electrical currents of corresponding strength.

These fluctuating currents are passed through the normal trunk line wires to the receiving unit, where they are transformed into light values, with

ing unit, where they are transformed into light values, with the varying intensities of light and shade, to the photographic film wrapped round a drum similar to the transmitting unit. The finished product is then identical with a normal photographic negative.

Subjected to a specialised darkroom technique, the finished print—comparable with normal photographic prints—is available to the addressee within ten minutes after reception.

This amazing advance in telegraphy contrasts sharply with the early days of the telegraph, when the sender was given stamps covering the cost of transmission, to place on the message form. A few days later an irate man would lay a bitter complaint to the GPO over the non-delivery of his message. No evidence existed of any such message having been dispatched. Indignantly the sender would retort, "Ridiculous! Here's your official receipt!"—blandly producing the message which he should have returned to the clerk after the stamps had been attached!

Gradual increase in telegraphic business has made the expansion of the operating imperative. New quarters, now in course of construction, will embody numerous improvements on the changes recently made in the Eastern States as well as in Western Australia, and will have the very latest in staff amenities.

The change-over, which is expected early this year, will be made at midnight, so eliminating any possible inconvenience to the business world of Adelaide.

A slight indication of the volume of messages can be obtained from the fact that the Telegraph Department handled approximately 300,000 messages during Christmas week. This means 29 messages every minute of seven consecutive days!



**The Brisbane-Adelaide, Adelaide-Perth, and Perth-Adelaide teletype machines, with telegraphists Corcoran, Hammond, Burns and Peters.**