

Bros., I believe, are not debarred from supplying equipment for New Zealand, but from what I learn they are so full of orders that they are not in a position to do so. This is confirmed by the fact that Siemens Bros. were not among the tenderers for equipment recently called for by the Commonwealth of Australia. There is a possibility of another concern in England, in about two years, being a competitor and supplying automatic-telephone apparatus.

Automatic apparatus for telephony is rapidly being standardized. The "dial" or "sender," is standardized as far as numbering and impulses are concerned.

New Zealand is in an ideal position for the introduction of modern machine-switching apparatus. We have only three of what may be termed modern manually operated exchanges—viz., Invercargill, Timaru, and Hastings. The branching multiple magneto switchboards in the cities and larger towns have, in the majority of cases, reached a condition where they are both difficult and expensive to maintain. Under the conditions existing to-day in the country it will be economical to install automatics in quite small communities, especially in localities adjacent to centres where the exchanges can be unattended, only visited at regular periods for charging batteries and a little routine testing. Automatics would provide continuous service at places where the number of lines is so small that even if the rates were very high the exchanges, if operated manually, would show a serious loss. Even in our small localities where we have a comparatively large number of party lines automatics could be installed.

The magneto telephones on the long party lines would not have to be changed to enable these subscribers to enjoy automatic service; dials for calling could be attached to the magneto telephones. The party-line subscribers under this system would be given individual numbers, and thus called by automatic code ringing. The magneto ringers of these party-line telephones would be used for calling from one to another party on the same line. This would avoid the necessity for placing expensive revertive ringing-apparatus in the automatic exchanges.

HIGH-FREQUENCY CARRIER SYSTEM.

Startling announcements have frequently appeared in the public Press referring to a sensational discovery whereby several independent telephone conversations are possible over an existing metallic circuit without in any way impairing the efficiency of that circuit for the purpose for which it was being used. The system is known as "multiplex telephony"; and is brought about by superimposing a number of telephone channels on an ordinary metallic circuit. The underlying principles of the system are in many respects identical with those of radio-telephony, but in adapting those principles to wire telephony it has been necessary to carry out a vast amount of laboratory and field research work.

The system used on one circuit in the United States of 250 miles in length provides four multiplex channels, and the efficiency of transmission between terminals is equal to five miles of standard cable. The articulation on these channels is remarkably good, and the circuits are peculiarly silent. The special apparatus is elaborate, and its high cost of installation and maintenance precludes its use for distances under 250 miles. For shorter distances it is at present cheaper to provide additional copper conductors, although the American engineers expect the evolution of a system requiring simpler and less-costly apparatus.

I do not anticipate that the system will have much field for employment in New Zealand, as our distances are comparatively short. The successful commercial development of the telephone repeater, with the introduction of the high-vacuum three-electrode thermionic valve, will enable the more distant centres to be provided with telephone facilities by means of a lighter-gauge copper than hitherto was thought possible. High frequency cannot as yet be used over cables, or even comparatively short lengths of covered wire, and on one set can be used on a pole line.

It perhaps would not be out of place to mention here that "high-frequency carrier" or "wired wireless" is looked upon by some American engineers as a means of transmitting power to a distance. A light-gauge wire would be used from the source of the power to a point where the power can be utilized; the wire to be used merely for directional purposes, and the ether the medium through which the power will be transmitted. We have seen such startling radio developments in the last few years that I would not predict that such a dream will not come true.

INTER-ISLAND TELEPHONIC COMMUNICATION.

There are two mediums by which a toll service can be established between the North and South Islands: these are—(1) Submarine cable, (2) wireless. If such a service is opened to the public, at least three channels must be available—i.e., provision made for three pairs of persons to hold simultaneous conversations.

Submarine Cable.

To meet this provision a submarine cable will require to have four continuously loaded conductors, giving two metallic circuits, and a phantom circuit superimposed. The only country making such a cable at present is Great Britain. The cable would weigh from 800 to 1,000 tons, and would have to be brought to New Zealand and laid by a special ship—i.e., a cable-ship. The cost of the cable, including the cost of freight, laying, cable-huts, and land line from huts at each side of the strait to Wellington and Blenheim respectively would be quite £100,000. In the absence of trunk lines from Blenheim to Christchurch, the cable would serve only Marlborough and Nelson in the South Island. The cost of erecting the necessary trunks from Blenheim to Christchurch, and strengthening the existing poles to carry the extra wires, is estimated to cost £26,000; therefore, before Wellington and other centres in the North Island could have telephone talks to the chief centres in the South Island it would involve the country in an expenditure of £126,000. I have considered the