

It has been shown that the semi-automatic costs £2,080 per annum, plus extra appliances and floor-space. These have now to be compared with the costs for full automatics. At the subscriber's telephone in full automatic there is a dial which costs £1, or £6,000 for 6,000 subscribers. This may conservatively be given a life of about eight years, or, say, 12 per cent. depreciation, and there is interest to be reckoned at 4 per cent. The cost of maintenance of the dial in exchanges that were visited was said not to be of consequence. The Automatic Electric Company, of Chicago, states that from a record kept for a considerable period at four exchanges the dial maintenance cost did not exceed 8½d. each per annum. That we may be certain this maintenance is not being considered at too low a figure, it will be introducing a desirable margin to take it at 1s. per dial per annum. This makes £300 for the 6,000, which is practically equivalent to setting aside two men to attend to dials only. Summarizing, we get—Dials: Maintenance, £300; depreciation and interest, 16 per cent. on £6,000, £960: total annual charge for dials, £1,260. Full automatic should also bear an additional charge of £160 per annum for two extra information and complaint clerks—total £1,420, as compared with £2,080 annual charges for semi-automatic, which also requires much more floor-space. These sums do not include the cost of maintaining and keeping in order the central-station mechanism, which is the same for both. That is dealt with later.

This shows that from economic considerations semi-automatic switchboards, *under New Zealand conditions*, do not "prove in" against full automatic, and judgment has now to be formed between full automatic and manual. It should be carefully noticed that the comparisons that have been made so far between semi-automatics and manually operated switchboards have *not* been made with manual boards of the type that we are at present operating, but with the most approved type of manual common-battery board that can be obtained. Had the comparison been made with our present types of magneto-board and equipment generally, it would have been necessary to charge many more operators against the manual board than have been charged.

It is proper in reviewing systems the use of which may be contemplated to compare the most approved of one type with the most approved of another type, and this will now be done as between full automatics and manual common battery. It is assumed that the exchange is a single office. This assumption leaves the outside work in both systems the same, and thus avoids complication. The number of lines and telephones is taken as 6,000, with an ultimate capacity of 10,000 and a calling-rate of 8 per subscriber per day. The first cost of such a manual switchboard would be, approximately, 6,000 lines at £3 10s. each = £21,000, plus £4,000 for installing = £25,000. The first cost of full-automatic central-exchange apparatus would be for 6,000 lines at £5 = £30,000, plus £4,000 for installing = £34,000. At the subscriber's telephone there would also be required a dial costing £1, making an additional amount of £6,000.

The annual charges for the manual exchange would be—

	£
Interest 4 per cent., depreciation 8 per cent. = 12 per cent. on £25,000 ..	3,000
1 manager	300
1 wire-chief	220
1 assistant wire-chief	160
2 distributing-frame men at £150	300
2 trouble or switchboard men (inside) at £170	340
1 information clerk at £80	80
1 complaint clerk at £80	80
1 observation clerk	100
56 operators at £70	3,920
4 monitors at £110	440
2 supervisors at £160	320
	£9,260

Annual charges for automatic:—

	£
Interest 4 per cent., depreciation 6½ per cent. = 10½ per cent. on £34,000 ..	3,570
1 manager	300
4 { information clerks at £80 } { complaint clerks at £80 }	320
1 switchboard foreman	250
1 wire-chief	220
1 wire-chief assistant	160
2 distributing-frame men at £150	300
8 trouble attendants (inside) at £170	1,360
Extra for interest, depreciation and maintenance of dials at subscribers' stations, particulars already shown	1,260
	£7,740

The difference in favour of automatics is £1,520. If the depreciation on automatics be taken the same as manual—*i.e.*, 8 per cent., instead of 6½ per cent.—the difference mentioned would be reduced by £510 to £1,010.

Another way of viewing the matter is that it would be necessary for the first cost of manual common-battery equipment not to exceed about £1 8s. 9d. a line to cause the *annual* charges in both systems to about balance. For 6,000 lines at £1 8s. 9d. first cost = £8,627, plus £4,000 for installing = £12,627. This at 12 per cent. per annum = £1,512. This will reduce the annual charges shown for manual by £1,488, or from £9,260 to £7,772, which is in close agreement with £7,740, the worked-out annual charges for automatics, and this would be more marked in an exchange