

1922.



THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

Brought up
Laid on the Table by
..... Senator Newland

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

Pursuant to Statute
In return to Order

..... G. St. Morahan

Clerk of the Senate:

6-10-22

R E P O R T

Together with

MINUTES OF EVIDENCE

Relating to the proposed

ESTABLISHMENT OF AN AUTOMATIC TELEPHONE EXCHANGE

AT BOX HILL, VICTORIA.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

Third Committee.

The Honorable HENRY GREGORY, M.P., Chairman.

Senate.

Senator Hattil Spencer Foll.*
 Senator George Henderson.†
 Senator John Newland, Vice-Chairman.‡
 Senator Edward Needham.§
 Senator William Plain.*

House of Representatives.

Llewelyn Atkinson, Esquire, M.P.¶
 The Honorable Frederick William Bamford, M.P.
 David Sydney Jackson, Esquire, M.P.**
 George Hugh Mackay, Esquire, M.P.
 James Mathews, Esquire, M.P.
 Parker, John Moloney, Esquire, M.P.

* Appointed 28th July, 1920. † Resigned 22nd July, 1920. ‡ Re-appointed 28th July, 1920.
 § Obed to be a member of the Senate, 30th June, 1920. ¶ Resigned 12th May, 1921. ** Appointed 16th May, 1921.

INDEX.

	PAGE
Report	iii
Minutes of Evidence	I

LIST OF WITNESSES

Page.

Becher, Edgar, Supervising Engineer,
Postmaster-General's Department,
Melbourne.

Fanning, Lawrence Bede, Telephone
Traffic Officer, Postmaster-
General's Department, Melbourne.

Morgan, George Herbert, Manager of
Telephones, Postmaster-General's De-
partment, Melbourne.

Murdoch, John Smith, Chief Commonwealth
Architect, Department of Works and
Railways, Melbourne.

EXTRACT FROM VOTES AND PROCEEDINGS OF THE
HOUSE OF REPRESENTATIVES.

No. 205 of 7th December, 1921.

31. PUBLIC WORKS COMMITTEE - REFERENCE OF WORKS -
AUTOMATIC TELEPHONE EXCHANGES, CANTERBURY, SOUTH
MELBOURNE AND BOX HILL - Mr Groom, moved,
pursuant to notice, amended, That, in accordance
with the provisions of the Commonwealth Public
Works Committee Act 1913-1914, the following works
be referred to the Parliamentary Standing Committee
on Public Works for its investigation and report
thereon, viz :- Automatic Telephone Exchanges and
Equipment at the following places in Victoria :-
Canterbury, South Melbourne, Box Hill.
Mr Groom having laid on the Table plans &c., in
connexion with the proposed works -
Question - put and passed.

AUTOMATIC TELEPHONE EXCHANGES - BOX HILL - VICTORIA.

REPORT.

The Parliamentary Standing Committee on Public Works to which the House of Representatives referred for investigation and report the question of the establishment of an automatic telephone exchange at Box Hill, Victoria, has the honour to report as follows :-

PROPOSAL SUBMITTED TO THE COMMITTEE.

1. The proposal submitted to the Committee is to erect a telephone exchange building on a site at the corner of Whitehorse Road and Station-street, Box Hill, on land the property of the Commonwealth at the rear of the existing Post-office and to install therein an automatic telephone switching system having an immediate equipment of 1,500 subscribers' lines and an ultimate capacity of 5,000 subscribers lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named thereby affording sufficient accommodation for the anticipated development in the proposed Box Hill automatic exchange area.

REASONS GIVEN FOR THE PROPOSAL.

2. The reasons placed before the Committee for the proposal

were that the subscribers in the proposed area are at present served by a manual magneto non-multiple switchboard in the Box Hill exchange. It is estimated by the telephone engineers that the ultimate capacity of the portion of the Box Hill Post Office Building available for use for telephone exchange purposes will be reached in January, 1927 and, as the type of switchboard in use is not economical to operate, it is urged that steps should be taken to establish, in the near future, a new exchange to serve the subscribers and meet prospective development in the Box Hill area. It is claimed that it would therefore be necessary to erect a new building on the existing site and install therein a new telephone exchange plant. This installation ^{of} ~~is~~ automatic ^{equipment} would, it is said, be a definite step towards increasing the general efficiency of the net-work and allow ^{of} an improved service being rendered to subscribers connected to the Box-Hill Exchange.

ESTIMATED COST.

3. The estimated immediate cost of the work is set down at :-

Site	£ 142.
Building	5,106
Air-conditioning, heating, ventilating, vacuum cleaning and air compression plant		3,100.
Exchange equipment		31,175.
Sub-station equipment		5,148.
line plant, (conduits, cables and open lines)		110.

COMMITTEE'S INVESTIGATIONS.

4. The Committee visited Box Hill and inspected the proposed site and the existing ^{manually} operated exchange and traversed portion of the area, which would be served by the proposed installation.

Evidence was taken from the Chief Commonwealth Architect, Department of Works and Railways and from the Supervising Engineer Telephone Manager and Traffic Officer in the Postmaster-General's Department.

p.2. It was stated in evidence that the number of subscribers connected to the present exchange at Box Hill was, on the 9th March, 1922, 621 with 27 waiting telephone connections and it was anticipated that by the 1st January, 1929, the number of p.1. subscribers would have increased to 1,430.

As an argument in favor of the installation of the automatic apparatus, it was shown by the Supervising Engineer that the total annual charges under the proposed automatic system, as at 1st January, 1924, were estimated at £8,463, while the total annual charges under an alternative common battery annual system as at 1st January, 1924, were estimated at £8,883.

p.14. It was ascertained, however, that the Department has not installed a common Battery switchboard in Australia during the last /

the last ten years, and that those in use in Australia do not contain the latest improvements. The Committee, therefore, turned its attention to the possibility of utilising the existing exchange with any necessary extensions required, provided the service to the subscribers would not be impaired, and asked for figures to enable a comparison to be made in respect of the costs of the proposed automatic system and those of the existing non-multiple magnetic type in use at Box Hill.

It was stated in evidence that the equipment at Box Hill is standard equipment and, although not modern, is quite capable of giving satisfactory service. It is of the same as is being built in the workshops of the Department every day, and is the type, at present being installed in country and many metropolitan exchanges.

It was stated in evidence that the equipment at Box Hill at present comprises 5 160A or subscribers' positions and 3 multiple "B" positions and that the switchboards, which are loaded up to carry 160 subscribers each, could be increased to carry 180 subscribers each. This would provide for 100 more subscribers. In addition to this number, it would be necessary to install four further 200 line positions to provide for the 1,430 subscribers estimated as requiring telephone connection by 1st January, 1929.

These additional boards need not all be installed at once, but one at a time periodically as required. It was stated that there will be no necessity to put in any additional equipment for two years at least, that is to say, that the existing equipment, without any expenditure whatever, will meet requirements until about June, 1924.

Additional space beyond that at present available will be required to extend the equipment, but that can be made available by taking out a 7 feet partition between the exchange and the telephonists retiring room, and placing, at the disposal of the telephonists, a room on the verandah now used as a storeroom. Very little use is made of this store room and the old ferns, dockets, etc., kept there, could be provided for in presses in the Post Office. The Department of Works and Railways have estimated that the cost of removing the partition and extending the room on the verandah would be approximately £45. This would give the telephonists a retiring room 16 feet long and 6' 6" wide with a height varying from 9' 6" at the lowest to 11' 6" at the highest.

Under these conditions, it would be possible to keep the existing exchange in operation until 1929 with a capital expenditure of approximately £2,720.

This expenditure, which would not all be incurred at once,

This expenditure which would not all be incurred at once would consist of

Buildings alterations	£ 45.
Increasing Switchboard positions so as to accommodate 180 instead of 160 subscribers.	180.
Provision for outlying junction lines to other exchanges	440.
Additional incoming lines.	740.
Installing 4 additional 200 lines.	<u>1315.</u>
	<u>£2,720.</u>

The Committee was assured that there would be no appreciable difference in the quality of the service rendered, in the case of Box Hill with its small number of subscribers, whether the automatic system be installed or whether the existing system be retained for a further period until 1st January, 1929.

In view of all the circumstances, the Committee considers that there is no necessity, at the present time, to incur an expenditure of ^{£44,800} ~~£2,500~~ on the installation of an automatic system, and recommends that the equipment at present in use be extended at a cost of approximately £2,720 to meet requirements until 1st January, 1929.

COMMITTEE'S DECISION.

The /

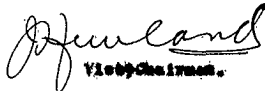
The decision arrived at in connection with this matter is shown in the following extract from the Minutes of Proceedings -

Mr Mackay Moved

That, from the evidence placed before it, the Committee is satisfied that there is no present necessity for the installation of an automatic telephone exchange at Fox Hill.

Seconded by Mr McLeney.

Carried unanimously.


Vice-Chairman.

Office of the Parliamentary Standing Committee on Public Works,
Parliament House,
Melbourne. 3rd October, 1922.

AUTOMATIC TELEPHONE EXCHANGE—Box Hill 1

SATURDAY, 12TH AUGUST, 1922.
(Taken at Melbourne.)

Present:

Senator NEWLAND in the chair;
Senator Plain. | Mr. Mathews
Mr. Jackson | Mr. Parker Moloney.
Mr. Mackay

Edgar Becher, Supervising Engineer, Postmaster-General's Department, Melbourne, sworn and examined.

1. To Senator Newland.—I present a statement setting out in detail the proposal for establishing an automatic telephone exchange at Box Hill, Victoria.

The proposal is to erect a telephone exchange building on a site at the corner of Whitehorse-road and Station-street, Box Hill, on land, the property of this Department, at the rear of the existing Post Office (this point being at or near the telephonic centre), and to install therein an automatic telephone switching system, having an immediate equipment of 1,500 subscribers' lines and an ultimate capacity of approximately 5,000 subscribers' lines. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the proposed Box Hill automatic exchange area.

The subscribers in the proposed area are served by a manual magneto non-multiple switchboard in the Box Hill exchange. It is estimated that the ultimate capacity of the portion of the Box Hill Post Office building available for use for telephone exchange purposes will be reached in January, 1927, and, as the type of switchboard in use is not economical to operate, steps should be taken to establish in the near future, a new exchange to serve the subscribers and meet prospective development in the Box Hill area. It would, therefore, be necessary to erect a new building on the existing site and install therein a new telephone exchange plant. The installation of automatic equipment would be a definite step towards increasing the general efficiency of the network and allow of improved service being rendered to subscribers connected to the Box Hill exchange.

The estimated immediate cost of the work is:—

	£
Site	142
Building	5,100
Air conditioning, heating, ventilating, vacuum cleaning and air compression plant	3,100
Exchange equipment	31,175
Sub-station equipment	5,148
Line plant (conduits, cables and open lines)	110
Cutover	60
	£44,841

The approximate annual revenue derived and the annual revenue it is estimated will be obtained on the date of transfer, viz., 1.1.24 and with five years' development is shown hereunder:—

Average number of lines connected two years ended 1.12.20	382
Average annual revenue received two years ended 1.12.20	£2,893
Estimated number of subscribers' lines 1.1.24	760
Estimated annual revenue 1.1.24	£7,220
Estimated number of subscribers' lines 1.1.29	1,430
Estimated annual revenue 1.1.29	£13,585

It is proposed that the building shall be of simple design and built on the latest fire-resisting principles. The immediate installation in the exchange is for an equipment of 1,500 subscribers' lines, but it is proposed that the building be designed sufficiently large to accommodate an equipment having a capacity of approximately 5,000 subscribers' lines.

AUTOMATIC TELEPHONE EXCHANGE--Box Hill #

FINANCIAL ASPECT.

	£	£
1. Capital cost--new	44,841	50,103
2. Capital cost--new and in situ	71,817	80,853
3. Annual working expenses of existing manual system as at 1.1.24	2,001	—
4. Annual Revenue-- Actual (average for past two years)	2,833	—
Estimated, 1.1.24	7,220	—
Estimated, 1.1.29	13,565	13,565
5. Annual working expenses of proposed automatic system at 1.1.24	1,916	2,879
6. Total annual charges for proposed automatic system as at 1.1.24	8,403	10,631
7. Annual working expenses of proposed alternative common battery manual system as at 1.1.24	2,668	4,813
8. Total annual charges for proposed alternative common battery manual system as at 1.1.24	8,883	11,846
9. Assets recoverable or thrown spare if automatic exchange is installed (i) book value	5,786	—

Regarding Item 9 the difference between sub-items (i) and (ii), viz., £3,157, is an amount which will have to be written off in the Departmental Accounts as representing the proportion of the capital outlay on the original asset which is ~~irrecoverable~~. This amount represents ordinary depreciation due to wear and tear, which would be written off and the same recovery costs, viz., £143, incurred when new equipment is installed, whether it be of the common battery manual or automatic type.

Development studies have been made as in the case of other similar proposals and it is believed that in fifteen years time there will be 3,000 subscribers' lines connected with the new exchange at Box Hill with the exception of a small area in the vicinity of the post-office, which may be regarded as a business centre. Box Hill is chiefly a residential suburb which has developed very rapidly in recent years. The local exchange was opened two or three years ago, subscribers prior to then being connected with the exchange at Canterbury. At 31st December, 1919, there were 396 subscribers representing an increase of 21.1 per cent. At 31st December, 1920, there were 485 subscribers, representing an increase of 22 per cent., and on 31st December, 1921, 567 subscribers, an increase of 17.39 per cent. On 9th March of this year, the number was 621 and with 27 awaiting telephonic connexion it was 648. The waiting subscribers will, of course, be connected as soon as possible. These figures show that the development has almost doubled in less than three years. One of the difficulties confronting the Department is to advise as to the equipment necessary to provide for future expansion of business. If I were to urge that we get equipment to meet the requirements of the Box Hill district in fifteen years' time at the present rate of development, we might be getting too much equipment so, in my estimates, I would rather err on the conservative side. From a survey of the past growth of the district, we have estimated that the annual development at Box Hill will equal about 13.5 per cent. The increase during the past three years, ranging from 17 per cent. to 22 per cent. is, I think, slightly abnormal compared with development in other exchanges in the network. I do not think development at that rate will be continued for any length of time. The building could be designed to carry another storey, if necessary, so there will be ample provision for requirements beyond the estimate fifteen years hence; members of the Committee who visited Box Hill perhaps have in their minds the present situation, and will remember that the switchboards are lined up to a wooden partition separating the equipment from the telephonists' retiring room. It is possible for us to take that partition down, put an additional switchboard in the present retiring room for telephonists and

(i) Recoverable value £ 2639
(ii) Cost of provision 143.
Difference in amount.
Change in working
establishing and
automatic system
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house the telephonists elsewhere, probably on the verandah. Otherwise we should have to encroach on the accommodation of the post-office or erect a separate building. Possibly, we could provide an annex on the verandah for the telephonists and in that way carry on for a few more years, but the present system is the oldest form of telephone switchboards that we have in operation, and with it the telephonists cannot give as quick or efficient a service as is possible with an up-to-date switchboard. If it is the policy of the Department to install the automatic system in the metropolitan areas—and I do not think there is any argument against it—then it stands to reason that further expenditure on the present obsolete system is to some extent wasted. The Committee heard evidence quite recently in connexion with the establishment of an automatic exchange at Canterbury. It is proposed to have there what is known as a main automatic exchange which, I may explain, is an exchange designed to provide ~~local~~ communications within itself. For example, assuming that Canterbury were equipped as an automatic exchange, any subscriber connected with Canterbury could call another subscriber on the exchange with the mechanism in the Canterbury office. There would be no need to employ any other mechanism outside of that office. But there is another type of automatic known as the branch exchange which does not ~~require~~ the entire automatic equipment to complete all the calls. It is more economical to install some of that equipment in the main exchange—in this case it would be Canterbury—rather than duplicate it at Box Hill. Box Hill will not be regarded as a satellite exchange. That term was formerly applied to such exchanges, but we now designate the several types of exchanges, as main, branch, and sub-exchange. In a sub-exchange there is ~~usually~~ enough equipment to complete the various connexions. A sub-exchange depends more on a main exchange for its connexions. For this reason, sub-exchanges are only established in sparsely-populated localities where the development will not exceed 1,000 lines. In Box Hill, where it is anticipated the development will exceed 5,000 lines in 15 years, we must establish what is known as a branch exchange. Were we to maintain Box Hill as a manual exchange, with Canterbury on the automatic, the telephonists at Box Hill would have ~~more work to do~~. They have to dial up all the local ~~with the~~ transferred traffic to Canterbury, and likewise Canterbury subscribers would have to dial up in order to get communication with Box Hill subscribers. This of course, would involve more time. Telephonists operating a switchboard like that of Box Hill are allowed 24 seconds to complete a local call as compared with ten seconds ~~time allowed~~ with the automatic mechanism. In the latter case there would be a saving of fourteen seconds on each local call. For a transferred call say, from Box Hill to Canterbury, the present time allowance is 32 seconds, but if the whole network were on the automatic system the ~~time allowance would be ten seconds~~ ~~allowed for the connexion~~. It will be seen, therefore, that the installation of the automatic will mean an immense saving in time ~~alone~~. Moreover, there are inherent difficulties in connexion with operating mixed systems, so the installation of automatic exchanges are much to be preferred in the interests of the general public ~~and from an administrative point of view~~. It is proposed to make Box Hill a ~~sub-station to~~ Canterbury. If the anticipated development exceeds 5,000 lines it will still be possible, with the automatic equipment, to carry on efficiently as a branch automatic exchange up to a development of 9,999 lines. The figures I have furnished show that the estimated annual working expenses of the proposed automatic system at 1st January, 1924, would be £1,916, as compared with the working expenses of the existing manual system at the same date of £2,601. These figures include telephonists' and mechanics' salaries. Under the existing system one mechanic is able to look after 700 mag-

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all connexions for local traffic with the equipment installed in that exchange

Spinal

have installed therein

to the care of all telephonists.

than if the traffic were handled automatically

for the telephonists.

would be set up in 10 seconds

to the members of

branch exchange of

AUTOMATIC TELEPHONE EXCHANGE—Box Hill 4

neto telephones whereas with the automatic in operation our mechanic may attend to 1875, or nearly three times the number. At present, magneto telephones have to be inspected every four months, but we propose to make an economy by using dry cells, and we think we can reduce the inspection to once in twelve months. With the automatic however, it is only necessary to inspect the dial, which does not get out of order very often, and if it does the mechanic merely changes it and takes it to the workshop to be adjusted. It is not necessary, therefore, for him to carry supplies as in the case of the magneto telephone. The plan of the proposed building meets our requirements. A slight alteration has been made in the original design, but the floor space is the same, and so far as the concerned alteration of the plan has not made any difference whatever.

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2. To Mr. Parker Moloney.—The price paid for the Collingwood exchange, £20 per line plus labour costs is the basis of our estimates for all these exchanges. Canterbury is practically double the size of the proposed Box Hill exchange and in addition it will carry some of the Box Hill equipment. The initial cost includes the necessary telephone switchboard equipment, battery accumulators, generator, power plant and some miscellaneous items. The battery tank will meet the ultimate requirements of the exchange, as also will the power plant, so that if the exchange is extended at any time we shall not need to obtain additional power plant. Although the initial cost may appear high, subsequent extensions are comparatively cheap.

other portions of the #

3. To Mr. Mackay.—The Box Hill exchange is ~~also~~ from the Canterbury exchange. It might be argued that an expenditure of £44,000, representing the capital cost, of the proposed new automatic exchange to accommodate 700 subscribers in two years, is ahead of its time, but there are two ways of looking at that proposal. One is—Can the Department carry on with the present equipment? and the other—Should the Department put in more efficient equipment? On this point I may emphasize the fact that the cost of extending the present exchange to meet future developments will more than equal the interest on the capital cost of a new automatic exchange. The working expenses of the automatic system at Box Hill two years hence is estimated at £1,916, as against £2,601 as the estimated annual working expenses of the existing manual system at the same date. But of course there is the item interest on capital cost, which may be placed at ~~£2,200~~. Assuming that expectations of development are realized and the Department did not install the automatic system, we would still have to put in what is regarded as obsolete equipment at Box Hill to provide for the increased traffic, and this would not lead to economy or efficiency. If Canterbury is made an automatic exchange and Box Hill is not, then subscribers operating between Box Hill and Canterbury, or for that matter, between Box Hill and any of the automatic exchanges will find it awkward to work in. The practice is to install the automatic system in the network, and as the Canterbury exchange area will embrace Box Hill, in order to give all its subscribers an efficient service we should convert the whole of the equipment to the automatic. Were we to leave Box Hill as a manual exchange, we should have to provide more accommodation by taking down the partition between the switchboard and the telephonists' retiring room and find accommodation for the telephonists elsewhere. To arrange for another 480 subscribers' lines would cost approximately £1,600, and taking into consideration depreciation, operating and administrative charges, and interest on capital, the amount would be approximately £2,489. We could not charge against the automatic interest on

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AUTOMATIC TELEPHONE EXCHANGE—Box Hill 5

capital cost of the site because we have it, and as interest on the automatic exchange would be £2,234, the difference in favour of the automatic system would be £255 annually. The installation of the automatic equipment at Box Hill will not delay the conversion of any other exchange in the Commonwealth. Each position is dealt with on its merits.

line the indirect charges
look #

4. To Senator Plain.—Practically the whole of the manual equipment at Box Hill could be utilized for country exchanges. I may explain that, assuming that the Box Hill exchange is continued on the manual system, the equipment necessary for its maintenance to meet future development is not on the shelves, so to speak. It would have to be manufactured in our workshops. The item in my statement £3,157, representing the difference between the book value of assets recoverable (£5,756) and the recoverable value (£2,625), includes the ~~book value of exchange equipment~~ ~~value of exchange equipment~~ and existing equipment such as telephones at subscribers' premises. ~~I have depreciated the value of this equipment at £1,437.~~ I could not say definitely how many years this equipment has been in use, as many subscribers were connected with Canterbury before the Box Hill exchange was established, but in some cases it would be earlier than 1911. Then, of course, there is the depreciation of line plant to be considered. Lead cable is frequently very much knocked about when it is taken out of the conduit. We have not allowed for the depreciation of the exchange site or for that portion of the building which the exchange occupies, but we have allowed for depreciation on the exchange equipment, sub-station equipment, and line plant.

Lectionson

depreciation on
depreciation on

amounting to £1,437.
depreciation on
amounting to £1,706.0

5. To Mr. Mathews.—The item £142 estimated cost for site, represents the pro-rata cost of the land, the balance being occupied by the post-office. I do not think there is anything in the suggestion that the costs of the manual system have been made high in order to enforce the acceptance of the automatic equipment, because we assemble all the manual equipment in our own workshops, and the costs I recited to Mr. Mackay are actual workshop costs. The manufacture in Melbourne of a non-multiple switchboard for Box Hill would cost £200. I have considered the proposal from all aspects, and I ~~approve~~ ~~approve~~ the automatic system as being more efficient and more economical.

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6. To Senator Newland.—Portions of the cables in the Box Hill district are underground. The value of the line work to be undertaken there is not very great, the estimated cost being only £110, because we have most of our plant underground. The situation of the proposed exchange is near the theoretical centre of the telephone area.

#

7. To Mr. Mackay.—I should say that we could not very well encroach further upon the post-office accommodation in order to extend the manual system. As a layman I think it reasonable to assume that as the district is growing the postal officials themselves will want more accommodation.

The witness withdrew.

the room on the verandah could be extended to provide a retiring room for the telephoneists, and the switching-board could be extended into the present retiring room. I have prepared a plan which I think would meet requirements until 1928. At present I cannot say what expenditure would be involved. With the conversion of Box Hill to automatic there would be a considerable increase in the total annual charges. Possibly our annual charges would go up £3,000 a year as compared with the existing plant. Everything depends on whether we can make the existing plant do the work, and on that aspect of the case I have not completed my inquiries. As far as I have gone it looks as if we can ~~do it~~.

lowest end of the

10. To Mr. Jackson.—I would recommend the extension of the present Box Hill exchange if it is practicable. This would save an immediate capital expenditure of £45,000, which could be spent on more urgent and necessary work, such, for instance, as the extension of the trunk-line system and country lines. The working costs of the automatic system would be £3,000 per year greater. As far as my investigations have gone, they show that the present annual charge of the manual plant, including operating costs, maintenance of existing plant and buildings, and interest on capital, new and *in situ*, and including depreciation, is £25,384. Under the automatic system the annual charge would be £8,463, thus making an immediate increase of £3,079. There would not be any increase in revenue.

L to #

11. To Mr. Mathers.—To keep Box Hill as a manual exchange would not be a drawback to the system generally, any more than it would be a drawback to have a manual exchange at Northcote or Brunswick, which are both larger than Box Hill, and have the same type of equipment. It has not been the policy of the Department to put in new exchanges if the existing plant would suffice. There is an example of this at Albion in Queensland, where there are 2,000 subscribers connected to an equipment which is not so good as that at Box Hill. At Randwick ~~there are~~ 1,700 subscribers, and similar equipment is in use at Paddington, Sydney, Waverley, Hanley Beach (S.A.), Cottesloe (W.A.), and ~~Townsville~~ (Queensland). The equipment at ~~Townsville is not so good as that at Box Hill.~~

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The Box Hill equipment, if the room will allow for extensions, will give a reasonably satisfactory service. The question is whether it is worth while spending £45,000 to ~~replace the existing plant~~. The service will not be improved very much until the whole of the metropolitan system becomes automatic. The provision of automatic exchanges outside the city will not help the service in the city. At the present time the total number of calls originating at Box Hill during the busiest hour of the day is 232. Of those seventy-one go to Central; Canterbury, which will be automatic, takes twenty-three, or a little less than 10 per cent.; and Melrose and Brighton, the automatic, take seven. Thus if Box Hill ~~becomes automatic~~, less than 10 per cent. of the traffic would go to automatic exchanges, and the balance to manual exchanges. The suggestion for the Box Hill automatic exchange ~~comes from~~ the State Engineer. I do not know any of the reasons that caused him to form his opinion. It is the policy of the Department to establish automatic exchanges.

At present about 6% of the calls dealt with at Box Hill is for automatic exchanges, was, I think,

The witness withdrew.
The Committee adjourned.

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L Other examples are Land in Sydney

L made by

AUTOMATIC TELEPHONE EXCHANGE—Box Hill 8

(Taken at Melbourne.)

TUESDAY, 15TH AUGUST, 1922.

Present:

Senator NEWLAND, in the Chair;

Senator Plain,

Mr. Mathews

Mr. Jackson,

Mr. Parker Moloney.

Mr. Mackay

John Smith Murdoch, Chief Architect, Commonwealth Department of Works and Railways, sworn and examined.

12. To Senator Newland.—The building plans before the Committee were submitted before I had had an opportunity to see them. Following an examination, I considered it would be well to considerably alter the layout of the proposal. In connexion with the plans which have been submitted to the Committee, the site is behind the present Box Hill Post-office, and it falls a great deal. At its low end it is 8 feet below the floor level; that involved such a lot of space—which, in the plans first submitted, had been put to no use—that I came to the conclusion that we would be justified in submitting fresh plans tending to make the best practical use of the space so afforded. I have re-planned the building so as to utilize that space, and, at the same time, I have taken advantage of working out the plans to suggest a building with concrete ceiling construction instead of one with a timber and iron roof, such as appears on the original plans. By utilizing the space under the building we will be able to create what I have termed a basement floor. In that lower floor I propose to put a battery room, and the air-conditioning room, and lavatory, and storerooms. On the ground floor I have planned ~~to place~~ the switch room, the staff recreation room, and a second store. By such a plan we will secure more yard space than would have been afforded by the other, and a far less cramped means of access to the building. Indeed, there will be excellent yard accommodation, with good entrances both from the post-office side of the building and from the side on to the right-of-way at the lower end of the allotment. The building will go to the right-of-way at the bottom of the yard, and, between the post-office and the upper end of the telephone building, there will be a space of about 17 ft. 6 in. Between the side of the new telephone exchange building, which will be in shape like the letter L, and the dividing fence of the next piece of ground, we shall have a fine yard space 25 feet wide, which will be very useful. ~~In connection with this site~~ I have introduced concrete construction all over the building, and I think it will cost ~~2100 less~~ ^{less} than ~~in connection with~~ the original plan. Altogether, this plan is a very convenient one. I have already pointed out that it utilizes the yard space much more effectively, and it will be a better looking building. The accommodation will be about the same, but will be on different lines. With the permission of the Committee, therefore, I substitute these plans for the original ones. The upper part of the building will be of one storey, and the lower end will be two-storeyed. The entrance to the basement floor will be from the lane, and also from the yard behind the post-office; but, to reach the building from the yard, one will have to go downstairs. The switch room will be 75 feet by 33 ft. 6 in., the battery room 42 feet by 16 ft. 6 in., and the air-conditioning room 31 feet by 16 ft. 6 in. There will be ample store and lavatory accommodation; and then, on the main floor, there will be the staff retiring room, 19 ft. 8 in. by 19 feet, with the usual accessories. This building will ~~also~~ be finished with a parapet and iron roof, ~~and there will be a flat concrete roof over the battery room.~~ The structure will come within 4 ft. 6 in. of the neighbouring property at the end. By building to these plans, I might add, we will save a lot in foundations, in that we will not have to cover the same area of ground.

no more

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low

AUTOMATIC TELEPHONE EXCHANGE—Box IIII 9

13. To Mr. Mackay.—The switch room will be nearly as large as those proposed for the Canterbury and South Melbourne exchanges, although, according to the departmental estimates, the number of lines being allowed for in regard to future extension are not so numerous. In the light of the facts brought to my attention, I shall bring this aspect of the matter before the Postmaster-General's Department's engineers, and if it is possible, after a consultation with them, to reduce the length of the proposed building, that can be done. This would not interfere with the facility for making future extensions if necessary. If we could do away with two bays of this building, which would involve a space of 25 feet by 34 feet, a big saving would be made—probably a matter of £950 to £1,000. But if only one bay could be cut out of the present project, I doubt if it would be economical to do so.

14. To Mr. Parker Motony.—With respect to the cost, in the light of the plans which I have just substituted, I think that a saving of £100 can be made. Altogether, the new plans will provide a superior type of building and better yard space. We will be making more use of the brickwork which we shall be obliged to put into the foundations. The accommodation, so far as the post-office service is concerned, will be equal under either set of plans.

The witness withdrew.

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AUTOMATIC TELEPHONE EXCHANGE - BOX HILL 10

PUBLIC WORKS COMMITTEE.

Automatic Telephone Exchange, Fox Hill.

(Taken at Melbourne)

TUESDAY, 12th SEPTEMBER, 1922.

Present:

Mr. Matthews, in the chair;
Senator Plain Mr. Mackay
Mr. Jackson Mr. Parker Maloney

LAWRENCE BEDE FANNING, Traffic Officer, Postmaster-General's Department, recalled, and further examined.

15. TO MR. MATTHEWS. - I have further considered the proposal for the establishment of an Automatic Telephone Exchange at Fox Hill. When I was last before the Committee I said I thought there was no necessity for the proposed Box Hill Automatic Exchange, as the existing exchange could be made to meet requirements for some time to come. I now find that the present exchange can be made to meet requirements until 1929. There are 620 subscribers connected to the exchange, and it is anticipated that that number will increase to 762 by 1st January, 1924, which is the date when it was proposed to establish the new automatic exchange, if approved. It is estimated that on the 1st January, 1929, there will be 1,430 subscribers connected to the exchange. The existing exchange was established in 1918; it was an offshoot from Canterbury. The subscribers connected to it at the opening were Canterbury subscribers. Most of the equipment is new. The multiple B positions are new, and three of the subscribers' positions were installed in 1920. The equipment has a very long life yet. It is quite capable of giving a satisfactory service, and is, in fact, doing so. From a service point of view there is no necessity to build a new exchange. I think a statement has already been placed before the Committee showing the financial aspect of the proposed new automatic exchange, and giving a comparison of the working costs and annual charges of the common battery and automatic systems. In that statement the annual working expenses of the existing manual exchange are compared with the annual working expenses of the proposed automatic exchange. The working expenses of the manual exchange are given

as £2,601, and of the automatic exchange as £1,916, showing a difference of approximately £700. That statement hardly shows the true position, because it is a comparison of the annual working expenses only, and does not take into consideration interest on capital. Apparently a statement was not placed before the Committee shewing the total annual charges of the existing manual exchange as compared with the proposed automatic exchange. I have prepared a financial statement on these lines which I now place before the Committee. The statement is as follows. -

Comparative Statement showing the Total Annual Charges at at 1/1/24 of existing Manual and proposed Automatic Exchange.

	<u>Existing Manual Exchange.</u>	<u>Proposed Automatic Exchange.</u>
	£	£
<u>Working Expenses. -</u>		
<u>Operating</u> ...	1,284	-
<u>Maintenance. -</u>		
Exchange Equipment ...	413)	1,308
Substation Equipment ...	443)	
Building ...	4	42
Line Plant ...	457	457
Air Conditioning Plant ...	-	109
<u>Interest on Capital - New and In Situ</u>	1,620	3,591
<u>Depreciation. -</u>		
Building ...	5	59
Air Conditioning Plant ...	-	202
Exchange Equipment ...	128	1,662
Conduits ...	246	243
<u>Administration Charges. -</u> ...	511	785
	<u>£5,111</u>	<u>£8,463</u>
		<u>£3,352</u>

Total Annual Charges Proposed Automatic	£8,463
" " " Existing Manual	5,111
	<u>£3,352</u>

Difference in Annual Charges in favor of existing Manual System £3,352

The statement is a comparison of the position as at 1st January, 1924, at which date it was anticipated that the new automatic exchange would be installed and it takes into consideration all charges against the existing manual exchange and the proposed automatic exchange. It will be seen that the total annual charges of the proposed automatic exchange are £8,463, whereas the total annual charges of the existing manual exchange are only £5,111. This shows a difference in favour of the existing manual exchange of £3,352. I have also prepared an additional financial statement showing/

showing the position as at 1st January, 1929, by which date the present manual exchange will probably have to be replaced. The statement is as follows. -

Comparative Statement showing the Total Annual Charges as at 1/1/29 of existing Manual Exchange and proposed Automatic System.

	<u>Existing Manual Exchange.</u>	<u>Proposed Automatic Exchange.</u>
	£	£
<u>Working Expenses. -</u>		
Operating	2,391	138
Maintenance. -		
Exchange Equipment } ...	2,474	1,952
Substation Equipment } ...		538
Line Plant } ...		42
Building	4	109
Air Conditioning Plant, etc. ...	-	-
<u>Interest on Capital</u>	2,110	4,041
<u>Depreciation. -</u>		
Building	5	59
Exchange Equipment	289	1,662
Air Conditioning Plant, etc. ...	-	202
Conduit	246	248
<u>Administration Charges:</u>	922	1,440
	<u>£8,441</u>	<u>£10,531</u>

Total Annual Charges of Proposed Automatic	£10,531
" " " " Existing Manual	8,441
	<u>£2,090</u>

Difference in Annual Charges in favour
of existing manual system £2,090

This statement shows that even at 1st January, 1929, there is a difference in favour of the existing manual exchange of £2,090 per annum. If we install the automatic exchange we shall have to spend new capital to the extent of approx. £45,000, and, in addition, our annual charges will go up in the first year by £3,352, with practically no benefit to be derived from the alteration.

16. TO MR. JACKSON. - I do not think that the installation of an automatic exchange would cause any

immediate increase in the number of subscribers. It would not alter the telephone rates, and, really, the question that governs whether people take telephones or not is the rates. There will be no appreciable difference in the quality of the service. At first, the quality of the service might be, if anything, worse on account of the large number of manual exchanges that would be in operation in the same net-work. The service would certainly not be better until all the exchanges in the net-work had been converted to automatic. The proposal is not to defer the installation of an automatic exchange for all time, but to postpone it for a period. There is no necessity for an automatic exchange at the present time, and there will not be any for a period of at least five years. The cost of operating includes salaries and allowances. In computing ~~salaries~~ I have included ~~allowances~~ such as the cost of staffing on Sundays and holidays, and the cost of providing recreation and sick relief. The present exchange would reach about the limit of its life in 1929. The present building could not accommodate the equipment beyond that date. The comparative statement ~~as at that date~~ shows a balance in favour of the manual system, as against the automatic, of £2,000. In comparing the costs I have taken into consideration the additional capital that it will be necessary to spend on the manual exchange to keep it going until 1929. The Chairman of this Committee asked me to give particulars of the additional expenditure that would be necessary on the manual exchange if the proposal for an automatic exchange were not proceeded with, and he also asked me to furnish a sketch showing the present exchange and the alterations that would be necessary to permit of the existing equipment being extended. The switchboards at Box IIII are ~~arranged~~ to carry 100 subscribers each. On looking into the matter I find that the number of subscribers ~~from~~ each position can be increased from 100 to 150. This will give an increase of twenty lines per position, and will provide for 100 additional subscribers. It is anticipated that on the 1st January, 1929, we shall have to provide for 1,430 subscribers. To do that it will be necessary to install four additional 200-line positions. They will not all be installed at once, but periodically, as required, ~~and probably one at a time~~. There will be no necessity to put in any additional equipment for two years at least. The present equipment, without any expenditure whatever, will meet requirements until about June, 1924. It will be necessary, in order to extend the equipment, to acquire the room which is now set aside as a telephonists' retiring room. There is a wood partition 7 feet high between the exchange room and the retiring room. If ~~that~~ room is taken for the purposes of the exchange there is a room on the verandah now used as a store room, at the rear of the post-office which can be converted and used as a telephonists' retiring room. The Works and Railways Department have estimated that the cost of removing the partition and extending the room on the verandah would be approximately £15. This would give the girls a retiring room 16 feet long and 6 ft. 6 in. wide, with a height varying from 9 ft. 6 in. at the lowest to 11 ft. 6 in. at the highest. ~~It is~~ lined and ceiled ~~and will be~~ and will be entirely in every way to the present retiring room. Very little use is made of ~~the~~ store room, and in order to ~~store~~ what is now there it would only be necessary to provide a couple of presses in the post-office. The store room contains old forms and dockets which have to be kept for a certain length of time before being destroyed. The removal of the partition would ~~enable~~ allow ~~to put in~~ four 200-line positions, which would meet requirements until 1929. The capital expenditure necessary to keep the existing exchange going from the present date until 1929 would be £2,730. This sum

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AUTOMATIC TELEPHONE EXCHANGE—Box Hill 45

would be made up of building alterations, £45; increasing the switchboard positions so as to accommodate 180 instead of 160 subscribers, £180; making provision for outgoing junction lines to other exchanges, £440; additional incoming lines, £740; installing four additional 200-line positions, £1,315. This expenditure would not be incurred all at once, but gradually, as required to meet development. I have not included expenditure on outside ~~lines~~ because that would be common to both the manual and automatic systems. The development figures used by me in estimating costs are the same as those used by the chief electrical engineer in preparing the financial statement already placed before the Committee. ~~Approximately these figures would be the cost.~~ The equipment in use at Box Hill is standard equipment. It has been stated that it is obsolete, but that statement is hardly ~~correct~~. It is not modern equipment, but it is quite capable of giving satisfactory service. It is of the same type as we are building in our work shops every day. It is the most up-to-date equipment of its class. It is a magneto non-multiple ~~electric circuit~~. We ~~are not using this type of equipment in any of our country exchanges and many metropolitan exchanges.~~ It is the most economical board to operate, and is particularly suitable for small exchanges. There is no necessity at Box Hill for a multiple board. Where there are only 500 or 600 subscribers connected to an exchange, it is not economical to put in multiple boards. ~~The non-multiple board costs about £200, and the multiple board costs four or five times that amount.~~ The difference between the two is largely a matter of cost. Not only shall we continue to build the non-multiple type of board, but we shall continue to use it as being the most suitable type for small exchanges. We shall probably improve the existing type of board by using a combined indicator and jack. There is a type of equipment on the market at the present time in which ~~these facilities~~ are combined. The advantage is that the board is smaller, it occupies less room, and the cost of handling calls is reduced. The same type of equipment as is used at Box Hill is also installed at Ascot Vale, Brunswick, Northcote, and Footscray, and at some of the exchanges in the other States. There is no great delay in transfer work between the common battery and magneto switchboards. There are inherent difficulties in transferring calls from one exchange to another with any system. A girl with the type of board in use at Box Hill cannot handle as many calls in an hour as a girl with the type of board in use, say, at the Central Exchange. The load that we prescribe for telephonists at the Central Exchange is 225 calls per hour, but at Box Hill it is only 150. If we were to install the common battery equipment at Box Hill to-morrow it would make very little difference in ~~the size of the staff.~~ I am in the secretary's branch of the Department. I was formerly in the engineers' branch. I have not been able to ascertain exactly who started the proposal for an automatic exchange at Box Hill. Apparently the question of whether the present exchange would meet requirements was not considered. ~~Prior to the rearrangement of the staff in the Central Office these proposals did not come to me.~~ There is no dispute between the engineering and clerical sections regarding these matters. In the future these proposals will pass through my hands, and will be reported on by me before they are passed. The engineering section will prepare the plans, but the financial aspect will be inquired into by me before anything is done. Up to the present time the engineering staff have formulated a proposal and dealt with it from beginning to end, but the traffic side has now been separated from the engineering side. Pro-

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~~posals will now originate with the traffic section. The service side of telephones has been separated from the mechanical side. The situation has received Ministerial sanction. The new organization is not in operation. A conference of telephone managers will be held within a fortnight to draw up the new scheme of organization and deal with the new conditions. The magneto system in the Box Hill exchange will give an adequate and full service. I have no doubt about that, and I am speaking from practical experience. I was in charge of the traffic side of telephones in Sydney for some years, while both the manual and automatic systems were in operation there. The facilities to be provided at Box Hill will permit of calls being passed satisfactorily from the manual to the automatic system. A dial will be provided at each of the positions, and the telephonists will dial the automatic numbers, and thus have direct access to the automatic exchanges. They will get connexion from Box Hill to the automatic exchanges without calling up ~~any other~~ operator at any other exchange. Calls from Box Hill to Central will be handled manually. The facilities for handling calls at Box Hill will be the same as those provided at manual exchanges in Sydney at the present time. ~~It is proposed to provide these facilities at all the exchanges in Melbourne.~~~~

Law

There will be less difficulty in handling a call from Box Hill to an automatic exchange than from Central. Only 9.5 per cent. of the total calls handled at Box Hill go to Canterbury, and from Canterbury to Box Hill there is less than 6.2 per cent. The community of interest between Canterbury and Box Hill is almost negligible. If the Box Hill exchange were automatic, each subscriber would have facilities for reaching other automatic exchanges direct, but with the manual system instead of the subscriber dialing, the operator at the exchange dials for him. ~~At exchanges larger than Box Hill we have equipment that is not so good. I have heard complaints regarding magneto exchanges, but I do not understand them. They are not correct. I am afraid that wrong information has been given to the Committee.~~ If a Box Hill telephonist receives a call for a subscriber on any position other than the one upon which she is working she transfers it to the multiple position. If a girl on No. 5 position has a call for a subscriber on No. 1, she does not pass the cord over to the other position, but presses a key and transfers to the multiple position. This causes a little more work in the exchange than if we had multiple switchboards, but it would not pay to put in multiple switchboards. The local traffic is not more than 15 per cent. of the total traffic, and this would mean that we would use the multiple for only 15 per cent. of the total calls handled. In places like New York, Chicago and London, switchboards are provided without multiples. There is so much transfer work, and it does not pay to have the multiple lying idle. Instead of the multiples being provided throughout the switchboards, they are provided only at certain points. The staff at Box Hill consists of one monitor and six telephonists. The maximum number on duty at one time is three. In 1929 we shall require thirteen telephonists and two monitors. The retiring room will be sufficient for them, and it will be much better than that provided at ~~some other exchanges which are larger than that at~~ Box Hill. A new exchange will be necessary in 1929. There would rarely be more than four girls using the room at one time, and then only for an hour each day. Facilities would be provided for heating water and, if necessary, the portion of the room used for that purpose could be partitioned off.

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AUTOMATIC TELEPHONE EXCHANGE—Box Hill 4

17. To Mr. Mackay.—The percentage of traffic from Box Hill to automatic exchanges is so low that it does not affect the position. The facilities for handling the traffic will be adequate. The reasons advanced to the Committee by Mr. Decker in favour of erecting an automatic exchange at Box Hill could be applied also to the Central or Windsor exchanges. Windsor has a very great community of interest with Malvern. The volume of traffic that goes through Windsor to Malvern is ~~very great~~ and there is more reason for building at Windsor than at Box Hill. Similar ~~arguments might be applied to Northcote and Brunswick~~. The arguments advanced are no reason for spending £45,000 in building an exchange. The difficulty of operating mixed systems is with us already. I do not know that we can claim that the telephone service has improved since the advent of the automatic system, although, no doubt, the method of handling calls will ultimately be mechanical. The comparison between the working expenses of the manual and automatic systems is hardly fair, seeing that it does not take into consideration the important fact that we would have to spend £45,000 of capital on the automatic exchange. The interest on that money has to be covered everywhere. The Department has to meet the interest bill every year. ~~The comparison should be on the basis of the total annual charges.~~ An accountant, I think, would not accept any other basis of comparing costs. The automatic system at Box Hill would, undoubtedly, be more expensive. There is no doubt about that. I am speaking, of course, only of Box Hill, and am comparing the present exchange with an automatic exchange. ~~My statement does not refer to the automatic system generally.~~ In no case would the capital cost of the manual system be anything like that of the automatic. I have considered the figures in reference to the proposed exchanges at South Melbourne and Canterbury, and I reached a dead-end. I could not ascertain exactly how the cost of the common battery switchboards was arrived at. I do not know ~~that~~ the common battery switchboards would meet requirements ~~the maintenance of fact that these would not from our point of view.~~ We have not installed a common battery switchboard in Australia during the last ten years, and those that we have are out of date. They do not contain the latest facilities for operating. The latest type of common battery switchboard provides for the automatic metering of calls. The operator does not need to listen-in on calls. Supervision is automatic, and ringing is automatic. Facilities are provided which enable the telephonist to handle very much higher loads than telephonists can handle with our existing common battery switchboards. Unless the comparison of common battery costs has been made on the latest type of switchboard, I do not think it can be accepted. I discussed this matter some time ago with a representative of the American Telephone Company. I was anxious to ascertain what it would cost to ~~have~~ the latest type of common battery switchboard. ~~They~~ told me it would cost £10 per line. That was merely ~~his~~ statement, and I have nothing to support it, but it was a considered statement. Unless we actually were to call tenders to-day, I do not think we could give any really accurate figures as to the cost, but I think it would be much lower than the estimated figure of £16 10s. per line.

18. To Mr. Matthews.—The estimate of the cost of a common battery system is arrived at on the basis of £16 10s. per line, and the total amount is calculated by multiplying the total number of subscribers by £16 10s. I think that the automatic is costing more than the manual; if not, it is remarkable that other countries are not adopting it. The British Post Office sent five

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AUTOMATIC TELEPHONE EXCHANGE—Box Hill

17. To Mr. Mackay.—The percentage of traffic from Box Hill to automatic exchanges is so low that it does not affect the position. The facilities for handling the traffic will be adequate. The reasons advanced to the Committee by Mr. Beecher in favour of erecting an automatic exchange at Box Hill could be applied also to the Central or Windsor exchanges. Windsor has a very great community of interest with Malvern. The volume of traffic that goes through Windsor to Malvern is ~~very great~~ and there is more reason for building at Windsor than at Box Hill. Similar ~~arguments might be applied to Northcote and Brunswick~~. The arguments advanced are no reason for spending £45,000 in building an exchange. The difficulty of operating mixed systems is with us already. I do not know that we can claim that the telephone service has improved since the advent of the automatic system, although, no doubt, the method of handling calls will ultimately be mechanical. The comparison between the working expenses of the manual and automatic systems is hardly fair, seeing that it does not take into consideration the important fact that we would have to spend £45,000 of capital on the automatic exchange. The interest on that money has to be covered somewhere. The Department has to meet the interest bill every year. ~~The comparison should be on the basis of the total annual charges.~~ An accountant, I think, would not accept any other basis of comparing costs. The automatic system at Box Hill would, undoubtedly, be more expensive. There is no doubt about that. I am speaking, of course, only of Box Hill, and am comparing the present exchange with an automatic exchange. ~~My statement does not refer to the automatic system generally.~~ In no case would the capital cost of the manual system be anything like that of the automatic. I have considered the figures in reference to the proposed exchanges at South Melbourne and Canterbury, and I reached a dead-end. I could not ascertain exactly how the cost of the common battery switchboards was arrived at. I do not know ~~that~~ the common battery switchboards would meet requirements. ~~It is a matter of fact, that would not from any point of view.~~ We have not installed in common battery switchboards in Australia during the last ten years, and those that we have are out of date. They do not contain the latest facilities for operating. The latest type of common battery switchboard provides for the automatic metering of calls. The operator does not need to listen-in on calls. Supervision is automatic, and ringing is automatic. Facilities are provided which enable the telephonist to handle very much higher loads than telephonists can handle with our existing common battery switchboards. Unless the comparison of common battery costs has been made on the latest type of switchboard, I do not think it can be accepted. I discussed this matter some time ago with a representative of the American Telephone Company. I was anxious to ascertain what it would cost to ~~run~~ the latest type of common battery switchboard. ~~They told me it would cost £10 per line.~~ That was merely ~~his~~ statement, and I have nothing to support it, but it was a considered statement. Unless we actually were to call tenders to-day, I do not think we could give any really accurate figures as to the cost, but I think it would be much lower than the estimated figure of £16 10s. per line.

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 if the community of interest between a manual exchange and an automatic were taken as the principal factor in determining whether a manual exchange is to be converted to automatic, the necessity for making Windsor automatic would be very much greater than converting a small exchange like Box Hill.

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engineers to America in 1920. They investigated the matter thoroughly, and came back convinced that the automatic system would do all that was claimed for it. The British Post Office, however, has not installed the automatic system, and the Postmaster-General definitely stated that it was too expensive. When I was giving evidence previously, I read an extract from the report of a Select Committee of the House of Commons. The Committee advised the Government to hasten slowly with automatic telephone exchanges. The Committee took evidence last year, and its report was tabled on the 20th March this year. They dealt with the whole question of rates, and they not only took evidence, but visited other countries. Two of the members went to Canada and North America, and others went to Norway, Sweden, and Belgium. In dealing with the provision of automatic exchanges, they say—

Automatic telephony falls into the category of questions of policy. Steady progress is being made in developing this type of apparatus, especially in the United States of America. At present, the first cost is so high that it cannot be said that its adoption would necessarily reduce the cost of giving service, and it is evident that the expectation on the part of the public that the automatic system would immediately cure all service defects is not likely to be fulfilled, although there is no doubt that a faster service would result on the majority of calls. The actual type of apparatus to be employed requires careful study in each case, and no general ruling can be made. The evidence shows that the Post Office have installed, or are planning to install, equipments of each type which is available, and until the commercial results of the introduction of automatic apparatus are ascertained for that country, your committee do not recommend unduly hasty adoption of the system. The quality of the service is a point on which public opinion has a right to be heard, but the means of attaining it is a technical matter which is chiefly one for the administration.

Since I was before the Committee on the last occasion, I have read the evidence on which that statement was based. It was based largely on evidence given by Sir William Noble, chief engineer of the British Post Office. I think that Australia is right in adopting the automatic telephone, and I say that after having had experience of both systems. I think it is possible with the common battery system at the present time to give a service equal to the automatic, but I think that in the future the better service will be given by the automatic. The modern tendency is to develop machine switching as against manual switching appliances. Every year the automatic system is improving. I think, however, that the cost of it is unduly high, and at Box Hill it would be a waste of money because it is unnecessary.

19. *To Mr. Jackson.*—If it is a question of speedily converting exchange to automatic, we ought to commence with the larger exchanges. I am not satisfied that the automatic system would be cheaper for Canterbury or South Melbourne. I am not in a position to speak definitely on that because, unfortunately, I cannot get figures of the cost of an up-to-date manual equipment.

20. *To Mr. Mackay.*—Under the present system of management, the business side of telephony is separated from the engineering side. This is as it ought to be, and the change brings our administration into line with telephony administration in every other country. In Great Britain the traffic and business side of telephone management is distinct from the engineering

18

~~side. It is the function of a telephone engineer to design and plan equipment, and maintain it. It is not his function to give service. I have been doing my present work for the last four years, and the change merely means that I have been taken from one point and placed at another. Previously, however, I did not deal with the question of automatic exchanges. The first one that came before me was the Cottee proposal. I do not think there is any doubt about the accuracy of the revenue figures submitted to the Committee. There is a slight difference between my figures and those supplied by Mr. Beecher, but that is due to the fact that Mr. Beecher's figures were prepared a few months ago. His figures were correct, as far as they went.~~

21. To Mr. Parker Moloney.—The Select Committee to which I have referred did not state in their report that for exchanges up to 5,000 subscribers the manual system was good enough, but that for exchanges with more than 5,000 subscribers they recommended the automatic system. In the course of evidence, however, that point was brought out by some of the post-office engineers. The British Post Office are installing new manual exchanges up to 4,000 subscribers. The South African Government has turned down the automatic telephone on account of the high capital cost. They would be satisfied to have the automatic telephone if they could get it at a reasonable price. The American Telephone and Telegraph Company control about 10,000,000 telephones, and their policy is the policy of all the associated companies. According to their last annual report they are practically only experimenting with the automatic system. The New York telephone service, which is the largest in the world, is still manual. The Bell Telephone Company have developed an automatic telephone system known as the Panel system. That is the system which the British Post Office intends to adopt for the London network. The Western Electric Company, which is really the manufacturing side of the American Telephone and Telegraph Company, have developed an automatic system of their own, and they intend to install it. There is hesitancy in scrapping existing manual equipment, but the question of the efficiency of service also enters in. It is not desirable to scrap existing exchanges unless they have reached the end of their useful life. ~~Most of our equipment has a fairly high residual value, and to use it again there is only the cost of reconditioning, and sometimes the cost of reconditioning.~~ On the question of common battery costs, I can give the Committee an interesting statement. The question was the provision of a telephone exchange at Hamilton, Victoria, and the question came before me in relation to the building. The State Engineer pointed out that a proposal had been submitted for a magneto ~~and~~ non-multiple switchboard at Hamilton; but on investigating the matter quotations obtained from the Stromberg-Carlson Company's representative for that company's multiple C B switchboard, and the cost of this compared favorably with the Department's estimate for installing a magneto non-multiple switchboard. ~~The cost was about 65 pence per line for an 800-line board, or at the outside, £2.~~ The statement means that we can buy a superior switchboard from America, and install it at Hamilton at a lower price than that at which we can make an inferior type of board in our own workshops. That is illuminating on the question of common battery costs. Apparently that type of board can be bought for about £3 per line. The only reference in the report of the British Select Committee to the capital cost of automatic telephones was in the evidence given by Sir William Noble. He said that, generally speaking, the capital cost of automatic equipment was about 65 per cent. higher than that of manual equipment. He also

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The statement is as follows and shows the position as at 1.1.20 and 1.1.29

BOX HILL EXCHANGE

(a) Present manual exchange.

Total Annual Charges ^{Dr.} £5,111 Annual rentals ^{Cr.} £7,220.

Profit £2,109 p.a.

(b) Proposed Automatic Exchange.

Total Annual Charges ^{Dr.} £8,463. Annual rental etc ^{Cr.} £7,220

Loss £1,243 p.a.

1/1/29.

(a) Present manual exchange:-

Total Annual Charges ^{Dr.} £8,441. Annual rentals etc ^{Cr.} £13,585.

Profit £5,144 p.a.

(b) Proposed Automatic Exchange -

Total Annual Charges ^{Dr.} £10,531 Annual rentals etc ^{Cr.} £13,585.

Profit £3,054 p.a.

AUTOMATIC TELEPHONE EXCHANGE—Box Hill

19

gave figures regarding annual charges, but the only case I could follow clearly was that at Swansen, where, in round figures, the charges were about £20,000, with a difference of under £1,000 in favour of the manual system. I do not think that the Committee should attach very much importance to one instance like that.

~~The rates for telephone operators in England are high. The cost of living bonus has not been reduced. An operator staying in the service receives 25s. and the cost of living bonus. Operating costs are, therefore, high, but they will come down with the reduction in the cost of living. The Chairman of this Committee would like to go through the evidence given by Mr. Morgan and Mr. Beecher, and in that connection, I have prepared a statement showing the profit and loss on an automatic exchange at Box Hill in ~~the present time~~ ^{the present} time. The present total annual charges of the manual exchange are £3,111; we receive by way of revenue from rentals and calls £7,320, showing a surplus of £2,109. If we put in the automatic exchange, the annual charges would be £5,403, and the revenue would still be £7,320, which would show a definite loss of £1,243 per annum. In 1929 the total annual charges of the manual exchange would be £5,441, and the annual rentals would be £13,585, showing an excess of revenue over outgoings of £5,144. The annual charges of the automatic exchange at that date would be £10,531, and the annual rentals £13,585, showing an excess of revenue of £3,054. Thus, in five years the debit on the automatic system would be converted into a surplus, but the improvement would not be so great with the automatic as with the manual. ~~Mr. Beecher stated~~ that the time taken to handle a local call at Box Hill was 24 seconds, and that with an automatic exchange it would be 10 seconds. ~~He also stated that a transferred call took 32 seconds. These statements are not strictly correct.~~~~

It will be seen from the statement referred to that

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Take in A

It has been stated in evidence before the Committee

In staffing telephone exchanges we work on a unit basis; we say that each girl is capable of handling in a given time a certain number of calls. We value those calls in terms of units. The unit load of an operator is 225. If 1,000 units have to be handled during an hour, we divide 1,000 by 225 to arrive at the number of staff required. For the purpose of calculating unit value, ~~the time taken~~ ^{the} ~~call~~ ^{calls}. In an exchange like Box Hill it takes 15 seconds, and not 24, to handle a local call; and 90 seconds, instead of 32, to deal with a transferred call. Generally speaking, the delay in effecting calls is due to shortage of equipment rather than to the particular class of equipment in use. I could quote figures showing that the percentage of wrong calls is higher with the automatic system than with the manual. Wrong numbers are obtained by other causes than wrong dialling. With the automatic system in general use in Melbourne, the service would become better ~~but no better than would~~ ^{be the case if up-to-date manual equipment were provided}.

It was
The statements made do not correctly set out the position

the \int of a call the time actually taken is determined and this represents manipulation time

be the case if up-to-date manual equipment were provided