

POST 1221 964

Former Reference TH/C/333

TH/C/333 Telecommunications: coin box study
group set up June 1953: papers 1 to
16

PUBLIC RECORD

THESE PAPERS HAVE BEEN
SELECTED FOR PRESERVATION.
IT IS ESSENTIAL THAT NOTHING
BE ADDED OR REMOVED.

POST OFFICE TELECOMMS. H.Q.

PART I	FILE TITLE COIN BOX DESIGN STUDY GROUP - PAPER NUMBERS 1-16 - SET UP JUNE 1953.	TH / C / 333
TH / C / 333	FILE BEGINS 1956 <i>16.6.54</i>	ENDS
	INDEX HEADINGS	PART I
COMMITTEES AND CONFERENCES	PARENT BRANCH <i>SV 1122</i>	

RETAIN FOR
2nd REVIEW
IN **1979**

*read it down to
only contain duplicate*

REFER TO	DATE	REFER TO	DATE	REFER TO	DATE
FORMERLY 50713/56 File 2					
RETAIN UNTIL 31st MAY 1976					
✓ MRS EVANS X	8.5.73				
MRS EVANS	18.6.73				
✓ <i>SAE</i>	25.6.73				
MRS EVANS	4.9.74				
X <i>91</i>	5.1.77				
✓ SV: 1.1.2.2	21.3.78				
RETAIN UNTIL 21.3.80					
X	21.3.78				
SV 1122	6.6.79				
PUBLIC RECORD					
<i>15/7/79</i>					

RETAIN FOR
2nd REVIEW
IN

REVIEW OF PAPERS FOR PERMANENT PRESERVATION

Under the Public Records Acts 1958 and 1967, the Post Office has a statutory obligation to review all papers which have been in existence for 25 years to determine whether they are of sufficient historical importance to justify permanent preservation as public records. The comparatively few papers so selected are, under the terms of the Public Records Acts, open for inspection by the public 30 years after their creation unless specifically excluded by permission of the Lord Chancellor.

* * * * *

SVS/SV1.1.2.2

Subject:

The papers indicated in the margin are due to be considered under the above Acts.

Coin Box Design Study et-
Papers numbers 1-16
SET 4/ JUNE 53.

Unless it is considered that the papers are of permanent value to the Post Office or are of historical importance serious consideration should now be given to their destruction. Only in exceptional circumstances should it be necessary to re-submit papers which have lain inactive for a number of years.

Reg No.

TA/c/333
M.I. II

In order to facilitate the numbering sequence of retained records your co-operation is sought in the early return of these files.

(01-638 6669)

for A C PANTON
Telecomms Business Record Officer

66..... 1979

X

ASD/AS1.4.1.4
ROOM G04
14/15 Bridgewater Square
London EC2Y 8BS

X

Would you please:-

- 1 ~~Destroy~~
- 2 Arrange for their permanent retention.
- 3 ~~Re-submit in years.~~

(delete as applicable)

[Signature]
.....
(HEO or equivalent grade)

Dept/Division *SV122*

.....
13/6 1979

Reg. No. **TH** // **C** // **333** **PT: II**.

✓ **SU: 1.1.2.2** ... Division/Section

Please state below whether the attached papers should be destroyed or retained. Authority for the destruction of regd papers can only be given by Management Level 2 and above.

S.M. Quinn

SUD Registry **21.3** 19 **78**.

The **SUD** Registry

~~* (1) Destroy.~~

* (2) Retain for a further period of **2** years.

K. Walker

S01122 **21/3** 19 **78**.

Coin Box Design Study Group

Minutes of the first meeting - 16th June 1954

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S.Bch.	Mr. B. Lloyd	ITD/OB
Mr. S. W. Dabbs	ITD/FB	Mr. C. G. Osmond	FD/IB
Mr. H. E. Francis	ED/Tp.Bch.	Mr. E. S. Fritchard	AGD/TFB
Mr. S. L. Helman	ED/S.Bch.	Miss N. Whitelaw	PODWC Staff Side
Mr. A. V. Leaver	ITD/SSE		

Mr. D. W. Burtenshaw ITD/OB (Secretary)

Mr. F. C. Carter, ED/S.Bch. also attended

Mr. L. G. Fox, POEF and SMC, Staff Side, was unable to be present.

1. The Chairman welcomed the members of the Study Group and drew attention to numerous items which would need to be considered. He referred to the fact that the present coin collecting box was basically the same in design as when first introduced in 1925. Weaknesses in the design had been revealed from time to time and these had been overcome as far as possible by modifications. The Post Office was aware that there were still a number of unsatisfactory features and these, together with the need to take account of other developments in the telephone service, made it necessary to consider redesign. The terms of reference were:-

"To consider the need for the introduction of a call office telephone coin collecting box and associated apparatus and fittings of a new design in the light of probable future service and public requirements. To make recommendations about the facilities to be given by it and to report on the practical aspects of its introduction into general use".

Study to be confined to auto. exchanges.

2. The Chairman stated that this was essentially a long term project; it would probably be about five years before new equipment could be brought into use in any quantity and on past experience it might be expected to have a life of 25 to 30 years. He suggested, therefore, that the Study Group should restrict its deliberations to the development of a coin box for use with automatic exchanges. Mr. Dabbs said on the other hand that manual exchanges would be in existence for a number of years to come and that 20 - 25% of all coin boxes were at present connected to manual exchanges. He suggested that the proposal not to proceed with the re-design of the manual coin box should be confirmed at a later date, and this was agreed.

Factors to be borne in mind in connection with design.

3. The Chairman went on to suggest that the main factors to be borne in mind in connection with the new design were (a) convenience to users - simplicity of operation - maximum facilities, (b) ease and economy of maintenance, (c) effect on exchange equipment design, (d) avoidance of undue complication in exchange operating procedure, (e) prevention of fraud, (f) convenience and economy of coin collecting arrangements, (g) neat appearance and layout of the coin box and associated fittings.

Facilities in other countries.

4. Regard should be had to other developments in the telephone field, and the Study Group should know what facilities were available to coin box users in other countries, particularly in America, Sweden and Switzerland.

Mr. Carter agreed that the Engineering Department would collect this information and provide a committee paper on the subject. Miss Whitelaw suggested that useful information might also be obtained through trade union contacts in other countries and she undertook to make enquiries.

5. The Chairman said that following consultation with the operating and engineering sides a tentative list had been prepared of the main items which should receive the attention of the Study Group, but he would be pleased to receive any additions to this list if the members had any suggestions to make. It was important, however, to avoid committing the Engineering Department to lengthy technical studies unless there was a good case for investigation. The list to date was as follows:-

Main items to be considered.

- (a) Multi-metering and subscriber trunk dialling.
- (b) Restriction of the duration of dialled calls.
- (c) Denomination of coins for which provision is to be made.
- (d) The arrangements for the deposit, or return, of money inserted in the coin box.
- (e) The possibility of giving an indication to exchange operating staffs when they are connecting a call to a coin box line, e.g., for incoming transferred charge calls.
- (f) The provision to be made for emergency calls.
- (g) The coin storage arrangements.
- (h) The exterior design of the coin box and the type and layout of the associated equipment.
- (i) The practical problems of introducing a new coin box into general use - this should cover coin box subscribers in addition to call offices.

6. The Chairman then invited comments on the order in which these items should be tackled but suggested that as a previous Study Group had reported in 1945 on the problem of multi-metering from coin boxes it might be as well, in the first instance, to review their findings and at the same time consider the further question of subscriber trunk dialling from call offices. The problem of coin box redesign, which was now to be considered, would no doubt be considerably influenced by any decision on multi-metering and subscriber trunk dialling. A copy of the previous Study Group's report on multi-metering was then distributed as Committee Paper No. 1. The Chairman said that when it came up for discussion obvious engineering points would be whether there was any new technical approach to this problem and, if not, whether the figures given in the Committee Paper gave a fair indication of the relative cost of providing extended dialling facilities from coin box lines at the present time, having regard to the redesign of the coin box.

1945 Study Group - Committee Paper No. 1.

7. Mr. Francis thought that the modifications necessary to coin box working to provide for multi-metering might also help the introduction of subscriber trunk dialling and he would look into the findings of the previous Report in conjunction with Mr. Helman.

8. The operating savings, which should include savings on switch-board positions, would also need to be brought up to date and The Chairman asked the ITD/OB and AGD representatives to look into these. The savings for various charge steps should, if possible, be indicated and should provide for subscriber trunk dialling as well as multi-metering.

Savings by introduction of extended dialling.

Tariff modifications - effect on design.

9. The Chairman said that the effect of a possible simplification of the tariffs should be borne in mind. Mr. Leaver said that the question of tariffs was not within the terms of reference of the Study Group, but he thought that comment about the effect of modifications to tariffs on the simplification of design of the coin box would be appropriate if this proved to be the case. Mr. Lloyd asked whether there must be the same tariff for ordinary subscribers and call office users. The Chairman replied that he did not think this was necessarily so but, if possible, there should be a similar pattern.

Coin box buttons.

10. Mr. Francis said that the problems associated with the arrangements for the automatic deposit and return of coins inserted in the coin box were to a certain extent allied to the signalling methods which might be employed for extended dialling facilities. The Chairman said that the ITD (SSB) would prepare a paper on the question of coin box buttons.

Design of coin box - wishes of public.

11. The meeting then discussed in general terms the other items to be considered by the Study Group and The Chairman asked whether the Post Office was really aware of the public's wishes in coin box design and suggested that useful information might be obtained through a special survey carried out by the Central Office of Information. Members expressed some doubt about the real value of such a survey, and Mr. Lloyd felt that considerable care would have to be given to the wording of questions if useful information was to be obtained. He thought that it would also be useful to obtain a report from the travelling observation supervisors employed in the ITD and he promised to do this. Mr. Francis supported the idea of using the COI and said that the Post Office only knew the reactions of that relatively small section of the public which felt sufficiently strongly to protest or write to the Department. The Chairman said that the ITD/SSB would examine the possibility of making use of the COI and report at the next meeting. Mr. Arnold thought that the views of the staff would be helpful and Miss Whitelaw said that she would obtain some opinions from the Staff Side.

12. Miss Whitelaw said that she attended the meeting as the Staff Side representative of the PODWC and she would like to feel free to consult other staff representatives as occasion arose, and even to invite individuals to attend meetings if their interests were concerned. The Chairman agreed to this.

13. The next meeting was arranged for 2.30 p.m. on Monday, 9th August, 1954.

Action to be taken.

<u>Minute No.</u>	<u>Action</u>	<u>Action by</u>
4	Coin box facilities in other countries - Committee Paper - information through trade union contacts.	ED PODWC Representative
7	Examination of Coin Box Study Group (1945) report on multi-fee dialling facilities.	ED
8	Estimate of savings from the introduction of extended dialling	ITD/OB and AGD
10	Committee Paper on coin box buttons.	ITD/SSB
11	Possibility of using COI for survey of public's wishes in design of coin box.	ITD/SSB
	Staff views on re-design of coin box.	PODWC Representative
	Report from travelling observation supervisors.	ITD/OB

COIN BOX DESIGN STUDY GROUP

Copy of Coin Box Study Group
Interim Report on Provision of Multi-fee Dialling Facilities
for Call Office Users

1. GENERAL

1.1 We were appointed on the 9th November 1944 to consider, in relation to public telephone call offices,

- (i) the employment of self sealing coin collecting boxes; and
- (ii) the provision of additional facilities.

It was evident that the latter item could be conveniently divided into two parts, namely:-

- (a) the provision of multi-metering facilities and
- (b) miscellaneous improvements of a minor nature.

1.2 Our investigations regarding multi-metering facilities (i.e. the provision of facilities to enable a caller to obtain automatically his own call up to the fourth unit (7d.) fee), have reached a stage where it is evident that the engineering costs will be very much in excess of any savings which may be looked for on the operational side and we accordingly consider it desirable to submit this interim report.

2. POSSIBLE SCHEMES FOR PROVIDING MULTI-METERING FACILITIES

2.1 To enable a call office user to obtain a local call automatically (up to 7d. fee) apparatus will be necessary to record the fee inserted for a desired call and to ensure that the call does not mature unless the appropriate fee has been inserted. Three possible schemes have been considered.

- (a) Installation of the complete recording and checking equipment at each call office.
- (b) Installation of equipment in the call office designed to transmit pulses to the exchange in response to the coins inserted and provision of equipment at the exchange for checking these pulses against the meter pulses for the relative call.
- (c) Installation of equipment in the call office designed to record mechanically the number and type of coins inserted and of equipment at the exchange for relaying the appropriate meter pulses back to the coin box to operate fee checking mechanism.

2.2 With scheme (a) the equipment at each call office would probably take the form of a complex mechanical sender and, as the checking of the fee would be effected mechanically in the coin box, the minimum of modifications would be necessary to exchange equipment. The mechanism would ensure that the user could not set up a call if less than the appropriate fee had been inserted and hence switches and junctions would not be held ineffectively.

It would also be possible to bar access to non-parent manual boards and service levels and thus to simplify the modifications required to the exchange barring equipment. On the other hand the

/design

design of such a complex mechanism sufficiently robust to withstand maltreatment and variable atmospheric conditions would present considerable difficulty and the apparatus would be expensive.

The method of making a call from such equipment would probably have to differ considerably from existing call office procedure inasmuch as some form of keysender would be necessary.

2.3 Scheme (b) requires the minimum additional apparatus at the coin box and a suitable design does not appear to present any great difficulty. Considerable additional equipment would, however, be required at the exchange even though the fee checking apparatus would probably be provided on a traffic basis rather than per call office line. It would be necessary to provide a reliable earth at the call office to ensure satisfactory transmission of impulses to the exchange and a certain amount of interference with other circuits may result from earthed impulsing.

The method of making a call would not differ materially from present practice but when a connection was cleared it would be necessary to re-set to normal the fee recording equipment at the exchange and this would mean that on an ineffective call it would be necessary for the user before making another call to recover his coins and re-insert them. Furthermore the caller under this scheme would have to listen for dialling tone before inserting any coins, whereas under present arrangements the coins can be inserted either before or after lifting the receiver.

Since metering is not effected until the called party answers, the caller and the called party would be connected (but unable to converse) for the period taken to effect metering and checking the coins. This period would average 4.5 seconds and might give rise to difficulty in that a caller who had inserted insufficient coins might hear the called party answer and, as a consequence, press Button A (thus forfeiting his money) before the meter pulses disclosed the shortage and the line was disconnected. On the other hand the called party on not receiving an immediate response might release the connection prematurely.

To avoid any degradation of impulsing it would also be necessary for the coin counting equipment at the exchange to be disconnected from the line before dialling commences. A signal to indicate when the last of a series of coins had been inserted would be difficult to provide owing to the different call fees involved.

2.4 Scheme (c) envisages a mechanism in the coin box which would be stepped forward once for each penny (or equivalent) inserted and stepped back again by the meter pulses which would be relayed over the line to the coin box. If the correct fee had been inserted, the equipment would be stepped back to normal and the caller would be able to speak on pressing Button A. If an insufficient fee had been inserted, the pressing of Button A would perform the function of Button B, releasing the connection and refunding the money.

The method of making a call would be as at present.

The time lag of 4.5 seconds between the called party answering and the establishment of a speech connection would obtain as in Scheme (b). On an ineffective call, for which the correct fee had been inserted, it would not be necessary for the user to recover his money and reinsert it before making another call.

/less

Less complex additional equipment would be required at the exchange than with Scheme (b) but a complicated mechanism (although not so costly as in Scheme (a)) would be required at every coin box.

3. RELATIVE MERITS OF SCHEME (a), (b) & (c)

3.1 We considered it of some importance that the current procedure in use by call office users to set up a call, with which the public is now generally familiar, should be disturbed as little as possible unless there were over-riding advantages in other directions.

Scheme (a), which involves radical alterations in such procedure without compensating advantages, cannot be recommended.

Scheme (b) has the advantage that minimum alterations to the coin box are involved. The present operating procedure would, however, require to be amended and the use of earth impulsing for transmitting signals to the exchange might present difficulties. Furthermore, the provision of considerable additional complex equipment at the exchange would be involved.

Scheme (c) would permit the present operating procedure to remain substantially unaltered and, although the coin box mechanism would be rather complicated, a smaller amount of exchange equipment of a simpler character would be required.

3.2 After considering the advantages and disadvantages inherent in the three schemes we reached the conclusion that the balance of advantage lay with Scheme (c) and we have accordingly given detailed consideration to the practicability of this scheme and its probable cost.

4. FLEXIBLE METERING ARRANGEMENTS

4.1 Before discussing Scheme (c) it is necessary to refer to a serious problem - applicable to all three Schemes - which will require solution before multi-metering from call offices can be effected if, as we understand, it is regarded as imperative that there shall be a check by meter readings on the takings in the coin-box.

4.2 At present 1, 2, 3 or 4 metering pulses are employed at automatic exchanges where multi-metering conditions exist to stop the subscribers' meters 1, 2, 3 or 4 units according to the value of the call made.

The value of calls originated on any particular line by an ordinary subscriber can be readily ascertained from the meter readings provided the value of calls to the fourth unit fee progresses in equal steps. (At present they are 1d., 2d., 3d. or 4d.)

In the same manner, so long as call office charges progress in equal steps, e.g. 2d., 4d., 6d., 8d. or 3d., 6d., 9d., 1/-, the value of such calls could readily be obtained by doubling or trebling the difference between successive meter readings but in fact the fees for local calls from call offices are at present 2d., 4d., 6d., and 7d. In the case of four-unit fee calls therefore, a discrepancy between the meter readings and the actual takings in the box will arise inasmuch as the meter pulses will record 4 units on the meter (4 x 2 = 8d.) whereas the actual fee will be 7d.

4.3 Under present conditions a precise reconciliation between collections from the coin box and recorded dues is, for various reasons, impracticable. The dialling of the 4 units (7d.),

/though

though such calls are comparatively few, will result in an added discrepancy and we understand that there would be objections to the acceptance of this additional source of error even if a self sealing coin box be ultimately adopted.

4.4 The simplest solution would be to increase the fourth unit fee to 8d. but this would impose on the administration the necessity to maintain call office fees on a scale of equal steps composed of pennies. (The use of half-pennies in public coin boxes has not been envisaged.)

4.5 An alternative solution, which would permit of complete flexibility in regard to tariff charges up to a given maximum, would be to arrange for the generation of meter pulses over the full range of possible fees, say 1d. to 8d. The difficulties of arranging this are set out in paragraph 5 Appendix 1.

5. ENGINEERING CONSIDERATIONS

The practicability from an engineering view point of adopting Scheme (c), with or without the flexible metering arrangements referred to above, is dealt with in detail in Appendix I. The general position is that, assuming the design of a satisfactory coin-box mechanism and a reliable means of relaying metering pulses thereto, no undue technical difficulty is foreseen in extending multi-metering facilities to coin-box users, except possibly at U.A.X.'s 12 and 13 on accommodation grounds. If, however, flexible metering arrangements are essential serious technical difficulties at all but Director exchanges would arise. In either case there would be serious engineering objection to increasing the complexity and fault liability of the plant and, in the case of U.A.X.'s, to the consequential departure from the present uniformity and interchangeability of standard items of equipment.

6. FINANCIAL CONSIDERATIONS

6.1 The introduction of multi-metering for coin-box traffic would lead to certain operating staff savings. No records exist of the distribution of coin-box traffic over the local fee ranges and the same distribution as for ordinary subscribers has, therefore, been assumed. The staff saving in respect of call-office traffic has been estimated from this distribution using figures of national call-office revenue, but it is necessary to assume a wide margin of non-attainability in practice, since the saving will be spread over individual exchanges and through-out the day. With these assumptions it is estimated that the staff savings in respect of those Call Offices which are connected with Automatic Exchanges would be approximately:-

70 operators for the year 1945 (30,000 call-offices estimated)
100 operators for the year 1950 (40,000 call-offices estimated).

At an annual cost of £325 per annum per operator this represents an operating saving at 1950 of approximately £32,500 per annum or about 16s. per call-office line.

In addition there would be some savings in operating positions, accommodation, etc., but no attempt has been made to estimate the value of these; they would not materially increase the foregoing figures.

6.2 Details of the engineering costs involved in the introduction of Scheme (c) are given in Appendix II. The total annual additional cost is estimated to be nearly £8 per line or about £7 if it be decided that flexible metering facilities can be dispensed with.

6.3 The introduction of Scheme (c) would, under these estimates, involve an additional expenditure of some £217,000 per annum to convert existing boxes and this would increase to a figure of about £290,000 in 1950 (approximately £187,000 and £250,000 if flexible metering arrangements are excluded.)

6.4 The costs given in the previous paragraph relate of course only to boxes at present connected with Automatic Exchanges or expected to be connected by 1950. Assuming complete automation, the annual cost in 1950 of providing multi-metering facilities at Call Offices (estimated at 60,000) would be about £450,000 (or £390,000 if flexible metering arrangements were excluded) and this cost would rise as the number of kiosks increased.

6.5 A very rough investigation into the annual charges for Schemes (a) and (b) show that those under (a) are likely to be heavier than Scheme (c). Those under Scheme (b) will be slightly lower but the annual charges in 1950 (assuming full automation) would probably reach about £300,000 - £350,000 per annum.

7. CONCLUSIONS

7.1 The estimated cost of introducing multi-metering on coin-box circuits is out of all proportion to any advantages likely to accrue either to the public or to the Post Office. Apart from the economic aspect, however, we have reached the conclusion, after careful consideration of the position, that the introduction of the facility would be undesirable from the service aspect owing to the serious increase in fault liability which would result from the introduction of a necessarily complicated coin-box mechanism. Further, provision of the facility would increase the complexity of switching and testing equipment to an undesirable extent and would commit the Post Office to the necessity of modifying or replacing already complex equipment to meet future changes of tariff both as regards steps in units of charge and in distance. We recommend, therefore, that the facility of multi-metering from coin boxes should not be provided.

7.2 As over 95% of coin-box traffic within the local fee ranges consists of first (92.0%) and second (3.5%) unit calls, we have considered whether it might be practicable to provide equipment to allow call-office users to dial the first and second unit fee calls for themselves while continuing to seek the aid of an operator for third and fourth unit calls. Such a scheme would, however, have repercussions on present trunking arrangements and we have not been able to devise any method to overcome the difficulties involved.

8. We are pursuing our investigations into the question of the self-sealing coin-box and other improvements of a minor nature and will report further in due course.

(Sgt.) H.A. NORTON
(Chairman)

on behalf of the Study Group.

July, 1945.

Coin Box Study Group
Multi-fee Dialling from Call Offices
(Engineering Considerations)

1. GENERAL

This memorandum discusses the practicability of providing facilities for coin box users to originate multi-fee calls.

The scheme under consideration is designed to record the number and type of coins inserted in the coin box, the set up subsequently being checked against multi-metering pulses relayed back to the coin box over the line; should the check prove correct the pressing of Button 'A' will deposit the coins and enable the user to speak whereas if the incorrect fee has been inserted the pressing of Button 'A' will perform the present function of Button 'B' releasing the connection and refunding the coins.

The practicability of including flexible metering arrangements to cater for possible future changes in call office charges is also discussed.

2. TRANSMISSION OF FEE CHECKING PULSES TO COIN BOX

The use of leg (single line) signals for relaying the meter pulses to the coin box for fee checking is not viewed favourably owing to the risk of interference with other circuits.

The use of reversals of polarity would entail the provision of an additional bridge in the subscriber's line circuit which is to be deprecated on both transmission and signalling grounds.

As an alternative preliminary tests have been conducted on a circuit arrangement employing pulses of 17 cycle ringing applied to line in a balanced manner.

This scheme appears to offer a satisfactory compromise but the power available for operating the electro-mechanical device at the coin box, and the resultant force for operating the mechanism will be small, i.e. 50 - 60 grams.

The practicability of the scheme will largely depend on the design of the coin box mechanism. Field trial tests to determine the extent of interference (if any) will also be necessary.

3. MODIFICATIONS TO EXCHANGE EQUIPT. TO UNBAR ROUTES TO COIN BOX USERS

The modifications to existing exchange equipment to unbar routes to coin box users may be summarised as follows:-

(a) DIRECTOR EXCHANGES. No circuit modifications involved but fairly extensive grading changes will be necessary to combine ordinary and barred trunk selector levels. Vertical marking banks will require to be fitted to barred trunk group of selectors where not at present existing.

(b) NON DIRECTOR MAIN EXCHANGES. Assuming the adoption of the new proposals for multi-metering for ordinary subscribers the modifications will relate mainly to trunking re-arrangements as follows:-

- (i) Where there are no excess fee manual exchanges level 8 of the barred trunk group of 1st selectors will require to be commoded to level 8 of the ordinary group.
- (ii) Where there are excess fee manual exchanges a separate barred trunk group of 2nd selectors and one or more separate groups of 3rd selectors will be necessary depending on the number of manual exchanges and relative fees.
- (c) NON DIRECTOR SATELLITE EXCHANGES. Circuit modifications involving substitution of one relay and addition of another and fairly extensive wiring changes.
- (d) U.A.X. NO'S 13 AND 14 Minor circuit modifications.
- (e) U.A.X. NO'S 7 AND 12 A special difficulty arises at these exchanges owing to the present method of discriminating between coin box and ordinary lines, viz, battery and earth connected actors respectively.

Since this discrimination will continue to be necessary for '0' level calls it follows that a means must be provided for converting battery pulses to earth pulses for coin box calls to unbarred routes.

This can be achieved by the addition of one relay, but unfortunately in the case of the U.A.X. 12 the relative relay mounting plates are already full to capacity. Hence it would be necessary to mount these relays remotely with consequent accommodation and cabling difficulties.

The alternative would be to embark on re-design of the outgoing relay set.

4. ACCOMMODATION FOR AUXILIARY EQUIPMENT

No difficulty is anticipated in finding suitable accommodation at Director and non-director exchanges for the equipment for relaying motor pulses.

The position at U.A.X.'s is not so favourable and the respective difficulties are as follows:-

- (a) U.A.X. No. 12 A total of 6 auxiliary equipments (1 per 1st Selector) each consisting of a minimum of 3 relays will be required plus one additional relay for each outgoing relay set (see 3c)

Alternatively the equipment may be fitted on a per line basis. The normal equipment at this U.A.X. is of the jacked-in type and where the exchange is fully equipped no rack space is available. Hence it would be necessary to mount the auxiliary equipment on a specially constructed unit - possibly mounted on the wall to which there would be serious objections from a cabling and maintenance point of view.

- (b) U.A.X. No. 13 A total of 32 auxiliary equipments (1 per 1st selector) each of a minimum of 3 relays will be required.

Alternatively the equipment may be fitted on a per line basis. Assuming a fully equipped exchange no spare rack capacity exists on the selector unit. Mounting space could possibly be found on the junction relay set rack which is built up in accordance with exchange requirements but this is not desirable owing to cabling difficulties.

(c) U.A.X. No's 7 and 14 Only in exceptional circumstances would accommodation difficulties be encountered.

5. MODIFICATIONS TO EXCHANGE EQUIPMENT TO PROVIDE FLEXIBLE ARRANGEMENTS FOR METERING

(a) DIRECTOR EXCHANGES It is evident that the simplest scheme for complete flexibility in the matter of metering to cater for possible future changes in call office charges would be to generate pulses in multiples of one over the full range of possible fees, say 1d., to 8d.

Such an arrangement would however, result in calls being recorded in terms of total call fees (in pence) but not the number of actual calls.

The scheme could conveniently be introduced at Director exchanges by substituting the existing meter pulse machines (Normal and stand-by) by machines designed to generate pulses equivalent to the full range of call office fees. It would, of course, be necessary to determine in advance what the maximum possible charge would be.

Assuming that the maximum fee is 8d. the additional time required to effect metering of such a call would be 1.6 secs = approx: 6 secs overall and this would involve a modification of the circuit element designed to obviate clipped impulses.

Where excess fee routes of more than one value are trunked from 2nd or 3rd Code selectors it will also be necessary to provide segregated groups of such selectors for coin box traffic as the relation between fees for ordinary and coin box subscribers may be changed from time to time.

The extent of such work is indeterminate in the absence of trunking information in respect of multi-metering up to the 4 fee area.

(b) NON DIRECTOR EXCHANGES The case of non director exchanges has not been examined in detail but it is apparent that even if the proposed simplified scheme of multi-metering is adopted the provision of this additional facility, though feasible, will result in considerable added complexity and cost as compared with Director exchanges.

(c) U.A.X's At U.A.X's 7, 12, 13 and 14 the application of 1, 2, 3 or 4 pulses to the meter is determined by the pre-operation of one or more of three relays depending upon the particular routing of the call and not under the direct control of level parking equipment. Hence, the schemes envisaged for Director exchanges is not applicable.

Short of embarking on complete re-design of existing equipment the only solution appears to be to arrange for pulse counting equipment to be associated with the meter wire of each coin box line and to translate the existing 1, 2, 3 or 4 pulses as the case may be into train of pulses of the appropriate call office charge and in turn apply these to the meter.

The pulse counting equipment would consist of a minimum of 6 relays per line and in addition means would have to be provided for extending the range of generated pulses from 1 - 4 to say 1 - 8.

At U.A.X's 7 and 14 this would only involve a change of meter pulse machines but at U.A.X's 12 and 13, where meter pulses are generated by a uniselector, major modifications would be involved.

/The

The accommodation difficulties at U.A.X's 12 and 13 referred to in 4 (a) and (b) would be accentuated to such a degree as to become almost insuperable for practical purposes.

6. MAINTENANCE CONSIDERATIONS

From a maintenance viewpoint the standard of service given by unattended call offices is far from satisfactory, and must necessarily be so owing to the high fault rate resulting from wilful damage, misuse, subjection of equipment to extremes of temperature and humidity variations etc, in the absence of any change of policy in regard to provision of attended as against unattended call offices it is strongly considered that the coin box equipment should be kept as simple as possible and that the user should be enabled by the simplest possible operation to obtain the services of an operator for the purpose of setting up a call. The aforementioned fault susceptibilities will be increased by any further complication of the coin box mechanism and the scheme cannot therefore be viewed with favour from an engineering maintenance viewpoint.

7. CONCLUSIONS

Summarising the foregoing it may be said that assuming the design of a satisfactory coin box mechanism and a reliable means of relaying metering pulses thereto the extension of multi-metering facilities to coin box users does not present any undue technical difficulty but may be precluded at U.A.X's 12 and 13 owing to lack of accommodation.

On the other hand the inclusion of flexible metering arrangements would considerably enhance the cost of the scheme: would present serious technical difficulties at all but Director exchanges and would most probably raise insuperable accommodation difficulties at U.A.X's 12 and 13.

Furthermore, there are serious engineering objections to increasing the complexity of U.A.X. equipment and to the consequential departure from the present uniformity and interchangeability of standard items of equipment.

From the maintenance viewpoint any increase in the present complexity and vulnerability of call office equipment is to be deprecated since it is felt the result will be to bring the public service into disrepute.

May, 1945.

COIN BOX STUDY GROUP
MULTI-FEE DIALLING FROM CALL OFFICES
ESTIMATE OF ENGINEERING COSTS (SCHEME C)

1. Coin Box Costs.

It will be clear that the primary cost will be in respect of that equipment which is provided on a line basis, i.e. the coin box equipment. As a result of a consideration of the facilities required to be given by the new mechanism and a detailed study of maintenance charges of comparable equipment and assuming a 50% increase in capital cost it is estimated that the additional annual charges will be of the order of £6 per coin box line.

2. Exchange Equipment Costs.

Based on a study of present multi-metering facilities at four London Director exchanges the estimated average additional annual charges in respect of exchange equipment would be of the order of £1 per coin box line for the provision of multi-metering facilities with a further addition of 14/- per line if flexible metering facilities were to be included. As an offset to this there would ultimately be some saving in 'O' level relay sets; manual board equipment etc., but this economy would not be realised unless or until coin box users made full use of the multi-metering facilities.

It can be said that the costs in respect of non-director exchanges would be no less than those quoted for Director exchanges and would probably be much higher.

This would apply also to U.A.X's if flexible metering facilities were to be provided (assuming, of course, that accommodation were available).

The tendency is for the exchange equipment costs to fall as the number of coin box lines increases.

May, 1945.

Coin Box Design Study Group

Minutes of Second Meeting - 9th August, 1954.

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S Bch	Mr. A. V. Leaver	ITD/SSB
Mr. S. W. Dobbs	ITD/PB	Mr. C. G. Osmond	PD/IB
Mr. L. G. Fox	POEF & SDWC Staff Side	Mr. E. S. Pritchard	AGD/TTB
Mr. H. E. Francis	ED/Tp, Bch	Miss N. Whitelaw	PCDWC Staff Side
Mr. S. L. Helman	ED/S Bch		

Mr. D. W. Burtenshaw ITD/CB (Secretary)

Mr. Brurby AGD/TCB and Mr. E. W. Jones ITD/CB also attended.

1. The Chairman welcomed Mr. Fox on his first attendance on the Study Group and mentioned that Mr. Jones was substituting for Mr. Lloyd on annual leave.

2. The Minutes of the 1st Meeting were agreed and the following matters arose.

3. Minute 4. Mr. Francis said that enquiries were still being made by the Engineering Department, but he hoped it would be possible to produce a Committee Paper by the end of August. Miss Whitelaw referred to the offer she had made at the previous meeting to obtain information through trade union contacts in other countries and said that preliminary enquiries had been made. The Chairman thought that as there was doubt about the kind of information required by the Study Group, Miss Whitelaw should suspend further enquiries for the time being.

4. Minute 5. The Chairman mentioned that the list of items which should receive the attention of the Study Group had not been added to, and asked for comments. Mr. Dobbs referred to the difficulty encountered because of children making false emergency calls by the "999" service and then leaving the kiosk; he thought that the dial should be fixed in a higher position. The Chairman thought that that was a matter to be considered under item (h). In reply to Mr. Pritchard, the Chairman said that change-giving machines would be considered under item (e). Miss Whitelaw presented a Press cutting from the "Financial Times" which described an American device for illuminating the dial automatically when the receiver was lifted. The matter was left to be dealt with under item (h).

5. Minute 7. Mr. Francis said that the Engineering Department had examined the three possible schemes described in the Interim Report of the 1945 Coin Box Study Group, and scheme B* was considered to have advantages over scheme C**

/if

* Installation of equipment in the call office designed to transmit pulses to the exchange in response to the coins inserted and provision of equipment at the exchange for checking these pulses for the relative call.

** Installation of equipment in the call office designed to record mechanically the number and type of coins inserted and of equipment at the exchange for relaying the appropriate meter pulses back to the coin box to operate fee checking mechanism.

Minutes of 1st Meeting

Facilities in other Countries

Main items to be considered

Report on Multi-Fee Dialling Facilities (C.P. No. 1)

if, subscriber trunk dialling were also taken into account and a new coin box were to be reduced. There would be fewer points where complex equipment would be needed and the problem of maintenance would be eased. The type of coin box would be comparatively simple and probably the scheme would be the cheapest. Mr. Osmond said that he supported the provision of a simple type of coin box, because the problem of fraud would thereby be minimised. The Chairman asked if any idea of the cost of the scheme could be given. Mr. Francis replied that the Engineering Department could not give accurate figures as it was not certain which metering scheme would be adopted, but he did not think that the cost would be much greater than that envisaged by the 1945 Study Group. Further discussion ensued on the extent to which the scheme might ultimately be applied and the Chairman thought that the matter should be left to be dealt with under item (i).

6. Minute 11. The Chairman reported that a letter had been sent to the C.O.I., who had replied that if the Post Office could state their detailed requirements a useful social survey could probably be made. The matter was left in abeyance until the Study Group had more definite information about its requirements. Miss Whitelaw said that she was still awaiting replies to her enquiries about staff views. Mr. Jones said that the Travelling Observation Supervisors had only minor points to make which had no real bearing on a new design of the coin box.

Design of Coin Box -
Wishes of the Public

7. Minute 8. Mr. Jones stated that the expected operating and switchboard equipment savings arising from the introduction of multi-metering from coin box lines had been recalculated at 340 telephonists and 320 positions, valued at £240,000 per annum, including overheads. The figures applied only to the present number of coin boxes at automatic exchanges and assumed multi-metering up to 4 units with 10% assistance traffic to the manual board. There would be some additional savings on accounting work, but these would be relatively small and could not readily be calculated. If trunk calls were dialled it was estimated that there would be additional savings of 190 positions and 650 telephonists valued at £420,000 per annum; this was on the basis of the existing operating procedure and assuming that 20% of trunk calls would be routed to the manual board for assistance. Miss Whitelaw suggested that the percentage of manual board traffic might be higher, because she thought that as more facilities were offered more difficult calls would be encountered, thereby creating a need for greater assistance. Mr. Brumby said that the overall savings quoted represented a figure of about £7 per coin box per annum. Mr. Leaver thought that the savings per box would be greater in the urban areas than in the rural areas but that the cost per box of providing the facilities would be greater in the rural areas because of the smaller number of boxes on each exchange. He therefore suggested that the Study Group should consider sub-dividing the estimated savings into two broad groups, (1) Director and Non-Director exchanges and (2) U.A.X's and relate them to the corresponding costs. Mr. Jones said that separate figures for savings were not available and although it was possible that figures for timed traffic could be obtained from the trunk call analysis, he was doubtful if the information could be obtained for untimed calls. The Chairman thought that as a long-term project, endeavour should be made to obtain the figures. Mr. Jones referred to the question of obtaining the savings for the various charge steps and said that it had not been possible for untimed calls. For timed traffic, calls for charge steps D and E would account for 20% of the additional

Savings by introduction
of extended dialling.

savings and if calls to charge step F were included, the figure would be 30%. Mr. Francis said that the engineering costs for full trunk dialling, including the present multi-metering range would probably be about the same as for multi-metering alone.

Coin Box Buttons (C.P. No.2)

8. Mr. Leaver introduced Committee Paper No. 2, "Buttons on Coin Boxes" which had been prepared in conjunction with the engineering representatives. The following points arose:-

Paragraph 2. After some discussion the Study Group felt there were doubts about advantages (b) and (c), and thought the main advantage was item (a) i.e. the deposit or return of the coins being controlled by the caller and no special electric arrangements being required at the exchange. In considering the disadvantages, Mr. Osmond thought that item (i) was important because of the different operating processes which had to be learned by people who travelled to various parts of the country. Mr. Leaver emphasised that the Department had no information that the public were finding the existing boxes complicated to operate. As regards the drag on switchboard operating mentioned in (ii) it was thought that the seven seconds disconnection of the calling subscriber, following the operation of Button B, was also an important item. Mr. Leaver said that disadvantage (iii) (a) was in fact being experienced, as a recent case of fairly widespread abuse had shown; but it was thought that the number of such cases represented only a very small percentage of the total calls made. Following further discussion the Chairman said that the main advantage of a coin box with buttons seemed to be that the subscriber had control of the money, and the main disadvantage was the fraud aspect.

Paragraph 5. In discussion of the Engineering considerations, Mr. Francis said that with a box without button A there were problems to be overcome on calls routed via an operator, e.g. a supervisory signal was returned on most calls routed via an intermediate switchboard and to prevent premature deposit of coins in the cash box before the called subscriber answered, the signal would have to be suppressed. There were various types of equipment to be considered and it would be some months before full information was available. Mr. Helman said that if it was decided to develop a coin box without Button A, a field trial would be necessary before any conclusions could be reached. Mr. Fox felt that there was more wrong number trouble than the Study Group supposed and the abolition of Button A and the automatic deposit of money when a distant subscriber answered would give rise to difficulties. He further mentioned that call office installations were more liable to damage than ordinary subscribers' installations and there was, therefore, a greater risk of coin box users meeting with faulty conditions. This point should be taken into consideration in any new design for a coin box. Mr. Francis suggested that to overcome the risk of callers losing the whole of a call charge, it might be possible, given a suitable tariff structure, to arrange for only a portion of the charge to be put in the coin box initially and the remainder later. He said in reply to a query by Mr. Leaver that considerations on the design of a buttonless box were related to, but not dependent on, decisions on subscriber trunk dialling. Any final decisions would have to await cost figures. Mr. Francis then suggested that the best solution might be to adopt a post payment coin box. This would considerably simplify the engineering arrangements, would reduce costs and also eliminate many of the fraud aspects of prepayment boxes. It would however have the disadvantage that dialling would be possible over long distance circuits without putting money in the box and callers

/would

would be able to receive short messages without payment unless a tone were put on the line when the called subscriber answered, to indicate that the money should be inserted. In that event, however, callers would lose their initial deposit on wrong number calls. If, however, such a box could be accepted and the penny slot was replaced by a 3d. slot the engineering problems would be considerably eased. After further discussion the Chairman said that although at first sight a postpayment coin box appeared attractive, there were many problems to be considered and he asked Mr. Francis if he would prepare a Committee Paper on the subject.

9. The Chairman said that 85% of calls from coin boxes were unit fee calls and it was important to bear this in mind in deciding the facilities to be provided in the redesigned coin box. In the past the unit fee charge had been adjusted in penny stages, the last change in October 1951 being an increase from 2d to 3d, but withdrawal of the penny slot would reduce the flexibility for the adjustment of the call charge. Mr. Francis said that if provision were to be made for the acceptance of pennies in the new coin box this would present almost insurmountable engineering problems in connection with the application of trunk dialling from coin boxes. The Engineering Department favoured the adoption of the threepenny piece as the unit coin for coin boxes and felt that in the long-term, it offered distinct advantages. It would simplify the problem of the transmission of pulses for the timing of calls, and in addition there would be advantages from the coin collecting point of view, as there would be less weight and bulk of coins to be collected. He said that adjustments in call charges could be achieved by timing local calls as well as trunk calls, and varying the duration allowed for a unit fee, e.g. the unit fee call could be restricted to, say, three minutes duration for 3d. and then to two minutes if it was necessary to increase the revenue from call charges still further. The Chairman asked whether it would be possible to introduce timing of local calls from coin boxes without having also to time local calls for ordinary subscribers. Mr. Francis thought that that would be possible. Mr. Leaver expressed doubt whether restriction of the duration of the unit fee call would give more than a marginal increase in revenue. He said that local calls in Hull were diverted to the operator after six minutes had expired and his recollection was that only a relatively few callers said for additional time; but this could be confirmed with the Hull Corporation. The Chairman asked that this should be done; and he also asked that information should be obtained from the Royal Mint about the future of the threepenny piece and the problem of the silver threepenny piece in Scotland.

Need for Penny slot

10. The next Meeting was arranged for 2.30 p.m. on Friday, 8th October, 1954.

/Action

<u>Action to be taken</u>	<u>Minute No.</u>	<u>Action</u>	<u>Action by</u>
	7	Sub-division of estimated savings from introduction of extended dialling.	ITD/OB
	8	Committee Paper on a Post Payment Box.	ED
	9	Restriction of local calls - enquiry of Hull Corporation.	ITD/SSB
		Future of threepenny piece	ITD/SSB

COIN BOX DESIGN STUDY GROUP

BUTTONS ON COIN BOXES

1. Existing coin box. Briefly, the working of the existing prepayment coin box on automatic exchanges is as follows:-

- (a) On lifting the telephone receiver dialling tone is heard but a call to another subscriber cannot be dialled, because the dial is shortcircuited, until 3 pennies are inserted in the box (calls to 0 and 999 can, however, be dialled without inserting coins).
- (b) The insertion of three pennies removes the short-circuit from the dial but puts a short-circuit across the transmitter so that the caller cannot speak to the called number.
- (c) When the called number answers the call is metered; the caller can hear his correspondent but cannot speak until he presses button A, which removes the short-circuit from the transmitter and deposits the coins in the coin chamber.
- (d) Depression of button B disconnects the line for 7 seconds, breaks down the connection and releases the coins into the return chute.
- (e) On calls via the auto-manual board the caller inserts the coins under the direction of the operator who checks them by the gong sounds. This is generally done before the call is set up to save junction and trunk time; it is also of advantage from the operating point of view since the operator can leave the circuits to deal with other calls while the called party is being rung and the caller can promptly press button A when his correspondent answers.

2. The advantages and disadvantages of the present buttons are:-

Advantages

- (a) The deposit, and return, of the coins is under the control of the caller and no special electrical arrangements are required at the exchange either on the automatic equipment or the switchboard.
- (b) If a caller obtains a wrong number, in most cases he does not lose his money but can make further attempts and subsequently regain his coins if the call is ineffective.
- (c) The cost of the coin box and the associated equipment is probably less than it would be if no buttons were provided.

Disadvantages

- (i) The operation of the box is complicated from the caller's point of view although there has been little or no complaint to this effect in recent years.
- (ii) There is a slight drag on the operating procedure in exchanges due to the need to make it clear to callers when to press the appropriate button.
- (iii) Callers are able to make calls without payment of:-
 - (a) Pre-arrangement with the called party and receiving a message but not speaking.
 - (b) Speaking through the earpiece or via the coin transmitter.

/(iv)

- (iv) Discrepancies between the exchange records and coin collections arise due to the conditions in (iii) and to the fact that callers regain their money on wrong connections.
- (v) The start of conversation is delayed until button A is pressed.
- (vi) Callers sometimes fail to press button B to regain their money on ineffective calls.

3. Alternative arrangements. In the design of a new coin box the following alternatives should perhaps be considered:-

- A. Retention of the existing buttons A and B
- B. Abolition of buttons and the provision of electrical means for ensuring the automatic deposit, or return, of coins.
- C. Provision of one dual purpose button to serve both the functions of the present A and B buttons (see C.P.I., para.2.4.)
- D. Provision of one button which would deposit the coins on effective calls, refundment on ineffective calls being effected automatically.
- E. Provision of one button for the refundment of coins on ineffective calls, the deposit of coins on effective calls being arranged automatically.

4. The following summary shows the extent to which the advantages and disadvantages stated in paragraph 2 are met by these alternatives:-

Alternative A. As stated in paragraph 2.

Alternative B. Advantages (a) to (c) would be lost - as regards (b), wrong number complaints to the switchboard would be increased and there would undoubtedly be more work in dealing with refundments, particularly in the range of dialling from coin boxes was extended. Disadvantages (i) and (iii) to (vi) would be overcome, and although the slight drag on operating referred to in (ii) would be removed it would probably be necessary to introduce an additional operation at the switchboard on a certain proportion of the calls.

This design would probably make it possible to use a system under which coin box calls could be operated in a manner identical with that for ordinary calls (the estimated additional cost of operating coin box calls is of the order of £700,000).

If a change would otherwise have to be made in the use of buttons, this alternative would have added merit. A change to another type still using buttons would be bound to lead to confusion.

Alternative C. Advantages (a) to (c) would not apply. As regards (b) a wrong number connection would produce the same electrical conditions as an effective call and therefore the coins would be deposited in the coin box - the remarks under alternative B would thus apply. Disadvantages (ii), (v) and (vi) would remain, (iii) and (iv) would be removed and as regards (i) the box would be simpler to operate.

Alternative D. Advantages (a) and (c) would not apply. The position in regard to advantage (b) and disadvantages (iii) and (iv) is not clear without further study. Disadvantages (ii) and (v) would remain but (vi) would be removed, and as regards (i) the box would be simpler to operate.

Alternative E. Advantages (a) to (c) would not apply. As regards (b) the remarks under alternative C apply. Disadvantages (ii) to (v) would be removed but (vi) would remain. As regards (i) the box would be simpler to operate.

5. Engineering Considerations.

It should be emphasized that any system which enables a subscriber to complete long distance calls, involving the expenditure of a shilling or two, will without doubt increase the possibility of fraud and the designer must bear this point very closely in view.

It is assumed in the following paragraphs that the box will deal with multi-metered calls and with trunk subscribers dialling.

A Button

If no "A" button is provided, a signal that the distant subscriber has answered must be returned to the call box to cause the money placed in the box to be passed to the cash box. This involves an electrical device to deposit the coins. There would be no difficulty in providing a signal from the exchange to deposit the money on directly dialled calls, but on manually controlled calls the operator would have to press a key to give the necessary signal. This might be done by the operator starting the timing device or by the use of a special key.

If an A Button is provided, the conditions will be as with the present box. If the user has put an appropriate amount in the box for the required call, he will receive ringing tone from the distant end and when an answer has been received, Button A may or may not be operated at the will of the caller. This introduces the possibility of fraud which may be more frequent when long distance calls can be dialled directly.

The Engineering Dept. is of the opinion at present that the A Button should be eliminated, mainly on the grounds that its retention introduces the possibility of quite a number of frauds.

B Button

The elimination of the B Button can be done by arranging that the placing of the hand microphone on the rest returns any money to the caller not deposited in the coin box. There are two methods in which this might be done. If the problem of switchhook dialling does not have to be considered, the more economical method can probably be used. Again it is probable that the inclusion of this button may well introduce some form of fraud and the Engineering Dept. would prefer that one is not provided.

The proposal, in C, that one button should replace both A and B Buttons is, in theory, possible, but it is not considered to be an economic proposition.

Another possibility is the use of a post payment type box, but it appears to have operational disadvantages.

6. Factors concerned with the introduction of a new coin box. Before reaching a decision on the question of buttons the Study Group should perhaps consider the practical problems associated with the introduction of a new coin box. The question of the extent to which uniformity of operation can be departed from both the callers and the exchange operator's point of view, and over how long a period this state of affairs can be allowed to obtain, should be considered. Alternatively, the merits of any new design should be weighed against the cost of replacing existing coin boxes - there are at present over 120,000 call offices and subscribers' coin boxes in use - as well as the expense and time required should modification of the exchange equipment be involved.

Coin Box Design Study Group

Minutes of 3rd meeting - 14th December 1954

PRESENT:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. B. E. Hearn	AGD/TCB
" D. W. Burtenshaw	ITD/PB	" S. L. Helman	ED/S
" E. G. Crisp	ITD/OB	" A. V. Leaver	ITD/SSB
" S. W. Dabbs	ITD/PB	" E. S. Pritchard	AGD/TFB
" L. G. Fox	POED. & SDWC., Staff Side	Miss N. Whitelaw	PODWC, Staff Side
" H. E. Francis	ED/TP.		

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman welcomed Mr. Hearn as an additional AGD member of the Group and Mr. Crisp who was taking Mr. Lloyd's place as the ITD/OB representative. Mr. Burtenshaw had moved to the Planning Branch and was being succeeded as Secretary by Mr. Lennox. He expressed the thanks of the Group to Mr. Burtenshaw for his services.

Minutes of
previous
meeting

2. Mr. Hearn questioned the figures of staff and position savings given in item 7 of the previous minutes. Under item 9 he noticed that the Chairman had given the percentage of unit fee coin box calls as 85 but the latest information from a return taken in the period September 1952 to March 1953 showed that the figure was 71%. The Chairman explained that the figures quoted in item 7 had been calculated by the ITD/OB in conjunction with the A.G.D.; he asked that they should be verified.

Visits abroad

3. The Chairman reported that the DDG had sent Messrs. Francis, Helman, Leaver and himself to Switzerland at short notice to have a look at the trunk dialling facilities and the coin boxes in use there. A report was being made to the DDG and it would be made available later to the Study Group. Mr. Francis had subsequently gone on to Germany and had taken the opportunity to look at the new coin box they were designing.

Threepenny
slot

4. Mr. Leaver reported correspondence between the Director and the Deputy Master of the Mint regarding the use of threepenny pieces in coin boxes. An assurance had been given that, provided the Mint had warning of the introduction of a threepenny slot, there would be an adequate supply of threepenny pieces in general use. The silver threepenny piece had not been minted since 1946 and was gradually being withdrawn from circulation; it would not, therefore, be necessary for the Group to take it into account. Mr. Francis did not foresee any difficulty in designing a mechanism to take a coin that was not round. He recollected that the two anna piece, a square coin, was used in Indian coin boxes. There was general agreement with the need for a threepenny slot but the Chairman said that the Study Group would have to decide whether it should replace the existing penny slot or be in addition to it.

5. Mr. Helman said that the coin slots to be provided had a bearing on the method of signalling from the coin box to the exchange to indicate that coins had been inserted. Under existing conditions, with dialling confined to unit fee calls, a simple mechanical condition was set up in the box when three pennies were inserted and that provided the necessary electrical conditions which allowed the caller to dial. As pennies were inserted into the box they struck a low pitched gong; silver coins hit a higher toned bell, the sixpence striking it once and the shilling twice. Thus on calls set up via the manual board the operator was able to differentiate between the coins inserted. Mr. Helman went on to explain that for multi fee dialling from coin boxes a uniform method of signalling for all coins would be necessary to enable the automatic equipment to count the value of the coins inserted. Electrical pulses would be transmitted with a tone equivalent for operator controlled calls; the number of pulses, in multiples of the basic coin unit, would depend on the value of the coin inserted. If the penny were to continue as the basic unit it would be signalled by one pulse and a shilling would be twelve pulses. If, however, threepence were to be adopted as the basic coin unit (represented by one pulse), a shilling would be only four pulses.

Need for a
penny slot

A slow rate of pulsing, about 5 pulses per second, would have to be employed to avoid making the equipment too complicated and expensive. The fewer pulses required with the threepenny basic coin unit would speed up the operation of the coin box and at the same time would make the checking of coins easier on operator controlled calls. The Chairman felt that an operator could distinguish up to 6 pulses of tone without difficulty but Miss Whitelaw foresaw difficulties if a number of coins were inserted quickly in succession. Mr. Fox questioned the need for a shilling slot; the shortage of shillings was well known but there were plenty of sixpences. He suggested the replacement of the shilling slot by one for two shillings. The Chairman thought that there would be some complaint at the loss of a facility if the shilling slot were removed, but it might be worth-while approaching the Mint at a later date on the question. Miss Whitelaw referred to the difficulty that would be experienced in timing the clearance of boxes if either the penny or threepenny slots could be used for local calls. Callers might try to pay for trunk calls in a combination of small copper coins.

6. The Chairman asked Mr. Helman to experiment with the capacity of the existing coin container when using threepenny pieces or a combination of pennies and threepenny pieces. The existing capacity with pennies was £2 10s. 0d. Mr. Francis said that with a buttonless prepayment box there would be a limit on the weight of coin that could be suspended and Mr. Arnold drew attention to the fact that the existing box could only hold 11 pennies in suspension.

7. The Chairman went on to say that if some minor adjustments were made to the existing coin box trunk tariff there would be no need to retain the penny slot but its abolition could result in less flexibility for adjusting local call charges in the future. It might well mean that the only change of local call tariff possible would be an increase from 3d. to 6d. The Swiss authorities had been questioned on the point, but the problem had not arisen with them because their call tariff had remained unchanged for 30 years. He asked if it would be possible to vary the revenue obtained from coin boxes by adjusting the period of time allowed for the unit fee. Mr. Francis said that, from the engineering

Flexibility
in charging

point of view, time adjustment presented little difficulty and it could be finely graduated. A change of time allowance would mean no more than the alteration of exchange common equipment. Mr. Leaver pointed out that a restriction on the duration of local calls from call offices was desirable on the grounds of public complaint at the length of time kiosks were occupied. There would be an increase in revenue if callers were encouraged to pay for additional time. He referred to the arrangement in Hull but thought it was no true guide because the period allowed was 5 minutes and that meant that callers rarely paid for additional time. The results might well be different if the time allowance for the initial fee were only 3 minutes. A record taken in 1953 showed that the average duration of calls from coin boxes in the daytime was $3\frac{1}{2}$ minutes and in the evening $4\frac{1}{2}$ minutes; 15% of calls exceeded 6 minutes in daytime and 22% in the evening. Miss Whitslaw said that complaints would arise from restricting duration if a coin box caller were waiting for a PBX extension; she had often experienced long delays from enquiry points at railway stations. The Chairman agreed that there would be difficulty with PBX extensions but he felt that the solution to that problem was not at the coin box but at the PBX. Mr. Francis thought it would be possible to stop the timing equipment when a call was extended by a PBX operator. Mr. Crisp said that he would scrutinise the Service Observation returns to see to what extent long duration calls were made from coin boxes to PBX extensions. Mr. Fox suggested that the difficulty might be overcome by adjusting the size of the unit fee area for a call from a coin box rather than limiting the time. The Chairman felt there was difficulties in that proposal but it could not be ruled out. He then asked the AGD representatives if they were satisfied that a box without a penny slot, designed to permit adjustment of call duration, would afford adequate flexibility for changing tariffs. Mr. Hearn said that so far as he could see the whole tariff structure would need to be based on the unit fee and he would like to make a study of the kind of structure envisaged. Threepence seemed to be too low for the unit basic fee under present conditions. His information was that the unit fee call from a coin box cost the Post Office nearly 5d. Mr. Pritchard confirmed that the margin, with the local call at 3d., was too narrow. Mr. Leaver argued that the 5d. included the cost of the call office installation; he did not think that the provision of coin boxes in isolated places should, of necessity, be borne by call office users alone but should be a charge on the service as a whole. Mr. Francis was quite satisfied that complete charging flexibility could be provided by means of time adjustment and he offered to prepare a committee paper on the subject for the next meeting. The Chairman said that he envisaged a unit fee charge of 3d. for 6 minutes at the outset with the period of time gradually decreasing as costs arose. At a later stage it might be desirable to increase the charge to 6d. and to restore the time allowance to 6 minutes.

8. There was general agreement that the penny slot should be abolished in the interests of simplicity of design of the coin box and the associated exchange equipment, factors which would have an important bearing on initial as well as maintenance costs.

9. The Chairman read a letter he had received from Miss Whitelaw giving the views of service observation supervisors on difficulties experienced with the existing coin box. They were:-

Difficulties
with the
existing box

1. In Birmingham a coin box user requiring a long distance call was asked to clear down and wait for recall. That arose from the transfer of the call to the long distance suite. Callers did not like it. (Mr. Crisp promised to look into the operating procedurs.)
2. Callers often inserted coins without listening for dialling tone and later complained to the operator that they could not get the number they had dialled.
3. Faults on coin box telephones were excessively high and there seemed to be a case for more frequent maintenance visits.
4. Operators frequently had difficulty in distinguishing the various coin tone signals; it caused subscribers annoyance to be asked to press button B and re-insert the coins.
5. The plan 5E system, provided at many rural scale payment post offices, led to difficulties. Members of the public often thought the box was out of order when in fact it was in use for transmitting telegrams from the scale payment office. (Mr. Dabbs said that a field trial of a circuit designed to overcome the difficulty of the control switch being left inadvertently in the wrong position was in progress.)
6. Callers sometimes removed the receiver and then started searching for coins so that the forced release condition had disconnected the dialling tone by the time they tried to dial the call.
7. Callers often had difficulty in seeing the number of the box shown on the label in the centre of the dial. (The number is also shown on the instruction card)
8. Unless they were prompted by the operator, callers often failed to press button A when the distant subscriber answered.
9. Many coin box users had little knowledge of the automatic tones and, as a result, experienced difficulties.
10. The 7 seconds release period provided by button B could lead to difficulties. On a call from a manual exchange extended to a trunk operator, a false clear was sometimes received. It would help the operator if a distinguishing tone could be connected to the line when button B was pressed.
11. As soon as the operator restored her speak key, conversation was possible without pressing button A. It was also known that conversation could be carried on if button A was half depressed; the money was returned at the end of the call by pressing button B.

The Chairman said that they were useful points and should be borne in mind when the various aspects of the new design were being considered.

Committee Paper 3
Foreign Coin box
systems.

10. Mr. Francis introduced Committee Paper 3 saying that the information available on coin boxes abroad varied from one country to another. He remarked that other countries did not provide kiosks so lavishly, particularly in rural areas, as did the British Post Office; it was an important point to be borne in mind when discussing maintenance costs. The Study Group then considered the Paper in detail, taking note of the trend of modern developments in other countries. It was evident that buttonless boxes were gaining favour and were in use, or being developed, in Denmark, Germany, Holland, Sweden, Switzerland and U.S.A.; postpayment buttonless boxes had been tried, or were in use, in three other countries. Many of the existing buttonless boxes were for unit fee calls only but in countries like Switzerland, Germany, Holland, Sweden and South Africa, where subscribers were able to dial multi-fee calls, the facility had been, or was being, extended to coin box lines. Postpayment working on automatic exchanges had been developed in some countries but little information was available of the experience which had been gained of that method of working.

NEXT MEETING

Friday, the 28th January, 2.30 p.m.

<u>Item</u>	<u>Action</u>
2 To verify figures quoted in items 7 and 9 of the 2nd meeting.	ITD/OB
6 To experiment with the capacity of the coin container using threepenny pieces.	ED/S
7 To scrutinise Service Observations to see to what extent long duration calls are made from coin boxes to PBX extensions.	ITD/OB
7 To prepare Committee Paper on a new method of charging for calls.	ED/Tp.
9.1 To examine the operating procedure used for transferring coin box callers from the local to long distance suites where single channel working is not in operation.	ITD/OB.

Coinbox Design Study Group
Foreign Coinbox Systems

1. This CP gives a summary of the information available in the Engineering Department on the coinbox systems used in other countries.

2. Pre-payment Systems

2.1 Denmark. A buttonless coinbox is used from which unit fee dialled calls can be obtained.

2.2 Germany. Both single button and buttonless coinboxes are in use for unit fee dialled calls. The button type coinbox can also be used for trunk calls completed via an operator, the deposit of the money being effected by depressing the button on the instruction of the operator.

A new system permitting the dialling of multi-fee timed calls is on trial. Payment is made by 10 Pfg, 50 Pfg, and 1 DM coins which can be inserted in any order, and in any number within the capacity of the coin-chute. The coins suspended in the chute can be seen behind a plexi-glass pane. The words "please pay" are illuminated by a lamp behind the pane when money has to be inserted to set up or extend a call. The words "end of call" are illuminated when paid time has expired, and the call is then cut off. Depositing pulses are transmitted from the exchange after every 10-Pfg-worth of time, but on a unit-fee call (payable by 20 Pfg) actual deposit of coins is delayed until the end of the call. On multi-fee calls coins are deposited as expended, operation of the depositing mechanism being suppressed for the appropriate number of pulses after a 50 Pfg or 1 DM coin has been deposited. All coins remaining in suspense on clear-down are refunded. The coinbox is extremely complex and costly.

2.3 Holland. Both single button and buttonless coinboxes are in use for unit fee dialled calls as in Germany.

The Administration is understood however to be considering a design of buttonless coinbox, in which, to make a multi-fee call, the user may insert, for example, two 10-cent pieces and one 25-cent piece. Depending on the duration of the call, either 10, 20, 25, 35 or 45 cents will be deposited on clear-down, the remainder being refunded. If the call lasts for more than 35 cents-worth of time, all coins will be deposited. Further coins will have to be inserted if additional time is required.

2.4 Luxemburg. A pre-payment system allowing unit and multi-fee dialling has been in use since about 1936. The system has possibly altered since the war, but originally only 1 Franc coins could be used. Presumably, since the country is small, this restriction caused no difficulty. It certainly made for simplicity. A tone indicated when paid time was expiring on a multi-fee call and the user inserted a further coin if he wished to extend the call. If the user, having inserted a further coin on hearing the tone, actually hung up before the start of the next period, the unexpended coin was refunded.

2.5 Nigeria. Single and 2 unit fee untimed calls can be made from a buttonless type coinbox. In Lagos the present standard B.P.O. type coinbox is used.

2.6 Sierra Leone. Coinboxes are of the present B.P.O. type.

2.7 Portugal and Portuguese East Africa. A button type box is used.

2.8 Sweden. It appears that until recently coinboxes for automatic exchanges were arranged only for unit-fee dialled calls. An interesting feature of the coinbox was "open deposit" of the coin. The coin-slot projected above the box itself in such a way that the inserted coin could be recovered by the user at any time before it was automatically "uncashed" on answer of the call.

A trial was made in 1963 of a coinbox from which multi-fee calls could be

dialled. The coinbox accepts 10 ore, 25 ore and 1 Krona coins. A tone is given 10 seconds before the expiry of paid time and insertion of more money extends the call. Emergency calls are obtained by pressing a button. Insufficient information is available to describe how a user makes a call.

2.9 Switzerland. Designs of buttonless pre-payment coinbox providing for multi-fee dialling have existed since the 1930s and now almost all coinboxes provide this facility.

The value of each coin is signalled to a coin register at the exchange when it is inserted, at the rate of 5 pulses per second. The coin slots are closed during coin signalling, during dialling, and when the receiver is on the rest. Also the dial is locked during coin signalling.

If coins are inserted in excess of unit fee, a fee register is associated with the line and is stepped by the first pulse trains dialled. It is necessary for the user to have inserted exactly the fee required, for otherwise the settings of the coin and fee registers do not correspond, the call is blocked and tone is given to the user, and all coins are refunded on clear-down. The purpose of this restriction is to avoid discrepancies between meter records and coinbox takings.

Multi-fee calls are timed in 3 minute periods, and the initial insertion of coins must be sufficient for 3 minutes, plus the coinbox service charge. Pulses given on insertion of coins step not only the coin register at the exchange, but also an indicator at the coinbox, which shows what the charge will be for extending a call for a second and for subsequent 3 minute periods. The figures are not displayed until a shutter opens when the dial is first rotated off-normal, presumably because they show less than the sum inserted by the amount of service charge.

On an answered call the coins are deposited on clear-down or at the end of 3 minutes' conversation on a multi-fee call. At the end of 3 minutes on such a call, a recorded announcement directs the caller to insert the exact amount shown on the coinbox indicator, if he wishes to extend the call. He is allowed 40 seconds in which to do this and, if he does insert the correct amount within this period he is allowed 15 seconds in which to hang up and have his money refunded, in case the called subscriber has cleared meanwhile. Should the call last beyond this 15 seconds it is timed for another 3 minutes beginning from the time that the correct amount was inserted. If the correct additional fee is not inserted within 40 seconds, tone is given to the user and any coins he has inserted are refunded when he clears. Deposit and refund are effected by 9CV positive pulses connected at the exchange to one or other of the line wires.

On calls dialled to a manual board from a coinbox the operator hears two pips of tone when she answers. (When the caller inserts coins she hears the coin signals converted to pulses of tone.) The connexion is reversed to associate special apparatus for control of coin deposit and refund. Deposit is effected on completion of the call when the operator withdraws the plug, or by operation of the metering key; refund is by operation of the ringing key, or in some cases automatically on clear-down. The only non-metered coinbox calls are those to the equivalent of our "EMG" service points. The amount of assistance traffic is negligible, the policy being to discourage it.

2.10 U.S.A. A buttonless coinbox is in general use from which unit fee dialled calls can be made. It is understood that trials of a multi-fee box are being made but no details are available.

3. Post-payment Systems

3.1 Belgium, Canada, Denmark, Germany, Holland and the U.S.A. have all, it seems, at some time used post-payment coinboxes from which, however, only unit fee calls could be dialled, but it is not known to what extent they are still in use.

3.2 South Africa. Buttonless coinboxes are in use from which 1-, 2- and 3-unit fee calls can be dialled. A fee register at the exchange is set according to the digits dialled. The first insertion of coins is made on answer of the call, as in the system described in CP4, and the amount inserted must be sufficient for 3 minutes at the appropriate fee. Further payment can be made to extend a call in periods of 3 minutes.

COIN-BOX DESIGN STUDY GROUP

Minutes of 4th meeting - 28th January 1955

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. A. V. Leaver	ITD/SSB
" E. G. Crisp	ITD/OB	" C. G. Osmond	FD/IB
" S. W. Dabbs	ITD/PB	" E. S. Pritchard	AGD/TFB
" H. E. Francis	ED/TP	Miss N. Whitlaw	POD&C Staff Side
" B. E. Hearn	AGD/TCB	Mr. G. Wrangmore	POED & SD&C Staff Side
" S. L. Helman	ED/S		

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman welcomed Mr. Wrangmore of the POEU who was taking the place of Mr. Fox.

Minutes

2. The minutes of the third meeting were agreed.

Matters arising

3. (a) Mr. Hearn confirmed that the figures quoted in paras. 7 and 9 of the minutes of the second meeting were correct. They referred to the number of calls whereas the figures he had in mind referred to the revenue value of those calls.

(b) Mr. Helman said that he had carried out experiments with the capacity of the existing coin container, using threepenny pieces. He had found that it would take £10 worth of coin weighing 12 lb. but if pennies and threepenny pieces were mixed at random the capacity was 24. 12s. and the weight 11½ lb. Collections were at present based on a copper content of 22. 10s. The Chairman commented that it would be undesirable to have as much as £10 in a coin box but Mr. Leaver suggested that the size of the container would probably be different in a newly designed coin box.

(c) Mr. Crisp reported on his enquiries about the transfer of coin box calls from the local to trunk suites at Birmingham. At one time calls were transferred from one suite to the other by the operation of a transfer key but frequently calls were lost in the equipment. The present system, whereby the local operator extended the caller to the trunk operator who recorded details of the call before ringing the caller back to obtain full supervision, had been introduced as a more satisfactory alternative. So far as he was aware the condition was unique to the Birmingham Telephone House exchange.

Committee Paper

4
Method of operation of Coin-Box Line with Delayed Payment System

4. Mr. Francis introduced Committee Paper 4 describing a "delayed payment" coin box. In its preparation he had assumed multi-fee dialling by subscribers, using a buttonless box with slots for threepence, sixpence and a shilling. He had used the title "delayed payment" because the call was paid for after the connexion had been set up; when the called subscriber answered an indication, either by a tone or a record announcement, was given to the caller to insert his money. The box had a number of advantages: it could be used both for multi-fee calls dialled direct by the subscriber and for calls passed via the operator; its mechanism and the exchange equipment would both be simpler and cheaper than with a prepayment box; the absence of suspense mechanism eliminated one of the principal fraud risks. Apart from the need to re-educate the public in the use of a new box, a difficulty common to any new design, its main disadvantage was the loss of line time while money was being inserted after the call had been set up. The Chairman said he was particularly impressed by the fact that the money inserted in the box would be recorded on a meter at the exchange. It might be possible to dispense with the very elaborate arrangements for checking coin box takings. He then

then invited members of the Group to comment on the paper.

5. Mr. Osmond welcomed the proposal. It would do much to prevent fraud but he foresaw two difficulties: there would be complaints about loss of money due to wrong number calls and the facility of dialling calls without payment might increase the number and the range of nuisance and malicious calls. Mr. Francis pointed out that in regard to wrong numbers the caller would be no worse off with a delayed payment box than with a buttonless prepayment box. In either case the money would be automatically deposited when the called subscriber answered and could not be regained if it was a wrong number. Even an ordinary subscriber who obtained a wrong number had it recorded on his meter and could only have the overcharge corrected by calling the operator.

6. Miss Whitelaw asked if the Group were committed to designing a box to permit subscriber trunk dialling. The Chairman said that the new box would probably have to last for 20-25 years, as had the present one, and it would, therefore, be as well for the Group to work on the basis of meeting both present conditions and those likely to be encountered under trunk dialling.

7. Miss Whitelaw thought that the loss of circuit time with a delayed payment box was a consideration which should not be underrated. The present operating procedure, whereby a caller inserted money in the box before connection was set up, had been introduced before the war with the object of saving circuit time; she thought an endeavour should be made to assess the loss of circuit time that would result from the introduction of a delayed payment box.

Mr. Leaver pointed out that on subscriber dialled calls the timing mechanism would normally start as soon as the first coin had been inserted and that the loss of circuit time might be no greater than that arising at present from the need to press button A before speaking. Mr. Crisp agreed that circuit time was still important but the relative costs of long distance lines was less than pre-war. Mr. Brammore said he felt a little uneasy at the thought that the caller might lose his money on a call that was ineffective because of a plant failure. An attempt would have to be made to achieve engineering perfection if the public were to be satisfied with the service given. The Chairman agreed that it was a most desirable aim.

8. Summing up the discussion, the Chairman said that there seemed to be an advantage with the delayed payment box although he did not wish to minimise its disadvantages. They should, however, be looked at in relation to the additional facilities that would be given to the call office user and to the position of the ordinary subscriber as regards wrong number calls. He realised the importance of lost circuit time and asked the OB and AGD representatives to make the best assessment they could of the time that would be lost and the line charges that would be incurred. Malicious calls occurred with the present box, although the caller had to insert money first. He thought that there would be no great risk of them increasing with a delayed payment box particularly as the caller would have to deposit money if he wished to have the satisfaction of hearing the called subscriber.

9. On the question of the method of indicating to the caller when to insert his money either for the initial call or for an extension of time, the Chairman suggested that there were three ways in which it might be done. A tone could be applied to the line, there could be a recorded announcement and/or an indicator could be provided on the box itself. If an indicator were used, it could not be of the Swiss pattern unless charging was for 3 minute periods. He then asked the engineering representatives to enlarge on their proposals. Mr. Francis explained that when the caller had dialled a number, he would hear a ringing tone if the line was free. When the called subscriber lifted the receiver,

Tone,
announcement or
indicator

a tone or recorded announcement would signal to him that a call office was coming through and a similar arrangement would tell the caller to insert the fee. (Neither party would hear the other until money had been inserted). The caller could be allowed, say, 15 seconds to insert his money. If he did not so do in that time the call would be disconnected and the called subscriber's line released. If he inserted his money, timing would commence immediately and at the expiration of the period of paid time, the tone or announcement could be applied again for, say, two seconds to indicate that more money would have to be inserted if further time was required. A period of about 8 seconds could then be allowed during which the caller could end his conversation or insert more money. If he did pay for more time, the timing mechanism would run on continuously and include the time that the indicating tone was on the line and the 8 seconds following it. Thus however often a call was extended a period of "free" time would be allowed only at the end of the call. Mr. Leaver thought that a recorded announcement was better than tones as a signal to the caller that he should put his money in the box but he appreciated that it might be difficult and expensive to provide in rural areas. He suggested that the Group might consider a recorded announcement for call offices served by the larger exchanges and tones elsewhere. Uniformity was desirable but it would be a pity to forego the advantages of a recorded announcement for the busier call offices in towns. Mr. Francis agreed, but said that a 400 cycle tone was the simplest and cheapest method as it was available at all exchanges. Mr. Osmond suggested the provision of a visual lamp signal in the call office itself but Mr. Francis thought that the coin-box mechanism required would be unduly complicated. Mr. Helman agreed, but said that he would like to examine the possibilities of using an indicator both nationally and on urban boxes only. The Chairman said that it was clear that the matter would have to be discussed further, not only from the point of view of the type of signal to be provided but of the interval to be allowed to the caller to insert his money. In regard to the latter, the information to be obtained about the loss of circuit time would have a bearing on the matter and consideration should also be had to the economics of call office working both in urban and rural areas. Mr. Hearn promised to prepare a paper on the latter subject.

Next meeting

Friday 25th February at 2.30 p.m.

Action

Para. 8 To assess the loss of circuit time and the line charges incurred during the insertion of money with a delayed payment coin-box.

ITD/OB and AGD/TCB

Para. 9 To prepare a Committee Paper on the economics of call office working both in urban and rural areas.

AGD

COIN-BOX DESIGN STUDY GROUPA "DELAYED-PAYMENT" SYSTEM1. INTRODUCTION

1.1 In considering possible systems of multi-fee coin-box working, there appear to be decided economic and technical advantages in a form of post-payment working. The form of post-payment system described in this paper is referred to as a "Delayed-payment" system, partly to avoid confusion with existing post-payment manual systems but chiefly because it is a more accurate description of the facilities provided.

1.2 The "delayed-payment" system has been devised largely because it avoids many of the technical problems which would arise in applying to existing exchanges a pre-payment system giving comparable facilities. The "delayed-payment" system is simple and relatively cheap, and it should be easy for the coin-box user to operate. The system also appears to avoid most of the present known methods of making calls fraudulently.

1.3 To enable a comparison to be made a description of a pre-payment system suitable for use with a multi-fee buttonless coin-box, together with an estimate of comparative costs will be given in a later C.F.

2. GENERAL REQUIREMENTS AND ASSUMPTIONS

2.1 It has been assumed for the purpose of the present C.F. that any new system of coin-box working should meet the following requirements:-

- (a) To work on lines connected to automatic exchanges. (It is desirable but not essential that it should also work on lines connected to manual exchanges).
- (b) Unit fee local calls and multi-fee trunk and junction calls to be directly dialled (where switching facilities available) without the intervention of an operator.
- (c) Facilities for timing to be available on all directly dialled calls, including unit fee calls.
- (d) On directly dialled calls the amount of money inserted in the coin-box to be checked automatically with the correct fee for the duration and distance of the call.
- (e) An indication to the user on timed calls when the paid time period has expired; and the subsequent disconnection of the call if no further money is inserted in the box.
- (f) Access to an operator by dialling "0" or "999" without it being necessary to insert money in the coin-box.
- (g) Facilities for the operator to check the value of the coins inserted in the box on manually controlled calls.
- (h) The system to be free of features which might lead to calls being obtained without the correct fee being paid.
- (i) The operation of the coin-box to be simple for the user to understand and work.
- (j) The cost of the system to be a minimum provided the essential facilities are given.

2.2 The charging method envisaged is outlined in C.F. 5. It proposes that the coin-box fees should be in multiples of 3d. and that the twelve-sided threepenny piece be taken as unit charge. On the same basis a sixpence would represent 2 units and a shilling 4 units.

2.3 It is desirable that some means be devised for recording at the exchange the amount of money deposited in the coin-box.

2.4 To simplify maintenance, it is desirable that a minimum of equipment be located at the coin-box.

3. OUTLINE OF FACILITIES

3.1 The Delayed-payment system has been designed to meet the requirements referred to in para. 2, and an outline of the general facilities is given below. A description of the method of operation by the coin-box user is included in the appendix.

3.2 An essential feature of the "Delayed-payment" system is that the coin-box user is permitted to dial the number required before inserting any coins in the box.

3.3 When the called subscriber answers a special distinctive tone is connected to the line to warn the coin-box user to insert the necessary coins in the box, and also to advise the called party that a call from a coin-box line is imminent. The special tone lasts for a period sufficiently long (say up to 15 seconds) to enable the coin-box user to insert the necessary coins, and during this period speech is prevented. The tone ceases and speech conditions are established as soon as the required fee has been inserted.

3.4 If no fee or an inadequate fee is inserted the connexion is broken down after the expiration of the 15 second tone period.

3.5 On timed calls (once the call is established), the special tone is re-applied for say, 2 seconds at the end of each period for which payment has been made, thus advising the caller that additional coins must be inserted if it is desired to continue conversation. A free period of say, 8 seconds is allowed at the end of the 2 second tone period, followed by disconnection of the call if no further money is inserted. (The free period will form part of the next paid time period so that if money is inserted piecemeal on a long duration call, the total extra unpaid conversation time will never exceed 8 seconds.)

3.6 On manually controlled calls, the operator remains in circuit until the called party answers, and then requests the insertion of the fee. The amount of money inserted is checked by the operator listening to pips of tone, one pip of tone representing each 50. deposited.

3.7 Money need not be inserted in the coin-box for Emergency, Assistance, or ineffective calls. In addition, difficulty will not arise with calls diverted to Changed Number or Service Interception, two way speech conditions being available if an answer signal is not received.

3.8 At the exchange a meter is associated with each line to record all the money inserted in the coin-box.

4. ADVANTAGES OF DELAYED-PAYMENT SYSTEM

(a) The coin-box equipment will be much simpler and cheaper than that required for a pre-payment system providing comparable facilities.

(b) The associated exchange equipment will be simpler and cheaper than that required for any form of pre-payment system involving the transmission of signals to the coin-box for deposition or refund of coins. (The provision of signals for deposition or refund of coins on manually controlled calls in particular, may present technical and practical difficulties.)

(c) The absence of A or B buttons or suspense mechanism will minimize the risk of fraud, since all money correctly inserted will be deposited immediately in a self-sealing cash-box. Moreover, as dialling is permitted without the insertion of money in the coin-box, there would be no purpose in attempting to establish calls fraudulently by switch-hook dialling, "back-dialling", etc.

(d) Emergency and Assistance calls can be made without the need to insert coins and without the need for a special type of coin-box dial.

(e) No difficulties will arise on calls to lines on interception or with calls to special services like TD.

(f) It will be possible to record automatically on a meter located at the exchange the total amount of money inserted in the coin-box.

5. DISADVANTAGES OF DELAYED-PAYMENT SYSTEM

(a) The method of operation will differ from the present pre-payment box and it will be necessary to re-educate the public by suitable forms of publicity. It is probable that to some degree this would be equally true of any system catering for multi-fee dialling.

(b) If a call is routed to a wrong number, the caller will have to insert money in the box before he can speak to or hear the distant subscriber and establish the fact that it is a wrong number. In this respect, however, the coin-box user is no worse off than the ordinary subscriber.

(c) A slight increase in lost circuit time will arise owing to the need for the caller to insert money after the call has been set up. However, with the elimination of the penny slot and money being counted in units of 3d, the additional time will not be appreciable.

6. MISCELLANEOUS COMMENT.

6.1 The distinctive tone previously referred to has the three following functions:-

- (a) To advise the caller that the called party has answered and he must now insert money in the box.
- (b) On timed calls to advise the caller that he must insert additional coins if he wishes to continue conversation.
- (c) To advise the called party that a call from a coin-box is imminent and that he should hold the connection for a short period in order to allow time for the caller to insert money in the box.

It is probable that a 400 cycle tone interrupted 0.2 secs. on, 0.2 secs. off, 0.2 secs. on, etc., would serve for the aforementioned purpose.

6.2 The object of preventing speech when the called party answers and before money is inserted in the box is to prevent the type of fraud which can be perpetrated with the present pre-payment type box and which might become serious when dialling over long distances is permitted. The fraud could be carried out in the following manner:- At a pre-arranged time a call would be set up from box A to box B and on answer, the called party could speak to the caller for a period of 15 seconds. On forcible release of the connection the user at box B could establish a call in the reverse direction and receive a reply to his former enquiry, again for a period of 15 seconds. This process could be continued indefinitely. Although the fraud involves an elaborate and cumbersome procedure the risk would nevertheless arise if the caller were allowed to hear the called party.

6.3 It appears that the system described avoids most, if not all, the present known methods of making calls fraudulently from call-offices. While the discovery of new methods of obtaining calls without payment may still be possible, the simplicity of the Delayed-payment system and particularly of the coin-box and its associated telephone circuit, makes it unlikely that the number of such frauds will be large or that they will be easy to carry out.

6.4 The exchange equipment associated with the Delayed-payment system would be in its simplest and cheapest form when used in conjunction with a charging method requiring single meter pulses at varying time intervals. This method of charging, which is described in C.F. 5 also confers an advantage on

the coin-box user since, if, on a timed call, the paid time period has expired conversation can be continued, at least for a short time (beyond the 8 second "free" period), by the insertion of a coin as low in value as a threepenny piece. With a charging method involving the purchase of large units of time, the caller may insert insufficient money to re-establish conversation and thus lose the money already inserted.

6.5 The system will function satisfactorily with a charging method whereby the charging rate is varied at different times of the day.

6.6 Timing can be introduced on unit fee local calls if desired.

ED/TF

27th August, 1954.

APPENDIX

METHOD OF OPERATION OF COIN-BOX LINE

WITH THE DELAYED-PAYMENT SYSTEM

1. A suitable notice will advise the coin-box user that he should have sufficient coins readily available to insert in the box when the called party answers, and in addition it will show him the minimum fee required for the different types of directly dialled call. (For the charging method proposed this is 3d for a local call and 6d for all other calls). The procedure for making calls is as follows:-

2. Local Calls. (Unit fee.)

(a) Dial the required number.

(b) On substitution of ringing tone by the special tone, indicating that the called party has answered, the caller inserts a threepenny piece in the coin-box.

(c) On insertion of the threepenny piece, tone is disconnected and speech conditions established.

(d) If call is ineffective, (e.g. engaged tone, N.U. tone or no reply) the caller will hear the appropriate tone and abandon the call without inserting any money in the box.

3. Trunk and Junction Calls. (Multi-fee timed calls.)

(a) Dial the required number.

(b) On substitution of ringing tone by the special tone, indicating that the called party has answered, the caller to insert a minimum of sixpence in the coin-box. (The insertion of sixpence establishes speech conditions for a period long enough to check the called party's identity, but on long distance calls additional coins may be required within 10 or 15 seconds.).

(c) On insertion of the fee, tone is disconnected and speech conditions are established.

(d) At the expiration of the period for which a fee has been paid, the special tone is reconnected to the line for a period of say, 2 seconds, followed by a "free" period of say, 8 seconds to enable the caller either to finish the conversation or to insert additional coins. If additional coins are inserted during the tone or "free" period, conversation could proceed to the limit of the paid time. If no additional coins are inserted the call is disconnected at the end of the "free" period. (The 10 second tone and "free" period is included in the next period of paid time so that not more than one such unpaid period can occur in any one call.)

(e) If the call is ineffective, (e.g. engaged tone, N.U. tone or no reply) the caller will hear the appropriate tone and abandon the call without inserting any money in the box.

4. Manually Controlled Calls.

(a) Caller dials "0" and is connected to an operator.

(b) After receiving details of the call, the operator advises the caller to have the required coins available but not to insert them until asked to do so. When the connection has been set up and the called party has answered, the operator asks for the insertion of the appropriate fee checking the amount by listening to pips of tone.

(c) On timed calls the operator starts the timing equipment associated with the cord circuit as soon as the correct fee has been inserted and, as and

when necessary, requests the insertion of additional money in a similar manner to that adopted with the present pre-payment system.

(d) The operator does not ask for money to be inserted for Assistance, Emergency, or ineffective calls.

5. Calls to Service Points.

(a) Dial the required code or number.

(b) If it is a free service e.g. Emergency or Changed Number Interception, the coin-box user can speak to the operator without inserting any money in the coin-box.

(c) If it is a service for which a charge is made e.g. TIM or Service PRX, the special tone will be heard and the coin-box user will have to insert the necessary fee in the box before the tone is disconnected and he can speak to the operator or hear the wanted message.

COIN BOX DESIGN STUDY GROUP

Minutes of the 5th Meeting - 25th February, 1955.

Present

Mr. G. A. Downes (Chairman)

Mr. C. W. Arnold ED/S	Mr. H. E. Francis ED/TP
Mr. R. Brusby AGD/TCB	" B. E. Hearn AGD/TCB
" E. G. Griesp ITD/OB	" A. V. Leaver ITD/SSB
" S. W. Dabbs ITD/FB	" C. G. Osmond PD/IP
" F. G. Fox POED & SDWC Staff Side	" E. S. Pritchard AGD/TFB

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman said that he had received apologies from Mr. Holman, who was absent on Sick Leave, and from Miss Whitelaw, who had an urgent UFW engagement. He welcomed Mr. Brusby as an additional AGD representative.

Minutes

2. The Minutes of the 4th meeting were agreed.

Abolition of
Penny slot

3. The Chairman said that he had seen Sir Gordon Radley and Mr. Anderson during the previous week to discuss the proposed abolition of the penny slot. They recognised that the Group needed to know at an early stage whether the recommendation was likely to be accepted, because a decision either way would affect the fundamental design of the new box and the associated exchange equipment. The technical and other advantages of abolishing the penny slot were appreciated by the General Directorate and its effect on the future tariff structure, with particular reference to the unit fee, had been discussed. It had been agreed that a decision would have to be sought from the P.H.C. and Mr. Downes said that he was preparing a Minute accordingly.

Committee Paper
5.

Single-pulse
time-zone
metering.

4. The Chairman said that he had asked Mr. Francis to prepare a Committee Paper on single-pulse time-zone metering so that the Group might have the principles of that charging system in mind as a background to their discussions on a delayed payment box. Mr. Francis then introduced Committee Paper No. 5. He said that single-pulse time-zone metering assumed bulk billing of all local and trunk calls dialled by subscribers; charging for trunk-calls would be by means of a single metering pulse applied to the subscriber's meter at regular intervals throughout the call. On long distance calls, it would be possible to send back an additional pulse initially to charge for the cost of setting up the connexion and to cover the call office fee.

Application to
delayed payment
coin box

5. Mr. Francis went on to say that, for ordinary subscribers, charging flexibility could be achieved in two ways. The unit charge could be altered (to decimal places of a penny if need be) and the time allowed for each unit charge (one meter operation) could be varied. For the coin box user it would not be possible to make fractional alterations in the charge unit because it had to be the same as, or a multiple of, the basic coin unit; but the other method of achieving charging flexibility would be fully available. The time allowed for the multi-fee range of calls could be varied quite simply and there would be even greater scope for altering the time allowed for a unit fee call because separate timing equipment would be used for those calls.

6. A coin box caller would not be able to hear the distant subscriber or speak on his call until he had deposited coins to cover the unit charge and, in the case of trunk calls, the call office fee. Those coins would permit speech for a fraction of a minute only on a long distance

call. Callers would be able to insert more money at the outset if they wished, but they might not think it advisable to do so until they were sure that they had a connexion to the right telephone number or that the person they wanted was available.

7. In reply to Mr. Pritchard, Mr. Francis said that the money which the caller inserted in the coin box would not only be recorded on the coin box meter (in units) but would also operate the "coin-and-fee checking" equipment; that equipment would also receive meter pulses during the progress of a trunk call and, by comparing one with the other, would control the duration of the call. If the caller did not use all the line time he had bought, there would be no direct relationship between the paid circuit time and the revenue recorded on the coin box meter. But there should always be an exact correspondence between the meter reading and the amount deposited in the box. He agreed that if the equipment were faulty it would not be immediately evident but suggested that in the majority of cases routine testing and service observations would show up the trouble fairly quickly. Mr. Fox asked what type of "coin and fee checking" equipment would be used. If it had to deal in time units of 10 seconds, tolerances would be strict and a high standard of maintenance would be required. Mr. Francis explained that it was intended to use the I.O. standard uniselectors and circuits would be so designed that a breakdown would favour the subscriber.

8. The Chairman asked the A.G.D. representatives if they had been able to assess the line charges that would be incurred while money was being inserted in a delayed payment box (Paragraph 8 of the minutes of the 4th meeting). Mr. Brunby replied that the calculations had been based on figures supplied by the ITD/OB and assumed full subscriber dialling. No account had been taken of the time it took at present to press button A. It was calculated that £60,000 per annum would be lost on timed calls and £40,000 on local calls. He was not too certain of the accuracy of the local call figure. Mr. Crisp said that observations had shown that it took 7 seconds to insert money for an untimed call, 13 seconds on a toll call and 25 seconds on a long distance call. The information given to the A.G.D. had been based on these figures. Mr. Leaver thought the calculations had been based on misunderstanding: speech would be established as soon as 3c. had been inserted for a local call or 6c. for a trunk call and timing would commence immediately. The time taken by a caller to insert the first coin would normally be no longer than that taken at present to press button A: it would only take a fraction of a second to signal the coins to the exchange. It did not, therefore, seem to him correct to base the calculation on the time at present taken to insert three pennies or, say, the whole of 3c. 9d. for a long distance call. The Chairman said that in view of what had been said it was clear that the loss of line time, if any, would be very small indeed and the other members of the Group agreed.

Delayed
payment
system

9. The Chairman recalled that the Engineering Department representatives had suggested that a period of 15 seconds should be allowed after the call had been set up on a delayed payment box in case the caller was slow in inserting the fee. After that period, if the unit charge had not been deposited, the call would be cut off. He asked the members of the Group for their views. Mr. Hearn suggested that, if the lost circuit time caused by the insertion of the first coin was negligible, there was little case for allowing more than a few seconds. Mr. Osmond did not agree. He thought there were bound to be difficulties with a new system at first and that it would be advisable to err on the side of generosity. He wondered if the engineers might be able to design the equipment so that the period could be decreased later when the public had gained experience of the new box. Mr. Francis thought that it would be possible to arrange for the period to be flexible although

Time allowed
to insert
first coin

Mr. Leaver pointed out that there would be little advantage in reducing the period after coin box users had become experienced because, by then, they would be inserting their money quickly and line time would not be wasted. Mr. Fox was opposed to the period being too long because the called subscriber might tire of waiting on the line and clear down. The Chairman, summing up, said that it would be advisable to be reasonably generous at first because the loss in line time would not be serious. It would only occur with the inexperienced caller who should be treated with consideration. He proposed that the period of 15 seconds should be accepted and it was generally agreed.

Extension
of
time

10. The Chairman reminded the Group that Committee Paper 4 had proposed that the caller should be allowed a 10 seconds extension of time during which he could terminate his call or insert the money required for extra time. The period of 10 seconds was to include the warning signal and would be deducted from the subsequent period of paid time. If the extension period were too short, it would cause annoyance to the public and might lead to complaints; he thought it unlikely that the caller would always have his additional money ready and the period should, therefore, take that fact into account, but if it were too long, there would be an appreciable loss of paid circuit time. Mr. Fox pointed out that even with 10 seconds, the extension of time on a call to Scotland could be almost as long as the paid time itself if the caller had only inserted the minimum fee. Mr. Leaver agreed and said that, since as little as 12 seconds line time could be bought for the unit charge, the period allowed should not exceed that. It would be undesirable for the caller to insert an additional coin only to hear the announcement again immediately. Mr. Learn thought much would depend on the number of very short duration calls that were made. Mr. Francis said that there were technical difficulties in applying the warning signal to the line before the end of the paid period; the whole of the extension time would come after the paid period and would, therefore, be "free". The Chairman suggested, and it was agreed, that the total extension period (including the warning signal) should be 12 seconds.

Warning
signal

11. The Chairman recalled that, at the previous meeting when the question of a warning signal had been discussed, most members had seemed to favour a recorded announcement although the engineering representatives had stressed the technical advantages of using rapidly interrupted 400 cycle tone. Since then he had spoken to a number of his colleagues and in each case their immediate reaction had been to favour a recorded voice. Despite that, he was not sure that a recorded announcement would be satisfactory; it would break into the conversation and might cause confusion to the caller. Unless it was repeated the caller might have difficulty in understanding what had been said. Mr. Francis said that trial recordings he had made took between 4 and 5 seconds to play back. Under practical conditions, there would be a continuously running recording which would be connected to the line at random so that a caller might be connected in the middle of the phrase. It would, therefore, be necessary for the recording to be connected to the line for about 10 seconds to ensure that the caller heard the complete announcement and a large portion of the period of extension time would be used.

12. In discussion, the following points were made:-

1. A short series of pips might precede the announcement but if there were difficulties in making the announcement available in rural areas the pips alone could be used there.

2. Country people, who were less experienced users of call offices than town people, had a greater need for an announcement; there was in any case an advantage in having a standard arrangement throughout the country.

3. The Post Office have standardised the use of tone signals and people were quite used to them.

4. From an engineering point of view a tone of 400 cycles (i.e. the "number unobtainable" tone) was already available in exchanges. It was preferable to the 900 cycle pip-pip tone (used to indicate the three-minute period on trunk calls) which was not available at U...Xs. or at many small manual exchanges.

13. The Chairman said that, although superficially the recorded announcement had a number of attractions, the Group were clearly of the opinion that rapidly interrupted tone was preferable. It seemed that a voice was likely to be confusing to the caller and would take up too much time. A series of rapid pips of tone should be readily understood, especially as callers were acquainted with the significance of the present three minute pip-pip signal. Before the Group came to a final decision on the question, however, he would like Mr. Francis to arrange for a record to be prepared for the next meeting, giving:

- (a) the standard three minute pip-pip tone (900 cycles)
- (b) the rapidly interrupted 400 cycle tone
- (c) the recorded voice announcement.

14. The Chairman thought there was something to be said for having, on the coin box itself, an indicator which would operate at the same time as the pips were returned to the caller. If it were clearly visible it would help to make plain to the caller the meaning of the warning signal. However, he understood there were engineering objections to such a device because it would complicate the box and exchange equipment. Mr. Francis confirmed that for general use a visual indicator was out of the question. It might, however, be worth considering the use of an illuminated panel on the backboard with instructions in a number of languages at places like London Airport and the main line stations; under those conditions a mains power supply would be available and one of the principal technical difficulties would then be overcome. The Chairman agreed in the circumstances not to pursue the question of the provision of an indicator except perhaps at the places mentioned.

Visual
indicator
at coin
box

15. The Chairman referred to Committee Paper 2 on "Buttons"; it had been studied at an earlier meeting of the group. Since then it seemed to have been taken for granted that the new coin box would be buttonless, but he thought that a deliberate decision should be taken. One big advantage of the buttonless box was that it prevented the "appointment" type call and the free calls that were habitually obtained by taxi cab drivers. Mr. Crisp pointed out that there was bound to be a risk of fraud so long as money was held in suspension under the control of the caller. The buttonless box seemed to him the only solution to that fraud problem. Mr. Arnold remarked that, while he did not advocate buttons, he thought it only right to mention that if the Group decided to have a box with buttons, it could be of a much more pleasing and modern design than the present pre-payment box.

Buttons

16. The Chairman summarised the conclusions reached during the meeting as follows. The Group were in favour of a buttonless box and were satisfied that the advantages of a delayed payment system outweighed those of a pre-payment system. They considered that 15 seconds should be allowed for the insertion of the initial call fee and that the extension period for the insertion of money for extra time should be 12 seconds. There seemed to be general support for an interrupted tone signal in preference to a recorded announcement to warn the

Conclusions

caller to insert money, but a decision would be deferred until members of the Group had had an opportunity of listening to the recordings to be made by the Engineering Department.

"Pay-on-answer".

17. The Chairman commented that he had been speaking to Sir Ben Barnett about the delayed payment buttonless box; Sir Ben was impressed by its facilities but did not like the proposed name. Mr. Dabbs suggested that "Pay-on-answer" might prove an acceptable alternative.

Date of next meeting

Friday, 18th March, 2.30 p.m.

Action

Paragraph 13. To arrange for a recording of various types of warning signal. ED/Tp.

COIN BOX DESIGN STUDY GROUPA system of Charging based on Single-Pulse Time-Zone Metering1. OUTLINE OF METERING SYSTEM:

1.1 Under this system the charge for a call is made by single operations of the subscriber's meter at intervals throughout the duration of the call. The intervals between successive operations are made shorter as the distance over which conversation takes place increases. For example, on a short distance calls, say 10 miles, the meter might operate once every minute, while on a long distance call of, say 100 miles, it might operate once every 10 seconds.

1.2 For calls directly dialled by subscribers, the cost of a call to the Department is roughly proportional to its duration, so that the advantage to the subscriber under the single-pulse time-zone metering of being able to have a short, cheap call should not result in the Department losing money. It is a fact, however, that some additional cost is incurred by the Department in setting up a call and also there is some lost circuit time waiting for the called subscriber to answer. If desired this extra cost could be met by providing for an additional operation of the subscriber's meter on receipt of the answer signal at the beginning of each call.

1.3 It is possible for a tariff to be devised for calls directly dialled by subscribers, therefore, which might contain one or more of the following methods of charging:

- (a) A single meter operation. The call would not be timed.
- (b) A meter operation at intervals throughout the duration of the call.
- (c) A meter operation on receipt of the answer signal followed by further meter operations at intervals throughout the duration of the call.

1.4 Flexibility is given to a tariff based on a single-pulse time-zone metering as it is possible to vary both the charge per unit call (meter operation) and on timed calls the length of the interval between successive operations of the meter.

2. APPLICATION OF THE SYSTEM TO COIN BOX LINES:

The system of single-pulse time-zone metering could be made to work satisfactorily with the coin box system described in CP 4. It is obvious, however, that flexibility cannot be obtained in quite the same manner, as the coin box must work on some unit of coinage and the threepenny piece as a unit has many advantages. Flexibility must be provided, therefore, by arranging that for unit money the length of time over which conversation can take place is variable; and for full flexibility this will mean timing all calls. The ratio of the time allowed per meter operation on an ordinary subscriber's line to the time allowed per unit money on the call from a coin box line would be the same as the ratio of the cost of unit call to the value of unit money used at the coin box. For example, assuming a unit call on an ordinary subscriber's line costs 1d. and for a particular tariff this buys 20 seconds of conversation time, then a coin box user would get 40 seconds conversation time for 3d. This example neglects any special call office charge which may also be levied.

ED/TP

28th January, 1955.

HQQ. 911/55.

COIN BOX DESIGN STUDY GROUP

Minutes of 6th Meeting - 18th March, 1955

Present

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. B. E. Hearn	AGD/FCB
" E. G. Crisp	ITD/OB	" S. L. Helman	EL/S
" S. W. Dabbs	ITD/PB	" A. V. Leaver	ITD/SSB
" L. G. Fox	POED & SDWC Staff Side	" C. G. Osmond	PD/IB
" H. E. Francis	ED/Tp	Miss N. Whitelaw	POD/C Staff Side

Mr. J. Lennox ITD/OB (Secretary)

Mr. D. J. Manning ED/Tp attended for part of the meeting.

1. The Chairman said he had apologies for absence from Messrs. Pritchard and Brumby, who had been detained on official business. He welcomed Mr. Manning of the Engineering Department who had come along to play recordings of the various types of warning signal.

Minutes

2. The minutes of the 4th meeting were agreed.

Committee Paper 6

Call Office
Finances

3. Mr. Hearn introduced Committee Paper 6 on Call Office Finances. He said that it covered public call offices only and took no account of some 60,000 subscribers' coin boxes. Since the profit on subscribers' coin boxes was no more than £163,000, their exclusion would have no practical effect on the figures quoted in the Committee Paper. No attempt had been made to offset the service value of the 15,000 Plan 5E kiosks. Installation costs had been based on the plant depreciation figures used by the Lives of Plant Committee and by assuming that the call office structure itself had a life of 40 years. Mr. Leaver drew attention to the difference between call offices and ordinary subscribers' lines when costs per unit call were being considered. The ordinary subscriber paid a separate rental to cover the cost of his installation, but the installation costs for call offices had to be met by the Post Office and were, therefore, set against the call charges themselves. He doubted that it was correct to charge on installation cost against Plan 5E lines because it was essential to the working of the telegraph service that they should be provided. The Chairman thanked the A.G.D. representatives for the information they had given to the Group: it would provide a useful background to their deliberations. From the point of view of the Study Group he thought that the equated cost figure was more valuable. He was not certain that it was correct to combine urban and rural call offices when considering call office charges; rural call offices were provided as a matter of policy and were not expected to pay for themselves.

"Pay-on-Answer"
Coin Box

Recordings of
various types of
warning signal.

4. Mr. Francis introduced the recordings of warning signals that had been made in the Circuit Laboratory. He said they were divided into two groups; firstly, the initial signal to insert money at the beginning of a call and secondly the warning signal at the end of the period of paid time, telling the caller that he should insert more money. In the first recording, the signal to insert money replaced ringing tone when the called subscriber answered. The recording of the warning signal (that the period of paid time had expired) was superimposed on a conversation. Five different signals had been recorded:-

(a) A recorded announcement for 10 seconds

(b) 400 cycle tone interrupted $2\frac{1}{2}$ times per second for 2 seconds

- (c) 400 cycle tone interrupted 5 times per second for 2 seconds.
- (d) 900 cycle tone interrupted $2\frac{1}{2}$ times per second for 2 seconds
- (e) 900 cycle tone interrupted 5 times per second for 2 seconds

5. The Group listened to the recordings and discussed them. Mr. Helman suggested that a loudspeaker could give a false impression. He considered that the tones would sound more impelling if listened to in an ordinary telephone instrument. After the Group had listened to the recording again, the Chairman summed up the views expressed, as follows:-

- (a) there was no doubt that the recorded voice interrupting the conversation was unsatisfactory and its use could not be recommended.
- (b) there was little to choose between the 400 cycle and the 900 cycle tones, although with the former there was some risk of it being confused with the busy tone.
- (c) although there might be individual preferences for the 900 cycle tone there were no strong views and, since 400 cycle tone was already available at all exchanges, it could be accepted.
- (d) tone interrupted $2\frac{1}{2}$ times per second was preferable to that interrupted 5 times per second.
- (e) a 2 second period of tone was not sufficiently long when superimposed on a conversation and it should be increased to between 3 and 4 seconds.

6. Mr. Francis introduced recordings of the signals that the operator would hear when coins were inserted in the box. Recordings using both 400 cycle tone and 900 cycle tone had been made: both were interrupted 5 times per second. The first recording assumed a basic coin unit of 3d, so that a shilling was signalled by four pulses of tone. The second recording assumed a basic coin unit of 1d, so that a shilling was twelve pulses of tone. Members of the Group listened to the recordings and then discussed them. Miss Whitelaw was not at all happy with what she had heard and said that the twelve pip signal based on the penny basic unit was entirely unacceptable to her. The Chairman recalled that in his minute to the Postmaster General he had pointed out the difficulty there would be in signalling to the operator if the penny slot were retained. The recording had confirmed the view he had expressed. His own opinion was that the tone pulses could be slower and should sound rather less artificial. He did not really like the signal even with the 3d basic unit. Mr. Francis said that he would like to have an opportunity to experiment with other types of tone or buzzer and to change the periodicity of the impulses. The Chairman asked him if he could have some new recordings made for the next meeting and, for comparison, to include a recording of the present coin signals. So that the signals might be heard in their proper setting, the recording should include the voice of the operator asking for the coins to be inserted.

Signalling coins to the operator

7. The Chairman said it was within the Group's terms of reference to consider what manual board services should be made available by direct dialling from coin boxes. At present coin box subscribers had to dial '0' for all other services except emergency calls. Mr. Francis thought that it would be technically possible to provide the additional facilities; those on which non-metering conditions applied could be obtained without the insertion of coins. The new type of coin box would also allow direct access to 'TH' because the caller would not be able to hear the clock until he had inserted money. Miss Whitelaw suggested that access might well be given to Enquiries, Directory Enquiries and the Engineering Repair Service. At the present time many of those calls were handled unnecessarily by operating staff. Mr. Leaver suggested that there might be some difficulty in providing separate

Direct access from coin boxes to manual board services.

groups of circuits so that the operator would know that she was receiving a call from a coin box. It would certainly be necessary if direct access to telegrams was given. Mr. Crisp agreed, but thought in some cases, such as Enquiries or Directory Enquiries, separate coin box groups would not be needed because the number of calls connected by the monitor was negligible. The Chairman asked Mr. Crisp to prepare a Committee Paper showing what facilities could be provided and indicating when it would be necessary to provide a separate coin box group of circuits.

Plan 5E
installations.

8. Mr. Leaver said that there were at present about 15,000 Plan 5E installations in use throughout the country. The majority had been provided as the result of the Jubilee Concession which promised a call office outside every Post Office. Under the Plan 5E arrangement, the Sub Postmaster had an ordinary telephone over which he could pass official calls (mainly telegrams). When the telephone was not in use in the Sub Post Office it was switched through to the call office (which was fitted with a coin box) outside the Office. The new "Pay-on-Answer" box would be connected to special exchange equipment which would not permit calls to be made until the appropriate coin impulses had been received: it was clear, therefore, that the present Plan 5E installation would not work. The only solutions seemed to be either (a) to provide separate lines for the kiosk and the sub-postmaster or (b) to retain the joint line and fit a coin box in the sub post office and make the sub postmaster pay for his calls in cash or by tokens. The provision of separate lines did not seem to be a practical solution while there was so large a rural order list. Mr. Osmond said that the I.B. would be very pleased to see the Plan 5E installations abolished; they were a continual source of difficulty to them. Sub Postmasters frequently failed to record their private calls and what was more serious, by engaging the coin box it was possible to prevent a Sub Postmaster from raising an alarm in the event of an attack on his Office. In addition, betting frauds could be carried out by handing in a telegram and then holding the call office in use so that the telegram could not be sent forward until the result of the race was known. The Chairman agreed that the Plan 5E would present a problem and he asked Mr. Helman to examine the question.

Timing of unit
fee calls from
call offices.

9. The Chairman reminded the Group that they had previously discussed the question of timing local calls from call offices. No definite decision had been taken at that time, but Miss Whitelaw had referred to the annoyance that would be caused by delay on calls being extended to PEX extensions, particularly at railway enquiry bureaux. Mr. Crisp said that service observation figures did not give any information about the extent of the trouble as observations were stopped when the called subscriber (that is the PEX operator) answered. The Chairman drew attention to the pressure from the public and from members of Parliament to stop long calls being made from call offices. They held up other callers. He thought it reasonable that the Post Office should charge for a call as soon as the PEX operator answered and that the remedy for Miss Whitelaw's difficulty would be a campaign for improved service at PEX's. British Railways, theatre box offices and similar organisations would have to be asked to improve their staffing arrangements, but he thought that in many cases they had no wish to receive enquiries by telephone and might not be co-operative. In that case timing of local calls would discourage enquiries from coin boxes, but it would have the advantage that call offices would be relieved of the delay caused by such calls and would therefore be free for other callers. Miss Whitelaw thought the problem would be most acute if the period of conversation for the basic charge was fixed as low as three minutes. If it could be made six minutes it would prevent the talkative person from holding a call office in use too long, but would allow reasonable time for a PEX extension to answer. She said that she would like to have a word with Mr. Hodgson of the Association of Controlling Officers to see if his Travelling Supervisors could give any useful information on the point. The Chairman pointed out that if the period were fixed at six minutes there would be no additional revenue from call offices. He did not think the Group could recommend a longer period of time on all

calls merely to compensate for the staffing inefficiencies of certain PEXs'. Mr. Osmond suggested that the difficulty might be overcome if enquiry points at railway stations were available on direct lines and not through the main PEX. In that case, an answer would only be received if the staff were available to take the enquiry.

10. The Chairman summing up said that there seemed to be general agreement to the timing of local calls from call offices. The problem of delay in connection to PEX extensions was appreciated, but might to some extent be overcome by a publicity campaign or by encouraging direct exchange lines to enquiry bureaux.

11. Mr. Leaver asked whether, if the Directorate agreed to the timing of local calls from call offices, it would be possible to introduce the new type of coin box before multi-fee dialling facilities were available. Mr. Francis said that there would be no difficulty, local calls could be dialled direct and timed while all multi-fee calls could be passed to the local manual board. The coin checking and pulsing equipment for multi-fee calls would have to be installed in the exchanges initially. The Chairman said that there might be pressure to increase the local call fee from the present 3d to 4d in order to increase revenue. To do that expensive modification of the existing box would be necessary. If the new box with timing could be introduced within a reasonable period it would be preferable to continue the present 3d charge until the new box was ready.

Use of new coin box in advance of provision of multi-metering facilities.

12. The Chairman asked the Group to consider the mounting of the telephone and dial. At present a separate telephone instrument was provided, but modern practice favoured a dial mounted on the coin box itself with a separate hand micro-telephone suspended at one side. The Swiss box was designed to that pattern and unless the Group had strong views to the contrary there were the advantages of speed of production and economy in accepting layout of that box. Mr. Helman agreed that it would help the Engineering Department if the Swiss design could be accepted. The exterior appearance of the box could, if necessary, be modified slightly. Mr. Fox wondered if the telephone hanging from a switchhook at the side of the box was more frequently damaged because it was carelessly replaced. The Chairman agreed that it seemed to be an obvious weakness and said that he would make enquiries of the Swiss Administration to see if they had any information on the subject. The difficulty might be overcome by mounting the telephone on a cradle at the top of the box. So far as the dial was concerned there was general agreement that it should be mounted on the coin box itself but sufficiently high to prevent small children from reaching it to make nuisance calls.

Mounting of telephone instrument and dial.

Wednesday 13th April 2.30 p.m.

Future meetings

Friday 6th May 2.30 p.m.

Para. 6 Recording of signalling of coins to operators ED/Ep

Action

Para. 7 Committee paper on special services indicating when separate coin box groups would be required. ITD/GB

Para. 8 Operation of Plan 5E installations with "Pay-on-Answer" system. ED/S

Coin Box Design Study Group

Call Office Finances

1. Based on the latest information available this Committee paper has been prepared to present the overall picture of call office finances, separately for Urban and Rural.

2. Appendix I sets revenue against expenditure at equated costs while Appendix II compares revenue with expenditure at current costs. Equated costs take into consideration all plant at prime cost whereas current costs are based on theoretical replacement costs at present day prices.

3. For purposes of this examination the number of call offices are those in existence at 30th September 1953 viz. Urban 41725 and Rural 22084, with cabinets and open telephones included. On this basis the approximate cost of the average installation including Structure and Equipment, Line Plant to Exchange, Exchange termination, Cleaning, Painting, Lighting, Coin Collecting and Commission payable to Railway Companies is:-

<u>Equated</u>		<u>Current</u>	
<u>Urban</u>	<u>Rural</u>	<u>Urban</u>	<u>Rural</u>
£	£	£	£
49	45	55	55

4. A comparison between revenue and cost for the average call office is approximately as follows:-

	<u>URBAN</u>			<u>RURAL</u>			<u>U.K.</u>		
	<u>Revenue</u>	<u>Expenditure</u>	<u>Profit+ Loss -</u>	<u>Revenue</u>	<u>Expenditure</u>	<u>Profit+ Loss -</u>	<u>Revenue</u>	<u>Expenditure</u>	<u>Profit+ Loss -</u>
Locals	53	73	- 20	19	27	- 8	41	57	- 16
Trunks	41	36	+ 5	23	21	+ 2	35	31	+ 4
Phonograms	2	3	- 1	2	2	-	2	3	- 1
Installation	48	49	- 1	15	45	- 30	37	47	- 10
	<u>144</u>	<u>161</u>	<u>- 17</u>	<u>59</u>	<u>95</u>	<u>- 36</u>	<u>115</u>	<u>138</u>	<u>- 23</u>
	<u>CURRENT</u>								
Locals	53	85	- 32	19	31	- 12	41	66	- 25
Trunks	41	45	- 4	23	26	- 3	35	39	- 4
Phonograms	2	3	- 1	2	2	-	2	3	- 1
Installation	48	55	- 7	15	55	- 40	37	55	- 18
	<u>144</u>	<u>188</u>	<u>- 44</u>	<u>59</u>	<u>114</u>	<u>- 55</u>	<u>115</u>	<u>163</u>	<u>- 48</u>

5. The average cost of a local call from an Urban and a Rural call office on a U.K. basis is estimated to be:-

	<u>EQUATED</u>			<u>CURRENT</u>			
	<u>Revenue</u>	<u>Call</u>	<u>Installation</u>	<u>Call</u>	<u>Installation</u>	<u>Total</u>	
	d.	d.	d.	d.	d.	d.	
3	1st Unit	2.12	2.08	4.20	2.46	2.42	4.88
4	2nd "	4.56	2.08	6.64	5.25	2.42	7.67
6	3rd "	5.60	2.08	7.68	6.49	2.42	8.91
8	4th "	8.02	2.08	10.10	9.34	2.42	11.76
3.46	Average	2.73	2.08	4.81	3.47	2.42	5.89

Accountant General's Department,
TCB, B.E.H.

15th March, 1955.

CALL OFFICE REVENUE AND EXPENDITURE (Equated)

	URBAN			RURAL			U.K.		
	Revenue	Expenditure	Profit + Loss -	Revenue	Expenditure	Profit + Loss -	Revenue	Expenditure	Profit + Loss -
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
LOCAL CALLS	2,217	3,086	- 869	413	582	- 179	2,450	3,668	- 1,018
TRUNK CALLS	1,707	1,616	+ 191	611	484	+ 67	2,218	1,870	+ 348
PHONORAMS ETC.	109	129	- 20	36	41	- 5	144	170	- 26
INSTALLATION	1,989	2,021	- 32	243	296	- 53	2,332	2,027	- 305
TOTAL	6,022	6,782	- 760	1,302	2,083	- 781	7,324	5,615	- 1,491

CALL OFFICE REVENUE AND EXPENDITURE (Current)

	URBAN			RURAL			U. K.		
	Revenue	Expenditure	Profit + Loss -	Revenue	Expenditure	Profit + Loss -	Revenue	Expenditure	Profit + Loss -
	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000	£'000
LOCAL CALLS	3,217	2,547	- 1,350	413	687	- 274	2,630	4,234	- 1,604
TRUNK CALLS	1,707	1,893	- 186	511	567	- 56	2,219	2,460	- 242
PHONOGRAMS ETC.	109	129	- 20	35	41	- 6	144	170	- 26
INSTALLATION	1,989	2,300	- 311	543	1,212	- 673	2,327	3,516	- 1,189
T O T A L	6,022	7,969	- 1,647	1,302	2,517	- 1,209	7,340	10,380	- 3,066

COIN BOX DESIGN STUDY GROUP

Minutes of 7th meeting - 13th April, 1955

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. B. E. Hearn	AGD/TCB
" R. Brasby	AGD/TCB	" S. L. Holman	ED/S
" E. G. Crisp	ITD/OB	" A. V. Leaver	ITD/SSB
" H. E. Francis	ED/TP	" G. G. Osmond	ED/IB
" J. V. Goodman	ITD/PB	" E. S. Pritchard	AGD/TFB
		" G. Wrangmore	POED & SDWC Staff Side

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman welcomed Messrs. Wrangmore and Goodman who were taking the places at the meeting of Messrs. Fox and Dabbs and explained that Miss Whitelaw had been unavoidably detained by an urgent Union engagement.

2. The Chairman suggested that, as the minutes of the 6th meeting had only just come to hand, their approval should be deferred until the next meeting.

3. Mr. Francis introduced a second group of recordings of coin signals to operators that had been made in the E-in-C's Circuit Laboratory. Recordings had been made of signals proposed for the new box and of these given by the existing box for purposes of comparison. There were nine recordings for the "Pay-on-Answer" box: all were of 400 cycle tone interrupted 3, 4 and 5 times per second. For each, three ratios of tone to silent period had been recorded. Firstly a one-to-one ratio; secondly with the silent period half the length of the tone period; and thirdly with the silent period twice the length of the tone period.

4. After the Group had listened to the recordings on ear-piece receivers, the following views were expressed:-

(a) When the operator had become used to the signals, she would recognise them as groups in the same way that a morse operator became used to the rhythm of a group of signals. The one-to-one ratio was therefore desirable. If the "double-length" silent period were used the operator might try to count the individual pulses rather than learn to identify groups of signals with particular coins.

(b) The morse analogy was not really sound because in practice an operator would not be listening to the tones continuously.

(c) The "half-length" silent period interval was not sufficient as the tones tended to run into one another and become indistinguishable.

(d) The signals for the "Pay-on-Answer" box were much superior to the tone gongs in the present pre-payment box.

5. Mr. Francis pointed out that the interruptions would be caused by mechanism in the box itself and there would, therefore, be maintenance tolerance on their periodicity. He thought that the Swiss box would generate something between the one-to-one ratio and the "double-length" period. If it were decided that four interruptions per second were preferable, there would be some variation between box and box but the limits of five and three interruptions per second would not be exceeded. The Chairman in summing up the discussion said that, although there was a divergence of opinion among members of the Group, there was some common ground. It was clear that the "half-length" silent period was not liked and that four interruptions per second would be acceptable to the

Minutes

"Pay-on-Answer"
Coin-box

Recordings of
Coin Signals
to operators.

majority of the Group although some would prefer three. He was sorry that Miss Whitelaw had not been able to hear the recording and asked Mr. Crisp to try to arrange for it to be demonstrated to her before the next meeting. He suggested that in addition it might be useful to test the reaction of a few telephonists to the new type of signal and that Miss Whitelaw might like to select a number of girls who would be willing to take part in a test. Mr. Francis said that, provided an exchange was selected where spare equipment and positions were available, there would be no difficulty in carrying out the required test. He thought that ideally the girls should first listen to the recording that had been made for the Group. They would then have an idea of the signals and could be asked to identify various sums of money using those signals. The periodicity of interruption and the silent period ratios could be altered and the relative degree of accuracy of the results achieved would be a guide as to the best signals to adopt.

6. Mr. Helman said that his enquiries into the use of the Plan 5E installation with the "Pay-on-Answer" system had shown that a "shared service" arrangement between the call office and the sub-postmaster's direct exchange line was not technically possible. There appeared, therefore, to be only two solutions, either (a) a coin box would have to be fitted in the sub-postmaster's premises, or (b) a separate direct exchange line would have to be provided for his use. Mr. Osmond again referred to the difficulties the IB experienced with discrepancies on Plan 5E installations and hoped that the Group would recommend their abolition. He thought that many Plan 5Es were to be found in Town Sub Offices and in those cases there should be little difficulty in providing direct exchange lines for the sub-postmasters. Town Sub Office boxes caused more trouble to the IB than those fitted at rural Post Offices. The Chairman said that the Plan 5E had few advocates, but it was a cheap way of fulfilling the pledge given by a former Postmaster General, and until the waiting list was much smaller there was little prospect of abolishing the 5E. The ITD/SSB had no analysis of the distribution of the installations but he was inclined to question the assumption that most of them were to be found in urban areas.

Plan 5 E
Installations

7. The Chairman said that since the last meeting he had had an opportunity of speaking with a member of the Swiss Administration about the position of the handset on their box. Apparently the Swiss experienced no exceptional trouble with breakages and he thought there was no reason to assume that there would be any difficulty if the Swiss design were used by the British Post Office. Mr. Francis pointed out that the Swiss box was designed at the time when the candlestick type telephone was in common use and the receiver would therefore naturally be hung at the side. Modern practice favoured placing the instrument centrally on a cradle and, if that were done, the coin box instrument would resemble an ordinary telephone. Mr. Hearn asked that regard should be paid to the use of call offices by left-handed people. He thought it was an argument for placing the telephone centrally in the new box. Mr. Wranmore suggested that there would be difficulties with accumulation of moisture in the microphone if the handset were placed at the side of the box. The Chairman in summing up the discussion said that there seemed to be a consensus of opinion in favour of placing the telephone horizontally on top of the box. The arguments in favour were:-

Position of
handset on
Swiss coin
box

- (a) it would resemble the ordinary telephone and would fit in with the modern fashion.
- (b) it would reduce the overall width of the coin box.
- (c) it would be of assistance to left-handed people.
- (d) it would prevent accumulation of moisture in the mouthpiece.

There seemed to be two main disadvantages to the change. Firstly, cradles were susceptible to breakage although the Engineering Department might be able to overcome that difficulty by designing a cradle similar to that used in the modern "cheese-dish" type of instrument. Secondly, the change in position of the switch hook might lead to some difficulties in the internal layout of the box. He suggested that a decision might be left until the Engineering Department had had a further opportunity to consider the problems involved. It would be undesirable to make changes in the Swiss design unless the balance of advantage was clearly in favour of doing so.

Field Trial
of Swiss
Coin-box

8. The Chairman recalled that, at one of the earlier meetings of the Group, the question of arranging a field trial for the new box had been touched upon. It seemed then that consideration of the matter could be left until the end of the Group's deliberations, but a new problem had recently arisen. The makers of the Swiss box had made it clear that they would require a patent fee before they would permit a British firm to manufacture their box under licence and, unless agreement was reached between the British and Swiss firms, no boxes of the Swiss design would be available. It would even be impossible to obtain a few for a field trial. Mr. Helman said that ED/S would be very loath to accept the new box for production without a field trial. Admittedly, boxes of the Swiss design had been working in Switzerland for many years but they would now be required to work with the lines and exchange equipment used by the B.P.O. A number of modifications, including those for British coinage, would be necessary. There were bound to be certain teething troubles and to place a bulk order without a field trial might well mean expensive modifications to tooling later. The Chairman considered that a field trial before Subscriber Trunk Dialling was available would present the new box to the public under unfavourable conditions but he knew that the general Directorate would not be willing to postpone the trial until the first STD installation was ready. Without STD, the new box would offer the public no very obvious advantage; it would, therefore, be wise when arranging a field trial to select a place where three minute timing would reduce the period that people had to wait for a free call office. Such a field trial would test public reaction to a buttonless box, the new tone signals, and to the "Pay-on-Answer" system. It would also show what effect on revenue there would be from the timing of local calls. Before the trial could take place, however, it would be necessary to have a tariff in multiples of threepence. Mr. Helman advised the Group that it would take about 18 months to prepare a number of Swiss boxes for a field trial. If the trial lasted a few months, and two years were allowed for tooling preparatory to production by a British company, the first production boxes would be ready for public service about four years after the trial boxes were ordered. For example:-

- June 1955 - Field trial boxes ordered.
- Dec 1956 - Field trial starts.
- April 1957 - Field trial ends and production order placed with British company.
- April 1959 - First production boxes ready for public service.

Mr. Francis said that, so far as the exchange equipment was concerned, normal development procedure took between three and four years but for the purpose of a field trial it should be possible to have the necessary equipment available within the eighteen months period mentioned by Mr. Helman. Mr. Hearn asked if the use of modified Swiss boxes for a field trial committed the Post Office to the purchase of the Swiss box. It seemed to him that if production models could not be available until 1959 there might be merit in the Post Office designing its own box. Mr. Helman pointed out that production of an entirely new design would take considerably longer than the four years required for

the modified Swiss box. Experience with the development of the self-sealing container showed the number of practical difficulties that could arise. With entirely new equipment extensive field trials were absolutely necessary. The big advantage of adopting the Swiss box was that the fundamental design was known to be sound. He agreed that use of the modified Swiss boxes for a field trial would commit the Post Office to guaranteeing an initial order.

9. The Chairman thought that it was necessary for the Group to weigh the cost and difficulty of a pilot scheme against the results that could be obtained from it. The representatives of the Engineering Department had made it clear that it would be foolish to place a large order for the new box without first having a field trial with a small number. He agreed that a trial in Piccadilly Circus would subject the box to the most rigorous conditions but there were two disadvantages. Firstly, the users of coin boxes at such places tended to be a shifting population and it was unlikely that within a period of three to six months any number of people would have an opportunity of getting used to the new system and testing it under normal conditions. Secondly, Piccadilly Circus was perhaps a little too much in the limelight. An experiment there was bound to attract notice in the national press and there might perhaps be pressure to introduce the timing facility at other "black spots" in London. If it were possible to find a town outside London where congestion was experienced on (say) market days at certain suites of call offices, it might be desirable to carry out the test there. He asked Mr. Leaver to look for possible places outside London where a field trial could take place. Mr. Francis said that he would examine the technical problems of field trial at director and non-director exchanges respectively.

10. Mr. Crisp introduced Committee Paper 7. He said there had been a difference of opinion between telephone and telegraph operating sections on the question of direct access from call offices to phonogram suites on the 90 level. From the telephone point of view there were advantages in providing access although it would mean charging the coin box user for a call to phonograms which was at present allowed free. The telegraph operating section on the other hand said that many of the calls going to phonograms were in the nature of enquiries and, if direct dialling access were permitted on the payment of the unit fee, they felt that they would be bound to offer refunds to callers who were not sending telegrams. Mr. Crisp went on to say that the call office fee concession largely arose from the conception that any member of the public should be able to hand in a telegram free of charge at any time; if the post office was closed free access to phonograms should be available from call offices. But calls to phonograms from ordinary subscribers were metered and there was therefore the anomaly that it was cheaper for an ordinary subscriber to go to a call office to send a telegram than to telephone it from his home. He thought that the time had come when the question of charging coin box users for calls to phonograms, whether or not they were for enquiries, should be reconsidered. The Chairman asked Mr. Leaver to look into the question. Continuing Mr. Crisp said that there would be no difficulty in providing access to the speaking clock, directory enquiry, the engineering repair service and to '999'. Separate coin box groups of circuits would not be needed. It had, however, been the practice in the past to bar access from coin box subscribers to the 95 level although, as far as he was aware, an ordinary subscriber could dial 95 and obtain the telephone-telegram operator. The problem in London, where ordinary subscribers dialled TOL and TRU for their shorter and longer distance calls while the coin box subscribers dialled '0' for all except local calls, had not been specially considered. Mr. Francis said that he hoped that a uniform procedure for ordinary and coin box subscribers could be introduced for the 90 service. If that were done, and the 95 problem were resolved, it would no longer be necessary to provide separate trunking for ordinary and coin box subscribers on the 9 level.

Committee Paper
Access to
Service levels
from "Pay-on-
Answer"
coin-boxes.

There would consequently be an appreciable saving of equipment in all exchanges. He confirmed that even with subscriber trunk dialling the TOL and TRU levels would remain in use in London for many years. If coin box subscribers were to be given access to them separate trunking with coin box discrimination would be necessary. The Chairman asked Mr. Crisp to consider again the use of the 95 facility, bearing in mind the possible future of Plan 5B installations with the introduction of the "Pay-on-Answer" system. He would also like him to consider the facilities that could be made available to coin box users in director areas.

Refund Chute

11. The Chairman reminded the Group that with the "Pay-on-Answer" box the refund chute would only be used for rejected coins or if a coin were placed in the wrong coin slot. The existing fraud of blocking the chute to collect money refunded after button 'B' had been pressed, would probably cease to be attractive. In the circumstances the expense of a glass front for the chute hardly seemed warranted. The chute itself need only be large enough to hold a single coin and it could presumably be placed at the side of the box without taking up too much space. The Group were in general agreement with the views expressed by the Chairman.

Wilful damage to instrument cords.

12. Mr. Osmond referred to the number of cases where telephone cords were cut and the handset removed. He wondered whether it would be possible to "armour" the instrument cord in some way so that it would be made rather more difficult. Mr. Arnold said that the problem had already been considered but the cost of armouring throughout the country far exceeded the cost of replacing the few handsets that were stolen.

Future Meetings

Friday, 6th May	2.30 p.m.
Wednesday, 1st June	2.30 p.m.

Action

Paragraph 5. To arrange a practical experiment, with a number of telephonists, of coin signals for a "Pay-on-Answer" coin box. ITD/OB.

Paragraph 7. To consider practicability of a centrally placed handset on the Swiss box. ED/S.

Paragraph 9. To find a suitable site outside London for a field trial of the new box. ITD/SSB.

Paragraph 10. Charging for calls from coin boxes to phonograms ITD/SSB.

To examine use of 95 facility and access to service levels in director systems. ITD/OB.

COIN-BOX STUDY GROUPAccess to Service levels from "pay-on-answer" coin-boxes.

1. This C.P. gives the views of the ITD/OB concerning the service levels to which call-office users should have access under the above system.
2. 90. Phonogram Service. At present call-office users do not have access to the "90" level but obtain phonograms by dialling "0"; they are not charged for the call. We have considered taking advantage of the facilities of the 'pay-on-answer' coin-box to give automatic access to the 90 level over the common group of circuits and rely upon the coin-box tone to enable the phonogram operator to distinguish between a call office and an ordinary subscriber. The disadvantages of this scheme would, however, be;
 - (i) the coin-box caller would have to pay a local fee in order to speak to the phonogram operator and credit for this amount would need to be allowed in the cost of the telegram. (Not all telegraph charges are multiples of 3d. and rounding up or down or refundment may be necessary in any case)
 - (ii) there are some calls to phonograms which are in the nature of enquiries or which do not result in the transmission of a message, e.g. handing-in time found to be too late to secure delivery by a required time. These should be allowed free of charge.
 - (iii) the number of telegrams from coin-box users, now approximately 20,000 per week is falling steadily with telegraph traffic generally, the number of such calls when the 'pay-on answer' box is available will probably be very much smaller.

Having regard to these circumstances we consider that coin-box callers should not have access to the 90 level but should obtain the phonogram service via the manual board. We are of the opinion however that should there be a change in policy which involves payment of a local fee for access to phonogram by call office users (as well as by subscribers) before the new coin-box is introduced, opportunity should be taken to review this recommendation.

3. 91. Enquiry. Access to this level without the insertion of money should be provided. No discriminatory signals will be necessary and the common group of 91 circuits could be used. In general the enquiry operator having given the callers the information sought, would expect them to clear and make a fresh call. Only in the case of a call for an XD subscriber which the latter accepts will the procedure require some amplification. The calls should be very rare, and suitable operating arrangements can be made without difficulty.

4. 95 and 951 Telephone telegram service. Where coin-boxes are provided on a plan 5E basis at sub post offices such lines should not have access to these levels but obtain the services via the manual board. Automatic access on a 'pay-on-answer' basis would involve the sub postmaster in the payment of a local fee before a telephone-telegram could be dictated.

5. 952 Speaking clock. Access should be given.

6. 953 Directory enquiry. Access should be made available on the same basis as for the 91 level.

7. 999 Service. Access without payment essential.

8. Other service levels. Access to the reserved 9 level codes e.g. 956 Weather bureau together with any other requirements will be considered as and when the need arises.

COIN BOX DESIGN STUDY GROUP

Minutes of the 8th meeting - 6th May 1955.

Present:-

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. A. V. Leaver	ITD/SSB
" E. G. Crisp	ITD/OB	" C. G. Osmond	PD/IB
" S. W. Dabbs	ITD/PB	" E. S. Pritchard	AGD/TFB
" H. E. Francis	ED/Sp.	Miss N. Whitelaw	PODWC
" S. L. Helman	ED/S		Staff Side

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman said he had had apologies for absence from Messrs. Hearn and Brumby.

Minutes

2. The minutes of the 6th and 7th meetings were agreed.

3. The Chairman commented on his impending move to the LPR and said that he would like to settle the main issues before the Study Group by the time he handed over to his successor. He thought it should be possible to draft the Group's final report by August if they concentrated their main effort on those points which directly affected the design of the coin box and the apparatus immediately associated with it, leaving side issues to be settled departmentally outside the Group.

Recording of
Coin Signals to
operators

4. Miss Whitelaw said that she had had an opportunity since the last meeting of listening to the recording of coin signals to operators. Her own preference was for the tone interrupted three times per second with the "double length" silent period. She thought that the idea of a practical test with telephonists was a good one but that it would be unwise to base a decision on one test alone. A more reliable result would be obtained if the experiment took place at two or three different exchanges. Mr. Francis said that he did not expect that there would be any engineering difficulty in making the recordings available at exchanges outside London. The Chairman asked Mr. Crisp to make a formal approach to the UFW asking for their cooperation in carrying out the tests. He suggested that the telephonists taking part should be told that new signals were being tried out with a view to the eventual introduction of a threepenny slot in coinboxes. He would like the experiments to take place within the next month or so if possible. (Later in the meeting - paragraph 12 - it was decided that the tests should be carried out at Reading as well as a London exchange).

Foreign Coin box
Systems

5. The Chairman said that Mr. Ray (Director, LTR) had obtained information about coin boxes in South Africa. The boxes in use there were buttonless and worked on a "Pay on Answer" principle. The three penny piece was the basic coin and the coins were signalled to the operators by pips of tone. No information was available on the method of tariff adjustment used there but the Chairman said that he would try to get further information before the next meeting. Mr. Francis said that the South African system had been mentioned in Committee Paper 3. Charging was by 3 minute periods and the operation was based on a different principle from that envisaged for the new British box. The South African box afforded limited multi fee dialling facilities only.

Plan 5 E
Installations

6. Mr. Helman reported that ED/S had had a further look at the possible operation of the Plan 5E installation with the "Pay on Answer" system. By using rather complicated equipment it would be possible to allow a Sub-Postmaster to call Phonograms direct by

lifting his telephone; his line would provide him with no other telephone facilities. Mr. Leaver did not think the arrangement would be acceptable because Sub-Postmasters had to 'phone telegrams direct to delivery offices within a prescribed radius. Normal direct exchange line facilities were therefore necessary. Referring to one of the two solutions to the problem previously suggested, he said that the ITD/SSB were investigating the possibilities of dispensing with Plan 5E installations in urban areas. He thought, however, that there might be a third solution. The present form of installation could be continued when the "Pay-on-Answer" coin-box was introduced and a Sub-Postmaster would be able to dial all non-meter codes; all other chargeable calls could be passed via the operator by dialling "0". Mr. Dabbs drew attention to the fact that it was proposed to make the 951 (Telephone Telegram) code chargeable. Mr. Helman thought that the solution proposed by Mr. Leaver would be unacceptable to the ITD/OB. From an engineering point of view there might still be difficulties with the "Pay on Answer" system; the existing installation provided inter-communication facilities between the coin box and the Sub-Postmaster. He was not even certain that it would be technically possible to provide a second coin-box for the use of the sub-postmaster. Before committing his Department he would like the opportunity of experimenting with the Swiss box.

7. The Chairman said that the problem should be solved inter-departmentally and he asked Mr. Leaver to arrange a meeting of the interested parties .

8. Mr. Crisp said that he had made further enquiries about access to the Telephone Telegram (951) service. There was no standard arrangement. Where the amount of traffic was small, only one group of circuits was provided and those gave normal metering facilities so that full supervision would be available on calls from dialling-in operators and UAXs. The Sub-Postmaster either completed his calls through the manual board or dialled the calls direct depending on whether he was renting his own private line and charging service calls to the Post Office or using a Plan 5E service installation. If the traffic were sufficient to justify it, a separate group of non metering circuits was provided for the use of ordinary and coin box lines. A metering group had to be retained to provide supervisory conditions for dialling-in operators and calls from UAXs. So far as the 951 service itself was concerned, there was, therefore, no need for segregation between ordinary and coin box subscribers. If access were given from coin-boxes to the speaking clock (952) and to Directory Enquiry (953) segregation between ordinary and coin box subscribers would be unnecessary on the 95 level.

Access to service levels.

Telephone-Telegrams

9. Mr. Crisp continuing, said that Phonograms (90) was barred to coin boxes but was available as a metered code to all other subscribers. Coin box users dialled "0" to obtain Phonograms and were not charged for the call. It would not be practicable to give coin boxes direct access unless they were charged for the call and unless the Phonogram operator had some means of identifying a coin box user. That could be done by providing two groups of circuits to the coin box suite, but it would be expensive where the Phonogram Room was some miles away from the exchange. A possible alternative would be to use a common group of junctions and rely on the coin box warning signal to provide identification for the Phonogram operator. Miss Whitelaw thought that there would be a danger of Phonogram operators plugging-in before they were ready to answer a call; the coin box warning signal would not then be heard. Mr. Crisp thought it might be possible in that case for the Engineers to devise a special warning signal (of the type used for coin box discrimination at UAX 5 exchanges) which came on the line when the speak key was thrown. Mr. Leaver said that free calls to

Phonograms

Phonograms from call offices was one of the Jubilee Concessions and had been introduced in 1936 to give the public the facility of being able to "hand in" a Phonogram at any time without special payment, even when Post Offices were closed. This helped in meeting public complaints about the earlier closing of Post Offices. He suggested that the 90 level could be made available to coin box users on the payment of 3d, the warning signal being relied on to provide identification, but that the facility would not be advertised and the normal method of obtaining Phonograms from coin boxes should be to dial "0". Another solution would be to make Phonograms a non-metering service to all users and to raise the call fee for ordinary subscribers on the phonogram ticket. Mr. Crisp pointed out that it would then be necessary to provide a separate group of circuits giving metering conditions so that proper supervisory conditions would obtain on calls from dialling-in exchanges and UAXs. Mr. Dabbs wondered if the problem of calls to Phonograms from call offices was as serious as it appeared. In Committee Paper 7 it was stated that the coin box users sent 20,000 telegrams a week. In other words Phonograms was, on the average, called from each coin box once every three weeks.

Trunks and Toll

10. Mr. Crisp said that access from coin boxes to THU, TOL and 94 would need to be barred. Facilities on those levels could only be offered to coin box users if separate groups of circuits to the manual board were provided or if there were a special coin box identification tone. Mr. Francis said that coin box users could be allowed to dial those codes without the insertion of money. The calls would be diverted to the manual board by teeing THU, TOL and 94 to the '0' level but it would involve a segregation of switches. He thought that a special coin box identification signal similar to that used for UAXs could be provided and asked for an opportunity to examine the possibilities. From an Engineering point of view, common access by ordinary and coin box subscribers was a desirable objective because it made the segregation of equipment unnecessary. Miss Whitelaw referred to the danger of permitting coin box subscribers direct access to directory enquiry. Since the re-organisation of the directory enquiry services the number of enquiries extended over trunk lines had increased considerably. If the enquiry originated from a call office, and a call was subsequently set up, the operator would have to rely on the caller's honesty for the collection of the call fee.

Directory
Enquiry

Summary

11. The Chairman commented that the decision to permit free calls to Phonograms from coin-boxes had been taken in 1936, in the days of the sixpenny telegram. He thought that the question should be re-examined in the light of present day circumstances and that it should be mentioned in the Report as a question for further consideration. The outcome largely depended on whether phonograms would be the only 9 level service on which segregation was necessary.

On the general question of access to service levels, he said that there were a number of problems that required further study. As they did not primarily affect the design of the coin box and the associated exchange apparatus, he proposed that they should be considered outside the Group.

Location of
Field Trial

12. Mr. Leaver said that he had obtained information about the call offices at Reading. In the vicinity of the Head Post Office and the South railway station were a score of call offices, the yearly average takings from which were between £300 and £400 per box. The effective use per box varied from 6,000 to 16,000 calls a year. Miss Whitelaw said that from her point of view a field trial at Reading would be particularly suitable. She suggested that, to prepare the way for the trial, telephonists at the Reading exchange should be asked to participate in the practical test of coin signals. (Paragraph 4 above). Mr. Francis thought that it could be readily arranged for

the present boxes and the new "Pay-on-Answer" boxes to call on separate 'O' levels circuits at Reading exchange. The Chairman thought that Reading was ideally suited for the field trial. The figures Mr. Leaver had quoted suggested that there was sufficient pressure on the call offices concerned to justify the timing of local calls. The boxes were likely to have a number of regular users who would soon get used to the new system and give it a fair test.

13. The Chairman reported that he had had no decision from the Minister on the question of abolishing the penny coin slot. He did not expect the question to be settled until after the General Election.

Abolition of
Penny Slot

14. The Chairman said there were conflicting requirements as regards the size of the coin container. A large container needed clearing less frequently and was less likely to overflow at holiday weekends. On the other hand, a smaller container was easier to handle and the amount of money that would be left lying in the box was less. Call office collections cost the Post Office about £ ½ m. per year from a total call office revenue of about £7 m. Mr. Leaver reminded the Group that the container at present in use would hold about £10 worth of coins if the penny slot were abolished and the threepenny slot introduced. The container used in the Swiss boxes was about 2/3rds the size of the present Post Office one and with a threepenny slot it would hold between £6 - £7 worth of coins. He thought that was just about the right size. Mr. Helman said that a large box had to be strengthened to prevent the extra weight of coin pulling it out of shape and self-sealing containers jammed very easily if they became distorted. He had envisaged that a container similar to that in the Swiss box would be used. It would have a handle and would be removed from the front. He thought however that it might be possible to have two sizes of containers for use in the same type of box; there would be a standard fitting to take either size, but with the smaller container there would be a dummy base between it and the coin box. He envisaged a separate lock to give access to the coin container, although one was not provided on the present Swiss box. Mr. Osmond said that he had at one time thought of suggesting that, as a security measure, access to the coin container should be from outside the call office but he realised that it would present obvious difficulties in arranging suites of call offices. There was no security reason for having a very robust container. He hoped that the coin box itself would be free from flanges and other gaps which could be prised open with a crowbar or similar instrument.

Coin
container

15. The Chairman said he was attracted by Mr. Helman's suggestion of a box capable of taking two sizes of container. The Swiss size had much to commend it, but it would be unfortunate if in the years to come a change in money values made it too small. Admittedly if the penny slot were abolished the Swiss container would hold about three times as much money as the present one, which gave a reasonable margin; his own inclination would be to adopt a box capable of taking two sizes. However, the question had not to be decided until the production order was being placed and in the meantime the Swiss container should be used in the Reading experiment so that practical experience of the frequency of clearances required could be obtained. He asked Mr. Helman to take account of the comments that Mr. Osmond had made and suggested that it would be helpful if ED/S could provide specimen containers for members of the Group to see at a future meeting.

<u>Future meetings</u>	Wednesday,	1st June, 1955	2 p.m.
	Monday	27th June, 1955	2 p.m.
	Friday	15th July, 1955	2 p.m.

Action

Paragraph 4. To arrange, in co-operation with the UPW, for telephonists to take part in a test of coin signals for the "Pay-on-Answer" coin box. ITD/OB

Paragraph 7. To pursue problems arising from the use of the Plan 5E installations with the "Pay-on-Answer" system. ITD/SSB.

Paragraph 10. To consider the possibility of providing a special coin box identification tone at manual boards and phonogram suites. ED/Sp.

Paragraph 15. To provide sample coin containers for examination at a future meeting. ED/S.

COIN BOX DESIGN STUDY GROUP

Fraud and Theft

This Committee Paper lists those methods of fraud and theft which are mainly attributable to weaknesses in the design of the present coin box or its associated exchange apparatus.

1. Faulty operation of coin box mechanism - may result in free calls.
2. Failure of coin box discrimination signal on calls from UAXs - operator will not ask for money.
3. Back dialling and clip dialling.
4. Speaking through receiver or coin transmitter.
5. 'Appointment' message calls - caller receives message but does not speak.
6. Switch-hook impulsing.
7. Use of slotted coins.
8. Imitation of coin signals.
9. Manipulation of Buttons 'A' and 'B' - permits conversation and refund of money.
10. Looping line at protector - only possible with overhead lead-in. Button B is pressed and money regained after connexion has been set up and held.
11. Transfer charge calls - offered, by arrangement, to a call office user.
12. Manual operation of mechanism - by persons in possession of a coin box key or other means of opening the box.
13. Obtaining access to mechanism and trapping coins, or dipping *into* container for coins.
14. Use of foreign coins or tokens.
15. Removal of whole coin box from its mounting.
16. Obstruction of return chute.
17. Delayed replacement of self-sealing container.
18. By prizing off front plate.

ITD/SSB

May, 1955.

COIN BOX DESIGN STUDY GROUP

Minutes of 9th Meeting, - 1st June 1955

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. B. E. Hearn	AGD/TCB
" E. G. Crisp	ITD/OB	" A. V. Leaver	ITD/SSB
" S. W. Dabbs	ITD/FB	" C. G. Osmond	FD/IB
" H. E. Francis	ED/TP	Miss N. Whitelaw	PODNC
" S. L. Helman	ED/S		Staff Side

Mr. J. Lennox ITD/OB (Secretary)

The Chairman said that he had to announce with regret that the Group had lost the services of Mr. Fritchard who had been transferred to other duties in the AGD. He had agreed with Mr. Hearn that as the work of the Group had reached an advanced stage it would not be necessary to bring in another AGD member in Mr. Fritchard's place. Mr. Fox had sent an apology for his absence.

Minutes

2. The minutes of the 8th meeting were agreed.

Recording of coin signals to operators

3. Mr. Crisp said that he had written to the UPW asking them to cooperate in the experiment with coin signals to operators. He had suggested that Monarch and Reading exchanges might be suitable. A script for the test had been prepared and the Engineering Department were making the recording. Miss Whitelaw thought that there was unlikely to be any objection to the experiments.

Special coin box identification signal

4. Mr. Leaver said that there was a need for a special coin box identification signal for calls originating from and for calls incoming to coin boxes. For the identification at manual boards of originating calls either an acoustic or a visual signal would prove satisfactory. The former seemed to have the advantage that it could also be used for identifying coin boxes on incoming calls. Mr. Francis said that he was still studying the problem of coin box identification but if a tone were used it should not be heard by the coin box user lest he should mistake it for the signal telling him to insert money. The Chairman asked Mr. Francis to extend the scope of his enquiry to include an identification signal for incoming calls to coin boxes.

Mounting of the coin box

5. The Chairman suggested that in considering the method of mounting three points had to be taken into account: security, appearance, and the placing of the coinbox. It would be useful to consider first the need for a wallboard. Mr. Helman recalled that in Switzerland the coinbox was fixed direct to the kiosk wall, which was made of a fairly light alloy; but in the U.K., where kiosks were of cast iron or concrete, direct mounting would be impracticable. Mr. Osmond said that the coinbox and wallboard were sometimes wrenched from their mounting and removed from the call office, but Mr. Arnold mentioned that in the latest type of No. 6 kiosk an attempt had been made to overcome the difficulty by bolting the coinbox direct to a boss in the wall of the kiosk. Unfortunately the position of the fixing boss might prejudice the Group's wish to place the coin box somewhat higher.

6. The general view was that a wallboard would be necessary, particularly as instruction notices would have to be displayed and it would be extremely troublesome to fix them separately to the back of the kiosk. The wallboard should however be of smart appearance. The Chairman observed that any limitation on the placing of the coin box because of the position of the fixing boss could be avoided in the design of a new kiosk. He asked Mr. Osmond to report to the Group on:

(i) how effective the bolting of boxes in the modern No.6 kiosk had been in preventing wrenching;

(ii) whether there were many crimes of that nature with those kiosks where the coinbox could not be bolted to the wall.

7. Mr. Helman said that the present coin boxes were of mild steel finished in black stove enamel. They chipped rather badly and in damp situations was subject to rust. He would prefer the coin box to be made of an aluminium alloy which could be anodised to give a natural or coloured finish. The aluminium alloy might in itself be more expensive than steel, but tooling would be easier and he thought the boxes would retain a smart appearance longer. Miss Whitlaw asked if it would not be possible to use a vitreous enamel finish giving the light colours common in a modern kitchen. Mr. Arnold confirmed that it would be possible, but vitreous enamel was the best and most expensive of the finishes available. The Chairman said that he had been considering various coloured telephones of the types commonly advertised by the American telephone companies, but had come to the conclusion that they would not be suitable because there might be difficulty in matching colours when breakages occurred. He expressed a personal preference for a dove grey coin box with a black or matching handset; Mr. Helman and others agreed with him. He asked Mr. Helman if he would produce some comparative cost figures for the use of steel and aluminium and furnish more information about the life and cost of various colours and finishes.

8. Mr. Helman said that, as the mechanism of the Swiss coin box could not be swung out, the maintenance engineer needed access to the top, bottom and both sides of the mechanism. He suggested that the coin box should have a strong single outside cover with two lighter inside covers giving separate access to the coin container and the mechanism. He felt that a single outside cover would look well and give added security. Mr. Osmond was strongly of the view that the coin container should be in a separate locked compartment as it would be unfair to the maintenance engineer to give him access to money when he removed the mechanism cover. The Chairman said that a locked outer cover and two locked inner covers seemed a rather elaborate and expensive arrangement. He had thought in terms of two separate outside covers each with a separate lock; one would be above the plate dividing the mechanism from the coin container and the other below it. However, his view would be influenced by the extra cost of the single overall cover and he asked Mr. Helman to report on that aspect at the next meeting. He suggested that Messrs. Helman and Osmond should discuss and report on the relative security merits of the single outer cover with two inner covers as compared with two separate outer covers.

Access to
mechanism and
coin container

9. The Chairman reminded the Group that, of the 120,000 coin boxes in use, about half were at subscribers' private installations. It seemed on the face of it an obvious economy to design a standard box suitable for subscribers' premises as well as public call offices. The only difficulty appeared to be that the subscriber would not want to have a self-sealing container. Mr. Leaver said that the present subscriber's coin box was smaller than that used in a public call office. Access to the coin container on the subscriber's box was from the front and was secured by a padlock while the self-sealing container in the public call office was reached from underneath. Mr. Helman thought that a standard design of box should be used even though they were likely to have separate engineering stores identification numbers. A self-sealing container without a lid could be used in the subscriber's coin box. The Chairman said that there seemed to be general agreement that uniformity was desirable. There should be a saving in production costs, but it would be essential to arrange for separate access to the coin container and the mechanism if the subscriber was to be denied access to the mechanism itself. (See paragraph 8 above.)

Subscribers'
coin box
installations

10. The Chairman introduced Committee Paper 8. He said its origin was an Appendix of the COPCR Study Group report and it was, so far as was known, exhaustive.

The items were considered seriatim to see what improvement would result from the introduction of the Pay-on-Answer system and the following were the conclusions reached:-

1. The action of the present pre-payment box was negative and any failure of the mechanism tended to allow a free call to be made. The Pay-on-Answer system, on the other hand, depended on positive signals for its operation and if these were not received speech and hearing conditions were not established. The difficulty should, therefore, be overcome.
2. Failure of the coin box discrimination signal was thought to be infrequent. It was essentially due to faulty exchange equipment and was not a weakness of the coin box itself. The existing WAX relay sets were unduly complicated: a new and more simple design, which should overcome the difficulty, was being considered.
3. With the Pay-on-Answer system dialling would always be possible without the insertion of money, but no conversation could take place until money had been deposited.
4. With the Pay-on-Answer system the insertion of coins would be signalled to the exchange by means of electrical pulses. There would, therefore, be no coin box transmitter. Speaking through the receiver would also be impossible as there would be no transmission path to the called party until money had been put in the box.
5. The type of message received by taxi-cab drivers and bookies' runners would no longer be possible as there would be no speech or hearing path until money had been inserted. The code ringing message (the businessman telling his wife that he was coming home) would still be possible.
6. No advantage to be gained from switch hook impulsing.
7. Any coins inserted in the box would be lost and there would, therefore, be no advantage in using slotted coins.
8. Since the tones heard by the operator would be generated by the exchange equipment they would not be heard by the coin box user himself. There was, however, the slight risk that someone with inside knowledge might employ a whistle or similar device to simulate the pipe appropriate to various coins; the risk would have to be accepted.
9. The Pay-on-Answer box would be buttonless and all frauds depending on the manipulation of Buttons A and B would, therefore, be eliminated.
10. There would be no advantage in looping the line at the protector as the crill would be released by the exchange equipment on the expiry of the paid time. It might, however, be possible to simulate money by simultaneously disconnecting one line and earthing the other. To do so would require considerable skill and a detailed knowledge of the operation of the Pay-on-Answer system.

Action

Paragraph 4	Identification signals for calls incoming to and originating from coin boxes.	ED/TP
Paragraph 6	(i) Has the bolting of boxes in the modern No.6 Kiosk been effective in preventing wrenching. (ii) Is there much wrenching of coin boxes nowadays in other types of kiosk.	ED/IB
Paragraph 7	Relative costs of steel and alloy coin boxes. Life and cost of various colours and finishes.	ED/S
Paragraph 8	Merits and cost of single and double coin box covers.	ED/S

Future Meetings

Monday	27th June	2pm
Friday	15th July	2pm

COIN BOX DESIGN STUDY GROUP

Minutes of 10th Meeting - 27th June 1955

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. B. E. Hearn	AGD/TCB
" E. G. Crisp	ITD/OB	" S. L. Helman	ED/S
" S. W. Debbs	ITD/PB	" C. G. Osmond	PE/IE
" L. G. Fox	PCEF & S DWC	Miss N. Whitelaw	PODWC
" H. E. Francis	ED/TP		Staff Side

1. The Chairman said that Mr. Leaver was unfortunately away on sick leave. Mr. Lennox was on annual leave and Mr. Kinder and Mr. Lawes were attending the meeting to represent the ITD/SSB and to take the minutes.

Minutes of 9th Meeting

2. Mr. Helman queried the statement in paragraph 9 of the previous minutes that a self sealing container without a lid could be used in the new coin box when fitted to subscribers' installations. Mr. Osmond thought that, at the risk of getting away from standardisation, the Group might consider some other form of container for subscribers boxes, e.g. a nylon bag on a fitting. The Chairman said that although it was desirable to have a standard coin box for both public call offices and subscribers, there was no need to standardise the container to collect the coins; and as no one but the subscriber would have access to the cash in the subscriber's coin box it seemed pointless to spend money on an elaborate coin container. A nylon or canvas bag sounded attractive, and this possibility would have to be given further consideration at a later stage.

3. Referring to Item 2 in para. 10 of the minutes Mr. Debbs said that it was not strictly true to say that failure of the coin box discrimination signal was thought to be infrequent. He contended that it was in fact a frequent source of trouble on UAXs, and proposed that this item should read "Failure of the coin box discrimination signal was essentially due to faulty exchange equipment etc." This was agreed.

Matters arising
Coin box
identification
signal

4. (a) Mr. Francis said that the question of providing an identification signal for calls originating from or for calls incoming to, coin boxes was a difficult problem and still needed further study; present indications were that provision of a signal for incoming calls to coin boxes would be very costly.

Fixing of coin
box and
wallboard to
kiosk.

(b) Mr. Osmond reported that 21 cases occurred during the last 12 months of coin boxes and wallboards being wrenched from their mountings in No. 6 kiosks, but only two concerned kiosks of the modified type. This trouble was still prevalent but bolting the coin box direct to a boss in the wall of the kiosk was the only remedy. Mr. Arnold pointed out that the improved arrangement for bolting was provided at the casting stage and therefore was only possible on new kiosks. Mr. Fox said that a great deal of trouble had been experienced by engineers with fixing wallboards into kiosks, particularly when the wallboard equipment was in one unit. Owing to the confined space it was most difficult for an engineer to get the wallboard into position and this had resulted in a number of cases of accident. The Chairman said he was surprised that the number of wrenchings was so great and it was essential that careful consideration should be given to the method of mounting the new assembly both from the point of view of theft and ease of erection.

/(c)

(c) Mr. Arnold reported that he had only been able to obtain provisional estimates of relative costs of steel and aluminium from one firm; they had quoted 11s. 2d. for mild steel and 22s. 11d. for aluminium; these figures applied to the basic material which would be required for the shell of the Swiss box. However, much depended on the quality of the metal chosen, a good quality alloy such as duralumin might cost three times as much as an inferior mild steel. But aluminium had advantages over steel in that it weighed less, had a better appearance and was capable of taking a better finish; in addition, the processing might be less expensive. As regards the comparative cost of various finishes, vitreous enamel was expensive and could not be applied to aluminium; although stoving could be applied to both metals, this was also as costly as the vitreous enamel finish; the anodising process was less expensive, being about half the price of stoving. The Chairman said that this question of material and finish was an important one and he invited Mr. Helman to produce a Committee Paper on it. The Paper should give relative costs of different materials and finishes and should briefly discuss their respective merits. It should make out a case for the combination which the ED considered most suitable for adoption, covering such aspects as appearance, durability, weight, thickness and resistance to theft and proof against rust.

Cost of steel
or alloy coin
box.

(d) Mr. Osmond said that from an IB point of view it was desirable to avoid two separate outer covers to the coin box as this might make the box more vulnerable to theft. He wondered whether one cover for the front and an additional inner cover for the cash compartment would be practicable; the lock combinations could be so arranged that an engineer's key would open the outer cover only and the postman's key would open both the outer and inner covers. The Chairman said that this scheme had the disadvantage of allowing postmen collectors access to the mechanism and suggested that another solution might be to have one strong outer cover, or cowling, embodying a small locked door, hinged inside, from which the self sealing container could be withdrawn without disturbing the cowling. In this way the postman would have access only to the cash and the engineer, on removing the cowling, would have access only to the mechanism. Mr. Helman thought that this might be difficult and expensive to manufacture. Querying the necessity for having an additional inside cover Mr. Fox asked whether the IB could produce figures to show the risk involved in allowing engineering officers access to the self sealing container. Mr. Osmond said that it was fundamental IB policy to reduce temptation as far as possible; it was morally wrong to provide employees with opportunities for theft or fraud where this could be avoided. Following further discussion, the Chairman said that it was clearly desirable to safeguard the coinbox both as regards the engineer and coin collector but the box must also be secure against theft by an outsider; a sense of proportion was necessary however with regard to the cost of providing absolute security. He invited Mr. Helman and Mr. Osmond to consider further what method they could recommend to ensure, (1) that the coin collector did not have access to the mechanism nor the engineer to the cash compartment; (2) that there was a good measure of security against the outsider, and (3) a good appearance. They should consider the various ideas so far suggested, i.e. (a) a strong single outside cover with two inner covers giving separate access to the cash compartment and the mechanism, (b) one single outside cover embodying a separate door to the cash container (c) two separate outside covers, one to each compartment and (d) two separate halves to the coin box. In reaching the conclusion some idea of the relative costs would be necessary and it would be desirable if possible to include some reference to this in the Interim Report.

Coin box
cover.

C.P. No.8
Fraud and
Theft

5. The remaining items on Committee Paper No.8 were discussed and the following were the conclusions reached.

11. The transferred charge fraud which only arises on manually controlled calls would probably persist with the new box. Present indications were that provision of an identification signal for calls incoming to coin boxes would be too costly but the transferred charge call was a public facility and could not be withdrawn. It was important that cases of this fraud coming to light should be reported to the PD/IB.

12. The question of fraudulent operation of the mechanism was dependent on the security obtained by the method of opening the coin box which was discussed earlier (para. 4(d)).

13. The introduction of self sealing containers had considerably reduced the extent of the 'dipping' fraud. Mr. Helman was invited to consider the possibility of providing a continuous coin guide in the new box thereby preventing the trapping of coins.

14. The use of the American one cent piece instead of sixpence was the most common 'foreign coin' fraud, and the narrower tolerance provided by Mechanism No. 18 which rejected one cent pieces should be included in the design of the new box. Nothing could be done in the coin box design about the use of the 20 franc piece, the dimension of which was between that of the silver shilling and the cupro-nickel shilling.

15. The removal of the whole coin box from its mounting had been discussed fully in para. 4(b). The solution was to provide a stronger method of mounting as with the modified No.5 kiosk.

16. Obstruction of the return chute would cease to be worthwhile with the Pay on Answer box as only rejected coins would be returned in the chute.

17. In the short time since self sealing containers had been introduced there had been no cases reported of theft of cash by the postman-collector delaying replacement of the self sealing container, but Mr. Helman was asked to consider whether any arrangement - either electrical or mechanical - could be incorporated in the new coin box to prevent money being inserted unless the coin container was in place.

18. The question of prizing off the front plate was dependent on the design of cover to be provided for the new coin box (see para.4.)

Draft Report

6. The Chairman introduced the draft interim report and suggested that the general layout should be as follows:

Minute to the D.I.T.
Need for a New Coin box
Considerations affecting design of new coin box
Pay on Answer system
Timing of Local Calls
Coin Slots
Signalling of coins
Extensions of Time
Fraud & Theft
Standardisation of coin box
Introduction of new system.

Miss Whitelaw

Miss Whitelaw said that the draft had not covered consideration of phonogram and directory enquiry calls about which there had been lengthy discussion but this aspect had been covered to some extent by the further paper which had now been added on Ancilliary Manual Board Services.

7. The Group agreed several minor amendments to the text and in addition the following matters were discussed:

It was agreed that reference should be made to the visit to Switzerland, to the kind of coin box the Group was recommending and to the intention to comment in the Final Report on a new design of kiosk. It was suggested that a photograph of the box should be included with the Report and the Chairman said he would consult Messrs. Helman and Francis on the possibility of producing a photograph.

Minute to D.I.T.

8. It was agreed that this chapter should be redrafted and strengthened and some sections expanded to present a better case for redesigning the coin box. In view of the limited objectives of the Norton Study Group the paragraph referring to their recommendations vis-a-vis multi-metering should be reduced in scope. Miss Whitelaw was concerned about the references in the draft to the introduction of subscriber trunk dialling as this was a contentious subject with her Staff Side. The Chairman agreed that all references to subscriber trunk dialling and statements about savings in operating staff should be suitably rephrased. On the question of including a reference to the segregation of coin box lines, the Chairman said he would consult Mr. Francis later.

Need for new coin box

9. The Chairman said that in discussions with various knowledgeable people during recent weeks he had become disturbed at the amount of feeling expressed against the proposed automatic system which prevented callers from hearing the subscriber answer before money was inserted in the box. Although the system provided an absolute solution to the appointment call fraud, it was difficult to justify on these grounds alone, especially as it gave the caller no safeguard against losing his money on wrong numbers. He had accordingly asked Mr. Francis to consider the practicability of allowing the caller to hear the called subscriber answer before inserting his money. Mr. Francis said that on a preliminary examination he had been unable to find a simple or cheap method of providing this facility, but he was pursuing his investigations. He explained that the main difficulty was providing a speech channel in one direction only as the control equipment was located at the exchange; the method of short circuiting the transmitter could not therefore be easily applied. He added that although there would be cases of money lost through getting wrong numbers this might often be no more than the unit of coin needed to obtain connection. In any case the caller could obtain a further call free of charge by calling the operator. Miss Whitelaw said that with a fully automatic system it would be unwise to publicise the fact that if money were lost on obtaining a wrong number the caller could obtain his call through the operator without further payment as this would encourage fraud on a wide scale. She thought that correct dialling should be part of the process of re-education of the public when introducing the new box. Mr. Crisp said that even if the 5 seconds facility could be provided this might be insufficient time in some cases for the caller to identify the subscriber. Furthermore, many subscribers simply answered the telephone by saying "Hello". After further discussion, the Chairman said that the chapter on the Pay-on-Answer system would have to be revised to show that both possibilities had been fully considered and, if a reasonable inexpensive solution was not forthcoming, that the cost of adopting the 5 seconds facility outweighed the advantages obtained.

Pay on Answer System - suggested modification

Introduction of
New System

10. Mr. Fox suggested that this section might conclude with a reference to the need for publicising the new box when the pilot scheme in Reading was to be introduced. The Chairman agreed and said that much could be done in this direction to help the public to understand the new system; publicity campaigns should be instituted in Reading and in other towns as and when the new coin box was introduced.

Paper on
Finance

11. The Chairman invited Mr. Heern to prepare a short financial section for inclusion in the Interim Report. This should cover such points as the tariff disadvantages of the present box, the rough estimated cost of the new box, and the broad effect on revenue of the provision of improved facilities, operator savings, timing of local calls, and in the long run, savings in the provision of kiosks.

Action

Paragraph 4(a)	Identification signals for calls incoming to and originating from coin boxes.	ED/Tp
Paragraph 4(c)	Committee Paper - ED recommendations on material and finish for new coin box.	ED/S
Paragraph 4(d)	Recommendations on merits and costs of various types of coin box cover.	ED/S PD/IB
Paragraph 5 Item 13	To consider provision of continuous coin guides in new coin box	ED/S
Paragraph 5 Item 17	To consider a practical solution to combat delayed replacement of self sealing container	ED/S
Paragraphs 6-10	Revision of draft Report	ITD/SSB
Paragraph 11	Paper on Finance for inclusion in draft Report	AGD/TCE

Next meeting Friday 15th July, 2p.m.

Interim Report of the
COIN BOX DESIGN STUDY GROUP

Director General,

The Group was appointed in April, 1954 with the following terms of reference:

"To consider the need for the introduction of a Call Office Coin-collecting Box and associated apparatus and fittings of a new design, in the light of probable future service and public requirements.

To make recommendations about the facilities to be given by it, and to report on the practical aspects of its introduction into general use."

The Group has held meetings at which it has largely confined its considerations to the design of a new coin box and the facilities to be given by it. Owing to the appointment in August 1955 of the Chairman to a post outside the ITD we considered it desirable to submit an Interim Report showing what progress had been made, leaving further study of the practical problems of introducing the new coin box, the general interior layout and decoration of call offices and comments on a new design of kiosk, to be dealt with by the Group under its new Chairman.

The present multi-coin box was designed in 1923 and was brought into use from 1926 onwards. Post Office policy has been to develop the public call office service more extensively than in other countries and the number of call offices has grown from 20,000 in 1926 to 65,000 in 1955. In addition the demand from hoteliers, boarding-house keepers and others for rented coin box telephones on their premises has been encouraged as this service meets a public need economically without the heavy capital and maintenance costs of kiosks and cabinets. There are about 60,000 of these "subscribers' coin-boxes" as they are called.

The present coin box has served its purpose very well on the whole; problems which have arisen from time to time have been overcome as far as possible by modification to the equipment, but the box is now inadequate to meet the needs of modern development of the telephone service with its rapid

/progress

progress in automatization and the introduction of subscriber trunk dialling. It is most desirable, for instance, to allow direct dialling access to special services such as the speaking clock and the weather forecast service, which cannot be provided with the present coin box. The present system entails special segregation of coin box lines at the switchboard and the mechanism does not permit of multi-metering facilities, all calls beyond unit fee having to be controlled by the exchange, which is expensive in operating staff. A further drawback with the present box is that although it can be modified to work with a unit fee of fourpence, if required, no further alteration in the unit fee tariff would be possible.

In May 1945 a Study Group under the chairmanship of Mr. H. A. Norton investigated the possibility of introducing multi-metering facilities on coin box circuits but came to the conclusion that the estimated cost of introducing such facilities was out of all proportion to any advantages likely to accrue either to the public or to the Post Office. The Group considered that the introduction of complicated coin box mechanism would result in a serious increase in fault liability, and further, that provision of such facilities would increase the complexity of switching and testing equipment to an undesirable extent, committing the Post Office to the necessity of modifying or replacing already complex equipment to meet further changes of tariff both as regards steps in units of charge and in distance. That Group therefore recommended that multi-metering facilities from coin boxes should not be provided. However with the introduction of subscriber trunk dialling, the need to plan for additional facilities and the obvious inadequacies of the coin box in other respects the time is now more propitious to reconsider the matter.

During the war and in the immediate post war period the number of cases of theft by wrenching coin boxes from their mounting showed a marked increase. This may have been a passing phase but there is evidence of increasing fraud and as indicated in the Report of the Call Offices - Protection of Revenue Group, the present coin box reveals a number of weaknesses which assist fraudulent use of the telephone and which cannot be eliminated unless the box is completely redesigned.

As regards the first part of our terms of reference therefore our conclusion is that the coin box should be redesigned and that the work should be put in hand as a matter of some urgency.

CONSIDERATIONS AFFECTING DESIGN OF NEW COIN BOX

We have taken as our starting point that the coin box should be simple to use, robust enough to stand up to heavy wear, generally attractive in appearance, and uniform throughout the country.

The Post Office requires a box which is easy to maintain. The associated equipment at the exchange should also be as simple as possible, but it is preferable that the more complicated parts of the apparatus should be at the exchange, where maintenance can be done more cheaply, more satisfactorily, and without delay. Protection of revenue is important, and the coin box should be so constructed as to give the maximum security against theft and fraud. Finally the replacement of 120,000 coin boxes is an expensive undertaking and the new design must therefore be expected to have a life of twenty to twenty-five years. For that reason it is essential in our view that such technical developments as multi-metering and subscriber trunk dialling should be incorporated in the design. There should be facilities for timing all calls, and freedom to make any tariff adjustments that may be required.

These are the broad principles which have governed our approach to the question of the facilities to be provided. Matters of detail are discussed in the following paragraphs.

Buttons

At present when money is inserted in the box it is held in suspense until either Button A is pressed, thus allowing the coins to drop into the self-sealing container, or the caller regains his money by pressing Button B.

This manual control of the coins is rather primitive and has been superseded in all the modern boxes abroad by an electrical system of control which dispenses with the need for buttons. The general principle is that the mechanism counts the coins electrically as they are inserted, accepting them if a connexion is established and returning them down the chute to the caller if the call is ineffective. There is certainly no case these days for retaining Button A, but there is room for argument about the withdrawal of Button B, since without it the caller runs more risk of losing his money if he gets a wrong number. On the other hand this risk would be minimised by the Pay-on-Answer system advocated in paragraph Further, we think that the public would find it more convenient not to have to bother with buttons

/(after

(after 30 years some people still have difficulty in manipulating them at the right time). But the chief reason for abolishing the Button B facility is that so long as the caller can set up a call, listen to the distant subscriber and then recover his money by pressing Button B the system is open to a fraud which is becoming increasingly prevalent with the present box; this is a weakness in the present arrangements to which the Protection of Call Office Revenue Group drew particular attention, and which if allowed to continue will offer increased scope for fraud when trunk dialling facilities are available. We therefore recommend that the box should have no buttons.

We considered at some length the method of payment to ^{be} adopted, whether pre-payment as at present, or payment when the caller hears the distant subscriber answer. For the reasons set out below we strongly favour the latter system which we have called "Pay-on-Answer" since the older term "postpayment" is misleading. Pay-on-Answer System

With the pay-on-answer system the coins drop straight into the self-sealing container, and as they do so their value is automatically signalled to the exchange equipment by electrical pulses. The money is not held in suspense at all.

To make a call the caller will lift the receiver, listen for dialling tone and dial the number. If the line is free he will get ringing tone and will then hear the distant subscriber answer. This will be the signal for him to insert his money and he will not be able to speak until he has done so. The insertion of threepence will enable the conversation to begin except for calls over very long distances, when a minimum of sixpence will be required. We consider that after hearing the distant subscriber the caller should be allowed five seconds (?) in which to insert the first coin, or the exchange equipment will release the call. With a view to stamping out the practice of fraudulent "one-way conversations" altogether we were at first inclined to think that neither party should hear the other until the first coin had been inserted, and that a distinctive tone should be used to signal to the caller when to put the money in; but we rejected this arrangement as being too automatic from the caller's point of view and as giving him no safeguard against losing his money on wrong numbers. For these reasons we think it would be preferable, at the outset at least, to accept the slight risk involved

in allowing the caller to hear his correspondent for five seconds.

Our reasons for preferring the pay-on-answer system are that:

1. It provides an accurate record at the exchange of the takings: this will simplify and cheapen the task of establishing the dues from call offices and enable instances of fraud to be pinpointed with greater certainty.
2. For practical purposes it prevents the fraudulent "one-way conversation", which is becoming increasingly prevalent.
3. It eliminates other frauds which are only possible so long as the money is held in suspense.
4. It simplifies, and therefore cheapens, the coin box and the associated exchange equipment.
5. It enables TBM and WEA calls to be made from call offices; at present they have to be barred. Because of the proposal to allow the caller five seconds' latitude before inserting his money special arrangements will have to be made in respect of TBM calls.

On the other hand there will be some loss of line time with pay-on-answer, but where there is subscriber trunk dialling this loss will be negligible for it will take very little longer to insert one coin than it does now to press Button A. It will be many years before subscriber trunk dialling is widely available and in the meantime calls will still be controlled by operators.

On these there will be a definite loss of line time under the pay-on-answer system, but we think it would be a great mistake to sacrifice the very considerable advantage of pay-on-answer on this account.

Timing of
Local Calls

At present, calls up to 15 miles from the exchange are untimed and a record taken in 1953 showed that the average duration of untimed calls from call offices in the daytime was $3\frac{1}{2}$ minutes and $4\frac{1}{2}$ minutes in the evening; 15% of untimed calls exceeded six minutes in the daytime and 22% in the evening. There has been persistent pressure from the public and Members of Parliament for the duration of local calls from call offices to be restricted to avoid queuing outside kiosks and the annoyance caused by callers occupying them for long periods. From the Post Office point of view the timing of local calls would result in some additional revenue from those who wanted a conversation exceeding the minimum period, and in the long run there would be less need to provide additional boxes at busy sites. We therefore recommend that local calls from coin boxes should be timed.

We are aware that complaints might arise from a caller who had dialled a PEX number, such as a railway enquiry office, and had not obtained the required extension before the time he had paid for had expired. This disadvantage already exists with the present system on toll and trunk calls and it is our view that a solution to the problem lies, not in the design of the coin box, but at the PEX. We suggest that, on the introduction of the new box, a campaign should be launched with PEX renters to stress the need for speedy connection of callers to extensions.

Coin
slots

Ever since October 1951 when the minimum coin box fee was raised from 2d to 3d, there has been a public demand for a slot to take a threepenny piece and, bearing in mind the approach of long distance dialling facilities whereby all calls must be connected automatically after insertion of high value coins, we strongly recommend provision of a threepenny slot. We considered further whether to provide slots for all four denominations of coin, penny, threepence, sixpence and shilling, or whether to abolish the penny slot altogether. Whilst it would be technically possible to design a box to work automatically with all four coins, retention of the penny slot would have serious disadvantages. It would involve additional mechanism in the box and at the exchange and would add £10 - £20 to the cost of perhaps £40 - £50 which would otherwise be involved; furthermore the additional complication would delay the introduction of a new design of box. Use of pennies would slow down the operation of the box since additional signals would have to be sent back to the exchange to compare the amount inserted with the amount due and would also reduce the economies which would otherwise be secured from the less frequent clearances of boxes. On this latter point, abolition of the penny slot would more than double the capacity in terms of value of the present cash container as shown by the following figures:-

Pennies and silver	£2. 10. 0.
Pennies, threepenny pieces and silver	£4. 12. 0.
Threepenny pieces and silver	£10. 0. 0.

On the other hand we took account of the possible reactions of the public if the penny slot were abolished while plenty of pennies were still in circulation; criticism might also arise from the implication that future call charge adjustments would proceed by steps of 5d. On the first point we were assured by the Royal Mint that an ample supply of threepenny pieces would be available to meet the additional needs. (At present there are 500 million threepenny pieces in circulation.) As regards the tariff, adjustment would be restricted in one sense but we suggest that adequate flexibility could be achieved by varying the time allowed for the unit fee - which could be done quite simply by adjustments at the exchange. We have

Extensions
of Time

The duration of a call will be automatically controlled by the exchange equipment in relation to the sum inserted in the box. It is obviously most undesirable that the caller should be cut off abruptly when the time paid for expires; indeed we think that he should have the opportunity to extend his call. We therefore propose that when the time has expired the caller should receive a warning signal for seconds and if he does not put in more money the call should be terminated after another seconds. If an extension is paid for, the timing will run straight on from the preceding period and will thus include the few seconds during which the extra money was inserted. The intention is that on any call, no matter how often it is extended, there should be only one period of seconds for which no payment is required.

We considered whether the warning signal should be in the form of a visual indicator on the front of the coin box, a recorded announcement, or a distinctive tone, and decided in favour of the tone. The first was ruled out because it could not be provided without a mains power supply at the coin box; nevertheless we recommend that consideration should be given to providing a visual indicator specially at places like London Airport and Ocean Terminal, Southampton, where there are always large concentrations of foreign travellers who may be unfamiliar with the British telephone system. The second possibility would be expensive but we thought at first that an announcement would be so much more easily understood by the caller than a tone that the extra cost was justified. In fact, however, we found on test that the tone gave a far clearer signal: the recorded voice breaking in on a conversation was disconcerting and caused confusion.

As regards the pitch of tone to be used there is little to choose between one of 900 cycles per second and one of 400. The former is the familiar three minute "pip-pip" tone and already has an association therefore with the payment of money. But as it is not available at remote automatic exchanges recommend the use of the 400 c.p.s. tone, which is available everywhere. In our view the most arresting signal was one consisting of $2\frac{1}{2}$ pulses per second.

of course no means of assessing the financial consequences of altering the length of time covered by a call fee as compared with raising the fee itself; but on balance we feel that the penny slot should be abolished in the interests of simplicity of design of coin box and exchange equipment and the effect on initial and maintenance costs, and we recommend accordingly.

We also considered providing a slot for florins. Four slots would add to the complication and cost of the mechanism and we therefore rejected any idea of providing a florin slot additionally. On the question whether the shilling slot should be replaced by one for a florin we considered that on the whole the public would find a shilling slot more convenient, especially as in future it will be possible to dial trunk calls of short duration for small amounts of money.

Fraud and Theft

As mentioned in paragraph , one of our aims in redesigning the coin box is to eliminate as far as possible opportunities for fraud and theft. The proposed system of pay-on-answer to a large extent achieves this aim and prevents most of the methods of fraud and theft practised with the present type of box, e.g. back-dialling, switch-hook impulsing etc. We have already referred (paragraph) to the arrangements we propose for reducing the opportunities for making the "appointment call", whereby a caller can receive a message from the called number without inserting money. The types of theft which it is not possible to eliminate entirely depend mainly on the use of force for their effectiveness, e.g. removing the whole coin box from its mounting, prising off the front of the coin box, etc., but we have proposed that strong mountings and locks should be provided to reduce this risk as far as possible.

Standardisation of coin box

From the point of view of economic production and storekeeping it is desirable that the public and the subscriber's coin boxes should be standardised. At present

Signalling
of coins
to
operators

With the new box many calls will continue to be handled by operators for a long time to come. At present, in order to check that the caller inserts the right amount of money the operator has to rely on sounds made by coins striking gongs in the coin box as they fall. These gong signals are a frequent source of complaint as the gong transmitter picks up extraneous noises, and the signals are particularly unsatisfactory on long rural lines. The new box will enable coins to be signalled by electrical tones and this should give a much clearer indication to operators.

For a system of tone signals to work, the number of pulses used to identify the various coins must be multiples of the basic coin unit. This is a further important reason for abolishing the penny slot (see para.), for with threepence as the basic coin unit sixpence is signalled by only two pulses of tone and a shilling by four, whereas if the penny remains as the basic unit sixpence will require six pulses and a shilling twelve. For the operator to distinguish such a long train of pulses the rate of pulsing would have to be slow, and would mean, of course, that it would take longer to signal the coins to the exchange equipment. Slow pulsing would therefore have two disadvantages: it would cause loss of line time on all calls, whether dialled direct by the caller or controlled at the manual board; and it would annoy and confuse the caller, who would have to pause two seconds after inserting each sixpence and four seconds after each shilling.

The Group heard recordings of various pulse signals of 400 c.p.s. tone based on both a threepenny and a penny basic coin unit, and for comparison heard a recording of the signals given by the existing prepayment coin box.

The conclusions reached were:-

1. that signals derived from the penny basic coin unit would be completely unacceptable to the operators.
2. that the tone signals derived from the threepenny basic coin unit were superior to those given by the gongs in the present prepayment box.

3. that tone intercepted about 4 times per second, with the period of interruption equal to or a little greater than the period of tone, provided a satisfactory signal, but
4. that it would be advisable to arrange an experiment with telephonists working under normal exchange conditions before a definite decision was reached.

We accordingly recommend that the coin signals to operators should be derived from a threepenny basic charge unit and should be of 400 c.p.s., and that the rate of interruption and the ratio of tone to silent period should depend on the results obtained from a practical experiment.

INTRODUCTION OF NEW SYSTEM

The Swiss Box

Four of our number visited Switzerland in October, 1954, to study the coin box arrangements there, and found that the Swiss box could be adapted without much difficulty to give all the facilities we have described in the preceding paragraphs as desirable features of a new coin box. (see Report of an official visit to Switzerland in October 1954 to study the Swiss Coin Box). We understand that to design a box of this kind from scratch and try it out in the field would mean that it could not be ready for service for at least five years and probably more. The Swiss box on the other hand is a well-tried mechanism which has been in public use for a number of years, and although any modification of it to suit British requirements would need to be thoroughly tested, this would be a much less onerous engineering undertaking than the production of an entirely new mechanism. Our Engineering Dept. colleagues consider that, given an early decision, sufficient quantities of a modified type of Swiss box could be available for introduction in the initial subscriber trunk dialling areas in 1958.

We therefore recommend that the new coin box should be based on the Swiss model.

Pilot Scheme

There would be a real advantage from the engineering point of view in conducting a pilot scheme with twenty or so of the new boxes in advance of the first large-scale installation, and in addition this would provide valuable guidance of the public's reactions to the new design. The ideal location for such an experiment would be a medium-sized town having a concentration of busy offices, so that the effect of timing the local calls can be assessed. The place should be near enough to London to be convenient for visiting and should not have a floating population: it would be impossible with a constantly shifting population to gain a reliable impression within a short time of any drawbacks from the caller's point of view. Reading seems to us to meet the requirements and we recommend that an experiment should be begun there as soon as possible. We assume that the Swiss manufacturers would be asked to modify the boxes for Reading, and that production quantities would be made in the United Kingdom.

COIN BOX DESIGN STUDY GROUP

Minutes of 11th Meeting - 15th July 1955.

Present:

Mr. G. R. Downes (Chairman)

Mr. C. W. Arnold	ED/S	Mr. H. E. Francis	ED/Tp
Mr. R. Brumby	AGD/TCB	Mr. S. L. Helman	ED/S
Mr. S. W. Dabbs	ITD/PB	Mr. R. C. Lawes	ITD/SSB
Mr. L. G. Fox	POEF & SEWC Staff Side	Mr. A. V. Leaver	ITD/SSB
		Mr. C. G. Osmond	PD/IB

Mr. J. Lennox ITD/OB (Secretary)

1. The Chairman said that he had an apology for absence from Miss Whitelaw who had been called to Glasgow on urgent Union business. Mr. Crisp was away on leave and Mr. Hearn was sick.

2. The Chairman told the Group that he had just learned from Mr. Fox of the tragic death in a road accident of Mr. Wrankmore of the P.O.E.U. The Group had had the advantage of Mr. Wrankmore's knowledge and sound common sense at a number of its meetings. His untimely loss would be felt not only by his Union colleagues but by the Post Office administration.

3. The minutes of the 10th meeting were agreed.

4. The Chairman told the Group that the Post Office Advisory Council had met on the previous day and had considered the introduction of a coin box with a threepenny, but no penny, slot. He understood that the proposal had been accepted together with the timing of local calls from coin boxes with the proviso that the minimum period of time allowed for the basic fee should not be reduced below 3 minutes. The Chairman went on to say that, as the Postmaster General was chairman of the Advisory Council, his approval of the proposals could be expected.

5. The Chairman said that he understood from the ED representatives that some difficulty was being experienced in coming to an agreement which would permit the manufacture by a British firm of boxes of the Swiss design. Unless an agreement was reached, no Swiss boxes would be available for a field trial and the timetable given at the 7th meeting (paragraph 8) for the production of a new coin box would no longer hold.

6. The Chairman, introducing the second draft of the Interim Report, said that he had received a letter from Miss Whitelaw asking that she might be permitted to submit her comments in writing during the following week. He asked the Group to allow him to agree any minor changes with Miss Whitelaw direct; should any major points arise it might be necessary to circulate members individually.

7. The Group then discussed the draft Interim Report paragraph by paragraph. It was agreed that the section on "Financial Aspects" should be re-drafted jointly by the ITD and AGD. (The final draft of this section is appended to these minutes). Finally the whole Report, with a few additions and amendments, was approved, subject to any alterations Miss Whitelaw might wish to have made. It was agreed that the Chairman might sign the Report on behalf of the Group.

8. Mr. Helman said that it was not possible in practice to suggest reliable theoretical costings for various types of material and finish for the coin box. He would not be in a position to give the Group any worthwhile information on costs until the shape and size

/of

Minutes

Consideration by
P.O.A.C.

Field trial of
Swiss coin box

Interim Report -
2nd draft.

Material and
finish for
coin box

of the box had been decided. Even then he would prefer to give comparative costs for different materials and finishes rather than to give absolute figures. Manufacturers themselves were loath to give figures until they had had production experience. The Chairman said that he appreciated Mr. Helman's difficulty. He thought the Interim Report might well confine itself to the mechanism of the new coin box and its operation, the exterior of the box, the layout of call offices, and the design of the kiosk being left for the Final Report.

9. The Chairman expressed his thanks to the members of the Group for the assistance they had given him. The fact that, in a comparatively short time, they had been able to cover so much ground in a highly complex field was testimony to the way in which all had worked together. Mr. Helman, speaking for his engineering colleagues, said how much they had enjoyed working with Mr. Downes during the past 2 or 3 years. He wished him well in his new sphere.

Valedictory

Date to be arranged.

Next meeting

III. FINANCIAL ASPECTS.

43. At this stage there is insufficient data to enable a financial appraisal to be made of the effects of adopting our recommendations. It is clear that the new box with its associated equipment for extended dialling will cost more than the present box; the latter costs about £12 and the price of the new box and its equipment is expected to be between £40 and £50. It will be seen from our earlier recommendations that our aim throughout has been to keep down expenditure and this extra cost is largely attributed to the provision of facilities for extended dialling and timing, though it will be realised that any new design is bound to cost more than the present one, for which the tooling was done well before the war. As against this extra cost substantial savings from extended dialling may be expected in the long run; on present day figures these are calculated to be of the order of £ $\frac{3}{4}$ m. a year. Maintenance costs are likely to be about the same as with the present box.

44. Other savings are to be expected from:-

- (a) eliminating or minimising operator handling of calls to special services (para 38)
- (b) dispensing with the need for separate coin box and ordinary 'O' level (manual board) circuits by introducing a new discriminating signal for coin box calls (para 37).
- (c) using common 2nd (and 3rd) selectors for coin box and ordinary subscribers' traffic (para 38)
- (d) reducing the work involved in the checking of coin box collections by recording on the call office meter the actual money deposited in the coin box (para 206)

As against these savings there will be some loss of trunk line time at the outset on calls manually controlled, owing to the need to collect the call fee after the call has been set up instead of before as at present, but this will diminish if dialling is extended. In fact there should be some savings on line time with subscriber dialling if only because of the more rapid disconnection of calls and more accurate timing.

45. On the revenue side there will be some increase from the timing of calls up to 15 miles, and the revenue per box will of course be higher. The effect on trunk revenue is difficult to forecast but the facility of being able to make trunk calls of short duration may encourage even greater trunk call users from coin boxes.

46. To replace all existing boxes by the new box and to provide the associated equipment for extending dialling and timing will involve a capital charge for equipment alone of the order of £6 $\frac{1}{2}$ m. In addition there will be labour costs for installation. This expenditure will be spread over a number of years and the extent of the spread will have a bearing on the extra expenditure incurred in withdrawing serviceable boxes from use. The programme of installation will be dealt with further in our final report.

Interim Report of the
COIN BOX DESIGN STUDY GROUP

Director of Inland Telecommunications,

1. You appointed the Group in April, 1954 with the following terms of reference:

"To consider the need for the introduction of a Call Office Coin-collecting Box and associated apparatus and fittings of a new design, in the light of probable future service and public requirements.

To make recommendations about the facilities to be given by it, and to report on the practical aspects of its introduction into general use."

2. We have held 11 meetings, in the course of which we have concentrated chiefly on the design of a new coin box for automatic exchanges and the facilities it should provide; and as the completion of this part of our work has coincided with the appointment of the Chairman to other duties we think it desirable to submit an interim report on the progress made so far. This will leave further study of the problem of introducing the new coin box and the general interior layout and decoration to be dealt with by the Group under its new Chairman. Although the design of the kiosk itself is not within our terms of reference it is a subject that has attracted a certain amount of attention in the Press and elsewhere in recent months, and we propose to make some general comments on it in our final report.
3. Shortly after the Group was set up four of our number visited Berne to study the Swiss coin box and call office system, and the information they brought back has been of considerable assistance to us in our deliberations.
4. As you will see from the report our broad conclusions are that a new design of coin box is necessary, and that it should incorporate the following features:-

- (i) payment for calls to be made when the caller answers and not before, as with the present box.
- (ii) there should be no buttons.
- (iii) the box should be capable of providing extended dialling facilities, including trunk dialling if required.
- (iv) there should be facilities for timing local calls and for extending these and other dialled calls by the insertion of additional money.
- (v) the penny slot should be replaced by one for threepenny pieces.

NEED FOR A NEW COIN BOX

Growth of coin box working

5. The present multi-coin box was designed in 1923 and was brought into use in 1926. Since that time there has been considerable development in the telephone system as a whole and we were interested to note that the public kiosk service in particular has been developed more extensively here than in other countries. The number of call offices has grown from 20,000 in 1926 to 65,000 in 1955, and over the same period the annual call office revenue has increased nine-fold from £847,000 to a figure approaching £7½ million, which shows a marked increase in the average takings per call office. In addition, the demand from hoteliers, boarding house keepers and others for rented coin box telephones on their premises has been encouraged, as this service meets a public need economically by avoiding outlay by the Post Office on the provision and maintenance of kiosks and cabinets. There are at present about 60,000 of these "subscribers' coin boxes", as they are called and added to the call office installations give a total of over 125,000 coin box telephones in use.

Extensions of automa- tisation and dialling

6. Although the present multi-coin box was designed for both manual and automatic exchanges, with dialling on local calls, there were in 1926 only 40 automatic exchange out of a total of 5,996 and no general decision had then been taken to extend automatic working or the range of dialling on automatic calls. The big increase in automatic working since that time and the decision to allow ordinary subscribers to dial calls beyond the unit fee range has called for a fresh outlook on coin box design from the point of view of giving coin box users facilities in line with those available to subscribers generally. Consideration was given in 1945, by a Study Group under the Chairmanship of Mr. H. A. Norton, to the possibility of introducing dialling up to the multi-metering range from coin box lines, but they recommended against it because of the estimated high cost and the technical disadvantages of complicating the coin box and the exchange equipment. However, the context of their discussions was limited: they had no opportunity to consider the proposition against the background of an entirely new design of coin box, and there was no question at that time of extending the range of dialling calls beyond 15 miles.

Modern
trends
abroad

7. The present coin box has served its purpose very well on the whole; it has been modified from time to time to reduce opportunities for fraud and theft and the most recent change of this kind was the introduction of the self-sealing container. In addition, the mechanism had to be altered in October 1951 when the unit fee was raised to threepence. But the box is now inadequate to meet the needs of modern development in automatic telephone services and is outdated compared with designs and developments in other countries. The modern trend is to dispense with buttons, and buttonless boxes are in use or are being developed in the U.S.A., Sweden, Germany, Holland and Switzerland. The range of dialling from coin boxes is also being extended, and some countries have recently departed from the prepayment method of working and are using boxes in which the money is inserted by the caller when the connection has been set up.

Protection
of revenue

8. The Call Office - Protection of Revenue Group indicated in their recent Report that there is evidence of increasing fraud and theft from coin boxes and drew attention to a number of weaknesses in the existing box which assist fraudulent use and which cannot be eliminated without complete redesign. Further, the Group felt the need for better facilities for recording the money inserted in public coin boxes: it would be a real advantage if this requirement could be met since checking work would be reduced and greater accuracy would result. As the takings from call offices exceed £7 million a year, it is most important to take all reasonable precautions to safeguard this revenue.

Tariff
changes

9. The increase in the unit fee from 2d. to 5d. in 1951 has resulted in public pressure to provide a coin slot for threepenny pieces. This cannot be done without a fundamental change of design, as the existing mechanism cannot be adapted to accept threepenny pieces for calls made automatically. A further serious drawback is that, although the box can be modified to work with a unit fee of fourpence, if required, no further alteration in the unit fee tariff would be practicable, even to the extent of timing local calls.

10. As regards the first part of our terms of reference, therefore, we have no doubt that the coin box should be redesigned, and in our opinion the work should be put in hand as a matter of urgency.

CONSIDERATIONS AFFECTING DESIGN OF NEW COIN BOX

11. We have taken as our starting point that from the caller's point of view the coin box should be simple to use, robust enough to stand up to heavy wear, generally attractive in appearance, and uniform throughout the country.

12. The Post Office requires a box which is easy to maintain. Whilst the associated equipment at the exchange should also be as simple as possible, it is preferable that the more complicated parts of the apparatus should be at the exchange, where maintenance can be done more cheaply, more satisfactorily and more promptly than at the office office. Protection of revenue is important, and the coin box should be so constructed and its method of operation so devised as to give the maximum security against theft and fraud. There should be facilities for timing all calls and freedom to make any required tariff alterations from time to time by adjusting the equipment at the exchange. Finally, the box must be designed with an eye to the future, because the expense of introducing an entirely new system every few years: for this reason it is essential in our view to incorporate features in the design to meet such possible technical developments as the dialling of trunk calls.

13. These are the broad principles which have governed our approach to the question of the facilities to be provided. Matters of detail are discussed in the following paragraphs.

Buttons

14. At present when money is inserted in the box it is held in suspense until one of the buttons is operated: if Button A is pressed the coins drop into the cash compartment or the caller can regain his money by pressing Button B. When the box was designed in 1923 this was the most satisfactory way of providing for the deposit or return of coins particularly as at that time a very large proportion of the call offices were connected to manual exchanges. But this manual control of coins by the caller is now regarded as rather primitive and has been superseded in most modern boxes abroad by a system of electrical control which dispenses with the need for buttons; in modern prepayment types the mechanism automatically deposits the coins if a connection is established or returns them down the chute if the call is ineffective. A return chute is however required for coins which the mechanism rejects.

15. Although the present box has been in use for nearly 50 years some people still have difficulty in manipulating the buttons at the right time, and the abolition of buttons would undoubtedly simplify the box for the caller. It would also facilitate the provision of direct dialling access to special services such as TLM and WEA which with the present box have to be obtained via the operator. A buttonless type of box increases the risk of a caller losing his money on obtaining a wrong number but this risk would be minimised by the "Pay on Answer" system advocated in paragraph 19.

Pay-on-Answer system 16. We considered at some length the method of payment to be adopted, whether pre-payment as at present, or payment when the caller hears the distant subscriber answer. For the reasons set out below we strongly favour the latter system, which we have called "Pay-on-Answer" since the older term "postpayment" is misleading.

17. With the pay-on-answer system the coins drop straight into the self-sealing container, and as they do so their value is automatically signalled to the exchange equipment by electrical pulses. The money is not held in suspense at all.

18. To make a call the caller would lift the receiver, listen for dialling tone and dial the number; if the line was free he would get ringing tone. When the distant subscriber lifted his receiver there would be a period of three seconds during which the caller would hear the subscriber answer (though the caller himself would not be heard); this would be followed by the automatic transmission to both of them, for a maximum of ten seconds, of an interrupted tone (which we term pay-tone), and this would be the signal for the caller to insert his money. The insertion of threepence at any time during the total of 15 seconds would enable the conversation to begin, except on long distance calls when a minimum of sixpence would be required. If after 10 seconds of pay-tone he had not inserted the initial coin the equipment would release the call and dialling tone would be re-established. To prevent the caller wasting his money by putting it in either too early or too late the coin slots would be closed when the box was not in use and would not open until the subscriber answered and would close just before the pay-tone ceased; on manually controlled calls the operator would tell the caller when to insert money.

19. We considered whether, in order to eliminate the "one way conversation" fraud altogether, the caller should be prevented from hearing the distant subscriber until the first coin had been inserted, the pay-tone being signalled as soon as the called subscriber lifted his receiver; but although this alternative would have been cheaper to provide (about £1 less in annual charges per coin box), we rejected it as being too automatic from the caller's point of view and as giving him no safeguard against losing his money on wrong numbers. By allowing him to hear the distant subscriber for only three seconds without payment, however, we consider that the opportunity for making fraudulent "one way conversations" would very largely be removed. We do not think it desirable to allow the subscriber a longer period in which to announce his identity as this would increase the risk of fraud - a particularly serious matter if the caller could dial trunk calls; it would also allow callers to obtain the speaking clock and weather facilities without inserting threepence. Nevertheless, we recommend that some time after the introduction of the new box a field trial should be held in a selected area with coin boxes not provided with the three seconds facility, so that the advisability of adopting a fully automatic box later on could be considered in the light of the public reaction. It would be a fairly simple matter from the engineering point of view to make the change generally.

20. Our reasons for preferring the proposed pay-on-answer system are that:

- (a) it will simplify the coin box and associated exchange equipment, resulting in lower capital and maintenance costs compared with a prepayment box providing the same facilities.
- (b) it will provide an accurate record at the exchange of the takings; this will greatly assist in the task of establishing dues from call offices and should enable considerable economies to be made in the arrangements for checking takings. It will also enable instances of fraud to be pinpointed with greater certainty.
- (c) for practical purposes it will prevent the fraudulent "one-way conversation", which is prevalent.
- (d) it will eliminate other frauds which are only possible so long as the money is held in suspense.

- (e) it will avoid the necessity for inserting money on ineffective calls and so lessen the risk of losing money on wrong number calls.
- (f) it will avoid the necessity which would arise with a pre-payment box of providing facilities for controlling the deposit or return of coins on manually handled calls. Provision of these facilities would not only add to the cost of the exchange equipment but would complicate operating procedure.

On the other hand there will be some loss of line time with pay-on-answer, but as callers gain experience of the new box this loss will be negligible on automatic calls for it will take very little longer to insert one coin than it does now to press Button A. It will be many years before subscriber trunk dialling is widely available and in the meantime calls will still be controlled by operators. On these there will be a definite loss of line time under the pay-on-answer system as the money will have to be collected after the call has been set up, instead of at the outset; but as the boxes may have to last for 25 years or more we think it would be a great mistake to sacrifice the very considerable advantage of pay-on-answer on this account.

Timing
of Local
Calls

21. At present, calls up to 15 miles from the exchange are untimed and a record taken in 1953 showed that the average duration of untimed calls from call offices was $5\frac{1}{2}$ minutes in the daytime and $4\frac{1}{2}$ minutes in the evening; the percentage of untimed calls exceeding six minutes was 15% in the daytime and 22% in the evening. There has been persistent pressure from the public and Members of Parliament for the duration of local calls from call offices to be restricted, so as to avoid queuing outside kiosks and the annoyance caused by callers occupying them for long periods. From the Post Office point of view the timing of untimed calls would result in some additional revenue from those who wanted a conversation exceeding the minimum period, and in the long run there would be financial savings because fewer extra boxes would need to be provided at busy sites. In any case future developments in subscriber dialling will probably necessitate the timing of coin box calls within the 15 mile range and we therefore recommend that all calls from coin boxes should be timed.

22. This may give rise to complaint from callers making calls to P.B.K.s such as railway enquiry offices if, after the P.B.K. operator answers, there is undue delay in connecting the caller to the required extension. This disadvantage already exists with the present system on toll and trunk calls, and, while it would probably be possible to stop the timing equipment when a

call was extended by a P.B.X. operator, it would be extremely expensive to do so. Most of our members feel, therefore, that a solution to the problem lies, not in the design of the coin box, but at the P.B.X., and that when the new box is introduced a campaign should be launched with P.B.X. renters to stress the need for the speedy connection of callers to extensions. Our POEWC Staff Side member is of the opinion that no amount of appealing to P.B.X. renters would overcome the difficulty and that the resentment of the public at losing their money on such calls would be visited upon Post Office operators.

Nevertheless, our general view is that the Post Office would not be justified in providing expensive and complicated ^{equipment} for this purpose alone.

Coin slots

25. Ever since October 1951 when the minimum coin box fee was raised from 2d. to 3d. there has been a public demand for a slot to take⁹ threepenny piece and, bearing in mind the approach of long distance dialling facilities whereby all calls must be connected automatically after insertion of high value coins, we strongly recommend provision of a threepenny slot. We considered further whether to provide slots for all four denominations of coin, penny, threepence, sixpence and shilling, or whether to abolish the penny slot altogether.

Whilst it would be technically possible to design a box to work automatically with all four coins, retention of the penny slot would have serious disadvantages. It would involve additional mechanism in the box and at the exchange and would add £10 - £20 to the cost of perhaps £40 - £50 which would otherwise be involved; furthermore the additional complication would delay the introduction of a new design of box. Use of pennies would slow down the operation of the box, causing annoyance to the caller and an increase in the unpaid line time since additional signals would have to be sent back to the exchange to compare the amount inserted with the amount due. Operating difficulties would also arise on manually controlled calls (see paras. 27 and 28).

Retention of pennies would also reduce the economies which would otherwise be secured from the less frequent clearances of boxes - a matter of some importance when one considers that the average takings per call office have increased from around £40 a year in the 1920's to over £100 at the present time, and that they may rise still further if dialling developments encourage a greater use of the trunk service. Abolition of the penny slot would more than double the capacity, in terms of value, of the present cash container as shown by the following figures:-

Pennies and silver	£ 2. 10. 0.
Pennies, threepenny pieces and silver	£ 4. 12. 0.
Threepenny pieces and silver	£10. 0. 0.

Worth while economies would therefore be achieved in the use of labour and motor transport for the collection of self sealing containers and incidentally in the counting and disposal of cash.

24. On the other hand we took account of the possible reactions of the public if the penny slot were abolished while plenty of pennies are still in circulation; criticism might also arise from the implication that future call charge adjustments would proceed by steps of 3d. On the first point we were assured by the Royal Mint that an ample supply of threepenny pieces would be available to meet the additional needs (at present there are 500 million threepenny pieces in circulation), and we were interested to note that gas and electricity undertakings are abandoning the use of penny slots in their coin meters. As regards the tariff aspects, adjustment would be restricted in one sense, but we suggest that adequate flexibility could be achieved by varying the time allowed for the unit fee - which could be done quite simply by adjustments at the exchange. We have of course no means of assessing the financial consequences of altering the length of time covered by a call fee as compared with raising the fee itself; but on balance we feel that the penny slot should be abolished in the interests of simplicity of design of coin box and exchange equipment and the effect on initial and maintenance costs, and we recommend accordingly. There should be no difficulty with calls beyond the unit fee provided that the charges are arranged in steps of 3d.

25. We also considered providing a slot for florins. Four slots would add to the complication and cost of the mechanism and we therefore rejected any idea of providing a florin slot additionally. On the question whether it should supersede the shilling slot we considered that on the whole the public would find a shilling slot more convenient, especially as in future it will be possible to have trunk calls of short duration for small amounts of money if subscriber trunk dialling is introduced.

Signalling
of coins
to
operators

26. With the new box many calls will continue to be handled by operators for a long time to come. At present, in order to check that the caller inserts the right amount of money the operator has to rely on sounds made by the coins striking a gong or bell in the coin box as they fall. These signals are a frequency source of complaint as the coin transmitter in the box picks up extraneous noises, and the signals are particularly unsatisfactory on long rural lines. The new box will enable coins to be signalled by electrical tones and this should give a much clearer indication to operators as well as greater uniformity in the method of signalling the three types of coin. These coin signals will not be heard by the caller.

27. For a system of tone signals to work, the number of pulses used to identify the various coins must be multiples of the basic coin unit for which one pulse of tone would be signalled. With threepence as the basic coin sixpence would be signalled by two pulses of tone and a shilling by four. If the penny were to be retained as the basic unit, sixpence would require six pulses of tone and a shilling twelve, and for the operator to distinguish such a long train of pulses the rate of pulsing would have to be slowed down.

28. The Group heard recordings of various pulse signals of 400 c.p.s. tone based on both a threepenny and a penny basic coin unit, and for comparison heard a recording of the signals given by the existing pre-payment coin box.

29. The conclusions reached were:-

- (a) that signals derived from the penny basic coin unit would be completely unacceptable to the operators.
- (b) that the tone signals derived from the threepenny basic coin unit were superior to those given by the gong and bell in the present prepayment box.
- (c) that tone interrupted about four times per second, with the period of interruption equal to or a little greater than the period of tone, provided a satisfactory signal, but
- (d) that it would be advisable to arrange an experiment with telephonists working under normal exchange conditions before a definite decision was reached.

30. We accordingly recommend that the coin signals to operators should be derived from a threepenny basic charge unit and should be of 400 c.p.s., and that the rate of interruption and the ratio of tone to silent period should depend on the results obtained from a practical experiment.

Extensions of Time 31. The duration of a call will be automatically controlled by the exchange equipment in relation to the sum inserted in the box. It is obviously most undesirable that the caller should be cut off abruptly when the time paid for expires; indeed we think that he should have the opportunity to extend his call. We therefore propose that when the time has expired the caller should receive a warning signal for 3 seconds and if he does not put in more money the call should be terminated after another 9 seconds. If an extension is paid for, the timing will run straight on from the preceding period and will thus include the few seconds during which the signal was on the line and extra money was being inserted. The intention is that on any call, no matter how often it is extended, the "free" time allowed for terminating the call or inserting additional coins should not exceed 12 seconds. It is possible that it will often be less than this.

32. We considered whether the warning signal should be in the form of a visual indicator on the front of the coin box, a recorded announcement, or a distinctive tone, and decided in favour of the tone. The first was ruled out because it could not be provided without a mains power supply at the coin box; nevertheless we recommend that consideration should be given to providing a visual indicator^{at} one or two special places like London Airport and Ocean Terminal, Southampton, where there are always large concentrations of foreign travellers, who may be unfamiliar with the British telephone system. The second possibility (a recorded announcement) would be expensive to provide generally, particularly at small exchanges such as U.A.K.'s, but we thought at first that it would be so much more easily understood by the caller than a tone that the extra cost was justified. In fact, however, we found on test that the tone gave a far clearer signal: the recorded voice breaking in not necessarily at the beginning of the announcement on a conversation was disconcerting and caused confusion. Furthermore, to allow two full announcements to be heard by the caller, which would be essential if he were to understand clearly the import of the message, would take an inordinate amount of time.

53. As regards the pitch of tone to be used there is little to choose between one of 900 cycles per second and one of 400. The former is the familiar three minute "pip-pip" tone and already has an association therefore with the payment of money. But as it is not available at the majority of automatic exchanges we recommend the use of the 400 c. .s. tone, which is available everywhere. In our view the most arresting signal was one consisting of $2\frac{1}{2}$ pulses per second.

Access to special services and manual board 34. The present box is designed to allow callers to complete automatically only those calls which are to numbers on automatic exchanges within the unit fee area. The caller has to pass all other calls via the manual switchboard

by dialling '0' (or '01') or, in an emergency, '999'. We have already stated that provision should be made in the new box and its associated equipment for extending the range of dialling, but we also turned our attention to the possibility of allowing coin box callers direct dialling access to services such as TIM, WEA (when provided) and also to phonograms, directory enquiries, enquiries (91) in non-director areas, and TOL and TRU services in London. The considerations affecting direct access to TIM and WEA are different from those involved in giving access to the other services, and the latter raises the general issue of the method of signalling a coin box line to operators. We have not yet completed our study of these problems but we give in the following paragraphs a brief resume of the considerations involved.

35. Direct access to TIM, and later to WEA, is precluded with the present box because its design enables the calling party to listen to the called party for an unlimited time without depressing Button A; thus if access were given to these services they could be obtained without payment. Even with the new design of box which we have proposed the caller, if given access to TIM and WEA, would be able to hear a small part of the announcements during the three seconds period before the connection of the pay-tone (see paragraph), but we feel that the small risk which this would involve is probably worth taking and we suggest that during the trial period of the box access should be given to these services on an experimental basis. We recommend that consideration should be given to the possibility of imposing a slight delay on the connection of the TIM and WEA announcements, with a view to eliminating the risk altogether.

36. With regard to direct access to phonograms, directory enquiries, enquiries (91) in non-director areas and to TOL and TRU services in London, the problem is mainly one of the method and cost of providing a signal to operators which will enable them to identify a coin box line as distinct from a subscriber's line. The present method is that manual board calls obtained by dialling '0' are signalled on a white lamp from a non-coin box line and on a red lamp for a coin box line. In director and non-director exchanges this involves the provision of separate groups of circuits, and separate junctions in many cases; but on U.A.Xs. a special discriminating device is provided, though this has not always worked satisfactorily. We recommend that a trial should be carried out of a discriminating device which will give a series of "pips" to indicate that a coin box line is calling and that if it is successful it should be adopted for general use. The annual charge for this facility should be less than 21 per line and this should be more than offset by dispensing with the need for separate coin box circuits.

37. Finally there is the important point that if it should prove possible to give coin box lines access to all special services available to ordinary subscribers, and to provide a discriminating signal of the kind indicated in the foregoing paragraph, this would not only cut down operating costs but also reduce the cost of automatic exchange equipment, by avoiding the need for separate switches for coin box lines.

Fraud and Theft

38. As mentioned in paragraph 8, one of our aims in redesigning the coin box is to eliminate opportunities for fraud and theft as far as possible. The proposed system of pay-on-answer to a large extent achieves this aim and prevents most of the methods of fraud and theft practised with the present type of box. The types of theft which it is not possible to eliminate entirely depend mainly on the use of force for their effectiveness, e.g. removing the whole coin box from its mounting, prising off the front of the coin box, etc., but we propose that strong mountings and locks should be provided to reduce this risk as far as possible.

Standardisation of coin box

39. At present the subscriber's coin box differs from the public coin box in the size of the cash compartment and the method of locking it: a strong padlock and draw plate and self sealing container is fitted in the public coin box, but in the subscriber's box, only a simple lock and tray is provided.

It is our view that, from the point of view of economic production and store-keeping, the public and the subscriber's coin boxes should be the same design. So far as collection of the coin is concerned, there is no need to use a self sealing container with a subscriber's coin box as only the subscriber has access to the money. We therefore recommend that further investigations should be made into providing a cheaper type of container for these boxes.

INTRODUCTION OF NEW SYSTEM

The Swiss Box

40. Four of our number visited Switzerland in October, 1954, to study the coin box arrangements there, and found that the Swiss box could be adapted without much difficulty to give all the facilities we have described in the preceding paragraphs as desirable features of a new coin box. (see Report of an official visit to Switzerland in October 1954 to study the Swiss Coin Box). We understand that to design a box of this kind from scratch and try it out in the field would mean that it could not be ready for service for at least five years and probably more. The Swiss box on the other hand is a well-tried mechanism which has been in public use for a number of years, and although any modification of it to suit British requirements would need to be thoroughly tested, this would be a much less onerous engineering undertaking than the production of an entirely new mechanism. Our Engineering Dept. colleagues consider that, given an early decision, sufficient quantities of a modified type of Swiss box could be available for introduction in the initial subscriber trunk dialling areas in 1958.

41. We therefore recommend that the new coin box should be based on the Swiss model.

Pilot Scheme

42. There would be a real advantage from the engineering point of view in conducting a pilot scheme with twenty or so of the new boxes in advance of the first large-scale installation, and in addition this would provide valuable guidance of the public's reactions to the new design. The ideal location for such an experiment would be a medium-sized town having a concentration of busy ^{and} offices, so that the effect of timing the local calls ~~can~~ be assessed. The place should be near enough to London to be convenient for visiting and should not have a floating population: it would be impossible with a constantly shifting population to gain a reliable impression within a short time of any drawbacks from the caller's point of view. Reading seems to us to meet the requirements and we recommend that an experiment should be begun there as soon as possible. We assume that the Swiss manufacturers would be asked to modify the boxes for Reading, and that production quantities would be made in the United Kingdom.

Education
of public

45. The introduction into public service of the coin box we recommend, with its different system of payment for calls and its extended range of dialling facilities will, of necessity, mean that much attention will have to be given to the education of the public in the new arrangements. We envisage that there will be a planned publicity campaign in each area in which the new box is introduced and that this will be accompanied by demonstrations at exhibitions, sales parlours, schools and, if possible, in main post offices. Special care will be needed in the drafting of the instructions to be displayed in call offices and where large suites of boxes are involved, such as on railway stations, it may be found advantageous to arrange for an attendant to be available during the busier hours for a few days following the changeover.

Summary of recommendations

Signed on behalf of Members

(G. R. DOWNES)

Members of the Study Group

Mr. G. R. Downes	ITD/SSB (Chairman)
Mr. C. W. Arnold	ED/S
Mr. E. G. Crisp	ITD/OB
Mr. S. W. Dabbs	ITD/EB
Mr. L. G. Fox	PQ/DWC Staff Side
Mr. H. E. Francis	ED/TP
Mr. D. E. Hearn	AGD/TCB
Mr. S. L. Helman	ED/S
Mr. A. V. Leaver	ITD/SSB
Mr. C. G. Osmond	ED/IB
Miss N. Whitelaw	PQ/DWC Staff Side
Secretary: Mr. J. Lennox	ITD/OB (succeeded Mr. D. W. Burtenshaw)

Note: Mr. W. S. Pritchard (AGD/TFB), Mr. R. Brumby (AGD/TCB) and Mr. G. Frankmore (PQ/DWC Staff Side) also attended a number of meetings.

COIN BOX DESIGN STUDY GROUPSignalling coins to operators - Tests with exchange staff

A tape recording was made describing the proposed pip signals and giving examples. Telephonists were then asked to co-operate in an experiment in which 26 examples (A to Z) were heard and for each one the telephonist wrote on a score sheet the amount of money represented. The examples were heard under normal exchange conditions with the participants sitting at the switchboard amongst other telephonists doing their normal work. Fifty telephonists at Monarch exchange and thirty at Reading exchanges took part.

The results of the test showed a large number of errors due, it was thought, to the telephonists not knowing how much money was due to be counted in each example. A further test was therefore carried out in which the telephonists were to check that money inserted (according to the signals) corresponded with the amounts shown on the new score sheets. In this second recording of 26 examples were 9 deliberate errors. Forty-eight telephonists at Monarch exchange and thirty at Reading exchange took part. Also 18 night telephonists at Paddington exchange took the 2nd test.

In both tests the frequency and rhythm of the pips was varied as follows:-

1. 3 pps silent period equal to the length of the tone period
2. 3 pps " " twice " " " " " "
3. 4 pps " " equal to " " " " " "
4. 4 pps " " twice " " " " " "

The errors in the tests did not indicate that any one of the above methods of signalling coins was better or worse than the others. At the end of the second test the telephonists were asked to listen to 1/9 being inserted with tone No. 1 and tone No. 4 and say which was preferred. Of day telephonists 59 voted for No. 1 and 37 for No. 2. Of night telephonists 8 voted for No. 1 and 10 for No. 2.

At the end of the first test telephonists were asked if they liked pip signals better than the present gong signals and 68 out of 80 preferred pip signals.

Number of errors per telephonist on 26 examples

No. of errors	1st test			2nd test			
	MONarch	Reading	Total	MONarch	Reading	PADt'n	Total
None	3	-	3	16	7	8	31
1	9	1	10	12	1	5	18
2	7	8	15	7	6	1	14
3	5	6	11	5	10	3	18
4	4	2	6	2	2	-	4
5	5	4	9	-	2	-	2
6	1	1	2	3	2	1	6
7	5	1	6	-	-	-	-
8	2	-	2	1	-	-	1
9	3	1	4	1	-	-	1
10	1	-	1	-	-	-	-
12	1	1	2	-	-	-	-
13	1	2	3	-	-	-	-
14	1	1	2	-	-	-	-
15	1	1	2	1	-	-	1
17	1	-	1	-	-	-	-
21	-	1	1	-	-	-	-
No. of telsts. taking part	50	30	80	48	30	18	96

COIN BOX DESIGN STUDY GROUP

Minutes of 12th meeting - 17th November, 1955.

Present: H. A. Daniels (Chairman)

Mr. C.W. Arnold	ED/S	Mr. S.L. Helman	ED/S
Mr. E.G. Crisp	ITD/OB	Mr. D.J. Kinder	ITD/SSE
Mr. L.C. Fox	F.O.E.F. & S.D.W.C. Staff Side	Mr. A.V. Leaver	ITD/SSE
Mr. H.E. Francis	ED/Sp.	Mr. C.G. Osmond	ID/IE
Mr. B.E. Hearn	AGD/TCB	Miss N. Whitelaw	F.O.D.W.C. Staff Side.

Mr. J. Lennox ITD/OB (Secretary)

Minutes.

1. The minutes of the 11th meeting were agreed.

Interim Report.

2. The Chairman said that the Interim Report had been submitted to the Director, but had not yet been formally approved. He had no reason to doubt that it would be approved in due course. Miss Whitelaw said that her constituents knew that the Study Group was in being and were anxious to see the report of its work. She hoped it would be possible to release the Report to them in time for discussion at the 1956 Association Conferences. The Chairman promised that he would do his best to ensure early approval and publication. (The Interim Report has since been approved and copies will shortly be available for general distribution).

Use of Swiss
coin box

3. The Chairman said that most members of the Group would be aware that negotiations for the purchase of the Swiss box had fallen through. Consequently the Engineering Department were negotiating a development contract for a new box with Messrs. Halls Telephone Accessories, who manufacture the present coin box. Mr. Helman said that the contract would be in the terms that a prototype should be ready within 12 months, but he doubted if the manufacturer would be able to meet that date. Mr. Leaver pointed out that the failure to obtain the Swiss box meant that the field trial would be delayed and it might be necessary to reconsider, in the light of other circumstances, whether the venue should still be Reading. Mr. Fox said he regretted that it should be necessary to place a development contract with Messrs. Halls; he believed that the development work could have been done by the Post Office. Mr. Helman explained that the specification for the new coin box would be drawn up by the Post Office but that use was being made of Messrs. Halls' wide practical experience of such mechanisms. Mr. Francis said that the exchange equipment would be designed by the Post Office.

Plan 5E
installations.

4. Mr. Leaver reviewed the progress that had been made on the investigation into the use of the Plan 5E installation when the new coin box was introduced. Information recently obtained from Regional Directors showed that there were about 13,000 Plan 5E installations (about 20% of all call offices); most of the call offices concerned were uneconomic; in fact only half produced a revenue of more than £50 per year. The bulk of the Plan 5E installations were in rural areas, and Regional Directors had stated that it would be difficult in many cases to find sufficient line plant to provide separate lines for the Sub-Postmaster and the call office. Apart from the call office angle, it was doubtful whether a separate line could be justified for the majority of the sub-offices concerned, but it would be difficult to withdraw telephone facilities from them. Miss Whitelaw wondered whether the Post Office was under

any obligation to provide telephone service to the Sub-Postmaster for his private business as distinct from the performance of his Post Office duties. It seemed to her that the limit of Post Office responsibility was to provide the Sub-Postmaster with connexion to the local telephone-telegram centre. Should the Sub-Postmaster want telephone facilities for his private business, he should apply for a business line in the normal way. The Chairman said that in principle that was the position. He doubted whether many small sub-offices had any need for a telephone, apart from the use made of it for sending telegrams; in an emergency the call office was always available. Mr. Osmond said that at the present time it was essential in the interests of security that all post offices, even the smallest, should be on the telephone. Ideally, there should be separate lines for the Sub-Postmaster and the call office; but if that were not practicable, he would have no objection to the Sub-Postmaster being provided with a line for his own use, recording separately the official calls that he had to make. Mr. Francis suggested that the problem would be overcome if the Sub-Postmaster was allowed direct access to non-metered services only (which he hoped would include telephone - telegrams) and dialled '0' for all other calls. In reply to a question from Mr. Leaver, Mr. Francis agreed that it might be possible to design a small press button unit which would simulate the insertion of 3d. in a coin box, but care would be necessary to ensure that repeated operation of the button would not permit trunk calls. The Chairman, summing up the discussion, said that there seemed to be four possible methods of overcoming the difficulty:-

- 1) To provide a coin box in the sub-office as well as in the call office.
- 2) To design a special apparatus to simulate the insertion of the unit fee for association with the sub-office telephone.
- 3) To provide separate lines for the call office and the sub-office.
- 4) To route all metered calls from the sub-office through the operator.

The first solution would be cumbersome and expensive, but he asked the IID/SSB to find out where it would be practicable to provide separate lines, and the ED to look into the practicability of the second solution.

5. Mr. Crisp introduced Committee Paper 9, which described experiments carried out on the signalling of coins to operators. The analysis of results suggested that there was no particular advantage in any ratio or rate of pulsing. Miss Whitelaw pointed out that, although the experiments had tested the use of the various tone combinations, they did not really assess staff reaction generally to the new system of signalling coins. She had hoped it might be possible to carry out wider tests to that end but thought that it might now be better to wait until the field trial. For that trial she suggested that the Group should determine beforehand the tone it considered to be most suitable but she sought an assurance that it could be modified both as to its ratio and rate in the light of experience gained. Mr. Helman confirmed that it would be possible within limits although it would be much more difficult to alter the ratio of pulsing than the rate of the pulses themselves. Mr. Francis pointed out that there were strong technical advantages in favour of having the silent period twice the length of the tone period. He suggested that the rate should be 4 pps; it could however be varied within the limits 3-5 at the time of the trial. The Chairman

G.P. No.9
Signalling
coins to
operators.

/said

said that he thought that the reaction of the operating staff to the new signals would change as they gained more experience of them. At first they might prefer the slower rate, because they were trying to count the pulses, but later they would come to recognise the signals in groups and prefer the faster rate of pulsing.

6. The Group agreed that, for the purpose of the field trial, pulsing should be at the rate of 4 pps with the silent period twice the length of the tone period.

Coin box
identification
signal.

7. Mr. Francis said that he would like an opportunity of preparing a Committee Paper, in conjunction with the ITD/OB, on access to special services and a coin box identification signal. He had not so far been able to devote much time to the job but he hoped to have something ready early in 1956.

Position of
coin slots.

8. Mr. Helman said that development of the mechanism by Messrs. Halls was in a very early stage, but it seemed that the new box would be a little larger than that in use in Switzerland. He asked for guidance on the position of the coin slots. They would need to be at the top of the box, but they could be in a horizontal, sloping or vertical plane.

9. After a general discussion, it was agreed that the slots should be parallel to the front of the box and mounted on a surface sloping towards the user, provided that a flat space was available nearby on which coins could be placed ready for insertion. It was necessary to bear in mind that the denomination markings on the slots would have to be seen by people of below average height.

Call office
layout.

10. Mr. Helman expressed the hope that the new coin box would not be considered in isolation from the lay-out of the call office itself. It seemed likely that the coin box would be finished in grey and it would look rather odd against the present black and chrome background. He thought such a hybrid arrangement would prejudice public reaction against the new box from the start. The Chairman agreed in principle, but considered it desirable that the new coin box should be so designed that it would not be too wide to fit into the existing call office lay-out as a temporary measure if necessary.

Coin box
cover.

11. The Chairman said that he understood that opinion was divided between a single outside cover (with inside covers to seal the coin container and mechanism respectively) and separate external covers for the container and mechanism. Mr. Fox said that there should be a balance between the security risk and the cost of preventing thefts from coin boxes; he suggested a single outside cover was sufficient. Mr. Osmond said that economic considerations were not all-important. He considered it was the responsibility of the Post Office as an employer to remove temptation from collectors and engineers who had access to coin boxes, and he recommended separate access to the mechanism and the coin container. Mr. Francis agreed, adding that he had understood it was the Group's objective to design a box which was as safe as possible so that suspicion could be eliminated. Mr. Leaver pointed out that separate access to the mechanism and the coin container was provided from the front of the present subscribers coin box.

12. After a general discussion, it was agreed that in the prototype there should be a locked cover for the mechanism and a separate locked door giving access to the coin container

/from

from the front of the coin box. The matter could be reconsidered when the prototype was available.

13. Wednesday, the 18th January 2.30 p.m.

Date of next meeting.

COIN-BOX DESIGN STUDY GROUP

Minutes of the 13th Meeting, 18th January, 1956.

Present:

Mr. H.A. Daniels (Chairman)

Mr. C. W. Arnold	ED/S:	Mr. D. J. Kinder	ITD/SSB
Mr. S. W. Dabbs	ITD/PB:	Mr. A. V. Leaver	ITD/SSB
Mr. H. E. Francis	ED/TP	Mr. E. G. Crisp	ITD/OB
Mr. L. G. Fox	EPDWC:	Miss N. Whitelaw	DWC
	Staff Side		Staff Side
Mr. B. E. Hearn	AGD/TCB:		

Mr. J. Lennox ITD/OB (Secretary)

Mr. Helman was absent on prolonged sick leave.

Minutes

1. The Minutes of the 12th Meeting were confirmed.

Coin box identification signal.

2. Mr. Francis said that a number of problems connected with the signalling of the coins to the exchange equipment had still to be resolved. Until then, he would not be able to produce his promised committee paper on a coin box identification signal for operators.

Size of the coin container

3. The Chairman said that earlier the Group had considered that there might be advantage in having two sizes of coin container. Now that the Engineering Department had reached the stage at which a prototype of the coin box was being designed, it was necessary to come to a firm decision on the container to be used during the field trial. Mr. Arnold said that a number of questions had to be considered in determining what size container should be used. Firstly, from the security point of view, there would be a maximum on the average sum of money that could safely be allowed to remain in coin boxes. Secondly, because copper would no longer be used in the new coin box, an equivalent sum in pounds sterling would weigh less than with the present box. Thirdly, he thought that by using drawn metal alloys it would be possible to reduce the weight of the empty self-sealing container from its present 5 lbs. Mr. Leaver suggested that the frequency of collection would have an important bearing on the size of the container. A call office receiving average use took between £3 and £4 per week. It was desirable that collections from the busy boxes should not be more frequent than, say, once a week and that even those boxes with the lightest user should be cleared at least once in four weeks. He hoped that it would be possible both for the collections from the busier boxes to be less frequent, and for the overall weight of the full containers to be reduced. Mr. Fox pointed out that, with the timing of shorter distance calls, it was likely that takings would increase. The Chairman agreed and went on to say that he thought that the Group should also assume for design purposes that call charges would rise - perhaps quite considerably - during the life of the newly-designed coin box. It was his opinion that the new container should be large enough to provide for between two and three times the sum held by the present container (£2.10.0. in copper). Mr. Arnold said that the present container when filled with £10 in threepenny pieces weighed 17 lbs (12 lbs in coin and 5 lbs the container), which was the same weight as when it was filled with £2.10.0d. in copper.

4. It was agreed that the container to be used for the prototype should be no larger, and might even be a little smaller, than the present standard self-sealing container, and should, if possible, be made of a lighter material. From experience gained at the field trial, the need for and practicability of having a smaller container could be reviewed.

5. At the invitation of the Chairman, Mr. Arnold showed the Group a number of drawings of new coin boxes, based on decisions already reached. After they had been examined, it was agreed that the layout of the coin slots should continue as at present (side by side): the idea that they might be placed end to end across the front of the box was not supported. So far as the position of the refund coin chute was concerned, it was agreed that it should be on the front rather than the side of the box, but that its precise position might be determined by engineering considerations. The Chairman, in summing up the general discussion on the appearance and layout of the new coin box, said that the handset would be in a cradle at the top of the coin box with the coin slots on the right and the dial on the left of the sloping face below. He asked the Engineering Department to prepare further sketches based on the suggestions that had been made during the discussion.

Appearance of
the new coin
box

6. It was agreed that, if the new sketches were satisfactory, the Engineering Department should arrange for a model of the shell to be made subject to agreement on the material and finish. The Chairman said that he would arrange for the model, and all the drawings, to be seen by the General Directorate.

7. The Chairman said that, when considering the external finish for the new coin box, it was well to bear in mind that the material used would probably not greatly affect the overall cost. Provided there was no unreasonable extravagance, appearance and utility rather than economy should be the criterion. He asked members of the Group if they had any preferences for the material and colour to be used. Miss Whitelaw said that she had always favoured a light grey vitreous enamel. From her experience in the home, it was of pleasing appearance, hard-wearing, and did not seem to chip or scratch. Mr. Arnold offered to the Group for inspection samples of aluminium alloys and of mild steel with different finishes. He said that from the engineering point of view there were advantages in using an aluminium alloy, because it was light and easy to work. He referred to his comments at a previous meeting (minutes 10th meeting, item 4c) about the metals and finishes available, and pointed out that vitreous enamel might crack and splinter if subjected to a sharp blow.

Materials and
finish of the
new coin box.

8. After the Group had had an opportunity of examining the samples, the Chairman summed up the advantages and disadvantages of the materials that had been seen. He said that anodised aluminium alloys had a good appearance when new, but it was obvious that they scratched fairly easily and might lose their appearance after they had been in use for some time. Stove enamel on mild steel (the material and finish of the existing box) chipped and rusted badly. Vitreous enamel on mild steel was expensive, but it seemed to produce a finish of good appearance which would not scratch and should wear well. On balance, he felt that the vitreous enamel finish would be preferable to an aluminium alloy and he asked the Engineering Department to examine further the practicability of producing a prototype box in silver grey with that finish.

9. Miss Whitelaw said that at the next meeting the Group would be discussing call office layout. She thought it would be helpful if they could have a committee paper listing all the accessories (umbrella stands, mirrors, ash-trays, etc.) in the present call office, and additional items that had been suggested from time to time by the Press and members of the public. The Chairman agreed that it would serve a useful purpose and asked Mr. Leaver to arrange for its preparation.

Layout of
call offices

Tuesday, the 13th March, 2.30 p.m.

Date of next
meeting.

COIN-BOX DESIGN STUDY GROUP

Minutes of the 14th Meeting, 13th March, 1956.

Present:-

Mr. H.A. Daniels (Chairman)

Mr. C.W. Arnold	ED/S	Mr. L.G. Fox	EFSDWC Staff Side
Mr. R. Brumby	AGD/TOB	Mr. D.J. Kinder	ITD/SSB
Mr. E.G. Crisp	ITD/OB	Mr. A.V. Leaver	ITD/SSD
Mr. S.W. Dabbs	ITD/PB	Mr. C.G. Osmond	PD/IB

Mr. J. Lennox ITD/OB (Secretary)

There were apologies for absence from Miss Whitelaw (on Union business), Mr. Francis and Mr. Hearn. Mr. Helman was still on sick leave.

Minutes

1. The Minutes of the 13th Meeting were confirmed.

Report of progress to Cost of Telephone Service Group.

2. The Chairman said he had been informed by the secretary of a small high-level group that was examining the cost of telephone service that the production of the new coin-box was regarded by that group as an item of the first order of importance, and that he wished to be kept informed of the progress made by the Coin-Box Design Study Group. The Chairman suggested that the first report should be that little positive progress beyond that set out in the Group's Interim Report had been made, but that a prototype of the shell of the new coin-box in mock-up form would be ready fairly soon. It could also be said that development of the mechanism of the new coin-box was in the hands of the contractor.

The new coin-box

Materials, finish and appearance.

3. Mr. Arnold produced a revised drawing of the new coin box based on comments made by the Group at its previous meeting. He said that the mock-ups would not be prepared in wood, as had been previously suggested, but in the metals that might ultimately be used. Two models were being prepared; the first in vitreous enamelled mild steel and the second in a stove enamelled aluminium alloy. Different colours of grey would be used. He hoped to have the mock-ups ready within a month provided specimens of the new 700 type handset were available. Mr. Osmond, commenting on the drawing, said that he felt the joint between the upper and lower cover offered opportunity for prising the box open. He thought it might be possible to design a pair of covers which flanged into each other in such a manner that sole reliance for security was not placed on the lock. He said he would reserve final judgment until he had an opportunity of examining the models, but he would like the chance of testing specimens of the metals to be used. Mr. Arnold said that the manufacturers had been warned that the joint between the two covers must be finely machined to ensure a tight and secure fit. Mr. Fox asked about ease of maintenance of the new coin box. Mr. Arnold pointed out that the whole of the top cover, including the gravity switch, would be removable. There would be holes in that cover for the dial and the coin slots, which would remain in place when the cover was removed. The mechanism itself would be of unit construction design, e.g., the pulsing mechanism could be taken out in its entirety for maintenance purposes. The Chairman said that he thought little progress could be made on the design of the coin box until the mock-ups were ready. After the Group had had an opportunity to examine them, he would ask the General Directorate to have a look at them; he believed that they might wish the Council of Industrial Design to give the design its blessing before production commenced.

G.P. 10 Layout of call office equipment.

4. Mr. Leaver introduced a Committee Paper on the lay-out of call office equipment. He said that the present backboard was designed to fit the standard kiosk, but there had been some suggestion that kiosks (particularly when in suites) should be smaller. He expressed the opinion that the backboard used by the Post Office was rather elaborate in comparison with that used by other Administrations, and he suggested that on the grounds of cost and maintenance, it would be undesirable to make it more

/so.

so. The Chairman suggested that the Group should consider in detail the points for discussion set out in the Paper.

5. Mr. Leaver said that a three year contract had been let to an advertising agency for the use of the long right-hand panel in all call offices in urban areas. The contract still had about two years to run and, because it was revenue producing, there seemed every likelihood that it would be renewed at the end of that period. It seemed, therefore, that there must be a permanent allocation of space for advertisements. Mr. Crisp said that the whole of the long left-hand panel was at present taken up by the instruction notices. Mr. Leaver pointed out that the instruction notice in the new coin box would need to include provision for STD working and the new tariff that would be introduced with it. The Chairman asked Mr. Crisp to arrange for a trial write up of the necessary instructions to see how much space would be required.

Instructions,
notices, etc.

6. It was agreed that the small frames for the emergency notice, and the publicity or foreign language notices would still be required.

7. Mr. Crisp referred to the special label which clipped round the cradle of the present handset and could be used for changed number schemes or for an "out-of-order" notice. He asked if provision was to be made in the new box for those notices. If so, it was necessary that the placing of the notice should be conspicuous so that it would come to the attention of the regular user who did not normally read the instruction card. After some discussion, it was agreed that special provision need not be made for such a notice. Call offices received emergency fault treatment and should not, therefore, be out of order for any long period except perhaps when there was a cable fault. Major changed number schemes were too infrequent to justify standard provision in all call offices.

"Out-of-order"
notice.

8. It was agreed that the mirror should be retained as at present. It improved the appearance of the call office, and was popular with the public. Mr. Leaver suggested, however, that the frame might be used temporarily on the installation of the new coin boxes for displaying a notice warning callers of the change.

Mirror

9. Referring to the suggestion that a special directory fitting should be provided in London call offices, Mr. Kinder said that the type of fitting in mind was similar to that in use at Piccadilly Underground Station. Directories were not put in the individual call offices there, but were available at a separate wall desk. He said that the SSB had received advertisement literature from a Swiss firm, who manufactured a directory holder which would be suitable for inclusion in kiosks. They were willing to provide a model for inspection by the Post Office. Mr. Osmond said that the GOMBE had a number of office equipment gadgets which might permit the use of the ordinary paper-backed, rather than the stiff-covered, directories in call offices. If that were possible, there would be a saving of several thousand pounds per year on stiff covered copies although much of that might be offset by the cost of the holders. Mr. Kinder said that in London, apart from the normal re-issues when new directories were printed, on the average two replacement sets of directories a year were provided in each kiosk. Where the use was very heavy as many as six replacements a year might be necessary. There was no indication that wilful damage rather than fair wear and tear was responsible for the replacements. Mr. Fox pointed out that the Call Office Maintenance Study Group, which reported in 1954, had made recommendations about the directories to be used in call offices. They had argued in favour of the stiff-backed directory, and he thought that account should be taken of their findings.

Directories

10. Mr. Leaver said that the majority of call offices in the London Postal Area had the four LPA volumes although some had the five Outer London volumes as well; outside the LPA the local Outer London volume and the four LPA volumes were normally provided. Allowing for long term

/growth

growth, capacity would be required for 8,000 pages in the 9 volumes, 5,000 pages in the 5 volumes, and 4,000 pages in the four LPA volumes. The thickness of each 1,000 pages was about $1\frac{1}{2}$ inches. Mr. Kinder pointed out that a holder of the type used at Piccadilly, including space for opening the books, would require 26 of the 29 inches available on the back-board and would leave no room for the coin box. The Chairman agreed but suggested that there were a number of alternative solutions to the problem. He understood that the question of removing directories entirely from call offices had been considered by the CO&MS but had been discarded as impracticable. It might, however, be possible to provide a maximum of five volumes in a holder. In those cases where nine volumes were required, the remaining four could be left on the parcel shelf. Mr. Kinder pointed out that even with a holder for five volumes it would be necessary for the telephone to be placed to one side of the backboard and not centrally as at present. Mr. Arnold agreed and suggested that it might be possible to have a holder for all nine directories placed at right angles to the present backboard and running along one side of the call office. He did not think it would restrict unduly the space available inside the call office although it would limit the arrangements that could be made for hanging the door. Mr. Osmond said that bearing in mind London and provincial needs, it appeared to him that three different conditions had to be catered for:-

- (i) The individual kiosk requiring a special holder for a number of volumes (as in London).
- (ii) The individual kiosk needing only a single volume (the normal provincial condition).
- (iii) Suites of kiosks conveniently situated so that the external desk type holder could be used. The individual call offices would not then need directories.

The Chairman suggested that the second and third categories might be regarded as the standard lay-out; the individual directory when required could be placed on the parcel shelf. The special arrangements need only be made for the first category. He felt that the Group had discussed the problem fairly fully and suggested that a decision might be deferred until a later meeting. Meanwhile, members might like to give further thought to the problem particularly in London and to take the opportunity of examining a call office for themselves to see what arrangements could be made.

Parcel Com-
partment.

11. Mr. Osmond thought that shelf space must be provided for ladies' handbags, but he thought that they would prefer a shelf which they could see rather than the present parcel compartment. Mr. Leaver reminded the Group that the parcel shelf or compartment might, in many kiosks, have to serve as the directory holder as well. The Chairman said that there was clearly agreement that there was need for a shelf for small parcels or handbags and that it might well replace the existing parcel compartment.

Cigarette
grill

12. Mr. Kinder said that a cigarette grill was at present provided, and in his experience was used by members of the public. Mr. Osmond expressed some doubts about its value. The Chairman said that he thought that an ash-tray, which had to be emptied, would be a nuisance, but that some provision for cigarettes was useful, if only to prevent lighted cigarettes from being placed on directories.

Umbrella
holder.

13. Mr. Arnold pointed out that an umbrella holder had at one time been fitted in all call offices but had been discontinued because there were complaints of torn clothes, and there was no indication that it received any great use. The Chairman agreed that an umbrella holder of the original pattern was not desirable but that a hook of some kind might well be useful.

14. The Chairman said that a discussion of the remaining points raised in the Committee Paper would be deferred until the next meeting.

Thursday, the 12th April, 2.30 p.m.

Date of next Meeting

Paragraph 5. To prepare a trial write-up of instruction card for new call office. ITD/OB.

Action

COIN BOX DESIGN STUDY GROUPLayout of Call Office Equipment

1. Wallboard D60577 (known as the Jubilee assembly - see Diagram E.C. 1851 and photograph attached), which was introduced in 1936 as a result of a recommendation of the Committee on Kiosks, is the standard fitting for No. 6 kiosks and standard call office cabinets. It is in two parts. The upper part is 29" wide and $30\frac{1}{8}$ " high and is constructed in bakelite-faced plywood; it is fitted with:

two Frames Notice No. 29 (size $1' 8\frac{3}{16}" \times 8\frac{1}{4}"$)	Left displays Instruction card. Right displays Commercial Advertisements or Foreign Language Instruction card or P.O. Publicity notice.
one Frame Notice No. 39 (size $7\frac{1}{16}" \times 6\frac{3}{8}"$)	Displays Foreign Language Instruction card or publicity notice.
One Frame, Mirror No. 1 (size $6" \times 6\frac{5}{8}"$)	
one Frame, Notice No. 31 (size $4\frac{3}{16}" \times 6\frac{5}{8}"$)	Displays emergency notice, and button in Manual areas.

The frames are constructed in stainless steel and are supplied with the wallboard, already fitted, and with the glasses.

The lower part of the wallboard is 18" high and 29" wide; it is constructed in ebonized wood and consists of a parcels receptacle on the left and a directories receptacle on the right, between which is a space in which is fixed the coinbox. A cigarette tray is also provided. (An umbrella holder used to be provided, but this was discontinued just before the war as it was found to be little used.) The telephone is placed on the parcels receptacle, and the top of the receptacles and coin box form a shelf across the whole width of the kiosk; this shelf is approximately 3' 7" from the floor. The dimensions of the present coin box are: height 18" width $8\frac{1}{2}"$ depth $5\frac{3}{4}"$. A narrower wallboard (No. D63747) 25" wide, but identical in appearance to D60577, is fitted in non-standard cabinets less than 29" in width.

2. The current rate-book price of the standard wallboard, including fittings (but not the coin box and the telephone) is £15.

3. It is generally felt that the appearance and layout of the present wallboard are attractive, and it may be considered undesirable to make any radical changes unless material advantages are to be gained or the changes are required because of possible redesign of the kiosk. At the 9th meeting the Group's view was that a wallboard would be necessary and that it should be of smart appearance. Some points of criticism on layout etc. which have been raised are dealt with in the following paragraphs.

4. COIN BOX The present central position of the coin box does not allow adequate space on the right-hand shelf for consulting directories, and, as the telephone handset is to be placed on top of the new coin box, it may be considered desirable for the coin box to be moved to the left. The position of the bosses in the wall of the kiosk to which the coin box is bolted would have to be altered.

5. DIRECTORIES (see also para. 4) In view of damage and theft of directories it has been suggested that some kind of fixture should be provided to hold them. On the other hand, the O&M Report on Directory Information Services recommends that a reading shelf be provided instead of a directory compartment. The call-office directory complement varies considerably with locality, e.g. in the London Postal

Area the four LPA volumes are provided, plus one or more Outer London directories in some call offices, whereas in the provinces a sectional directory only may be provided. Local directories, other Area and/or classified directories may be provided at the TMs discretion. There seems to be a case for a special directory fixture in London, possibly on the lines of the Swiss fixture (a fixture of this type is fitted at two London railway stations outside the suite of call offices) but it is doubtful if it would be justified elsewhere in view of the low cost of provincial directories and the problem of providing an efficient and inexpensive fitting. Corded directories were at one time provided for use with the old type of call office assembly but they did not keep directories in good condition or stop them being stolen. The Study Group on Call Office Maintenance reported that they could see no reason for the use of corded directories in any call office and they are not now provided.

6. Regard must be paid to simplicity of operation in inserting directories in any fixture as well as the need to avoid the possibility of theft and damage by members of the public.

7. PARCEL ACCOMMODATION. If the coin box were placed on the left of the new assembly, accommodation for parcels etc. could be provided by a shelf under the directory fixture.

8. TYPE OF NOTICES. During 1944 consideration was given to providing notices on anodised aluminium sheets as an alternative to card notices in frames. A specimen was obtained with white lettering on a black background (which, incidentally, is used in Switzerland) but this was considered to be funereal in appearance. The conclusions reached were that the idea was not unattractive, provided the plates could be produced in black lettering on white background and at a cost less than that of printed cards. Owing to the difficulties likely to be met in obtaining aluminium during the post-war period the matter was shelved. Consideration of metallic notices should pay regard to:

- (a) the need to avoid a surface which could be disfigured by penciling or scratching;
- (b) the higher cost as compared with card notices; all instruction cards and emergency notices bear local details, e.g. telephone number, address of kiosk, and this provision on metallic notices would probably be expensive in production. However the cost should be balanced against the non-provision of stainless steel notice frames and glasses;
- (c) the incidence of replacement due to change in dialling facilities, i.e. extension of automation and the speed with which replacement notices can be obtained - replacement cards can now be obtained within seven days.

9. Replacement of Obsolescent Wallboards Existing instructions provide that the present standard assembly should be installed in all new kiosks and cabinets and also when it is necessary to replace an existing assembly due to damage, discreditable appearance, or change in the type of exchange. In 1951, the Study Group on Call Office Maintenance estimated that there were about 12,500 obsolescent pre-war and wartime utility assemblies still in use, but their replacement at that time would have cost about £265,000 and could not be justified. The Group recommended, however, that all old-type wallboards should be replaced as quickly as economic conditions permitted. The number of obsolescent assemblies in use has probably been reduced to about 8,000 since 1951. If a new type of assembly were introduced costing approximately the same as the present one, an expenditure of about £1 m, exclusive of labour costs, would be involved if it were decided to fit it in all call offices. There would be little real advantage to be gained from such a course and it would seem wise to follow present policy in regard to the installation of any new layout.

10. Points for discussion. The following points are listed for the guidance of the Group in discussing this subject:-

(i) What provision is to be made for instructions, notices and advertisements? Should the mirror be retained?

(ii) Should a special fitting be provided for directories in London on the lines of the Swiss model? What provision should be made elsewhere?

(iii) Subject to the decision as regards (ii) is provision required for two compartments for (a) directories and (b) parcels, in both London and the provinces?

(iv) Is the cigarette tray required and should the umbrella holder be reintroduced?

(v) What type of materials and finish are to be used for:-

(a) backboard;

(b) directory and parcels .

(vi) Are the instructions, notices and advertisements to be displayed in their present form or in a different form.

(vii) Are the wallboard and fittings to be of the same size? Regard must be had to the interior dimensions of cabinets and kiosks and whether these are likely to be changed. The possibility of a different method of mounting the door should perhaps be considered.

(viii) Should the light be retained in its present position (in the roof) or be put at the top of the backboard?

(ix) Is the existing layout to be retained in existing call offices, except where for any reason the assembly has to be replaced?

*Problem
of a kind*

COIN BOX DESIGN STUDY GROUP

Minutes of 15th Meeting - 12th April, 1956.

Present

Mr. H. A. Daniels (Chairman)

Mr. C.W. Arnold	ED/S	Mr. S.L. Helman	ED/S
Mr. D.G. Crisp	ITD/OB	Mr. J.H. Jones	AGD/TOB
Mr. S.W. Dobbs	ITD/PB	Mr. D.J. Kinder	ITD/SEB
Mr. F.J. Bastow	ED/TF	Mr. A.V. Leaver	ITD/SSB
Mr. L.G. Fox	EFSDWC	Mr. C.G. Osmond	PD/IB

Staff Side

Mr. J. Lennox ITD/OB (Secretary)

The Chairman welcomed Messrs. Bastow and Jones, who were taking the places of Messrs. Francis and Brumby for the meeting. He welcomed back Mr. Helman, who had recently returned from a spell of sick leave. Miss Whitelaw had sent her apologies; she was detained on Union business.

Minutes

1. The Minutes of the 14th Meeting were confirmed.

Instruction card for new system.

2. Mr. Crisp presented a rough draft of an instruction card for the new coin box. He said that it had been possible to include all the necessary information within the space of a single long frame. There might, however, be a problem in London if it were necessary to provide a list to indicate those exchanges for which the initial fee would only be 3d. Mr. Osmond hoped that the instruction notice would describe the new Pay Tone adequately. The Chairman agreed that the novel features of the new box would have to be clearly described, but suggested that detail of the instructions could be left to the ITD/OB. The main point of concern for the Group was that the information could be contained adequately in a single notice frame.

Models of the new coin box

3. Mr. Arnold said that the models of the new box were not yet ready. The manufacturer had preferred to make a proper shell rather than a mere "mock-up". Before doing so, he had to be certain that the shell planned was sufficiently large to take all the mechanism of the new box. When ready, the models would be exact replicas of the covers for the new mechanism, and would be complete with locks. He had been promised the alloy shell within about a month, but it might be a little longer before the mild steel model was available.

"Tampering Alarm"

4. Mr. Osmond said that he would like to raise the question of "tampering alarms" lest development of the box should go too far for them to be included, if the Group thought it were desirable. He felt that, with an alloy cover divided into two portions, there was a real risk of efforts being made to prise off one of the covers. He would like facilities to be available for an alarm to be connected to the new coin box if such damage were concentrated in any particular area. The type of alarm mechanism he had in mind could be simple and inexpensive, but it was desirable that the fixing holes should be available as a standard item in all coin boxes. Mr. Leaver expressed some doubt whether the design of the new box should in any way be influenced by a "one-in-a-thousand" need. Mr. Arnold said that he understood that alarms of various types had been tried with the present box but had not proved very successful. Mr. Bastow did not foresee any technical difficulty in providing a special relay set at the exchange which could be connected temporarily to any coin box line so that it could be observed in the manner suggested by Mr. Osmond. The Chairman said that he thought all Mr. Osmond really wanted was for a couple of holes to be drilled and tapped in the cover

so that a mechanism could be fitted readily in any box if it should be required. He asked the Engineering Department to look into the question in conjunction with the IB.

5. The Chairman reminded the Group that discussion at the last meeting had reached the problem of accommodating the directories, particularly in London. Mr. Leaver said that he had been told by the LTR that there were over 12,000 public call offices in the Region; about a quarter of these carried all nine directory volumes, but the number could probably be reduced; the remainder had either four or five volumes each. The four IPA directory parts cost about 4s. 6d. each; it seemed worth while spending a little money to mount them in a satisfactory manner if it would cut down on the number of replacements required and keep the call offices tidier. Further, a point to be watched with the new coin box was that the handset was not struck and damaged by the directories when they were in use. Mr. Arnold demonstrated to the Group a model directory holder, which had been prepared in the Engineering Department's laboratories, to take five of the London directory volumes. The chief difficulty that had been encountered in preparing the holder was the narrowness of the inside margin of the telephone directory; adequate space was not available to get a proper bite on the spine. Mr. Leaver said that he appreciated the difficulty but it was not possible to increase the width of the margin. Call Office directories were printed on the same special machines as the subscribers' directories.

C.P.10.
Layout of call
office equip-
ment.

6. Discussion ensued on the suitability of the holder produced by the ED. The view was expressed that the public might be confused by the need to move a directory to the centre of the holder before it could be raised and opened. The Chairman suggested that the method of fixing and replacing directories would have to be considered in rather more detail. He asked the Engineering Department representatives to consult with the ITD/SSB to improve the design, and to produce a model and drawings of a suitable holder. The holder would need to provide for a maximum of 5 volumes (4 IPA parts and one of the Outer London directories).

7. The Chairman suggested that the Group should come to some provisional decision about the general layout of the backboard. Mr. Arnold said that it was desirable that the coin box should be remote from the door as a protection from the weather. The ideal arrangement would be to have the backboard always situated immediately opposite the door. Mr. Leaver thought that it would not always be possible to do that, and to provide adequate natural light, particularly when kiosks were placed in awkward corners. He went on to suggest that the position of the directory holder in London call offices in relation to the handset should be such that there was no danger of the handset being knocked from its rest when the directories were being consulted. The Chairman suggested that the provisional London lay-out might be with the coin box on the left of the backboard; the directory holder could then be placed on the right below the level of the handset to guard against the risk that Mr. Leaver had mentioned. He envisaged that the top of the directory holder would be about 3' 3" from the floor; that seemed a reasonable height for consulting directories, but was rather too low for people to lean on heavily. For all provincial call offices there could be two horizontal shelves (about 8 inches deep) on the right. A sloping lectern style shelf would not be satisfactory as it could not serve for parcels as well as for consulting the directory. The expense of providing a directory holder of the type proposed for London call offices could not be justified. The handset would be about 4 feet from the floor in both London and provincial call offices.

Position of
coin box and
directory
holder.

8. The Chairman went on to suggest that the stage had been reached when the Group could, with advantage, experiment with a kiosk and see

how their ideas worked out in practice, particularly so far as the layout was concerned. For instance, he would like to be sure that the layout that he had suggested would not foul the electrical fuses and Venner Time Switch at the bottom of the box. He asked the Secretary to arrange with the Engineering Department for a kiosk to be made available to the Group for practical experiments.

Date of next Meeting

Thursday, the 10th May, 2.30 p.m.

Action

Para 3.	Models of coin box shell.	ED/S
Para 4.	Tampering alarm.	ED/S and FD/IB
Para 6.	Holder for five directory volumes.	ED/S and TTD/SSB.

COIN BOX DESIGN STUDY GROUP

Minutes of the 16th meeting - 10th May, 1956

Present Mr. H.A. Daniels (Chairman)

Mr. C. W. Arnold	ED/S	Mr. J. H. Jones	AGD/TCB
Mr. F. J. Bastow	ED/Tp	Mr. D. J. Kinder	ITD/SSB
Mr. E. G. Crisp	ITD/CB	Mr. A.V. Leaver	ITD/SSB
Mr. S. W. Dabbs	ITD/FB	Mr. C. G. Osmond	FD/IB
Mr. S. L. Helman	ED/S		

Mr. J. Lennox ITD/CB (Secretary)

Miss Whitelaw and Mr. Fox were unable to be present because of their Association Conferences.

Minutes

1. The minutes of the 15th meeting were confirmed.

Tampering Alarm

2. Mr. Osmond said that he had had a meeting with Engineering Department representatives to discuss a tampering alarm. He considered that there would be need for such an alarm in the new coin box, firstly, because the new box would not be so strongly constructed as the old one, and secondly because of the divided cover. He had made enquiries about the number of physical attacks on present coin boxes, and had found that in the East Area, L.T.R. in a period of six months there had been about twenty-five; in a similar period there were about a score in each of the London and the larger provincial Areas. So far as he knew, the money stolen was comparatively small although he did not regard the number of attacks made as unimportant. He was of the opinion, that with the new coin box, the number of attacks might increase and, if they proved to be successful, that in itself would be an encouragement to criminals. He did not ask for permanent alarm equipment to be fitted in all coin boxes, but felt that all the new boxes fitted in call offices should be so designed that they could be connected to special exchange alarm equipment as required. He understood from his engineering colleagues that an exchange alarm unit, which could be transported from exchange to exchange, could be provided at the cost of about £25 per unit. Mr. Osmond concluded by offering to prepare a Committee Paper covering the fraud and theft aspects of the new coin box; in it he would include a review of the need for a tampering alarm. Mr. Helman said that he understood that the SSB had suggested that the new coin box should be so designed that it would be put out of action if the self-sealing container were not replaced. It might be possible to combine the IB and SSB requirements into a single alarm device. Mr. Leaver pointed out that he would not wish the self-sealing container safeguard to be provided if it would be costly. Mr. Jones suggested that a cost comparison should be made between the expenditure on IB staff in coin-box discrepancy investigation cases, and the cost of alarm equipment.

3. The Chairman thanked Mr. Osmond for his offer and asked him to produce his Committee Paper as soon as possible. He did not regard cost comparisons as the sole criterion and felt they would be rather difficult to establish in any case; but the paper might include such details of IB man-hours spent on coin-box investigations that were available, and any cost comparisons that could readily be obtained.

Model of new coin box

4. Mr. Arnold exhibited a model of the shell of the new coin box. He said that the manufacturer had not been able to produce the finish required in time. The model available was made from enamelling iron but was only painted.

5. The Group examined the model fitted in a kiosk No. 6.

/6.

6. In the ensuing discussion, Mr. Leaver said that he was unhappy about the handset and its rest. It did not look to him an integral part of the coin box; the rest in particular seemed a temptation to anyone trying to wrench off the top cover. The Chairman suggested that the proper models might be made with the switchhook plunger set farther back and crooked so that the handset itself would be in the same position. He thought that a rearrangement on those lines would largely overcome Mr. Leaver's criticism. He would prefer the handset rest to be made of aluminium alloy in its natural colouring.

7. Mr. Arnold said that the model directory holder, ^{was being} which had been designed in agreement with the SSB, ~~was being constructed in the L.F.R. workshops and should be ready by mid-June.~~

Model of directory holder

8. The Chairman said that the Group appeared to be agreed that in provincial call offices there should be two parcel shelves about 8" deep covering the space where the directory holder would be in the London call offices. The top shelf might be a couple of inches longer than the bottom one, and include a cigarette grill of the present pattern at the left-hand end. It would be rather difficult to provide a cigarette grill in a similar position in the London call offices because there would be a risk of fire if lighted cigarettes were placed near the directories. He suggested that the solution might be to provide a cigarette grill along one of the glazing bars of the windows. He asked the Engineering Department to prepare a model of the provincial shelves as soon as they could conveniently do so.

Shelves in provincial call offices.

Cigarette grill

9. Mr. Arnold said that the present backboard was $\frac{3}{4}$ " plywood with a bakelite facing. Little difficulty was experienced with it except that on occasions woodworm attacked the plywood, and "delamination" took place. A number of alternative finishes were available including metal-faced plywood, Formica-faced plywood, or solid PVC. Mr. Helman pointed out that bakelite was only available in black or walnut, but that Formica or solid PVC could be obtained in a wide variety of colours.

Backboard and notice frames.

10. After a general discussion the Chairman asked the Engineering Department to advise the Group on the relative strengths and costs of the existing backboard and one made from solid PVC. He went on to say that it appeared to be generally agreed that the backboard should continue to be black. He personally found the stainless steel of the notice frames a little garish. He asked the Engineering Department representatives to consider the possibility of frames made of plastic or other suitable materials which could be finished in grey to match the new coin box.

11. The Chairman said that the EEE had asked the Group to reconsider its decision not to provide a florin slot. They had pointed out that difficulty was experienced on Continental calls, which cost from 6/- for three minutes, and suggested that the shilling slot might be replaced by one for 2/-. About 50,000 continental calls per year were made from coin boxes. Mr. Leaver suggested that the 50,000 continental calls had to be compared with over forty million inland trunk calls a year costing between 1/- and 2/-, made from coin boxes and on which the caller would find a shilling slot useful. The shilling slot might also find a use on the short duration long distance call with S.T.D. Mr. Helman said that a change in slots at so late a stage in the design would certainly delay the completion of the new box. There would be complications in providing the eight pulses necessary to signal a florin. Mr. Bastow pointed out that modification would certainly be necessary to the proposed exchange equipment. The Chairman

Florin Slot

said that it was obvious to him that it would be impracticable to change the box as designed. He did, however, think that it might be desirable to consider separately the possible need for a special coin box with a florin slot for use at Piccadilly Circus, London Airport and certain main line stations; but that could wait until a much later stage in the development of the new box.

Date of
next Meet-
ing

12. Thursday, 31st May, at 2.30 p.m.

Action

Para. 3 Committee Paper on "Theft and Fraud with the new coin box".

FD/IB

Para. 8 Model of shelves for provincial call offices.

ED/S

Cigarette grill in glazing bar.

ED/S

Para. 10 Relative strengths and costs of present and solid PVC backboards.

ED/S

Alternative material for notice frames.

ED/S

COIN BOX DESIGN STUDY GROUP

Minutes of the 17th Meeting - 31st May, 1956.

Mr. H.A. Daniels (Chairman)

Mr. C.W. Arnold	ED/S	Mr. D.J. Kinder	ITD/SSB
Mr. F.J. Bestow	ED/TP	Mr. A.J. Leaver	ITB/SSB
Mr. E.G. Crisp	ITD/OB	Mr. K.S. Nash	AGD/TOB
Mr. S.W. Dabbs	ITD/PB	Mr. C.G. Osmond	PD/IB
Mr. S.L. Helman	ED/S		

Mr. J. Lennox ITD/OB (Secretary).

There were apologies for absence from Miss Whitelaw and Mr. Fox, both of whom were engaged on Association business. The Chairman welcomed Mr. Nash who was replacing Mr. Brumby as the A.G.D. representative on the Group.

Minutes

1. The minutes of the 16th Meeting were confirmed after paragraph 7 had been amended to read - "Mr. Arnold said that the model directory holder was being designed in agreement with the SSB."

Models of new coin box.

2. Mr. Arnold exhibited to the Group two models of the shell of the new coin box. The first was made of aluminium with a stove enamel finish coloured mid-grey, and the second had a vitreous enamel finish coloured blue-grey. The handset rest on the stove enamel model had been "crooked" in accordance with the previous decision of the Group and was finished in stainless steel. Mr. Arnold pointed out that the colour had not reproduced very satisfactorily in the vitreous finish. It was clear that if vitreous enamel was to be used, a heavier gauge metal would be necessary to prevent the covers becoming distorted during baking. The Chairman said that it was his impression from the models on view that it was not worth pursuing further the question of a vitreous enamel finish. The general appearance of the stove enamelled alloy was pleasing and, even if the finish itself might not be so durable, it had the advantage that it could be re-enamelled if it became worn or chipped. On the other hand vitreous enamel could not be resurfaced and a damaged box would have to be treated as scrap. Mr. Helman confirmed what the Chairman had said. In the long run there would be little difference in cost between the two finishes because the higher cost of the alloy was offset by the cheaper stove enamel finish. Messrs. Halls had pointed out to him that there would always be difficulty in obtaining close fitting covers if a vitreous process was to be used. The Chairman suggested, and the Group agreed, that further engineering design effort should be confined to the development of a stove enamel alloy box. He asked the E.D. to produce a second model in a suitable alloy with a stove enamel finish coloured blue-grey (BS 692). The second model should include such details of design as had so far been agreed by the Group, (i.e. the crooked handset rest, refund chute in which coins were rejected horizontally, and engraved coin slots.

Position of coin slots

3. Mr. Arnold said that, in designing the coin box mechanism, it had been found that more effective operation was possible if the coin slots were placed vertically rather than horizontally. He asked the Group if they had any objection to revising their previous decision on the position of the coin slots. The Chairman said that he personally could see little practical difference between horizontal and vertical slots. The risk of coins being fumbled and dropped to the floor seemed to him similar whichever

way the slots were placed. If the slots were placed vertically, the denomination could be engraved on the plate in figures above the slots themselves.

4. It was agreed that although horizontal slots, as in the present box were preferred, vertical slots would be acceptable if there were material engineering advantages to be gained. Mr. Arnold promised to find out whether it was possible to overcome the difficulty of having horizontal slots.

5. Mr. Arnold pointed out that the present backboard had been designed in the days when it had to carry the full weight of the coin box. But the coin box was fixed to the kiosk itself, and the backboard was therefore much stronger than it needed to be. It did not seem to him that the relative strengths of the present backboard and one of P.V.O. was relevant provided the P.V.O. could carry the notices and their frames. P.V.O. would be slightly more expensive than the present backboard and it had the disadvantage that it would collect dust due to its electrostatic properties. The Chairman agreed that the question of the material for the backboard could be left to the Engineering Department, who could inform the Group of its views in due course. The weight of the new London directory holder would need to be borne in mind.

Backboard

6. Mr. Helman said that the high gloss finish on the frames was necessary to prevent rust. As it was, stainless steel suffered from discolouration due to sulphiding if it was not dusted regularly. Plastic frames could be used but would have to be thicker than the existing frames if they were to be rigid. Mr. Kinder asked whether it would be possible for the frames to be made of similar material to, and finished in the same colour as, the new coin box. Mr. Helman thought there would be some variations in the shade of the colour. The Chairman said that the idea appealed to him; a slight variation in the colour would not be important provided the match was reasonable. It seemed that any natural metal either must be highly polished or would corrode or discolour in time. Mr. Crisp suggested that it might be possible to abolish frames altogether, and to inset the notices, covering them with a single sheet of glass or perspex. Mr. Osmond thought that perspex would have an advantage over glass, in that the latter provided a great temptation to malicious damage. The Chairman suggested that the question of material and finish for the frames might well be left for discussion between the Engineering Department and the contractor. He would like to have suggestions brought forward at a later meeting of the Group.

Notice frames

7. It was agreed that the notices themselves should be printed on paper and not engraved on anodised aluminium.

8. Mr. Arnold showed the Group a model of the directory and parcel shelves for use in provincial call offices. After discussion, the Chairman asked the ED. to produce another model to the following specification:-

Provincial
parcel
shelves.

- (i) the two shelves to be about 12" apart and of such width that the holder would be approximately the same size as the proposed directory holder for London call offices.
- (ii) the shelves at the righthand end to be about 10" deep but the corners of both shelves at the left-hand (i.e. coin box) end to be cut away in a similar manner to the shelves of the present call office directory and parcel holder.

(iii) the cigarette grill to be moved back and lowered to avoid cigarettes fouling the cover of an open directory.

(iv) the shelves to be open at the left hand end, and to be rather stronger than in the first model, the lower shelf being separately supported.

C.P.11. Fraud and theft in the new coin box.

9. Mr. Osmond introduced his Committee Paper. He said that he thought it probable that there would be attacks on the lower cover of the new coin box, and he would like it to be made of a stronger metal. The Chairman expressed the opinion that the lower cover was well designed with a strong lock supporting the front of it, and that it was unlikely to be forced. The bolts were so placed that it would be very difficult for them to be attacked. He did, however, think it was possible that the cover could be cut from the front; attack from the sides would be difficult because of the limited space available. Mr. Helman pointed out that one of the stronger aluminium alloys could be used; he felt that that would overcome the cutting risk. Mr. Bastow suggested that Mr. Osmond's point might well be met by reinforcing the top lip of the lower cover, and placing two small inside ribs to give additional support to the lock.

10. The Chairman asked the Engineering Department, in their second model, to increase the amount by which the lower cover overlapped the dividing tray. If it were practicable and would cost little, the lower cover could be reinforced in the manner suggested by Mr. Bastow, although the additional overlap of the tray might well meet the point.

11. Mr. Arnold said that he had spoken to Messrs. Halls about a tampering alarm and had learned that it could be fitted to the new boxes as part of the initial design at a cost of about 5/- per box. The alarm would cause a P.G. at the Exchange, but it would not operate until the self-sealing container was withdrawn. Mr. Leaver pointed out that such an alarm would have only limited use. It would not prevent damage to the cover, and by the time it did operate the thief would have stolen the container. The cost of providing alarms in all existing call offices would be about £16,000, and he doubted it losses from coin boxes as a result of forcing the box open and removing the self-sealing container would justify such expenditure. Mr. Helman said that for 6d. per box fitting holes could be provided so that the alarm mechanism could be installed if and when required. Labour costs for fitting equipment on site were high, and if any large number were to be fitted it would be more economic to install them initially. The Chairman asked members of the Group to give thought to the matter so that a decision could be reached at the next meeting.

Date of next meeting

Wednesday, the 4th of July, 2.30 p.m.

Action

Paras 2 and 10	Second model of coin box to include agreed modifications.	ED/S
Para 4.	Position of coin slots.	ED/S
Para 5.	Material and finish of backboard.	ED/S
Para 6.	Material and finish of notice frames.	ED/S
Para 8.	Model of provincial shelves.	ED/S
Para 11.	Need for a tampering alarm	Group.

Fraud & Theft - New Coin Box

(1) The design of the new coin box will eliminate many of the existing types or methods of call office frauds and thefts.

(2) Of the eighteen existing types of offence quoted in C.P.8 only six, so far as can be foreseen, will remain against which some security measures will need to be considered.

(3) Those six types are:-

(a) Fraudulent local and trunk calls obtained by manipulating the mechanism to simulate insertion of coins. This will involve removal of the top cover either by using a key or by using force.

(b) Fraudulent local and trunk calls obtained by using foreign coins or tokens.

(c) Theft of money by trapping coins in the mechanism compartment before they reach the self sealing container - i.e. by bending or otherwise obstructing the coin guides or by placing a container in the coin hopper. This will also involve removal of the top cover but as the success of this method of theft will depend largely upon how well the cover is replaced after the coin trap has been set it is more likely that removal of the cover will be achieved by using a key than by using force.

(d) Theft of money by stealing the entire coin box either by forcing it off the backboard or by forcing off the entire backboard with the coin box still attached.

(e) Theft of money by stealing the self-sealing container out of the coin box. This will call for (a) removal of the lower cover either by using a key or force or (b) cutting a hole in the lower cover large enough to allow the container to be pulled through.

(f) Theft of money (inserted for genuine calls) which is allowed to accumulate between deliberate removal and delayed replacement of the self sealing container. This type of offence will normally be restricted to a person say the collector - in possession of a key to the lower cover.

(4) Keys and Locks. It is clear that, the calibre of the two locks fitted to the cover of the new coin box, and no relaxation in the arrangements for safeguarding the keys, will be important factors in providing security against some of the future methods of committing fraud and theft at Call Offices.

(5) The IB considers:-

(a) that both locks should be of good quality;

(b) that the lower cover should be fitted with a five lever lock; that the lever combinations or "differs" should be numerous - of the order of six to each step of the key - and that any duplicated lock combinations should be widely scattered throughout the country, their dispositions being kept secret (see Notes Appendix B).

(c) that the top cover may be fitted with a four lever lock if the saving in cost, compared with a five lever lock, is appreciable and that, as now, all the locks in each Maintenance Control Area may be of the same lever combination;

(d) that, if possible, the lock bolts fitted to both covers should shoot into sockets that are not centrally situated - i.e. sockets should be remote from keyholes;

- (e) that the bolt sockets should be deep enough to allow the lock bolts to be shot safely home.
- (6) Forcing of Covers. There is no doubt that attacks are still made frequently on existing front plates. National figures to show a trend have not been obtained but some sample figures from several areas are given at Appendix A. The strength of the present box, and the fact that removal of the front plate does not give direct access to cash, cause the majority of these attacks to be fruitless. The loss of revenue resulting from actual theft is thought to be small. The level of these attacks as indicated by the sample figures is, however, sufficiently serious to provide a warning of what may be anticipated when the new box is introduced.
- (7) Although the prototype coin box has not yet been produced it seems likely that the strength of the metal - whether alloy or mild steel - to be used for the covers will be inferior to that of the existing front plate. Moreover, as already recognised by the Group, the necessity to have two covers, the edges of which will meet, introduces a further weakness to be overcome not found in the existing box.
- (8) Any serious lack of metal strength in the new box, allied to the fact that a greater average value in cash will in future be held in the self sealing container, will tend to attract thieves and so, perhaps, cause an increase in the overall number of attacks and in the number of successful attacks on coin boxes. The need for security measures against forcing is therefore, of great importance.
- (9) As a preliminary recommendation the IB considers that the lower cover at least should be made of strong metal - if necessary stronger than that used for the top cover; that the base edges of both covers should, when in the closed position, rest in a deep and close fitting channel to provide some defence against the use of forcing instruments; that the edges, where both covers meet, should be flanged for the same defensive purpose and that any hinges that may be used should preferably be concealed or made of a pattern designed to reduce or prevent hinge tampering.
- (10) Cutting of Covers. Cutting attacks on the present box are almost unknown. They might occur in future - particularly as there is a plentiful supply of electric current readily available. The IB suggests that two reasonable precautions should be considered at this stage:-
- (a) Hard metal ribs should be fitted longitudinally to the inside of the lower cover thus making a cutting operation as difficult and as lengthy as possible.
- (b) Electric light holders in the new call offices should not be of the conventional bayonet type fittings but of special Post Office design or shape in an effort to deny mains electric power to the cutting thief.
- (11) Foreign Coins and Tokens. The extent of this type of fraud, in terms of loss of revenue, is said to amount to about £200 a year at present. That level of loss is negligible but with the introduction of sub trunk dialling the IB is of opinion that such frauds will increase - particularly in the use of tokens.
- (12) It is a question for consideration whether, in the design stage, some provision should be made to enable the magnetic device (which traps tokens made of certain metal sand which apparently is already available) to be fitted specially and used as necessary in areas as and when such frauds become serious locally.
- (13) Delayed Replacement of S.S. Container. It is understood that a device is available which will temporarily put the coin box out of order during the time the self sealing container is withdrawn with the result that no coins will be inserted during that time which in turn will make this method of stealing impossible. The IB would strongly support any suggestion to embody that device in the new coin box.

(14) Complete theft (para. 3(d)). The deterrent effect of the proposed arrangements for having strong and inaccessible fixing bolts - already discussed by the Group in outline - should be adequate precaution against this method of stealing. The IB would, however, be glad to examine the final arrangements when full details are known. Compared with the irregular use of keys the complete theft of the box has the merit of bringing an offence to light speedily.

(15) Obstruction of Hopper. In the present box this type of offence is made possible because the mechanism is made to swing out (for maintenance purposes) and the hopper is then accessible. The proposals in this paper dealing with lock and key security will do much to prevent this method of stealing but it could be prevented altogether if the coin guides were lengthened to do the work of the hopper. This might be possible if the mechanism of the new box is not intended to swing out.

(16) Alarms. Despite the security measures already suggested as regards the two covers of the new box - measures which are within reasonable economic limits - there is little doubt that successful attacks on covers resulting in loss of revenue will occur. It will fall to the IB to take detective action in those cases and an alarm system would aid the IB.

(17) Any scheme to fit alarms to all coin boxes and Telephone Exchanges would be costly and disproportionate to IB needs but preliminary discussions between the IB and E.D. shew that mobile alarm equipment could be provided at small capital cost for use by the IB in any particular area where this kind of offence becomes serious. The equipment concerned would be held by the IB at a central point, taken to the appropriate exchange as required and wired up there under arrangements made by the IB/Telephone Manager. It would raise an alarm in the Exchange (buzzer or light signal) when one of the covers is removed and IB officers using mobile radio equipment would be available to take immediate action.

(18) It is understood that equipment and devices already to be fitted in coin boxes could be made to perform a dual purpose and to link with this proposed alarm system when required. In those circumstances the IB recommends that the design of the new box should make provision for an alarm system.

(C. G. OSMOND)

11th May, 1956.

Appendix A

Telephone Call Office Coin Boxes

Number of Attacks on Front Plates

Area	Period - if over 6 months	6 months ending 31 March '56
<u>LTR</u> East Area Centre " City " North " North West " South East " South West " West " Manchester Liverpool Exeter		25 8 17 25 25 19 29 40 15 19 2
Guildford Portsmouth	(Twelve months) 1952 = 19 1953 = 13 1954 = 20 1955 = 16 (Nine months) 1955/56 = 12	

Appendix B

Mortice Lock - Lever Combinations and other Security

1. On a mortice lock key of practical size it is normally practicable to get eight changes of combination on each step of the key.

2. Some figures as regards total number of different combinations are given below for four and five lever locks:-

								<u>Total Combinations</u>
(a)	4	lever	8	changes (or differs)	per	step	=	4096
	4	"	7	"	"	"	"	2401
	4	"	6	"	"	"	"	1296
	4	"	5	"	"	"	"	625
(b)	5	"	8	"	"	"	"	32,768
	5	"	7	"	"	"	"	16,807
	5	"	6	"	"	"	"	7776
	5	"	5	"	"	"	"	3125

3. These combinations are only possible if the lock is "one way" - i.e., operated by one key from one side of the door. If the lock is "two way" - i.e., operated by the same key from both sides of the door - only half the combinations quoted are available.

4. Additional security can be achieved by insisting that key blanks are not issued by the makers to the trade, by slotting or offsetting the 'bit' of the key, and by placing a plate between levers - the position of which can be varied.

5. A "one way" lock is almost impossible to master by using a skeleton key. The locks on the new telephone box will all be "one way". Picking such a lock would also be a difficult and lengthy procedure.

6. Spring-type locks as opposed to 'dead' locks have certain disadvantages and weaknesses which under certain conditions allow them to be opened without using a key. They are, however, almost immune to skeleton keys.

COIN BOX DESIGN STUDY GROUP

Minutes of the 16th meeting - 4th July, 1956.

PRESENT

Mr. H. A. Daniels (Chairman)

Mr. C. W. Arnold	ED/S :	Mr. S. L. Helman	ED/S
Mr. F. J. Bastow	ED/TP :	Mr. D. J. Kinder	ITD/S3B
Mr. E. G. Crisp	ITD/OB :	Mr. K. S. Nash	ACD/TCB
Mr. S. W. Debbs	ITD/PB :	Mr. C. G. Osmond	ED/LB
Mr. H. E. Francis	ED/TP :		

Mr. J. Lennox ITD/OB (Secretary)

There were apologies for absence from Miss Whitelaw (on Association business), and Mr. Leaver (on leave).

Minutes

1. The minutes of the 17th meeting were confirmed.

Models of new coin box

2. Mr. Arnold reported that Messrs. Halls did not expect to have the second model of the new coin box ready until September. It would include all the refinements the Group had so far agreed upon. Instead of strengthening ribs of the lower cover as had been suggested there would be a mild steel inner lining to protect the coin container. Halls had suggested a new type lock for the top cover, but Mr. Arnold suggested that there was no obvious reason for changing the existing lock No. 39 particularly as the old and new type boxes would for many years be in use together in each of the maintenance control areas. The Chairman said that it was generally agreed that the No. 39 lock should be retained. He went on to ask if it would be possible for the second model to be produced with a grey (BS colour 631) finish and for the first model to be stripped and refinished in the blue-grey (BS colour 692). If that were done, the second model, which included the refinements, would be available in the colour most likely to be adopted. Mr. Arnold promised to see what could be done, and went on to say that the second model would be complete except for the working mechanism.

Position of coin slots.

3. Mr. Arnold demonstrated to the Group the coin insertion mechanism with the coin slots positioned vertically. He drew particular attention to the pressure on the coins necessary to operate the mechanical winding device. It was generally agreed that difficulty might be experienced in using the sixpenny slot because of the comparative smallness and lightness of that coin. Mr. Francis hoped that it would prove possible to decrease the pressure needed when coins were inserted if tests proved that a greater tolerance would be possible on the coin pulsing mechanism. The Chairman said that vertical slots appeared to be satisfactory, but he would like the ED to see what they could do to decrease the coin pressure needed when coins were inserted.

London directory holder.

4. Mr. Arnold showed the Group a drawing of the proposed London directory holder. It had been designed to take five volumes and had wooden ends and an aluminium alloy back. It could either be fixed centrally in the space available at the right of the coin box, or it could be mounted on runners so that it could be moved from side to side to make consultation of directories more easy. Mr. Nash asked what the new holder would cost, and whether there would be any savings by its use. Mr. Arnold said that he could only give a very rough idea, but it might cost in the order of £5. It would permit the use of ordinary, rather than stiff covered, directories. Mr. Kinder thought that a comparative cost study could be made later when more was known about actual production cost of the new holder, but apart from the use of the cheaper directory it was hoped that replacement costs would decrease. The Chairman asked the Engineering Department to produce a model as soon as possible on the lines of the drawing that the Group had seen.

5. The Group examined a model of the provincial directory holder fitted in the demonstration kiosk with the shell of the new coin box. It was agreed that the holder itself was satisfactory, but some doubts were expressed whether the coin box itself should be on the left or the right hand side of the backboard. It was agreed to have another look at the arrangement when a full working model of the new coin box was available.

Provincial
directory holder.

6. Mr. Arnold said that it would be possible to use notice frames made from the same material as the new coin box and similarly finished. He would, however, like the Group to consider an alternative type of notice, one treated with a patent transparent plastic finish. Its use would make glass unnecessary, and the frames could be less robust than those used at present. After the Group had examined a specimen of the patent finish, the Chairman said that he would like the ED to carry out tests of its wearing qualities with a view to its adoption if it proved to be a satisfactory and economic proposition.

Notices and
Frames

7. Mr. Arnold said that experiments had proved that a 3/16" bakelite laminated backboard would prove strong enough to carry the notices. It would be lighter than the present backboard and much less costly. Its use with the new coin box was being considered.

Backboard

8. Mr. Kinder said that suggestions had been made from time to time that the light in kiosks should be placed over the backboard instead of in the roof. The argument in favour of the change was that a caller consulting the directory was standing in his own light. Mr. Dabbs asked whether consideration had ever been given to the economies that could be achieved by abolishing the expensive Venner time switch and having a continuously burning light. Mr. Kinder said that the proposal had been considered before, but had been abandoned because it was thought that public reaction would be unfavourable. The Chairman said that the present lighting seemed to be satisfactory provided the roof of the kiosk offered a reasonably good reflecting surface. In its present position, the bulb was out of reach but it would not be so if the light were fixed to the backboard. He thought that the question of the continuously burning light was one appropriate to kiosk design. Mr. Osmond asked whether consideration had been given to using a special type of lamp holder to prevent miscreants from using the electric supply for operating a cutting tool. Mr. Arnold said that the present fitting was of a locking bayonet type, and could only be reached with the aid of steps or a box. The Chairman suggested that all reasonable precautions had been taken, and that with the proposed reinforced cash container in the new box he did not feel any special action was necessary.

Position of light
in Kiosks.

9. Continuing with his Committee Paper No. 11, Mr. Osmond referred to the use of tokens in coin boxes. He said that at present all timed calls went via the operator, and there was a psychological deterrent to the use of tokens. Further, in persistent cases it was often possible to track down the culprit by an examination of the exchange tickets. With the new box and STD there would be no operator and no tickets. He asked if coin discriminating devices were available. Mr. Arnold said that the normal magnetic device would discriminate against the use of ferrous metals and some of the more intricate devices would differentiate between one metal and another. He emphasised that even the more simple ferrous discriminator was not cheap, the main problem being to release a bogus coin when it had been trapped. Mr. Kinder said that washers and metal discs, most of which were ferrous, were the most commonly used tokens; the revenue lost did not amount to more than three farthings per coin box per year. The Chairman suggested that the problem was not of great enough significance, and the design of the new box was too far advanced, to justify serious modification to incorporate coin discriminating devices of the type suggested. However, he suggested that the

C.P. 11. Fraud
and Theft in the
new coin box.

Engineering Department might like to find out more about the possible use of ferrous discriminating devices for the sixpenny and shilling slots with a view to space being left in the newly designed box to permit their fitting should the problem of tokens become serious.

10. Mr. Osmond asked whether the mechanism of the new box would swing out so that the feed to the coin container could be blocked up. Mr. Arnold said that it would not, and that there should be no problem with the new coin box.

Date of next meeting.

Thursday, August 2nd, 2.30 p.m.

Action.

Para. 3.	Pressure required on coins.	ED/S and Tp.
Para. 4.	Model of London directory holder.	ED/S
Para. 6.	Plastic protection finish for notices.	ED/S
Para. 9.	Ferrous discriminating devices for sixpenny and shilling slots.	ED/S.

COIN BOX DESIGN STUDY GROUPProvision of Tampering Alarm Switches in the
Pay-On-Answer Coin Box

It has been represented by the I.B. in C.P 11 that the Coin Box Study Group give consideration to the desirability of incorporating alarm facilities in the new coin box, to assist in the rapid detection of tampering offenders.

An Engineering assessment of the possibilities is given below:-

(1) Possible Types

- (i) To indicate when the cash compartment is opened.
- (ii) To indicate when the self-sealer is not in position.
- (iii) To indicate when the mechanism compartment cover is removed.

(2) Points to Consider when Providing Alarms(i) Cash compartment or lower half

Since the unauthorised opening of the cash compartment would undoubtedly be for the purpose of stealing the cash, and since this would be effected by removing the self-sealing cash container, the first two alarms could well be combined. In any case an alarm to indicate the unauthorised opening of the cash compartment would be difficult to design, since parts of the cover might be prised away and yet leave intact the part which triggers the switch. It is fairly simple to provide an alarm to indicate whether the self-sealer is in place and this would serve a double purpose of giving day to day indication that the self-sealer was not being omitted, and, when special exchange equipment is fitted also provide the theft warning that the I.B. might require from time to time. The day to day indication of "Self-Sealer Missing" would be a P.G. alarm; if coin boxes were in a segregated group this alarm could be made prompt. In unattended exchanges it would be undesirable to extend this alarm as an urgent one, since a receiver left off would cause the unnecessary call out of the emergency faults man; in an unattended exchange, of course, the type of signal causing the alarm would be checked before action was taken, i.e. a clean loop (receiver off) could then be ignored; a loop earth (the alarm signal) would be investigated.

If, in view of the foregoing, it is decided to fit an alarm permanently in the cash compartment (and so forestall the intermittent requests for alarms which have been a feature of the history of the present box, and also ensure that the expensive "self-sealers" are in fact being correctly used) the actual switch should be hidden from view as far as possible, and so arranged that it is as difficult as possible to wedge in the "off" position.

(ii) Mechanism compartment or ^{upper} ~~lower~~ half

The points to consider as regards the top cover are these:-

If the alarm is only to be fitted on I.B. request to combat a spate of top cover removals by outsiders, the switch need not be hidden, and can give a permanent alarm. The simple provision of fixing holes for the switch at some suitable point is all that would be required.

If the alarm is required to enable the I.B. to detect any removal of the top cover, the provision for switch mounting should be such that the switch when fitted is hidden from view, while the signal to operate the alarm should be a fleeting one, given during the removal of the cover. (If a permanent alarm were given the fact would become known to anyone removing the cover for the purpose of making free calls, since the box would be out of order and this would probably warn the offender before the investigation officer could act).

It is not considered that any useful purpose would be served by actually fitting a switch permanently in the mechanism compartment; in fact, the provision of any alarm facilities in this compartment is not thought to be worthwhile.

(3) Cost of Various Types of Alarm Provision

Note. The following figures are necessarily very approximate, since the design of equipment has not yet reached a stage where the amount of difficulty involved in providing the alarms or their mountings can be accurately assessed.

(a) Cash Compartment

- (i) Provision of mounting in cash compartment - no concealment of switch, no permanent wiring - suitable for theft alarm to be fitted as required but not as proof of the correct use of the self-sealer. Cost 6d.
- (ii) Complete permanent fitting in cash compartment - switch largely concealed and difficult to operate falsely - suitable for theft alarm (ready all the time - needs no alteration in coin box when required) and as day to day check of the presence of a self-sealer. Cost 5s.0d.

(b) Mechanism Compartment

- (i) "Top cover removed" alarm - Provision of mounting for switch to detect for example members of the public gaining unauthorised access - switch when fitted would be exposed and would give permanent alarm. Cost 1s.0d.
- (ii) Top cover alarm suitable for the detection of any unauthorised removal of the cover - provision of shield to hide switch when fitted on mounting and of device to enable the switch to give a brief signal only during actual removal of the cover. Cost 2s.6d.

(4) Cost of Actually Fitting the Switch when Required

If a switch has to be fitted and provision has been made as in 3 (a) (i) or 3 (b) (i) and (ii), the cost of the provision and recovery of a switch, excluding its value, would probably be of the order of 30s.0d. but this would of course only apply to the boxes where and when the alarm facility was actually required.

(5) The Provision of Equipment and Facilities in the Telephone Exchange

The special exchange equipment referred to in paragraph 2(i) would consist of a portable case e.g. wooden box with handle, containing equipment to detect an alarm signal sent from a coin box when the box was interfered with. The equipment would be connected in the exchange to each of the lines required to be placed under observation.

The case could conveniently contain sufficient detection equipment to deal with five coin boxes at one time. On receipt of a signal from one coin box, an audible alarm, e.g. buzzer, would be given and a lamp particular to that coin box would glow. The operation of a "receiving attention" key would cut off the buzzer and permanently maintain the lamp indication.

If one or more of the remaining coin boxes sent alarm signals, the buzzer would again operate and the appropriate lamp(s) would glow.

If desired, the alarm could be extended to a point remote from the portable equipment to avoid the I.B. officer having to remain in the vicinity.

The estimated capital cost of an equipment to deal with five coin boxes is £25.

ED

July, 1956.

COIN BOX DESIGN STUDY GROUP

Minutes of 19th Meeting - 2nd August, 1956.

Present:-

Mr. H. A. Daniels (Chairman)

Mr. C. W. Arnold	ED/S:	Mr. D. J. Kinder	ITD/SSB
Mr. S. W. Dabbs	ITD/PB:	Mr. K. S. Nash	AGD/TCB
Mr. H. E. Francis	ED/TP:	Mr. C. G. Crisp	ITD/OB
Mr. C. A. J. A. Harris	E.F.& S.W.C:	Mr. C. G. Osmand	PD/IB

(Staff Side):

Mr. S. L. Helman ED/S:

Mr. J. Lennox ITD/OB (Secretary)

There were apologies for absence from Mr. Leaver (on sick leave) and Miss Whitelaw (on Association business). The Chairman extended a welcome to Mr. Harris who was joining the Group to replace Mr. Fox, on his promotion to Welfare Officer.

Minutes

1. The minutes of the 18th meeting were confirmed.

Pressure
required to
insert coins.

2. Mr. Helman said that Messrs. Halls were designing an entirely new mechanism, which they hoped would be ready some time during September. Nothing more, therefore, had been done about the pressure required to insert coins with the old mechanism.

London
directory holder

3. Mr. Arnold said that the model of the London directory holder would not be ready until some time in September.

Call office
notices and
frames.

4. Mr. Arnold showed the Group copies of existing call office notices protected by the plastic finish discussed at the previous meeting. He said that, so far as he could tell, such a notice and its frame would on the average be rather more expensive than the present notice and frame if allowance were made for initial cost and frequent (say 6 monthly) replacement. If however replacements of the notices were infrequent (say less than every 2 years) there would be little difference in the cost, and the plastic notices might even prove to be cheaper in the long run. The cost of provision and maintenance of a complete set of the present notices and frames was estimated to be 2/6 a year a call office. The Chairman said that the plastic-covered notices were of pleasing appearance and suggested that the frequency with which notices would have to be changed depended to some extent on the backboard layout to be adopted. After general discussion, it was agreed that there was little virtue in changing the present backboard layout but that an Engineering Department proposal to modify the three centre frames so that a single holder could be used might be explored. The Chairman thought that the final arrangement in call offices with the new coin box might be a bakelite laminate backboard having plastic-protected notices in frames of stove-enamel alloy. He asked the Engineering Department if they would prepare a rough model of such a backboard.

Ferrous
discriminator
for sixpenny
and shilling
slots.

5. Mr. Helman said that the actual cost of providing a ferrous discriminator would be about 10s. Od. a chute, but until one was actually designed it was a little difficult to say what it would cost to arrange the mechanism in such a manner that space was available for the introduction of a discriminator later, if required. The Chairman reminded the Group that they had heard at the last meeting that the loss to the Department from the use of tokens amounted to as little as 2d. a box a year, but it seemed more or less fortuitous that no-one had set himself to mass produce stampings

which could be used in coin boxes. If, however, anyone did produce tokens in bulk, they might as well be non-ferrous as ferrous, and, on balance, it seemed to him that there was little point in pursuing further the question of a ferrous discriminator. Members of the Group were in general agreement, and it was decided that no further action should be taken.

6. Mr. Osmond said that he had in mind an alarm which would serve the dual purpose of indicating failure to replace a self-sealing container and that a physical attack had been made on the coin box. He thought that the Group might wish to consider these two aspects of a tampering alarm separately.

Tampering
Alarms
C.P.s 11 and 12.

7. Mr. Osmond suggested that the loss due to failure to replace the self-sealing container might be greater than was suspected. There seemed to him no reason why a container should not be left out for a period of up to a week at those call offices where collections were not frequent. Mr. Kinder, whilst agreeing that it might be possible to do so at the moment, pointed out that with the new box there would be an accurate assessment available of the dues. The opportunities available to a collector to obtain money would, therefore, be extremely limited. Referring to physical attacks on coin containers, Mr. Nash said that losses recently had not exceeded a couple of hundred pounds a year. Mr. Osmond agreed, but referred to the figures quoted in his Committee Paper which showed that the number of attacks, albeit many of them unsuccessful, was not insignificant. At the present moment, attacks on the front plate did not give immediate access to coin, but attacks on the lower cover of the new coin box would do so.

8. Referring to the form the alarm itself would take, Mr. Harris outlined the treatment of PGs in an exchange. He suggested that, even though connected to the prompt alarm, the staff would soon tire of checking each of them under normal conditions and that the tampering alarm would, therefore, lose its value. He went on to point out that few exchanges were staffed throughout the 24-hours. Mr. Francis expressed the opinion that the PG alarm was of secondary importance, provided that the box would be put out of action altogether if the self-sealing container was not replaced. Alternatively, if the coin slots were closed when the container was removed, calls to non-metering services would still be possible; but other automatic connexions would be prevented. The Chairman suggested that a simple way of guarding against failure to replace the self-sealing container was to make it impossible to close the lower cover unless the container was in its proper position. Calls to the operator and to 999 would still be possible. Theft by leaving out the self-sealing container would soon discontinue if it ceased to be profitable.

9. Turning to the question of fitting an alarm, the Chairman, suggested that there was little virtue in putting one in each call office at the outset even at the cost of 5/-. It seemed reasonable to provide the mounting so that the IB and the local TM could arrange for the device to be fitted in any locality where attacks became prevalent. There might be cases where fitting of the service at the outset could be justified. Mr. Osmond accepted with some reluctance the decision of the Group. He pointed out that it would be necessary for the Engineering Department to proceed with the design of the necessary portable exchange equipment needed to work in conjunction with the alarm.

10. Mr. Osmond said that he was quite satisfied that there was no need for any form of alarm on the top cover. The lock 39 was to be used, and it had proved to be very satisfactory. The risk of fraudulent coin pulse simulation seemed to be fairly small.

Plan 5 E
installations.

11. Mr. Francis said that his staff were experimenting with an arrangement similar to shared service which would allow the Sub-Postmaster to use an ordinary calling equipment and the call office to use a coin box calling equipment. Mr. Dabbs said that the question of providing separate lines for the call office and the sub-office had been considered but the cost, which was estimated to be in the order of £2,000,000, made it impracticable. An alternative solution, to provide the call office with a separate line and permit the sub-office to share with another subscriber under conditions of secrecy, had been explored, but had not been regarded as satisfactory because of the cost and the fact that the Sub-Postmaster had not full control of the shared line. The Chairman asked the Engineering Department to continue their researches and advise the Group of their findings, as soon as possible.

Identification
of coin boxes
to operators.

12. Mr. Francis said that the question of identifying a call office when calling on the manual board was allied to a number of problems of manual board services under STD conditions. Until the study of those problems was complete, he would have no further information for the Group. On the second point, that of letting an operator know that she had called a coin-box, it was clear that the facility would be too costly to be justified.

Apparatus room
space for coin
and checking
equipment.

13. Mr. Dabbs asked if the Engineering Department representatives were able to give any indication of the space that the coin and fee checking apparatus would take up in the exchange. Mr. Francis said that the relay sets would be about the size of a group selector but would be provided on a traffic, and not an individual line, basis. He estimated that on the average one relay set would be able to serve five or six coin-box lines.

Delay in
connecting
Pay-tone

14. Mr. Francis referred to the earlier decision of the Group that there should be a period of 3 seconds after the called party had answered before pay-tone came on the line. He understood that it was proposed initially that the equipment to give the facility should be provided, but that it should be short-circuited. He pointed out that if the field trial proved that the facility was not required, a considerable re-design of equipment would be necessary. The Chairman said that he understood the difficulty, but thought it would be unwise not to have the 3 second facility available if it were wanted. He suggested that the field trial should be as proposed with the facility available, but not in use. Mr. Francis said that he would proceed in his design accordingly, but would like the Group to have an opportunity of testing for themselves the value of the 3 second period, when a working model of the new coin box was available in the laboratory.

Introduction of
new coin box.

15. In reply to a question, the Chairman said that the SSB and ED representatives were currently preparing a Committee Paper on the problems of introducing the new coin box. He hoped that it would be ready for discussion by the Group at its next meeting.

Date of next
meeting.

Monday, the 1st October.

Action

Para. 4.	Model of backboard with "plastic" notices.	ED/S
Paras. 8 and 9	Designs of tampering alarm and its associated exchange equipment.	ED/Ip.
Para. 15.	Committee Paper on introduction of the new coin box.	ITT/SSB

COIN BOX DESIGN STUDY GROUPIntroduction of new Coin-Box

1. This paper presents for the consideration of the Group the various points which will arise in connection with the introduction of the new coin box, so that the broad principles of the installation programme may be drawn up. In the latter part of the paper the question of the introduction of the new call office assembly is also dealt with.
2. Subscriber Trunk Dialling. One of the main developments provided for in the new coin box is the facility to enable callers to dial their own trunk calls. It is, therefore, envisaged that when supplies of the new box become available first priority will be given to its installation in areas where subscriber trunk dialling is introduced, and that provision will be made in exchange equipment designs for subscriber trunk dialling for the exchange equipment required for the new coin box. Apart from the pilot installation of subscriber trunk dialling at Bristol early in 1959, no firm programme has yet been drawn up for the extension of subscriber trunk dialling to other areas. It may, however, be decided that the installation of the new coin box should proceed at a faster rate than the extension of subscriber trunk dialling; the problems which will arise in this connection are dealt with in the following paragraphs.
3. Exchange equipment aspect. As stated in the foregoing paragraph, it may be desired to introduce the new coin box in advance of the extension of subscriber trunk dialling, and this will depend on the provision of the necessary equipment in exchanges for coin signalling and the timing of local calls. Now that the unit coin box fee is to be increased to 4d., the new coin box, with its 3d. minimum fee, cannot be introduced unless provision is made for the timing of local calls. It will be necessary for the Group to assess the prospects of the installation of the coin and fee checking equipment in exchanges before conclusions can be reached on the programme for the installation of the coin box.
4. It is assumed that all coin boxes (call office and subscribers) in a given exchange area will be changed over at the same time, but it will often be desirable, for the convenience of the public, that there should be simultaneous replacement of the coin boxes in a number of adjacent exchange areas, e.g., throughout Central London. It will not, therefore, always be desirable for the new coin boxes to be fitted as soon as the necessary equipment is available at a particular exchange, but it will be necessary to wait until all the exchanges in a given area are equipped before the new coin boxes are introduced in that area. There is also the point to be borne in mind that some exchanges in the area may shortly be provided with subscriber trunk dialling and others may not, and that it may be desired to change in advance the assistance code for coin boxes from '0' to '100' in order to free the '0' level for subscriber trunk dialling.
5. There would certainly be some advantage in introducing the new coin box, subject to the foregoing, in any exchange area which was being converted from manual to director or non-director automatic working.
6. Operating considerations. From an exchange operating point of view, also, it is desirable to have uniformity of procedure but, in view of the large areas now served by auto-manual switchboards and the number and variety of exchanges involved, it seems that it will not be possible to avoid having both the existing boxes and the new boxes working to the same switchboard for some years during the conversion period. It will, of course, be essential that operators should be able to discriminate between calls from the existing boxes and calls from the new boxes. This could be effected by different markings on the calling signals, but it may be that it will be possible to introduce the new type of discriminating signal (referred to in Recommendation (g) (ii) of the Interim Report) when the new coin box is introduced in any area, and this needs to be considered.

7. Call fee tariff. Where subscriber trunk dialling is introduced the new method of charging for calls will provide for call charges to be paid in units of 3d., but where STD is not in operation steps will have to be taken to ensure that the call charges to be paid by coin box users are in 3d. steps.

8. Rate of supply. The need to fit coin and fee checking equipment in exchanges, even if only to provide for the direct dialling of local calls at the outset, may impose a restriction on the rate at which the new coin boxes can be installed. If this restriction does not apply, the rate of capital expenditure for this purpose, and the production programme of the manufacturers will have to be considered. On the capital expenditure side there will clearly have to be some spread of the burden over a number of years since, apart from the labour costs of installation, an expenditure of some £6½m. or more will be involved for the coin boxes and their associated equipment to complete the programme. As regards the manufacturer's production programme, marked fluctuations should, presumably, be avoided.

9. It may be that a small start will have to be made until the exchange equipment programme gets under way, but it is suggested that initial orders of the new coin box should be based on the assumption that no further new supplies of the existing coin box will be obtained after three months from the date of the introduction of the new coin box. If this basis is adopted, the initial supply would have to be related to current demands for coin boxes (and mechanisms) for new installations and replacements, the total figure for which is at present about 7,000 a year. It is assumed that existing boxes which are replaced by the new boxes would, in the main, be used for new installations and maintenance replacements in other areas, and that maintenance replacement of the new boxes would be a relatively small item for many years. At the foregoing rate of supply, therefore, it would take some 20 years to complete the installation programme and it will probably be felt that this period should be reduced. It is, therefore, suggested that initial supplies should be at the rate of 10,000 a year, and that there should be a fairly generous scrapping programme of existing boxes.

10. Backboard assembly. Replacement of the present assembly will not be essential when the new coin box is fitted; in fact to provide for this would add materially to the work and cost of the programme and little advantage would be gained. So far as London is concerned, however, it seems very desirable in the interests of tidiness of the call offices and economy of directories to fit the new directory holder within a reasonable time. There would, however, be no point in adopting the new lay-out with the directory holder unless the new coin boxes were already installed or were about to be installed. To change the lay-out at the same time as the new coin box is fitted would materially retard the coin box installation programme, and this should be avoided if the public are not to be confused by having old and new coin boxes working in the same area for some time, but it is hoped that it will be possible to follow up the installation of the new coin boxes in London by re-arranging the lay-out and fitting the directory holder after a fairly short interval. If this can be arranged, it is proposed that supplies of the lower part of the existing assembly should cease as soon as work can be started on installing the new directory holder in London, and that recovered assemblies should be used for new call offices and replacements elsewhere. It is questionable whether any assemblies to the new provincial design should be ordered until the recoveries from London have been used up, but there should be no reluctance to scrap any recovered assemblies if they are in need of attention.

11. Numbers of coin boxes. The following approximate figures of existing coin boxes will provide a useful guide to the magnitude of the conversion programme:-

	<u>Call Offices</u>		<u>Subscribers' Installations</u>	<u>Totals</u>
	<u>Urban</u>	<u>Rural</u>		
<u>London</u>				
City and Centre Areas	2,400	-	6,000	8,400
Rest of LPA	5,600	-	8,000	13,600
Rest of LSR	4,400	400	5,800	10,600
<u>Provinces</u>	31,000	23,000	42,200	96,200
<u>Totals</u>	43,400	23,400	62,000	128,800

It is estimated that by 1960 these figures will have increased by 10%.

ITD/SSB

October, 1956.

COIN BOX DESIGN STUDY GROUPArrangements at an Exchange for Introduction of the New Coin Box1. GENERAL

The new coin box requires to have associated with it a Coin and Fee-Checking Equipment which will also control the application of Pay Tone, and local fee timing. For economy reasons the C & F.C. equipment is provided on the basis of one per 1st selector in the coin box group as distinct from one per line circuit.

The equipment disconnects the transmission path and applies Pay Tone on receipt of a meter pulse. Speech is only restored when a coin signal is received from the new coin box. As the old coin box has no facilities for controlling the C & F.C. equipment, it is necessary for the old box to remain working to its existing 1st selectors which are not preceded by C & F.C. equipment. It thus follows that during the transition period when old boxes are being changed for new it will be necessary to have two groups of coin box selectors.

Ideally it would be preferable to have a duplicate group of 1st selectors to enable the transfer from old to new boxes to be carried out line by line as far as the exchange was concerned. In practice it is not always practical, nor necessarily most economical to have a complete duplicate group of selectors, and a more probable solution is either to segregate spare existing capacity or provide a small nucleus of new selectors. The new group would then be built up as the old boxes were replaced by the new.

2. CHANGE OF ASSISTANCE CODE

It will no doubt be desired to change the assistance code from '0' to '100' some months before the introduction of Subscriber Trunk Dialling in order to allow time for trapping false '0' level calls before 'register-translators' are provided on level '0'.

If this change of code is carried out at the same time as the coin boxes are changed no difficulty arises, but if done before installation of new boxes, a number of points have to be considered. These points are dealt with in paragraph 2.1 below.

2.1. '100' Code Introduced with Old Box.

2.1.1. Non-Director Main and Satellite Exchanges. The engineering aspects cause no difficulty in that the '1' will not be sent by the dial, the first '0' will route the call to the manual board via the existing manual board relay set and will call on the existing group of lamps. The second '0' will be ineffective. From the service aspects, however, it is possible (a) the caller might notice that Dial Tone persists after the initial '1' has been dialled, and (b) the operator might hear clicks caused by the last '0' being dialled.

2.1.2. Director Exchanges. As the 'A' digit selectors are common to both ordinary and coin box subscribers, access to the operator for both types of call will be via level '1' of the 'A' digit, and hence the existing boxes will have to be supplied with dials modified to permit the dialling of digit '1' without insertion of a coin.

A repercussion of this modification is that any numbers in use consisting of 1, 9 and 0's become available without payment, but this should not be serious if the period of transition is short.

3. EQUIPMENT ASPECTS

When the new coin box is installed the following equipment will be required:-

3.1. Non-Director Exchanges. The Main Exchange equipment will consist of the following items, the design work of which is in hand:-

(i) Coin and Fee-Checking Relay Set, which includes local fee timing and associated common services. (NOTE: If installed before S.T.D., locking type meters will have to be changed to non-locking type).

(ii) Plan 5E Relay Set (to permit Sub-Postmaster to use the same line as coin box).

(iii) Register Access Relay Set for S.T.D.

(iv) Operator Access Relay Set for '100' with slot opening facility and calling signal (lamp or tone as to be determined).

It will be possible with the new trunking to give access to register-translators when available and to services previously barred to existing coin box users, e.g., TID, WEA. The technical arrangement for Phonogram services is still under consideration, but it appears that it may have to be a non-metering service to prevent the application of Pay Tone.

3.2. Other Exchanges. The type of equipment for Director and Satellite exchanges and U.A.Xs is under consideration and will not be available until some while after the Main Exchange equipment. In the case of Director and Satellite exchanges an ideal solution might be to have re-designed D.S.R's and 1st Codes incorporating the Coin and Fee-Checking relay set facilities.

ED/Tp

October, 1956.

COIN BOX DESIGN STUDY GROUP

Minutes of the 20th meeting - 11th October, 1956

Present:-

Mr. D. E. Knapman (Chairman)

Mr. C. W. Arnold	ED/S	Mr. E. G. Crisp	ITD/OB
Mr. S. W. Dabbs	ITD/PB	Mr. D. J. Kinder	ITD/SSB
Mr. H. E. Francis	ED/TP	Mr. C.A.J.A. Harris	E.P&S.W.C: (Staff Side)
Mr. S. L. Helman	ED/S	Miss N. Whitelaw	P.O.D.W.C. (Staff Side)
Mr. A. V. Leaver	ITD/SSB	Mr. F. J. Bastow	ED/TP
Mr. C. G. Osmond	PD/IB	Mr. J. H. Janes	AGD/TCB.

Mr. J. Lennox ITD/OB (Secretary)

1. Mr. Knapman introduced himself to the Group as its new Chairman in succession to Mr. Daniels. In doing so he said that he would be asking the group to consider the re-design of the existing kiosk with a view to the Post Office having a more modern design on the lines of some of those used abroad. He said that the ITD/SSB would prepare a committee paper on the subject and he hoped that it would be possible to discuss it at the next meeting.

Minutes

2. The minutes of the 19th meeting were confirmed subject to the amendment of the last sentence of paragraph 10 to read: "The risk of fraudulent coin pulse simulation would have to be accepted."

Coin box
Mechanism

3. Mr. Helman said that Messrs. Halls were still engaged on the problem of the pressure required to insert a sixpence and they were at present designing another mechanism which should be ready within three months and which he hoped would prove satisfactory. If their efforts based on a mechanical technique failed, it might be necessary to consider a mains-operated coin box. Mains operation would be possible in about 90% of the existing kiosks; most of the remaining 10% were connected to UAXs and the need for the new boxes there would probably not arise for many years to come.

Models of
New Coin
box cover.

4. Mr. Arnold showed the Group two models of the cover of the new coin box. The first model, in light aluminium alloy, was finished in blue-grey (BS Colour 692), and the second, which was an aluminium casting armoured for security, was finished in light grey (BS Colour 631). He drew attention to the security measures in the second model; they included special holding studs to prevent the top cover (which was flanged) from being levered off, and a mild steel lining to the lower container with a front plate which was locked from below and slid downwards to open. Mr. Osmond regarded the blue-grey model as being unacceptable from the point of view of security. Commenting on the light grey armoured model, he said that the Lock M used was adequate and from his point of view there was no objection to it being fitted in the base of the container. He thought that the armouring had been rather overdone and was out of proportion to the money that would normally be held in the container. He suggested that the self-sealer itself could be of lighter construction. Mr. Kinder pointed out that a lighter self-sealing container had been the subject of an experiment, but had proved unsatisfactory because it was susceptible to damage and buckling. Miss Whitelaw asked that the Group should not commit itself to a coin box which was locked from underneath until she had had an opportunity of consulting the collecting staff concerned. Mr. Helman said that he hoped that Messrs. Hall's would shortly be able to quote prices for the two

/types

types of outer cover. When those prices were known he would like the Group to say how much they thought could be spent strengthening the cover for security reasons, and Halls would then be able to judge what modifications to the first (light blue) model could in fact be made at that price. The Chairman agreed with Mr. Helman that little progress could be made until relative costs of the two types of cover were known. It might be that there was a case for installing the armoured models in those locations which were prone to attack. If it were thought desirable to adopt a box with a lock in the base, staffing interests would be consulted before a decision was reached.

5. Mr. Arnold exhibited to the Group a model of the proposed London directory holder. Mr. Leaver said that he would like to have the opportunity of trying out the holders in existing kiosks although from the practical point of view it might be better at this stage if they were tried outside adjacent to a suite of call offices, e.g., in a railway station. So far as installation of the holder itself was concerned, he hoped that it would be possible to introduce it in London shortly after the new coin box itself was ready but it seemed that this could not be before about 1962. The Chairman said that members of the Group seemed to be agreed that the proposed holder was satisfactory and asked the Engineering Department if they could prepare some models for trial.

London
directory
holder.

6. The Group then examined a new interior layout arranged in the demonstration kiosk. It included a new type of backboard with plastic covered notices in frames of the same colour as the proposed coin box and a new coin box fitted at an angle in the left-hand corner.

Call office
layout

7. Mr. Arnold said that so far as he was aware the plastic coating on the notices would have to be applied at a central point. The costing machines cost about £80 each, and it might in practice be possible to provide one in each Region. Mr. Kinder said that as a measure of the work to be undertaken the Supplies Department issued about 36,000 notices of all types each year and many of them were individual to each kiosk and required to have the exchange and number inserted on them. It was generally agreed by the Group that a field trial in existing boxes of the plastic type notices was desirable as soon as possible. Mr. Leaver undertook to arrange the conduct of the experiment if the ED/S Branch would suggest three or four suitable Telephone Areas including, perhaps, one where there was sea air. The Chairman agreed that a field trial should take place, and asked the ITD/SSB and ED/S to arrange it.

Plastic
notices.

8. Some doubt was expressed by members of the Group as to the practicability of having the coin box at an angle in the left hand corner of the kiosk as it would prevent the use of a kiosk with a left-hand door opening. Mr. Kinder said that although current instructions specifically discouraged the installation of kiosks with the left-hand door, because it tended to expose the apparatus to the weather, many of this type were in use. Mr. Harris said that from his experience of a Telephone Area on the coast he found that the left-hand opening door was necessary in some cases as a weather protection. The Chairman suggested that a decision on the problem of the position of the coin box and of the general layout of the backboard could well await the impending discussion on the design of the kiosk itself. In the meantime it might be useful if the SSB would find out from Regions the extent to which use of the kiosk with the left-hand opening door was essential.

Position of
coin box.

9. Mr. Arnold drew the attention of the Group to the armoured cord of French design which they had seen in use in the demonstration kiosk. He pointed out that the cord itself was not satisfactory because of its weight, but asked if the Group wished any experiments with similar cords to be carried out. The Chairman said that he understood that the question of armoured cords had already been discussed by the Group, and had previously been

Armoured cord.

the subject of Departmental correspondence. It seemed to be generally agreed that the cost of armouring all kiosk cords exceeded the cost of replacement of those ordinary cords which were wilfully damaged. He did not think the matter could be pursued further at this stage.

10. Date of the next meeting. Tuesday, 6th November, 2.30 p.m.

<u>Action</u>	Para 1. Committee paper on kiosk design.	ITD/SSB
	Para 5. Directory holders suitable for trial in cabinets in London public office.	ED/S
	Para 7. Field trial of plastic covered notices.	ITD/SSB
	Para 8. Use of kiosk with left hand door.	ITD/SSB

COIN BOX DESIGN STUDY GROUP

KIOSK DESIGN

Introduction of Kiosk No. 6

1. The present standard kiosk No. 6, designed by Sir Giles Gilbert Scott, was introduced in 1936 when it was adopted as standard for all parts of the country; all other types were made obsolescent.

Colour

2. The Postmaster General approved the use of Post Office red as the standard colour for all kiosks No. 6 and this policy was reviewed in 1948 in conjunction with the Royal Fine Art Commission, the then Ministry of Town and Country Planning and the Councils for the Preservation of Rural England and Wales. It was unanimously agreed that Post Office red should continue to be the standard colour, the primary reason being that "a kiosk must be readily discernible from its surroundings so as to be recognised from a distance by a stranger in the stress of an emergency and uniformity of colour is essential if this object is to be achieved". In certain places of exceptional beauty one alternative colour may be permitted, viz. dark battleship grey with the glazing bars "picked out" in Post Office red.

Description

3. The Kiosk No. 6 (Sk. 2) comprises 18 cast iron parts, 24 large and 48 small glass panes and 4 translucent "Telephone" signs. The external dimensions are 3' 0 $\frac{1}{4}$ " x 3' 0 $\frac{1}{2}$ " x 8' 4" (door opening - height 6' 5 $\frac{1}{2}$ "). The current rate book cost is £52 16s. 0d. ex works. There are four types for meeting the various site requirements viz.:

	<u>Approximate Annual User</u>
No. 6A door fitted opposite back panel and hinged left -	720
" 6B door fitted opposite back panel and hinged right -	740
" 6C door fitted on left side panel and hinged left -	740
" 6D door fitted on right side panel and hinged right -	870

Types C and D are generally provided when the kiosk is sited against a fence, wall or building as this avoids as far as possible the risk of passers by being struck by the door when a caller makes a hurried exit. Type D is provided when the kiosk is sited on a korb in order that a caller may have a full view of oncoming traffic when leaving the kiosk. Due regard is also paid to the direction of the prevailing wind so that the tendency will be to close the door.

Criticisms of design

4. In recent years the design of the standard kiosk has been the subject of some criticism and invariably it is compared with the more modern designs of kiosks in other countries (photographs of some of these will be circulated to the Group). In an article published in "Design" September 1954, by the Secretary of the Street Furniture Committee, it was held that the No. 6 kiosk "although a good design of its day, reflected the architecture of yet an earlier period" that it was "by modern standards a little pompous and should be reconsidered". Representations have also

/been

been received from the Coventry Corporation for a design of kiosk more in keeping with the newly planned City centre.

5. In September, 1954, Mr. T. Driberg, M.P. author of a weekly article in the "Reynolds News" complained in that paper about the lack of comfort in telephone kiosks and the difficulty of locating the door; a prize was offered to any reader who submitted the best suggestion for a redesign of telephone kiosk. Subsequently when the entries were reviewed it was said that the favourite suggestion was that of better sound insulation but the prize was awarded to the competitor who forwarded the following entry:-

1. Omit vertical glazing bars (present style is out of context, Georgian).
2. Folded steel construction for lightness and low cost.
3. Adequate ventilation through shielded ducts to maintain balance of temperature thus avoiding heavy condensation.
4. Possible use of low wattage strip-heaters in winter (this would minimize internal condensation).
5. Large recessed external handle.
6. Glazing to terminate not less than 18 in. from ground (to avoid damage although appearance is not improved).
7. Provision to mount side to side or back to back."

6. Complaints are occasionally received from members of the public about (a) lack of ventilation provided in kiosks and (b) difficulty in locating the door. Ventilation slots are provided in the kiosk No. 6 below the "Telephone" panel and there is an aperture under the door but this might be regarded as insufficient ventilation during hot weather. Regard has however to be paid to the necessity to provide relatively quiet conditions for satisfactory telephone conversations. As regards (b) the door is very similar in appearance to the other glazed sides of the kiosk, both internally and externally and it is often found to be difficult to open. A glass bearing a Push/Pull sign is fitted to new kiosks and to existing kiosks where difficulties have resulted in glass breakages. In a new design of kiosk however it would be an advantage to have a door of distinctive design that could be readily recognised by callers and possibly a recessed external handle.

Ventilation

Door identification

7. Experience has shown that one of the most frequent troubles to which kiosks in this country are subject is the breakage of glass, much of it due to youthful vandalism. In areas where frequent breakages result in excessive maintenance costs toughened glass or wire mesh guards are fitted and in the worst cases metal plates are used in lieu of glass in the lower part of the kiosk.

Maintenance problems

8. The cost of cleaning kiosks could probably be considerably reduced if there were fewer panes of glass, although larger panes would be more expensive to replace. In the present kiosk there are 72 panes of glass and 144 surfaces to be washed and polished, which involve 576 corners to be "poked into" by wax leather and polishing cloth. Reduction in the number of panes of glass would also have some effect in cutting the expenditure on labour for the painting of kiosks.

9. The Study Group on Call Office Maintenance commented on the design as follows:-

(a) "Consideration should be given to the design of removable window panes in order to facilitate re-glazing and reduce the length of time a kiosk presents a dilapidated appearance."

(b) "We think that in any future design of the Kiosk No. 6, some thought might be given to the possibility of eliminating ledges and awkward and inaccessible corners especially inside the dome. An example is the ledge which surrounds the upper part of the kiosk and which serves as a structural support for the dome. It collects dirt and being rather difficult of access is not always properly cleaned. A design incorporating clean lines, and where possible, rounded corners would considerably ease the work of cleaning."

Adjacent Kiosks 10. Maintenance and other difficulties have also given rise to suggestions that kiosks be designed for assembly in multiple units for use where more than one kiosk is required on a site. The Call Office Maintenance Study Group suggested that such a development might be worthwhile from the maintenance point of view. The advantages and disadvantages of multiple kiosk units are:-

Advantages

- (a) Cleaning and maintenance would be simplified.
- (b) The unit would be useful where space is limited and a second kiosk could not otherwise be erected.
- (c) Costs for cabling and lighting would be reduced.
- (d) General appearance of a suite of kiosks would be improved.

Disadvantages

- (a) Erection would be more costly and difficult and would probably mean that the special kiosk trailer for transport and erection could not be used.
- (b) It would be very expensive to recover one existing kiosk and replace it with a two-kiosk unit where an additional kiosk is required.
- (c) The risk of overhearing would be increased.
- (d) A reduction in size is not favoured owing to the consequent worsening of ventilation.
- (e) The appearance of a single kiosk and a two-kiosk unit would not be pleasing unless the design was similar.

11. The extent to which kiosks are provided singly or in groups is shown by the following figures based on a recent return:-

Single kiosks	=	54,364
Groups of two	=	1,541
" " three	=	127
" " four	=	78
" " five or more	=	19

It should be remembered that it would not be economic to replace existing groups of kiosks and the number of new groups being set up is relatively small.

Experiments in construction and design

12. A new design of kiosk was provided on the site of the Festival of Britain (photographs are available for members of the Group to see). This design was not sponsored by the Post Office but was done by one of the Festival of Britain architects. No long term

/experience

experience of the suitability of this kiosk was obtained but troubles were experienced after only a short period of use due to the doors falling off (there was no closing device) and to the directories, when left open on the directory shelf, being fouled by the door.

13. An experiment has been conducted with a kiosk of the same design as the kiosk No. 6 but constructed in light-weight alloy and painted Post Office red. The dome, sides and door were made of magnesium alloy and the plinth of aluminium alloy. It was found to be satisfactory mechanically but was difficult to keep in reasonable decorative condition at its seaside location because of the corrosive action on the magnesium alloy of the salt laden atmosphere. The cost of kiosks made in light weight alloy would be higher than that for cast iron kiosks but if they were not painted some maintenance savings would result.

14. In the light of the foregoing information the views of the Study Group are invited on a new design of kiosk. Since the actual job of designing the kiosk will in due course have to be put in the hands of an architect through the Council of Industrial Design and other bodies will have to be consulted, the Study Group will not be expected to recommend a particular design. Its function, however, is to express its views on the requirements to be met and the following items, which might be regarded as a specification for the architect, are put forward for consideration:-

Action required

- (i) General appearance. The design should be such that the finished product will be readily recognisable as a public telephone call office. Such painting as is required will normally be in Post Office Red but exceptionally Dark Battleship Grey will be used in places of special beauty. Provision should be made for the word "Telephone" to be prominently displayed.
- (ii) Siting. The kiosk will be installed in both urban and rural areas, including National Parks and places of special beauty. It will be sited in exposed as well as in sheltered positions. Normally it will be placed on footways, either at the roadside or immediately against buildings; it may be in alcoves, forecourts, or other positions where it will be readily accessible to the public without causing obstruction both of passage or view.
- (iii) Dimensions. The external dimensions of the kiosk should be within the following limits:-

	<u>Maximum</u>	<u>Minimum</u>
Height	8 ft. 4 ins.	7 ft. 2½ ins.
(Door opening	6 ft. 5½ ins.	6 ft. 3 ins.)
Cross section	3 ft. ½ ins.	2 ft. 9½ ins. square

- (iv) Construction. The kiosk should be of sectional construction and be capable of being assembled in a depot and being transported to its site and erected by means of the trucks which have been specially designed for the purpose.
- (v) Door. The design should provide for four alternative arrangements of door opening to meet the requirements of different sites (see (11)). The requirements are:-

/(a)

- (a) Door fitted on the opposite side to the apparatus and hinged left.
- (b) Door fitted on the opposite side to the apparatus and hinged right.
- (c) Door fitted on the side to the left of the apparatus and hinged left.
- (d) Door fitted on the side to the right of the apparatus and hinged right.

The door should be easy to open, and have an automatic closing device.

(vi) Ventilation and sound-proofing. The kiosk should provide for reasonable ventilation in hot weather without discomfort in the winter, and give the maximum protection in all weather to the interior and its contents. Regard should also be had to the need to ensure quiet conditions in noisy surroundings so that satisfactory telephone conversations can take place.

(vii) Interior. One side of the interior will be required for:-

(a) two backboards, adjoining one another, covering an area of 4 ft. 0 ins. x 2 ft. 5 ins., the lower edge being 2 ft. 1 ins. from the floor, on which will be fitted:-

(1) on the upper backboard - two large notice frames, two small notice frames, and a mirror on the lines of the present lay-out;

(2) on the lower backboard - the coin-box, which will be on the left-hand side, and a directory holder to the right of the coin-box;

(b) A lead-in for the lighting cable, fuse box and time switch, which will be below the backboards.

Holes will be required in the floor of the kiosk for leading-in the telephone and lighting cables. Provision should be made in the roof for a lighting fitting, giving ready access for maintenance purposes, but of such design as to prevent interference by the public.

(viii) Cost. The capital cost of the kiosk should be at a minimum consistent with an attractive design and give a life of 30 to 50 years. In considering capital cost, however, regard should be had to the merits of one design as against another, and of the different materials which may be used, from the point of view of maintenance costs, i.e., painting, cleaning and replacement of broken windows.

COIN BOX DESIGN STUDY GROUP

Minutes of the 21st Meeting - 6th November 1956

Present

Mr. D. E. Knappan (Chairman)

Mr. C. V. Arnold	ED/S	Mr. C. A. J. A. Harris	P.O.M.F.D.W.C
Mr. F. J. Bestow	ED/Tp		Staff Side
Mr. E. G. Crisp	ITD/OB	Mr. S. L. Helman	ED/S
Mr. S. W. Dabbs	ITD/PB	Mr. D. J. Kinder	ITD/SSB
Mr. I. S. Davies	AGD/TCB	Mr. A. V. Leaver	ITD/SSB
Mr. H. E. Francis	ED/Tp	Mr. S. L. Helman	ED/S
Mr. T. R. H. Fletcher	AGD/TCB		

Mr. J. Lennox (Secretary)

Miss WhiteLaw sent an apology for her absence *and Mr Oswald.*

Minutes

1. The minutes of the 20th meeting were agreed.

Mechanism for the
New coin box

2. Mr. Helman said that Messrs. Halls hoped shortly to overcome the difficulty with the sixpenny slot, but he was not able to suggest a date when a new mechanism might be ready for the Group to see.

Council of Indust-
rial Design

3. The Chairman said that he had been approached to obtain the early approval of the Council of Industrial Design for the exterior appearance of the new coin box. Time could be saved if the opinion of an industrial designer, approved by the Council, were sought during development and manufacture of the box, and it had been decided to suggest such a course to Messrs. Halls.

C.P.15 - Kiosk
Design

4. The Chairman introducing the Committee Paper on Kiosk Design, said that the subject did not appear to be strictly within the terms of reference. The Group's interim report had, however, made mention of the subject, and he thought that the Group might like to express their views on any change in kiosk design. The Chairman went on to say that he had recently been approached by the Coventry City Architect who expressed the opinion that the Kiosk No. 6 would not harmonise with the modern buildings in the reconstructed city centre. Further, recent visitors to the Continent had been impressed by the simple designs in use there. In particular there had been favourable comment for the Dutch kiosk, which was of rectangular design with an anodised aluminium frame. Mr. Leaver said that, apart from the occasional comments on such matters as difficulty with the door, and ventilation, there had been little public comment on the present kiosk. Mr. Francis suggested that it would be difficult to design a kiosk which would look in place in the new city centre of Coventry, in Oxford Street and in a country market town. He regarded uniformity as essential, but at the same time, to serve their purpose, kiosks must stand out clearly so that they could be seen by the public. Mr. Helman pointed out that the Post Office regarded the life of a kiosk as about thirty years. He doubted if the finish on anodised aluminium would last more than about ten, but he was discussing the problem of anodising with ICI, and hoped to be able to give more information to the Group later.

5. The Chairman, summing up the discussion, said that it was clear that the Group did not feel strongly about a change in the design of kiosk. The basic design was, however, some thirty years old and it could not be overlooked that other administrations (for example the American Bell Company, who had recently embarked on a large programme of street call offices) were adopting a more simple and modern design. In those circumstances, he proposed recommending to the Director that a suitable Architect might be approached.

6. The Chairman thought that it was perhaps premature to discuss the problems of introduction of the new coin box in detail, but the Group might like to consider the general problem. The first call on new boxes would obviously be for the field trial, and then for the introduction of SID at Bristol. After that, broadly, the programme would appear to be that the new boxes should be made available as far as possible at those exchanges where there was SID. It did, however, seem possible that in the early years the supply of the new boxes might be in excess of SID requirements. Mr. Helman outlined a possible programme leading to the factory production of the new coin boxes. The 6 to 12 boxes for the field trial would be hand-made. The first one would be used for a laboratory test to prove that the new exchange equipment would work satisfactorily with the mechanism. After the field trial had been successfully completed, and any modifications agreed, Messrs. Halls would be given a production order and they would start tooling. It would be a little under two years from that date before production models become available. Thus, in tabular form, the programme might well be:-

Mechanism Designed	3/57
Laboratory test completed	6/57
Field trial starts	1/58
Field trial ends	7/58
Production models available	early 1960

Mr. Francois said that as much as a year might be saved if the new coin box equipment could be ordered in equipment data prepared as soon as the laboratory tests were satisfactorily concluded, and without awaiting the outcome of the field trial. To do so would be to accept the risk that changes resulting from the field trial would call for equipment modifications. He referred especially to the decision to make provision for the 3 second "one-way-conversation" facility during the field trial. But even if the outcome of the field trial were awaited, it was hoped that the equipment would be ready for new exchanges or extensions ordered in the 1958/9 programme. Between 2 and 3 years should be allowed from the time the order was placed until the equipment was ready for service. The Chairman suggested that the main purpose of the field trial was to see how the box stood up to heavy use, and to test the reaction of the public to it. Neither the mechanism nor the exchange equipment could be finalised until the field trial had been completed, and the eventual facilities determined. Mr. Drabbs said that details of the 1958/59 programme were available; it should not be difficult to make a fairly sound estimate of the number of coin boxes affected. Mr. Helman said that, ideally, his Branch would like to be able to place an initial order for 10,000 boxes although delivery could be extended over a period of more than a year. At the time the order for the new boxes was placed, they hoped to be able to stop ordering any more of the existing type box.

7. The Chairman said that it seemed clear that the demand for the new coin boxes, and therefore the rate at which they would be ordered, would be determined by the exchange equipment programme. He asked the IID/ES to give the Group an estimate of the likely demand for the new box so that they could discuss the problems of introduction against that background.

8. Mr. Harris said that, although detailed discussion of Committee Paper 13 was being held over, he would like to draw attention to the fact that no mention had been made of the cordless switchboard when referring to operating procedure. It was a point that should not be overlooked.

Date of next
meeting

Wednesday, the 28th November.

Action Para. 7. Estimate of requirements for the new coin box based
on exchange equipment programme. ITD/PB

COIN BOX DESIGN STUDY GROUP

Minute of 22nd Meeting; - 28th November 1956

Present

Mr. D. E. Knapman (Chairman)

Mr. C. W. Arnold	ED/S	Mr. C.A.J.A. Harris	POREFDWC
Mr. F. J. Bastow	ED/TP		Staff Side
Mr. E. G. Crisp	ITD/OB	Mr. S. L. Helman	ED/S
Mr. S. W. Dabbs	ITD/PB	Mr. J. H. James	AGE/TCB
Mr. H. E. Francis	ED/TP	Mr. D. J. Kinder	ITD/SSP
		Mr. A. V. Leaver	ITD/SSB
		Mr. C. G. Osmond	FD/IB

Mr. J. Lennox (Secretary)

Miss Whitelaw sent an apology for her absence.

Minutes

1. The minutes of the 21st meeting were agreed, subject to the deletion of Mr. Osmond's name from the list of those present; he had sent an apology.

Mechanism for
the new coin
box

2. Mr. Helman said that he hoped that Messrs. Halls would have a further mechanism ready for test in about three weeks time. If it proved to be unsatisfactory it would be necessary to consider a completely new concept of design, probably involving the use of main supply. He regarded a power driven mechanism as the only practical alternative to the clockwork mechanism so far tried, because it reduced to a minimum changes in the design of the associated exchange equipment.

Industrial
consultant

3. Mr. Helman said that Messrs. Halls had been asked to approach an industrial designer approved by the Council of Industrial Design. At the same time ED/S were preparing a brief on the general assembly of backboard equipment so that the designer might be able to consider the coin box in its proper setting. The Chairman pointed out that, although reference had been made in correspondence to associated equipment, it was not his intention that the designer should start the design of the whole assembly from the beginning. His main task would be to consider the new coin box in relation to its background of notices, directory holders, etc. Consideration would naturally be given to any suggestions which the designer might wish to put forward concerning the associated equipment. Mr. Leaver said that it should be made clear to the designer that the new coin box would for many years have to work in existing kiosks with at least the upper part of the present backboard unchanged.

Kiosk design

4. Mr. Helman said that he had received some information from I.C.I. about the wearing properties and finish for aluminium. Untreated aluminium, like that used in certain London Bus shelters, corroded quickly and soon lost its appearance. Anodising was not recommended because, unless it received frequent cleaning, it would not last ten years even in a good clean atmosphere. A second disadvantage with an anodised finish was that it could not be "touched up" if the anodising film were damaged. Mr. Helman said that the I.C.I. had referred to special aluminium paints which they thought would last about five times as long as paint on iron-work, but little was known of their appearance after some years of wear. I.C.I. had suggested stove enamelling, but the cost would be about 5/- per square foot area.

5. Mr. Leaver asked if 12 boxes were the maximum that could be made available for the field trial; he had thought in terms of 20 to 25. Mr. Helman pointed out that each box would be handmade and would cost about £200; he thought 12 were as many as could reasonably be bought. The Chairman asked the ITD/SSE if they would find out how many of the new boxes would be needed to equip a well-defined self-contained locality in or around the Reading HPO or Main Station. Mr. Francis drew attention to his need of traffic quantiles for the design of exchange equipment to work with the boxes used in the field trial. The provision of common equipment would be above normal because all the boxes under trial were likely to be in use together.

C.P.s 13 and 14
Introduction of the
new coin box

6. The Chairman said that there might be conflicting claims for the initial supply of the new coin box between those exchanges where S.T.D. was being introduced, and manual exchanges which were being converted to N.D. or director working. Mr. Francis doubted if the problem would arise. It seemed likely that from about 1960 all new exchanges would be provided with S.T.D. facilities including equipment for the new coin box. Clearly the greatest operator savings could only be achieved if the new coin box were associated with S.T.D. equipment. He felt that, except for the special problem of satellite exchanges and UAX's, the provision of S.T.D. and the conversion demands for the new coin box would come together without any special arrangements being made.

Allocation of first
supplies

7. Mr. Dabbs said that he had examined the 1956/57 equipment programme and from it had found that the number of public call offices concerned in the provision of new automatic exchanges and the extension of existing automatic exchanges would be about 10,000; no account had been taken of subscribers' coin boxes, the number of which would be about the same. The programme for subsequent years would if anything be rather larger than in 1956/57. It would appear that the coin box installation programme would not be held up by the exchange equipment programme. STD and the new coin box equipment would be provided together, and Mr. Francis pointed out that the controlling feature would be the space available in the apparatus room. He confirmed that it was highly unlikely that one type of equipment would be installed without the other. The Chairman said that he was satisfied, so far as he could tell at present, that the supply of new coin boxes and of the related exchange equipment would be in step. Clearly there might be need for an adjustment of the coin box manufacturing programme much nearer the date when the installation was likely to commence.

Demands for new
coin boxes

8. Mr. Leaver thought it might be useful for the Group to consider how long it would take to replace all the existing coin boxes. By the time the new coin box was ready there would be about 150,000 boxes in service. The present demand for new coin boxes and maintenance requirements necessitated a supply of about 7,000 per year at a capital cost of some £60,000. With a supply of the new coin box of between 10,000 and 12,000 a year it would take 12-15 years to replace all the boxes and the corresponding
/annual

Rate of replacement
of old coin boxes

annual expenditure would approach £2m. The Chairman said that it was clear that for many years the old and new boxes would be working together. It appeared that the supply of 10,000 per year should be regarded as a minimum but their cost and the cost of labour for their installation would have to be borne in mind.

Installing new coin boxes with existing backboard.

9. Mr. Arnold pointed out that access to the mechanism for maintenance would be very difficult if the new coin box were to replace the existing boxes in the lower portion of the present backboard. Modifications would in any case be necessary in order to fix the new box and to fill in the holes left by the removal of the existing telephone. Mr. Kinder thought it would be much easier to replace the whole of the lower part of the backboard, even though it cost £6. Current demand for the lower part of the backboard was about 4,000 per year, but the whole of the proposed supply of 10,000 new boxes per year could not be allocated to kiosks. The number of backboards that would have to be scrapped in the early years would be few. Mr. Leaver pointed out that if a new lower layout were used in existing call offices when the new coin box was installed it might be necessary to have two finishes, one matching the old type upper portion of the backboard and a second matching the new. It would be preferable if one finish could meet both requirements. The Chairman said that the maintenance requirements alone made it necessary that the lower portion of the backboard should be changed when a new coin box was fitted. The scrapping of those which could not be used again would have to be regarded as part of the cost of installing the new coin box.

Position of coin box

10. Mr. Arnold said that he would want to give guidance to the industrial designer about the position of the new coin box. If it were decided that it should be fitted on an angle bracket, that bracket could be so designed that the box could be either to the left or right of the backboard. The London directory holder would work satisfactorily on either side, but the provincial parcel shelf might need modification. Mr. Kinder said that his enquiries had shown that the demand for the left hand door on kiosks was equal to that of the other models, and that there were perhaps about 15,000 such kiosks in existence. After a general discussion, the Chairman said that the Group appeared to be agreed that the designer should be told that the coin box would be placed to one side of the backboard and at an angle from it. Its standard position would be on the left, but in kiosks with a left hand opening door it would be placed on the right. Before reaching a final decision on whether the left or right hand alternatives should be standardised, the Group would wish to know of the designer's views.

"100" code from coin boxes

11. Mr. Francis referred to the problem of introducing "100" as the operator code from existing coin boxes. There were two alternatives in director areas, either to replace the existing dial by one which would permit the dialling of 1, 9 and 0 without the insertion of coins, or to segregate the coin box & Digit Selectors to give coin boxes access to the Operator from the code "0". The latter alternative would be costly in exchange equipment. The Chairman suggested that the problem was rather one concerning S.T.D. than the new coin box and that it was best settled departmentally between the ITD/OB and the ED/TP.

Special services and identification of coin boxes to operators

12. Mr. Francis said that he had not overlooked his promise to prepare a paper on special services from coin boxes, and the identification of coin boxes to operators. Both questions were related to current S.T.D. problems and he would produce his promised Committee papers as soon as they were resolved.

13. The Chairman said that the next meeting of the Group would be arranged when the ED/S were able to report on the new mechanism.

Para. 5. Number of coin boxes required for Reading field trial. ITD/SSB Action

Para. 11. Access to manual boards in director areas. ITD/OB and ED/Tp.

COIN BOX DESIGN STUDY GROUP

Minutes of the 23rd Meeting - 28th October, 1957

Mr. D. E. Knagman ITD/SSB
Mr. A. J. Barnard ED/Tp Mr. D. J. Kinder ITD/SSB
Mr. F. J. Bastow ED/Tp Mr. A. V. Leaver ITD/SSB
Mr. F. C. Carter ED/S Mr. K. S. Nash AGD/TCB
Mr. E. C. Crisp ITD/OB Mr. C. G. Osmond FT/IB
Mr. H. E. Francis ED/Tp Mr. A. H. Mowatt ITD/TMB
Mr. C.A.J.A. Harris ROEFS/DWC Mr. E. H. Seymour ED/S
Staff Side Mr. K. P. Whitaker ITD/TMB
Mr. T. C. Harding ED/S Miss N. Whitelaw FODWC
Staff Side
Mr. J. Lennox ITD/TMB (Secretary)

The Chairman welcomed new members to the Group, extending his good wishes to Miss Whitelaw who had recently returned from a long period of sick leave.

Prototype of the new coin box

1. The Chairman reminded the Group that when they had last met in November, 1956, it had been hoped that a working prototype of the new coin box would be ready within a matter of weeks, but it had only recently become available. Members had had an opportunity of examining the prototype; he explained that it was the work of the designer, approved by the Council of Industrial Design, and the contractor who would make the mechanism. Although the design had met with general approval, there were a few points of criticism, e.g. the effect of setting the dial placed it in a shadow with normal kiosk lighting; a tall user might have difficulty in seeing the figures 8, 9 and 0 on the dial; the figures on the coin-slot plate were difficult to see. He asked members of the Group if they had any further comments they wished to make. Miss Whitelaw said her first impressions of the new design were most favourable. Her only reservation was on the method of unlocking the coin chamber, on which she would like to seek the views of her colleague concerned with outside staff. Mr. Carter said that the designer had kept closely to the requirements set down by the Group. If a list of possible minor modifications could be drawn up they would be put to the contractor for his consideration. The Chairman said that he would be pleased to make arrangements for the U.P.W. outside-staff representatives to examine the prototype for themselves. Later a list of possible modifications would be drawn up.

Cost of the new coin box

2. The Chairman said that first estimates showed that the new coin boxes themselves would cost about £50 each; the associated exchange equipment for each box would cost between £15 and £30 depending on the calling rate. Bearing in mind that there were roughly 130,000 public and subscribers coin boxes in use, their replacement presented a major capital expenditure problem for the Administration. The cost of the new coin box compared favourably with those of the Swiss and Swedish designs, but those administrations had many fewer coin boxes in use.

Timing of the initial application of pay tone

3. The Chairman reminded the Group that early in their deliberations they had been in favour of the application of paytone as soon as the called party answered, but in the Interim Report they had recommended a 3-second period of one way transmission before pay-tone was applied, to permit the caller to hear the called party answer. Because of the high cost of the new coin box, and the cost of providing the facility, it was now suggested that it be omitted. Mr. Francis felt that the Group had never been very happy about the 3-second period of one way transmission. There was doubt whether a period as short as 3 seconds was enough to allow the caller to identify the number that had answered, but if it were extended the possibility of fraud would be increased. There was also the question of access from coin boxes to the TIM, WEA and Test Score Services.

Observations suggested that the wrong number risk was comparatively small and in any case, with an initial coin-box fee of 3d., the caller stood to lose no more than the ordinary subscriber. The cost of providing the one-way transmission facility would be about £5 per coin box installation. Miss Whitelaw agreed that a 3-second period before the application of pay-tone would be of little use unless the public could be educated to answer with their numbers immediately. She thought that PBX operators might be inclined to go off the line if, when answering quickly, there was no one there; in that respect it was preferable that pay-tone should be applied to the line straightaway. The Chairman, summing up, said that there seemed to be general agreement that pay-tone should be applied as soon as the called party answered. Moreover, he felt that the Group would wish to recommend that the maximum possible access should be given from the new coin box to miscellaneous services, such as WEA and TM.

4. Mr. Francis said that he had been charged at an earlier meeting to look into a possible alternative method of identifying coin boxes at automatic boards. He had found that the problem needed to be considered in conjunction with other STD facilities, in particular those at remote automatic centres. There was no progress to report on those questions, and it could be assumed that the existing method of identification would be used when the new coin box was introduced.

Identification of coin boxes at automatic boards

5. The Chairman said that in their Interim Report the Group had recommended a field trial at Reading with about 20 of the new coin boxes. It had then been assumed that modified Swiss boxes would be used. Later, when it became clear that a new box would have to be designed, it had been hoped that perhaps half-a-dozen hand-made boxes would be available. It was now known the production models could not be made available until the end of 1958; the cost of even a small number of hand-made models was prohibitive. With STD scheduled to be introduced at Bristol early in 1959, there was a strong case for the first of the new coin boxes to be installed there and for that to be regarded as the field trial. He had in mind that initially about a dozen boxes might be installed in the centre of the city; after a couple of weeks, if there were no difficulties, they would be installed throughout the Bristol Central exchange area. In that area there were about 100 public call offices and 175 subscribers coin boxes, but the cost of the new coin box might mean that initially they would be limited to public call offices. He appreciated that to do so might lead to equipment problems in having old and new coin boxes working together in one exchange. Mr. Francis said that although the necessary exchange equipment had been designed it had not yet been made up and had not therefore been tried with the prototype coin box. When considering the proposed limited field trial with hand-made coin boxes, he had had in mind that sufficient exchange equipment could be made-up in the Circuit Laboratory. If, however, the first coin boxes were to be introduced at Bristol, the equipment would have to be manufactured by a contractor, and even if given priority treatment there was little hope of it being available before mid-1959. He felt there was a real prospect of the coin boxes being ready before the exchange equipment.

Field trial of the new coin box

6. Miss Whitelaw expressed her concern at the proposal to forego the Reading field trial and to introduce the new coin box at Bristol simultaneously with STD. There was strong resentment among the Bristol staff now that the extent of redundancy arising from trunk mechanisation and STD was known. It would be hopeless to try to judge staff reaction to the new coin box in such an atmosphere. She was certain that if a proper assessment of the new coin box were to be obtained, the trial would have to be divorced from the introduction of STD; otherwise the attitude of the staff towards the new coin box might well be prejudiced. She feared that the Group, after

having done a very good job, would be unwise to insist on Bristol for the field trial. She pointed out that the reasons (set out in paragraph 49 of the Interim Report) which had led to the proposal that the field trial should be at Reading seemed to have been overlooked. Concluding, Miss Whiteley said that, if it were decided to go ahead with the field trial at Bristol, she would have to ask the Chairman to put the proposal formally to her Staff Side. She would have to dissociate herself from such a proposal. Mr. Mowatt drew attention to the fact that a trial of the new coin box at an exchange where there was no STD would not permit testing of the trunk dialling facility. Mr. Harris, whilst appreciating Mr. Mowatt's point, felt that the introduction of STD and the new coin box simultaneously was asking rather a lot of the public. It would be almost impossible to assess which difficulties arose from which source.

7. The Chairman said that he would take note of the Staff representatives' views, but asked them to bear in mind that conditions had changed materially since the Interim Report was written. The design of the coin box had taken nearly a year longer than had been envisaged, and during that time the Administration had decided that, with the introduction of STD, ordinary subscribers local calls would be timed. It would be difficult to justify the timing of calls from ordinary subscribers when calls from coin boxes (where from the public's point of view there was a stronger case for timing) remained untimed. He promised however to give further consideration to the points that had been raised.

Layout of the
backboard

8. Mr. Carter explained that the designer had produced a new layout for the backboard, to harmonise with the new coin box. The "horizontal" inspection frames were considered more easy to read and more arresting to the eye. The Group had seen the new layout, and he invited comments. Mr. Leavel said there had been a number of criticisms. It had been suggested that the mirror, placed as it was well to the left, served little purpose; and that the mirror and the circular notice looked like portholes. The introduction of horizontal notice frames would make it necessary to print and stock two versions of the instruction and advertisement cards. In general discussion the members of the Group expressed satisfaction with the overall design of the new layout. It was generally accepted that with the telephone placed to one side, the mirror could not be dead-centre. The Chairman said that the designer had been told that he should design his new coin box and backboard as a single unit, and the final product had in general been well received. The question of duplicate notices could not however be lightly dismissed and he asked Mr. Carter if the designer, using the same materials, could produce an alternative layout with frames which would take the present notices. A decision could then be taken on which was more acceptable.

Kiosk design

9. The Chairman reminded the Group that at its previous meeting the question of kiosk design had been briefly discussed. The Administration had now asked three designers, approved by the Council of Industrial Design, to submit proposals for a new kiosk.

P.O.D.W.C. Staff
Sids's comments
on Interim Report

10. The Chairman reported that the non-engineering Staff Side had now commented on the Interim Report. They had stressed the problem that would arise with calls being extended at PEXs when timing was introduced at coin boxes. It seemed to him that apart from trying to educate the PEXs users themselves there were two practicable solutions. Firstly, it might be possible at railway station enquiry bureaux for direct exchange lines to be terminated on individual telephones, so that the caller would be connected to the person he wanted when timing started. Secondly, it might be possible to introduce a

queuing system similar to that recently provided for BOAC.

11. Continuing, the Chairman said that the Staff Side were concerned at the absence of a penny slot, but Miss Whitelaw thought that they had possibly been misled by the assumption that the tariff would continue to be based on the fourpenny call.

12. Referring to the question of publicity for the new coin boxes, the Chairman said that the Staff Side had commented on the proposal that there might be demonstration boxes in the main post offices among other places. They felt that the majority of post offices were too busy and too congested for it to be practicable. In fact however he thought that a rather more ambitious scheme than that envisaged in the Report would be desirable. It might be possible, for example, to make a publicity film to be available for general release when the new coin box was first introduced in a locality. The use of a film had the great advantage that all the tones to be used could be heard.

13. The Chairman in closing the meeting said that he thought the Group had very nearly completed its task, but that one or two more meetings might be necessary to clear up a few outstanding items.

Future meetings

COIN BOX DESIGN STUDY GROUP

Minutes of the 24th Meeting held on Monday 23rd March 1959

Mr. D. E. Krayman IED/SSB - Chairman

Mr. J. V. Bond	AED/TCB	Mr. A. V. Leaver	IED/SSB
Mr. E. G. Crisp	IED/OB	Mr. H. A. Longley	IED/TMB
Mr. H. E. Francis	ED/TED	Mr. B. E. Raker	SWR/TB
Mr. T. C. Harding	ED/S	Mr. E. H. Seymour	ED/S
Mr. C.A.J.A. Harris	PCF/EDWC	Miss N. Whitelaw	PCDWC
	Staff Side		Staff Side
Mr. J. K. Harper	IED/TMB		

Mr. J. Lennox IED/TMB - Secretary

Minutes

1. The Minutes of the 23rd Meeting were confirmed.

Review of progress

2. The Chairman said that in view of the time that had elapsed since the previous meeting he would like to review briefly the developments that had taken place since then. The design of the coin box itself had been finally agreed and had been approved by the Council of Industrial Design. An initial order had been placed for 5,000 of the new boxes; the first 50 would be delivered by the end of May 1959, and thereafter delivery would increase to a rate of about 350 per month by the end of 1960. Subject to a satisfactory field trial, the contract would be completed by the middle of 1961. Details of the new coin-box tariff and of the introduction of local call timing had been announced by the Postmaster General when he presented his White Paper on SID. At the last meeting of the Group no agreement had been reached on a field trial for the new coin box, but there had since been correspondence and discussions with the UPW, and it had been agreed that the field trial should be at Bristol.

3. The Chairman said that the first estimates of cost for the new coin box had proved to be substantially correct; on the initial contract the boxes and associated items would cost just under £50 and the exchange equipment between £25 and £30 per box depending on the calling rate. The overall cost of between £75 and £80 per coin box compared with between £150 and £250 for trunk dialling coin boxes in use on the Continent.

4. The Chairman said that the Group would know that three architects had been asked to submit designs for a new kiosk. That submitted by Neville Conder had been recommended by the Royal Fine Arts Commission and approved by the Postmaster General. So far only a model was available, a prototype might be ready towards the end of the year.

Access to coin container

5. Miss Whitelaw said that at the previous meeting she had promised to consult with her colleague concerned with coin-collecting staff to see whether the new coin box would be satisfactory to them. After examining the new coin box, her colleague had expressed himself as very satisfied with the new coin box and regarded it as a big improvement on the present one. He had no doubt that with practice coin collectors would have little difficulty with the locking arrangements for the coin chamber.

Delay in connexion to extensions at PEXs.

6. The Chairman said that there had been an exchange of correspondence with the DWO Staff Side about difficulties that might arise from delays in connexion to PEX extensions on calls from the new coin box. The Staff Side had suggested that there were two possible solutions. Firstly, separate groups of exchange lines might in certain circumstances replace PEX extensions. Secondly, publicity should be given to the difficulty that could be caused by delays at PEXs, and a general approach made to all customers with PEXs. Continuing, the Chairman said that the Staff Side's points had been accepted, and there had been meetings with the British Transport Commission. They had led to the provision of direct exchange lines instead of PEX extensions for passenger enquiries at Bristol Temple Meads station; British Railways intended to adopt the

arrangement wherever it was justified. Approaches would be made to other bodies where there was clearly a need, but there were few organisations of such wide coverage as the British Transport Commission. Mr. Raker said that the problem affected not only coin-box users but all subscribers with local call timing. Observations had been taken during the first three months of SED at Bristol. Of 646 calls observed, on 200 occasions another party was required when the call was answered. The average time taken on those calls to bring the required party to the phone was 44 seconds; the time in individual cases varied from a second or so to more than 10 minutes. In 20 cases the time exceeded 100 seconds. The Telephone Manager was continuing the observations and preparing a docket in respect of each case where there was delay. When sufficient information had been built up approaches would be made to the customers concerned. It was, however, evident that delays were just as likely to occur on single exchange lines rented by small firms as on PBX extensions.

7. Miss Whitelaw was of the opinion that, considered in terms of repercussions on the operating staff, there was a difference between delay in obtaining the required party on a direct exchange line, and delay in answer from a PBX extension. If the delay occurred on a direct exchange line the customer would know that he had been answered by the number called and that the delay was the responsibility of the called party, but a caller left waiting at a PBX might confuse the PBX operator with the exchange operator. During the trial of the new coin box at Bristol she would like information to be obtained about the number of occasions on which the coin-box user put additional money in the box while waiting for his correspondent. So far as publicity was concerned, the Staff Side expected the Department to make approaches in good time to PBX subscribers in those localities where SED was to be introduced. Concluding, Miss Whitelaw said that she would have to reserve the Staff Side's position on the question of delay at PBXs until evidence was available from the Bristol trial of the new coin boxes.

8. The Chairman said that although the first of the new coin boxes would be delivered at the end of May, the exchange equipment could not be ready until mid-June. It was proposed to install one or two of the new coin boxes in the Bristol exchange for training purposes as soon as the exchange equipment was ready. The training of telephonists and the coin collectors should be completed by the end of July, and on that basis it was proposed to commence the field trial early in August at 23 call offices in the centre of Bristol. They comprised a suite of 6 call offices inside the HPO and 10 at the town centre; the remaining 7 call offices were all within a few hundred yards of the centre of the city. He suggested that during the first three or four weeks of the trial a few telephonists should act as call office attendants covering a period of say 8 a.m. to 11 p.m. In order that they might be known to members of the public they could wear the small GPO lapel badges used by FSD staff at press conferences and exhibitions. Miss Whitelaw said that the Staff Side's original reservations on the proposed field at Bristol were based on the assumption that SED and the new coin box would be introduced simultaneously. That would not now be the case and there was no objection to a trial at Bristol. She personally had no objection to the proposal to employ telephonists as attendants during the trial period. She suggested that such matters as whether male or female telephonists should be employed, the period to be covered, duties, supervision and the call offices to be patrolled should be left to local discussion. The attendants would almost certainly find themselves being asked to provide change, and that was a point which might be considered locally. Mr. Harris suggested that arrangements might with advantage be made to afford special fault attention to the call offices concerned. Mr. Harding said that an engineer from his Branch would be available during the early days of the trial, and the training of local maintenance staff would be arranged. He agreed that

Field trial at
Bristol

it would be worthwhile having a local maintenance man on call so that any faults could be cleared quickly.

9. Summing up, the Chairman said that he would put the proposals for the trial formally to each of the Staff Sides, and would propose leaving the detailed arrangements to the Regional Director. Local publicity would be arranged: customers all over the country would be receiving calls (and hearing pay tone) from the new coin boxes at Bristol, and the need for national publicity was being considered. On the assumption that the trial started at the beginning of August and was satisfactory, he hoped that the general installation of new coin boxes on the Bristol Central Exchange could begin by the middle of September. In all there were 269 boxes to be changed, 104 of them in call offices and the remainder on customers' premises. It should be possible therefore to complete installation by the end of October.

Future
installation
programme

10. Mr. Harper said that special arrangements had been made to have the exchange equipment ready for the new coin box at Bristol. Although STD would by the end of 1959 be available at other exchanges, they would not have the new coin box because the associated exchange equipment would not become generally available before 1961. However, for a few special cases, such as manual exchange conversions to automatic working with STD, the associated exchange equipment might be made available from the middle of 1960. By doing so the need for a double change of coin boxes within a short period would be obviated. It was apparent that more new coin boxes would be available than could be used in the early stages, but that the reverse was likely to be the case later on.

Date of next
meeting

11. The Chairman suggested that, on the assumption that the field trial was satisfactory and that installation at Bristol was completed by the end of October, the next meeting should be held towards the end of November.

Coin Box Design Study Group

Minutes of the 25th Meeting held on Monday 14th December 1959

D. E. Knapman ITD/SSB (Chairman)

D. Allen	ITD/TMB	O. A. J. A. Harris	POEF & SDWC
A. Cook	ED/TPM		Staff Side
E. G. Crisp	ITD/CB	A. V. Leaver	ITD/SSB
I. S. Davies	AGD/TCB	C. G. Osmond	PE/IB
T. C. Harding	ED/S	E. H. Seymour	ED/S
J. M. Harper	ITD/TMB	N. Walker	ED/TPD
		W. F. Westaway	SWR/TB

J. Lennox ITD/TMB (Secretary)

An apology for absence was received from Miss Whitelaw, who was engaged on other pressing business.

Minutes

1 The Minutes of the 24th Meeting were confirmed.

Trial of the
new coin
box at Bristol

2 The Chairman said that the meeting had been called in order that an assessment might be made of the trial of the new coin box at Bristol. Twenty three of the boxes had been in service in the centre of the city since 5th September and the remaining sixty four call offices served by the central exchange had been equipped with the new coin box for more than a month. Installation of the new coin box on subscribers' premises had just commenced. As was to be expected, there had been a number of minor technical teething troubles, but the new box had been well received by the public and there were no major operating difficulties. In reply to Mr. Harris, the Chairman said that a committee paper would be prepared giving a brief resume of the trial.

3 Mr. Seymour said that the new coin boxes had been passed through an overhaul centre at Bristol where modifications had been carried out, and tests made before installation. The manufacturer's staff, although skilled, were not experienced in the production of the new coin box, and the work done at the Bristol overhaul centre was regarded by the ED as part of the field trial. At first some trouble was experienced with coins jamming in the runways, but that had been resolved. The design of the mechanism appeared to be sound, and the most recent figures suggested that mechanical faults were slightly less frequent than with the existing coin box. That in itself was a considerable achievement because the coin box mechanism was more complex and more definitive in its action. The manufacturer would incorporate the modifications found necessary at Bristol in all boxes after the first 500.

4 Mr. Cook said that five Engineering Instructions were being prepared for the use of the engineering staff who would maintain the new coin boxes. Special arrangements had been made by the ED to train the Bristol maintenance staff, but Regions would in future make their own training arrangements, probably by sending their instructors to Bristol to learn about the new coin box at first hand.

Future
ordering
programme

5 The Chairman said that on the evidence available he was satisfied that, subject to the modifications which the trial had shown to be necessary being made, further orders for new coin boxes could be placed. He quoted the following figures based on the main SED ordering programme to show the size of the coin box conversion programme envisaged:-

By March 1962 - 43,000 (17,000 call offices and 26,000 subscribers' coin boxes)

By March 1965 - 97,000 (38,000 call offices and 59,000 subscribers' coin boxes)

He had spoken to Miss Whitlaw who had expressed herself satisfied with the new coin box from the operating point of view and saw no objection to the programme proceeding. Mr. Harris said that he too was satisfied with the new coin box and hoped that orders for its supply in quantity would be placed without further delay. Mr. Harding said that the initial contract for 5,000 boxes would be completed by March 1964. It was hoped that a second manufacturer would be brought into the production programme, and an output of 20,000 boxes a year could be envisaged.

6 The Chairman said that bearing in mind the lower calling rates, there was some concern about using new coin boxes which cost between £70 and £80 each (including exchange equipment) for subscribers' installations. Consideration had been given to possible alternatives including single and two-coin boxes. There was however some doubt whether the public, who had been used to a box with full facilities, would be prepared to accept a coin box available for local dialled calls only. Further, there would be problems and additional expense on the operating and equipment sides. Current thought favoured a full facility box with a lighter gauge (and therefore less strong) metal casing, and having a separate telephone instrument. It was estimated that a saving of between £6 and £10 per box could thereby be achieved whilst at the same time giving subscribers the same facilities as those enjoyed at public call offices. The overall saving to the Department could be between half and three quarters of a million pounds over the next ten years. Subject to the concurrence of the Study Group, it was therefore proposed to go ahead with the design of a prototype subscribers' coin box. He hoped a wooden model would shortly be available.

7 Mr. Osmond hoped that the modifications would be confined to the case of the coin box and would not affect the lock. He would not wish the position to arise in which subscribers might be given keys which would give them access to public call office coin boxes. Mr. Harding confirmed that there would be separate locks for subscribers' coin boxes. The savings on the casing were possible because, as at present designed, the casing and the instrument alone cost about £17.

8 Mr. Westaway, referring to paragraph 6 of the previous minutes and the problem of delay in the commencement of effective conversation under STD conditions, said that of 334 coin box trunk calls observed in November, there were only four on which the caller did not start conversation with the person he wanted within 20 seconds of the call first being answered. On one call it was necessary for the coin-box user to insert more money, but in that case the total money inserted on the call was only 9d. Of 2,000 local calls observed, effective conversation started within 20 seconds of the call first being answered in all but 100 calls; in three cases more money was inserted. It had not been possible to identify particular subscribers' as being prone to connexion delays, and effort had been directed towards regular approaches to subscribers with larger PSX installations. It was hoped to obtain further Press publicity when subscribers' coin boxes had been installed, and a leaflet was being included with the next accounts. The Chairman suggested that, although publicity was

Delay in
connexion to
extensions
at PSXs

helpful, subscribers were likely to learn best from experience of the new system. British Railways had already agreed to direct exchange lines to their enquiry points wherever they were justified.

Future
meetings

9 The Chairman suggested that the Study Group should meet again when a model of the cheaper subscribers' box was ready. At that stage, if the Group were satisfied with the model, a final report could be drafted and the work of the Group would be complete.

COIN BOX DESIGN STUDY GROUP

Minutes of 26th Meeting - 8th July 1960

D. N. Knapman ITD/PB (Chairman)

J. V. Bond	AGE/TCB	A. V. Leaver	ITD/SSB
E. G. Crisp	ITD/OB	C. G. Osmond	PD/IB
J. V. Greenlaw	ITD/SSB	E. H. Seymour	ED/S
T. C. Harding	ED/S	H. S. Waters	ED/TPD
J. M. Harper	ITD/TMB		

J. Lennox ITD/OB (Secretary)

The Secretary said that both Mr. Harris and Miss Whitelaw were unfortunately on sick leave.

- | | |
|--|--|
| Minutes | 1. The minutes of the 25th meeting were confirmed. |
| CP 16 - Trial of new coin box at Bristol | 2. <u>The Chairman</u> said that the results of the trial as reported to the last meeting had been summarised and published as CP 16. |
| New subscribers' coin box | 3. A wooden model of the exterior of the new subscribers' coin box was shown to the Group. <u>The Chairman</u> reminded members that by separating the telephone instrument from the coin box, and making the coin box less robust, about £40 per box would be saved. An additional economy would be achieved by dispensing with the back-board at subscribers' installations, and displaying the instruction notice on the front of the coin box. <u>Mr. Harding</u> pointed out that the mechanism in the two types of box would be identical. The instruction notice would be an anodised aluminium plate fixed into a recess in the front cover. In new installations the subscribers' coin box would be screwed straight on to the wall, but in replacement cases the existing wallboard would be used if the subscriber wished it. |
| Draft Final Report | 4. The draft final report, which had been circulated to members, was discussed paragraph by paragraph. A number of minor amendments were made. Among the points mentioned were that the national PBX booklet was to be published in September, and that the new coin boxes would next be installed at Bodmin in August. |
| | 5. It was agreed that the Final Report as redrafted should be circulated to members, and then signed by the Chairman on behalf of the Group. |
| Conclusion of work of Group | 6. <u>The Chairman</u> , in bringing to a close the work of the Study Group which was formed six years ago, reminded members that their Secretary had served them throughout that time. It was agreed to record the Group's appreciation of his services in the Final Report. |

COIN BOX DESIGN STUDY GROUP

TRIAL OF NEW COIN BOX AT BRISTOL

1 Date and scope of trial The trial was started with 23 public call offices in the centre of Bristol on the 5th September, 1959. Having established that no serious difficulties were arising it was extended at the end of six weeks to the remainder of the 87 public call offices in the Bristol (Central) STD area, and these call offices were all equipped with the new box by the middle of November 1959. The fitting of the new box on subscribers' coin box installations was started during December and was completed by March, 1960.

2 Staff training During the two months before the start of the trial all the operating staff at Bristol were trained in the operation of the box and in the procedure for handling calls received at the switchboard. Demonstration boxes were fitted in the exchange, and these were also used to instruct postal staff in the method of coin collection. Two Bristol engineering officers were given a week's preliminary instruction at Engineering Department Headquarters on the operation and maintenance of the new coin box. Following this, instruction was given at the Bristol coin box overhaul centre, and subsequently a one week instructional course was organised at the Regional Training School.

3 Education of public Press publicity was arranged in the Bristol newspapers, and wider publicity was also given to the pay-tone which would be received by distant subscribers on calls from Bristol coin boxes. The first installation was inaugurated by the Deputy Lord Mayor of Bristol who made a call to the Lord Mayor of London. The Press were invited to the ceremony.

4 A special leaflet describing the new coin box was made available in Bristol Post Offices, and a demonstration bureau was set up in the Town Centre. For the first four weeks attendants were provided to assist the public at the two main suites in the Town Centre and in the Head Post Office.

5 New instruction cards, and booklets containing the local and trunk dialling codes were provided in the call offices. Owing to the printing strike the dialling code booklets were produced in makeshift form and were smaller than originally specified. The booklets are loose in the call offices, and are being lost at a rate of about 20 per week. Consideration is being given to ways of minimising these losses.

6 Service results The new coin boxes have been under continuous service observation since the start of the trial, and many thousands of observations have been taken on local and trunk calls from them. Over 60% of the attempts observed were either successful or received the number engaged or no reply conditions. There were many attempts on which the caller just lifted the receiver and replaced it, or did not insert a coin on receipt of pay tone after a call had been dialled. Many of these were obviously due to inquisitiveness on the part of callers who had no intention of making a call. In addition, despite the publicity given to the change of code, a good proportion of callers dialled '0' and no further digits, presumably in an attempt to obtain the operator. Wrong and incomplete dialling accounted overall for about 10% of local call failures and about 18% of trunk call failures (excluding those on which '0' only was dialled). Apart from the normal equipment failures associated with the automatic system, failures due to the coin box and associated equipment were extremely few.

7 Faults During the first week a total of 78 faults were reported on the 23 coin box lines, of which approximately one half could be attributed to the mechanism. The main cause of faults was coins jamming in the runways; the other causes were distributed and arose mainly because of miscellaneous manufacturing defects on some of the mechanism parts. These defects may be attributed to the teething troubles normally to be expected on the first production line of an entirely new mechanical design. They were immediately taken up with the manufacturer, and the total faults were halved in the second and third weeks. In the period from the fourth to the eighth week, total faults averaged 15 per week, and mechanism faults five per week. Progressive improvement

followed, the mechanism faults for the 23 boxes averaging three per week by mid-December, i.e. approximately $\frac{1}{5}$ fault per box per week or 6.5 faults per box per year.

8 Similar results were achieved when the remaining coin boxes were installed, and the long term indications are that the mechanism fault rate will be no higher, and quite possibly lower, than on the present type of coin box, despite the complexity of the new mechanism and the close tolerances required.

9 Callers reactions Over 6,000 members of the public attended the demonstration bureau during the first four weeks of the trial, and a further 500 were assisted by attendants at the call offices. The general reaction was favourable, although the remarks were many and varied. There were no widespread criticism of any particular feature of the new system, and it can be claimed that from the public's point of view it is a success and it will be more so when they have gained further experience in its operation.

10 Very few complaints were received about delay in obtaining the required person after the distant number had answered and no blame has been attached to the Post Office on this account. Nevertheless the problem has been stressed in Press publicity, and by means of a leaflet sent out with the September 1959 accounts. British Railways have agreed to rent direct lines for their enquiry points.

11 There have been a number of claims for refundment or free connexions which have been dealt with at the manual board, but it is too early yet to judge the trend of these. The main reasons given for these claims are (1) called subscriber cleared on pay-tone, and (2) out off. Every suitable opportunity is being taken to educate subscribers on the meaning of the pay-tone, and it is expected that the difficulties which callers are experiencing will diminish. According to observations there is some out-off trouble but it is very slight, and may in some instances result from callers leaning on the coin box and depressing the receiver rest.

12 Revenue There was a marked increase in trunk calls during the early stages of the trial, undoubtedly in part curiosity traffic. Durations were relatively short and averaged less than 90 seconds.

The average duration of local calls was just over two minutes. Despite the reduction of the unit fee from 4d. to 3d., revenue at the outset showed a marked increase. It has since fallen, and is now not significantly different from that obtained from the old pre-payment coin boxes.

13 Because of the substitution of threepenny pieces for pennies, the capacity in money terms of the coin-container has increased. This has reduced the risk of boxes being put out-of-order because the container is full, and has made possible a reduction in the frequency of collections. On the counting side, a prototype of a new machine is in use to count threepenny pieces, sixpences and shillings.

ITD/SSB

April, 1960

COIN BOX DESIGN STUDY GROUP

Draft Final Report

Director of Inland Telecommunications,

1. In 1955 we submitted to your predecessor an Interim Report in which we made recommendations on the design of a new coin box for automatic exchanges in the light of current and future developments in the telephone system. Since then we have held 15 further meetings, making 26 in all, and have dealt with the design of the associated fittings and the general layout of the interior of call offices, the arrangements for the introduction and trial of the new coin box, and the question of producing a cheaper coin box for subscribers' installations. We deferred the submission of this Final Report until experience had been gained of the working of the new coin box in Bristol.

Development
contract
and initial
order.

2. In our Interim Report we envisaged that a small number of modified Swiss coin boxes would be obtained for a trial at Reading, but negotiations with the Swiss manufacturer could not be brought to a successful conclusion. Accordingly authority was given for a development contract to be placed with Messrs. Associated Automation Ltd. The associated exchange equipment was designed and developed by the Engineering Department.

3. A number of prototype coin boxes was produced and tested, but the design was not finally approved until early in 1958. After it had been shown that the cost per box would have been much greater for a smaller order because of the heavy tooling costs, a contract was placed for the supply of 5,000 boxes. Photographs of the new box are shown in Appendix A.

Changes in
Facilities

4. The following changes were subsequently made to the facilities recommended in our Interim Report:-

Pay tone. This has been speeded up to 4 pulses per second, instead of $2\frac{1}{2}$ pulses per second, to obviate possible confusion with the new engaged tone when it is introduced to meet CCITT requirements.

One-way conversation period. We had originally proposed that Pay Tone should be connected immediately the called subscriber answered, but in the light of representations we recommended that the caller should be allowed 3 seconds to hear the called subscriber answer. In the event this facility proved too costly to provide and would have barred coin-box access to the information services. Accordingly the original proposal has been adopted.

Trial of
the new box.

5. Supplies of the new box started to become available in the Spring of 1959 and, following the training of operating and engineering staffs, a small scale trial on 23 call offices in the centre of the Bristol S.T.D. area was started on the 5th September 1959. After six weeks the trial was extended to the remainder of the 87 call offices in the Bristol S.T.D. area, and the boxes have since been installed on the 175 subscribers' coin box installations in the same area.

6. The trial has been an undoubted success both from the point of view of the functioning of the coin box and its associated exchange equipment, and from the public reaction to the facilities which it gives. Some minor technical modifications had to be made to the coin boxes in the light of the experience gained during the trial and these will be incorporated in future supplies.

7. The publicity given to the new box and the measures taken to educate and assist the public in its use made important contributions to the success of the trial. A demonstration bureau was set up in the centre of Bristol and attendants were provided at the main call-office suites in the early stages of the trial. Special leaflets were also provided. We cannot stress too strongly the value of these measures in obtaining the co-operation of the public in the successful introduction of the new box and we recommend that similar measures be adopted in other towns when the new boxes are installed.

8. It is too early yet to determine what lasting effect the new box will have on call-office revenue, but it was gratifying to note that in the early stages of the trial revenue from the call offices showed some increase on previous returns despite the reduction of the unit fee from 4d. to 3d.

Delay in connexion to extensions at PBXs

9. In our Interim Report (para 23) we referred to the possible complaints that might arise if there were delay at a PBX in connecting a coin-box caller to the required extension. Observations taken on nearly 2,500 local and trunk calls from coin boxes at Bristol show that on less than 5.8% of the calls did the coin box user have to wait more than 20 seconds before he was in conversation with the person wanted. On 4 occasions only did he first have to put more money in the box. Nevertheless we have given much thought to this problem and have agreed with British Railways that their passenger enquiry points at Bristol should have direct exchange lines; they propose to adopt this arrangement nationally as STD develops. The need for rapid connexion to the wanted PBX extension has been stressed in local press publicity, and a leaflet has been distributed to subscribers throughout the Bristol Area. The point will also be made in the national PBX users' booklet now being prepared.

Call Office layout.

10. To facilitate maintenance access in call offices we decided to place the new coin box to one side, and to change the layout of the lower half of the backboard; the upper half of the backboard will be retained. The new coin box will normally be on the left-hand side, but if difficulties are experienced because a call office door is adjacent to the coin box, consideration will be given to fitting the coin box on the right-hand side. The two containers provided for directories and parcels with the pre-payment box will be replaced by one container, and in call offices having London directories a special fitting, on the lines of the Swiss model, will be provided. Photographs of the new layouts are given in Appendix B, but in the final design of the London directory fitting a lower shelf will probably be provided for extra directories and parcels.

Call Office metering arrangements.

11. To give more accuracy and to simplify the work of checking coin box collections, arrangements were made at Bristol for the exchange meters associated with the call-office lines to record in three-penny units the amount of money inserted. The check of tickets for manually connected calls is thus eliminated. Experience has shown that this facility also gives a useful check on the functioning of the coin box and the correct signalling of coins to the exchange.

12. It is proposed that this facility be provided only in the larger exchanges where it is economic to have separate groups of coin and fee checking equipment, and first selectors for call-office lines and subscribers' coin-box lines respectively. The meters associated with the subscribers' coin-box lines will operate on call pulses from the timing equipment, and this condition will also apply to call-office lines on the smaller exchanges.

Access to special services, and coin box discrimination.

13. Provision was made in connection with the trial at Bristol for coin box lines to have dialling access to Special Service points and Information Services, e.g., enquiries, directory enquiries, phonograms, speaking clock, but to obviate fraudulent use from the old type boxes some of the facilities were not advertised until the conversion programme was completed. Dialling access to these services will in future be a standard facility from the new coin box.

14. No provision was made on the coin box exchange equipment at Bristol for any change in the method of discrimination used for coin box calls to operators, and on both the 100 level (manual board) and the 90 level (phonograms) a separate group of circuits was provided for coin-box calls. In all future cases, however, we propose that one common group of circuits be provided to operating positions for both ordinary and coin-box calls, and that coin-box discrimination be given by means of the pay tone when a call is answered. This will produce useful savings in exchange equipment and line plant.

Plan 5E/F installations.

15. There is no call office in the Bristol S.T.D. area which is served by an exchange line jointly used by a Post Office, i.e., a plan 5E or 5F installation. But there are many thousands of these installations throughout the country, particularly in rural areas, and in order to make them work with the new type coin box we propose that the telephone fitted in the Post Office be equipped with facilities to simulate coin pulses and a meter to provide for a record of the units used. These facilities are at present under development.

Coin collection and counting.

16. The self-sealing container used in the new coin box fitted in call offices has capacity for about 600 coins and, since there are no pennies

and the coins consist of threepenny pieces, sixpences and shillings, the value of the coins it will hold exceeds £7. 10s. There is thus less risk that the container will become full and the box put out-of-order.

Consequently the interval between collections can be extended. Experience so far at Bristol has shown that this interval can be at least three times as long as with the present prepayment box.

17. Arrangements were made at Bristol Head Post Office for the collections to be counted on a new type of coin counting machine which is designed for threepenny pieces, sixpences and shillings. This eases the work of coin counting and speeds up the process. The machine is experimental and will in due course be superseded by a design which, amongst other improvements, will count all the coin in threepenny units instead of in sterling and thus simplify the machine and the accounting arrangements. To cater for the interim period when there will be collections in most offices from both old and new boxes the machine will also be designed to count pennies.

Cheaper coin
box for
subscribers'
installations.

18. In our Interim Report we recommended in the interests of economic production and storekeeping that the same type of coin box be provided for both call office and subscribers' coin box installations. We have, however, been concerned at the heavy capital expenditure which will be involved in the conversion programme. Bearing in mind that more than half of the coin boxes throughout the country are on subscribers' installations, a disparity which will be likely to increase in future years, and that these installations are not so heavily used as call offices, we have considered whether a cheaper subscribers' box could be produced. A cheaper box would, of course, also help to keep down the rental charged to the subscriber for its use.

19. We first considered a box with fewer coin slots, i.e., for threepenny pieces and sixpences or for threepenny pieces only, the intention being that the subscriber could have the option of a 3-coin box or one with fewer coin slots. However, there were two main drawbacks to this idea, namely,

- (i) switchboard operating requirements would necessitate segregation of the exchange equipment (and junctions from remote exchanges)

for the two types of box, and this would place an undue burden on exchange equipment and line plant, and,

(ii) a box with slots for coins of the smaller denominations only would have a restrictive effect on the use of the line for the more expensive trunk calls as callers would not have the necessary change in small coinage to pay for the calls.

We felt that such developments, or one which would involve routing all trunk calls via the operator, would be contrary to the general trend of expanding the use of the telephone service, in particular the trunk service by means of subscriber trunk dialling.

20. We were finally left with a proposal for effecting economies on the box for subscribers' installations by

- (i) separating the telephone instrument from the coin box,
- (ii) providing a less robust coin chamber and
- (iii) making the sides and back of the case of pressed steel instead of aluminium.

These measures, together with the use of a plastic coin container instead of the self-sealing container, would save about £10 per box, i.e., a 20% saving, representing an economy on the overall conversion programme of about £750,000 on present figures. These economies, largely derived from making the coin-box less thief-proof, are possible because of the greater risk of detection in attacking a coin-box in occupied premises. We are satisfied that the modified coin-box will provide the subscriber with an efficient and secure instrument giving the same facilities as a public call box, and we recommend its adoption. A photograph of the proposed modified coin-box and its associated telephone is shown in Appendix C.

Future
programme.

21. Although further supplies of the new call-office coin-box will become available from the initial contract during 1960 we understand that, with the exception of one or two S.T.D. cases for which special arrangements are being made, there will be little progress in installing them until the beginning of 1961 when the associated exchange equipment begins to be fitted generally in S.T.D. exchanges.

22. By March 1962 it is estimated that the main S.T.D. programme will have progressed to the extent that there will be approximately 43,000 coin-box lines working on exchanges provided with S.T.D. facilities. This number will comprise approximately 17,000 call offices and 26,000 subscribers' coin-box lines. The estimated figures for 1965 are 40,000 call offices, and 60,000 subscribers' coin-boxes.

23. Now that the new coin box has been tried out successfully at Bristol we assume that further orders will be placed to match this programme. It is understood, however, that in the early years it is unlikely that deliveries can be stepped up to meet the peak requirements and that normally an interval will elapse between the introduction of S.T.D. and the fitting of the new coin boxes. We agree, however, that on conversion of exchanges from manual to automatic working with S.T.D. facilities the new coin box should be installed from the outset to avoid inconvenience to the public and unnecessary additional expense on exchange equipment which would otherwise arise from a double change of coin boxes.

Conclusions.

24. We do not propose to finish this Final Report with a list of recommendations since these were largely contained in our Interim Report, and the matters which we have now dealt with are in course of being implemented. It was necessary to proceed in this way with the outstanding items if the future installation programme was not to be delayed. We append, however, a list of the items covered in this Report, together with the relative paragraph numbers.