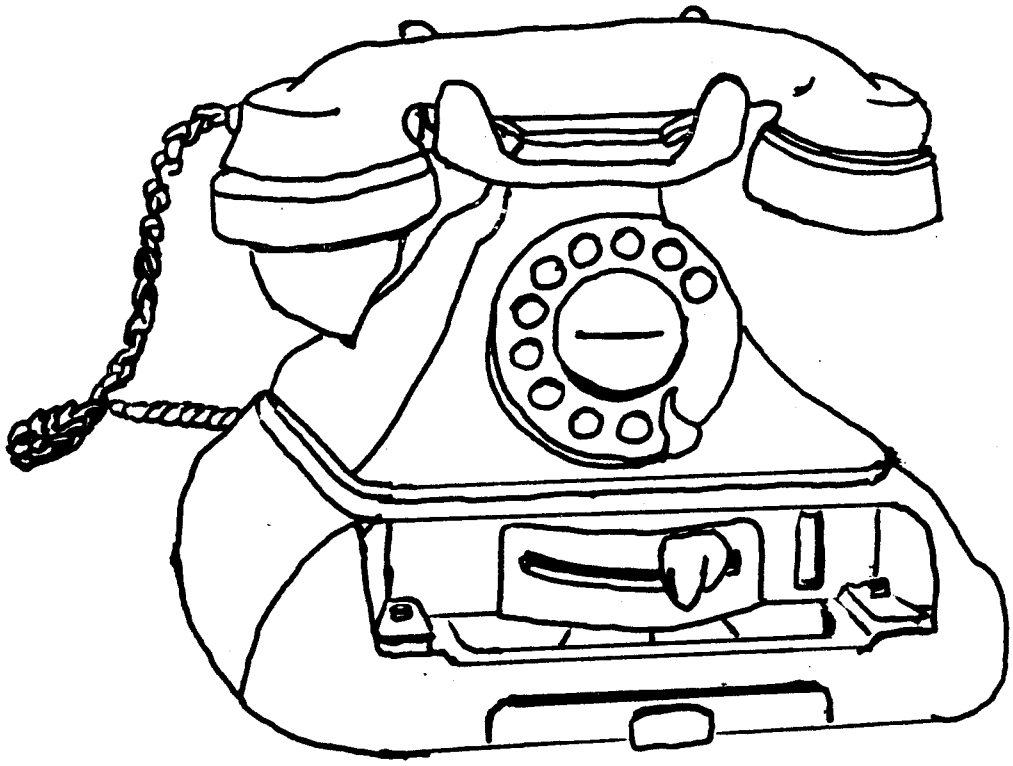
TELEPHONE SUBSCRIBER'S EXTENSION PLANS



Thomas G. Rhoden.

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I would like to thank Neil Johannesen, B.T. Museum Manager, also Andrew Emmerson and Ian Jolly, both of Telecommunications Heritage Group, for their help and advice in the preparation of this book.

Thomas G. Rhoden.

1996.

TELEPHONE SUBSCRIBER'S EXTENSION PLANS.

As the telephone gained in popularity, customers, or subscribers(as they were then known,) began to ask for further facilities on their installations.

Subscribers with a single telephone,(usually in the entrance hall,) were requesting a further instrument in a bedroom or the living room.

Various local methods were devised for providing these extensions, and eventually it became necessary to standardise wiring systems to simplify maintenance, these became known as Subscribers Extension Plans,(S.E.P's).

I shall attempt to give details of the plans that were provided before the advent of electronic switching systems, these will be explained with extracts from "N" diagrams 1424 to 1451 known in Post Office parlance as "Facility Diagrams" because they only show the facilities with the absolute minimum of wiring detail.

These S.E.P's provided extra telephone service to different rooms in residential premises, and different locations in small factories and offices, they were also provided on Private Branch Exchanges, (PBX's) to give facilities such as, filtering of calls, where the calls were answered by the secretary on the main, and only passed to the principal if they required their attention, In some cases double filtering could be provided e.g. calls received by the receptionist were passed to the secretary, and eventualy passed to the principal, (SEP 11).

Other SEP's were designed to give secrecy conditions,(SEP's 10 & 12),and others could hold a call and make an enquiry call on the same instrument, (SEP 9).

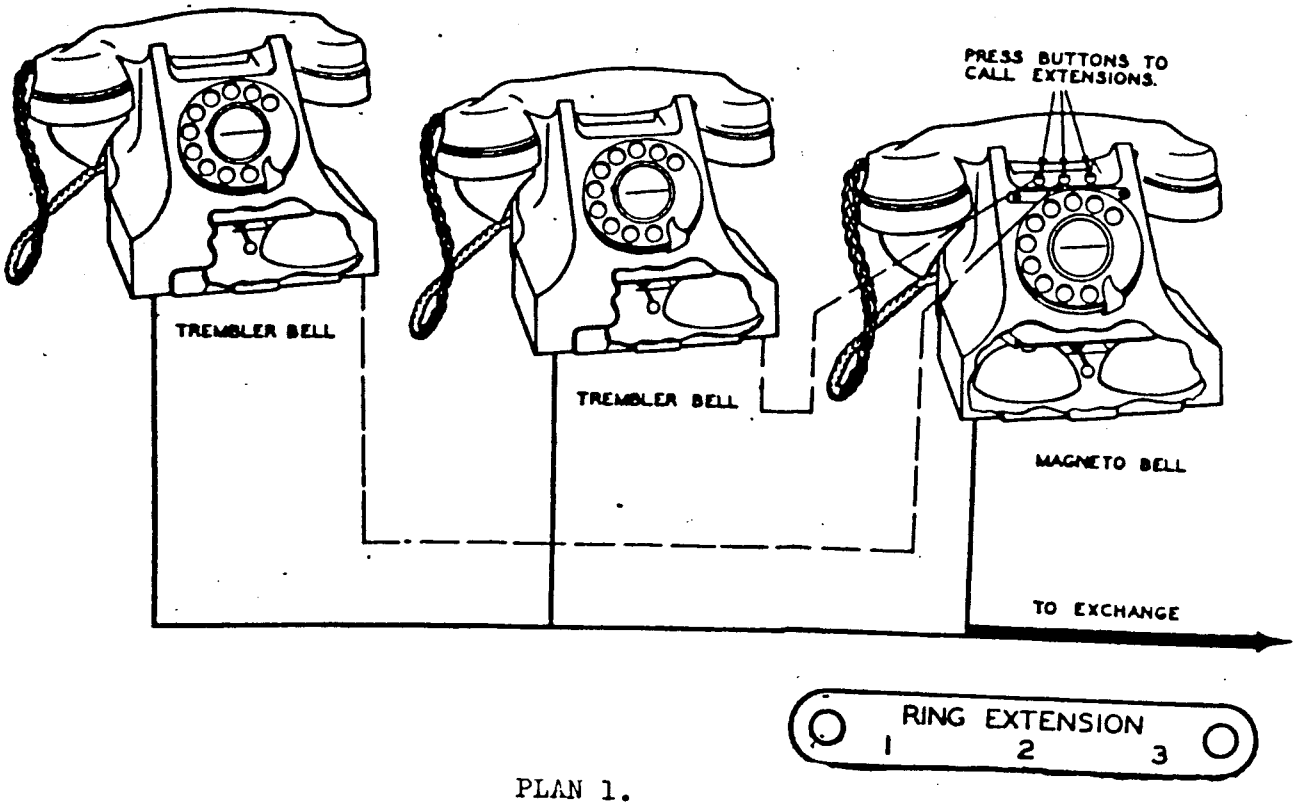
The telephones and diagram numbers shown in the examples are usually for 300 type table telephones,other instruments, e.g. 200 type or 300 wall types, were usually shown on the same set of wiring diagrams where there were only slight differences in wiring or construction.

No intercommunication was provided on some of the systems described in these notes, subscribers found ways of 'fiddling' the system,unfortunately this usually involved engaging exchange equipment unnecessarily; with the later electronic systems, intercommunication was a built in facility, making the need for this form of fiddling obsolete.

Readers may wonder why there is no Plan 6, this is something I have also puzzled over; I suspect that it was a system that was designed but never adopted....You may know different....If you have another explanation please let me know.

Thomas G. Rhoden.

EXTENSION 2 EXTENSION 1 MAIN



PLAN 1.

Plan 1. consists of a main telephone and one to six internal extensions connected in parallel, incoming calls are received at the main telephone, the main can call any extension by press button, all telephones can call the exchange direct, and there is no intercommunication between the telephones, and no secrecy is provided.

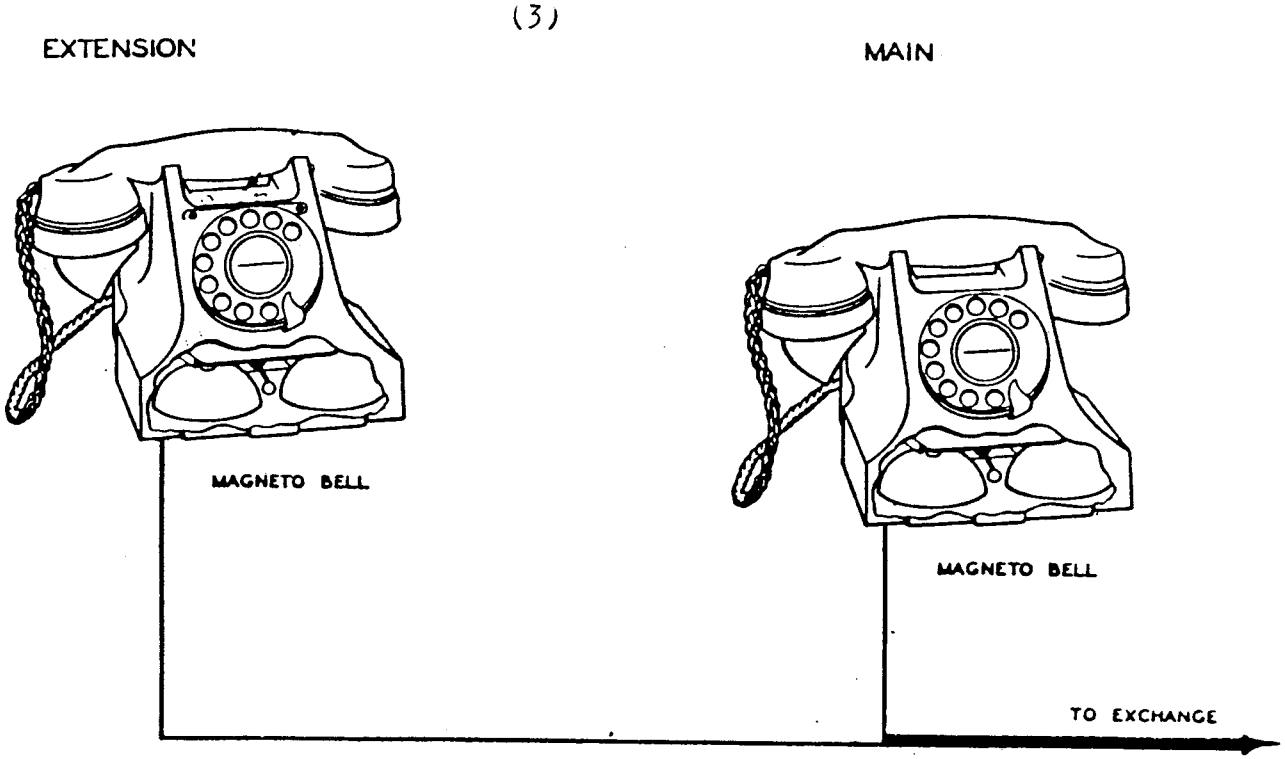
As there are only provision for three press buttons on the main telephone, extra press buttons are provided for extensions 4 to 6 by the use og "Press Button G".

Although the instructions state that up to six extensions are allowed, there is only one magneto bell in the circuit, so the number of extensions is, theoretically, unlimited.

The main telephone is either a TELE 328 with KEY 304a and a LABEL 252b, or, a TELE330, depending upon the number of extensions required; the extesion telephones are TELE's 326.

The "N" diagrams are :-

N1424	Facility Diagram.
N 4302 N 4501	Wiring Diagrams.



LABEL (ON PLAN IA ONLY)

PLANS 1a & 1c.

Plans 1a &1c consist of a main telephone and one to five extensions in parallel, on Plan 1c incoming calls ring all the bells in the circuit, on the Plan 1a the extensions can be fitted with a BELL ON - BELL OFF switch.

In both systems the main cannot switch off the bell, thereby ensuring at least one bell is connected in the circuit.

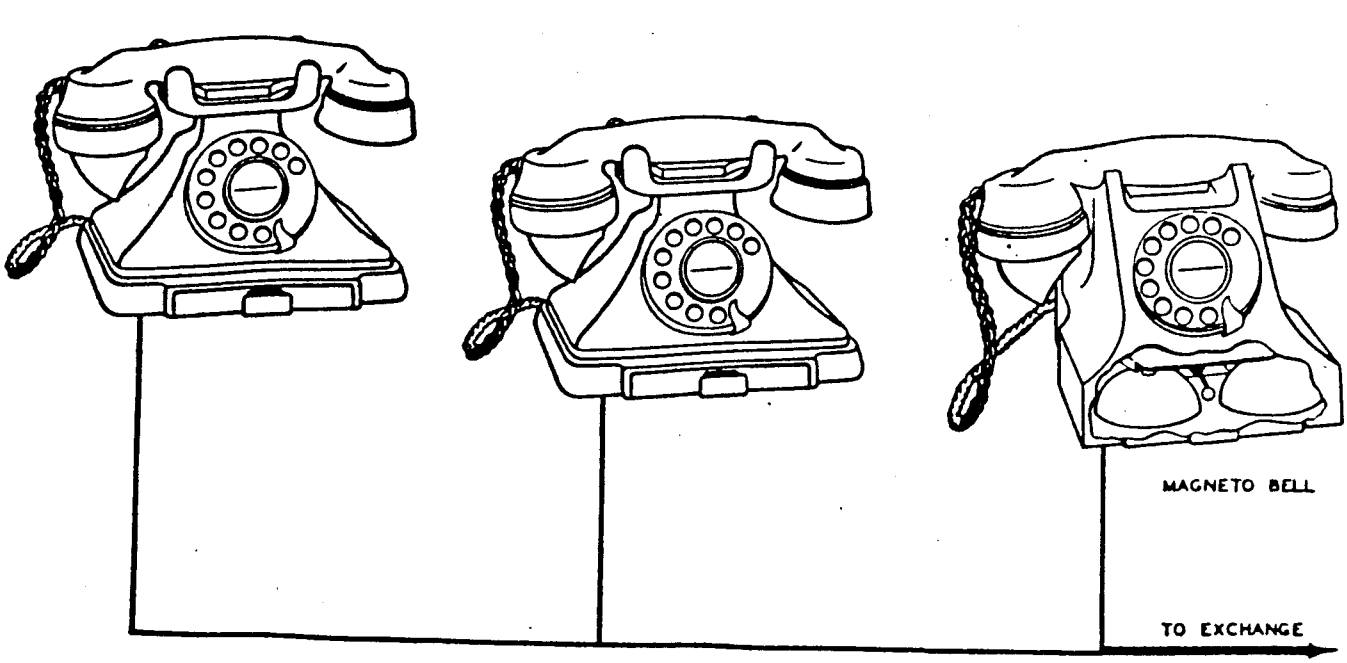
There is no secrecy or intercommunication between the telephones.

The main telephone is a TELE 332, this is also the instrument used for Plan 1c extensions, Plan 1a extensions use a TELE 328 with a LABEL 252c, and either a KEY 302a , or a KEY 302b.

The lack of intercommunication facilities was overcome by customers who just "happened" to know the faultsman's "Ring Back" number.

The "N" diagrams are :-

N 1425	Facility Diagram.
N 4303 N 4502	Wiring Diagrams.



PLAN 1b.

Plan 1b consists of one main telephone and one to six extensions in parallel, this system can only be provided where the main bell can be heard at all of the extensions.

There is no secrecy or intercommunication between the extensions.

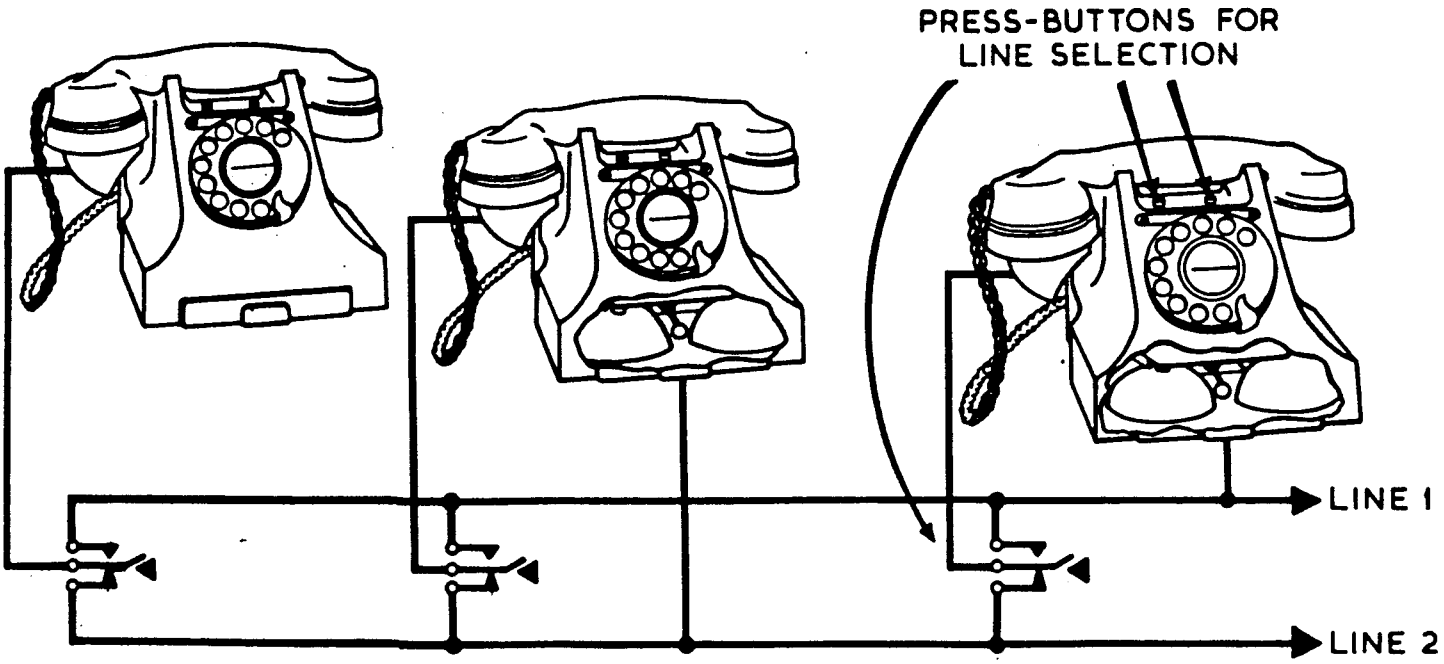
This system was popular in newspaper editorial offices, where each of the copywriters had an individual exchange line, and a Plan 1b extension, incoming calls rang the bell in the main telephone which can then be answered at any extension.

The main telephone is a TELE 332, the extensions are either a TELE 326 with the trembler bell disconnected, or preferably a TELE 1/232.

The "N" diagrams are :-

N 1436	Facility Diagram.
N 4304 N 4503	Wiring Diagrams.

EXTENSION MAIN 2 MAIN 1



PLAN 2.

Plan 2 consists of two to six telephones with access to two exchange lines.

Two of the telephones are designated as Main 1 and Main 2 respectively, the magneto bell of each main is connected to its appropriate exchange line. The extensions normally have their bells disconnected, but they can be connected as extension bells off a designated main telephone if required.

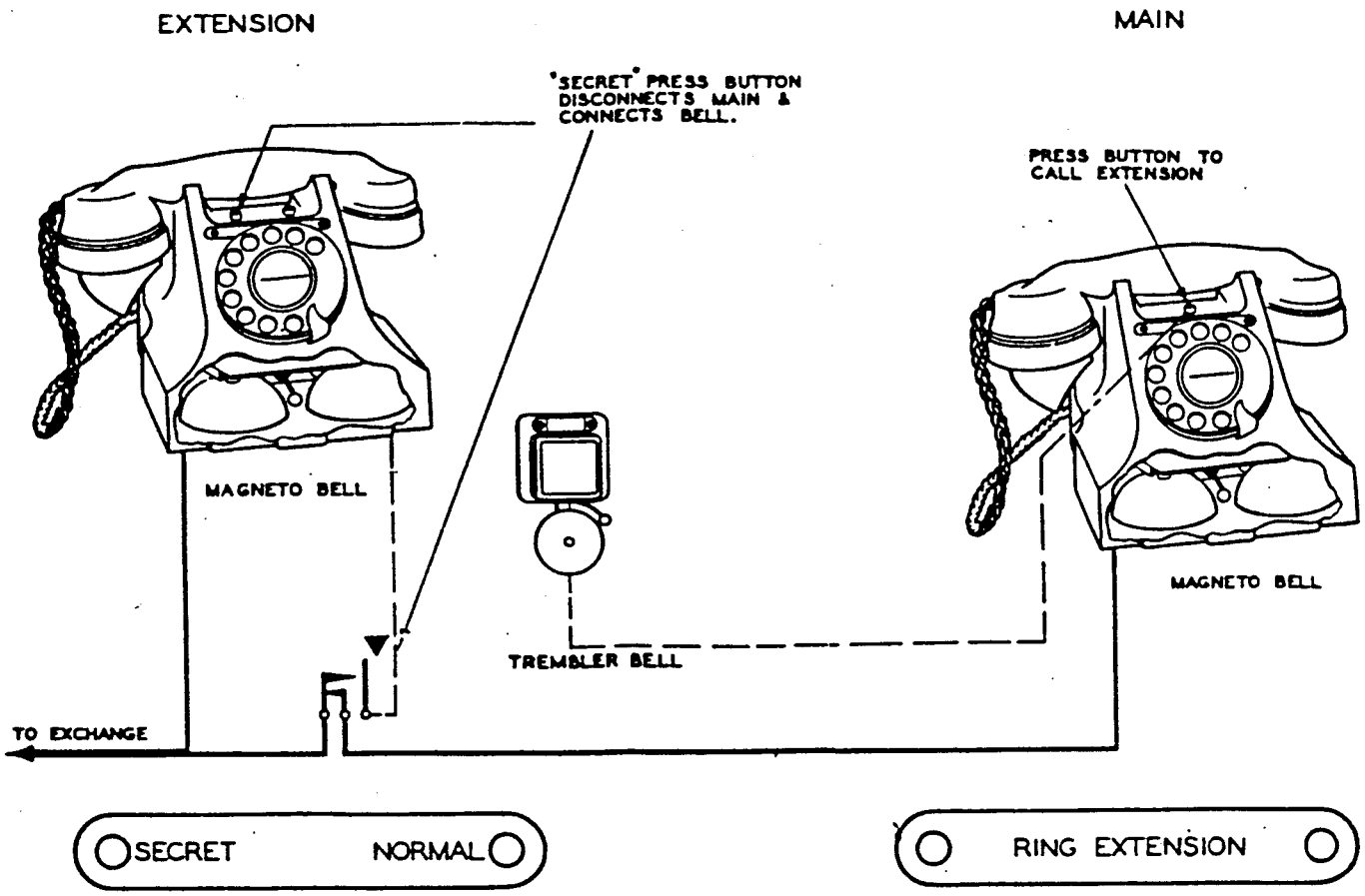
Calls may be answered or originated on either line by the use of the press buttons, a press button can only be released by operation of the other press button, buttons cannot be released by operating the receiver rest (Switch Hook).

It must be emphasised that the press buttons only switch the transmission elements of the circuit, the ringing is not switchable.

All instruments are TELE's 329 with KEY 303a And a LABEL 252g.

The "N" diagrams are :-

N 1435	Facility Diagram.
N 4317 N 4504	Wiring Diagrams.



PLAN 3.

Plan 3 consists of one main telephone and one internal extension with a secrecy switch.

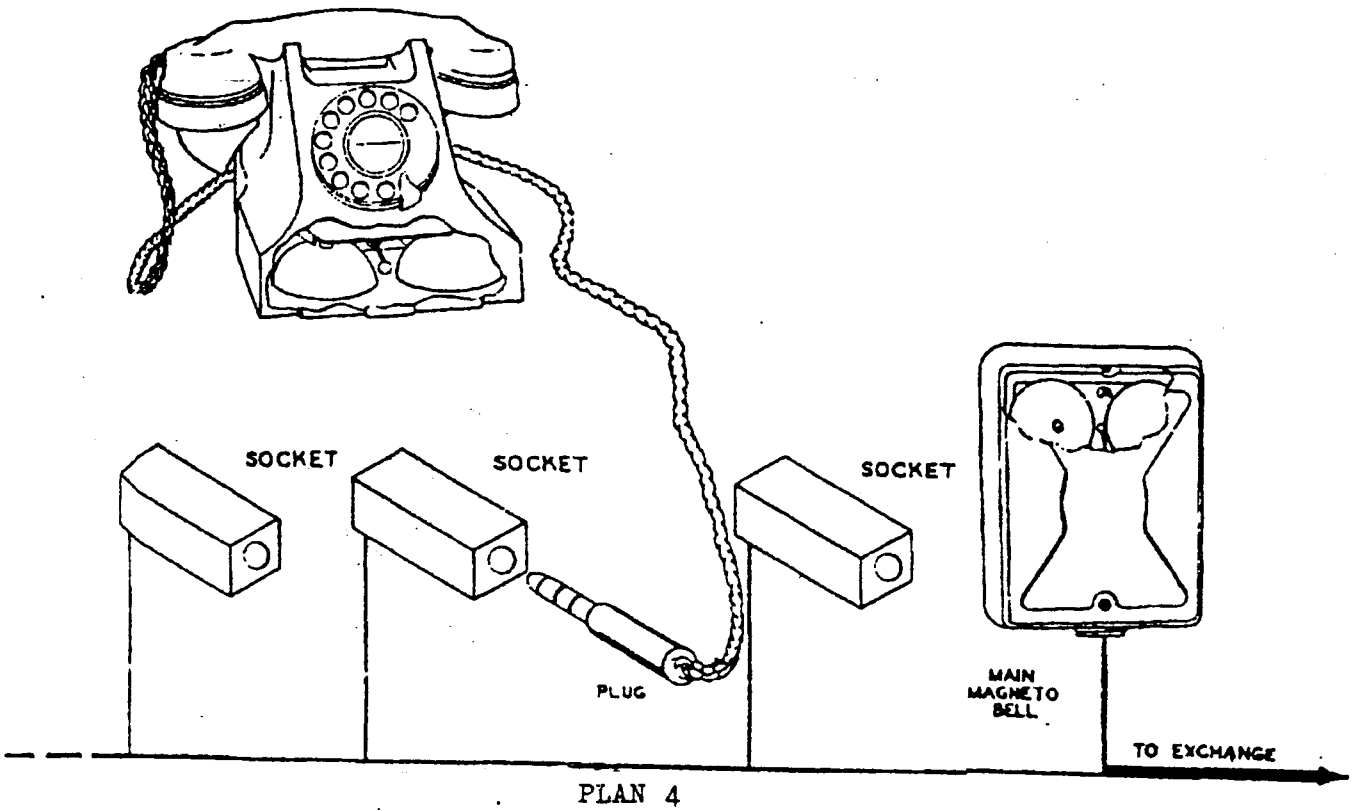
Incoming calls ring the main, the main can then ring a trembler bell at the extension by pressing a button, if the extension then requires to be secret, they can operate the "SECRET" switch on their telephone, if this switch is left operated incoming calls will ring the extension only, to avoid this condition, the "SECRET" switch can be arranged to restore when the handset is replaced on the receiver rest.

There is no official intercommunication between main and extension, but as seen on the Plan 1a this could be fiddled.

The main telephone is a TELE 330 with LABEL 252a, and the extension is a TELE 328 with a KEY 303a and a LABEL 252d.

The "N" diagrams are :-

N 1426	Facility Diagram.
N 4305	Wiring Diagram.



PLAN 4

Plan 4 consists of one to five portable telephones with any amount of sockets connected in parallel to the line.

The number of telephones is limited to five instead of the usual six, because a fixed magneto bell is connected permanently to the line.

The telephones are terminated on plugs and may be moved from socket to socket as required.

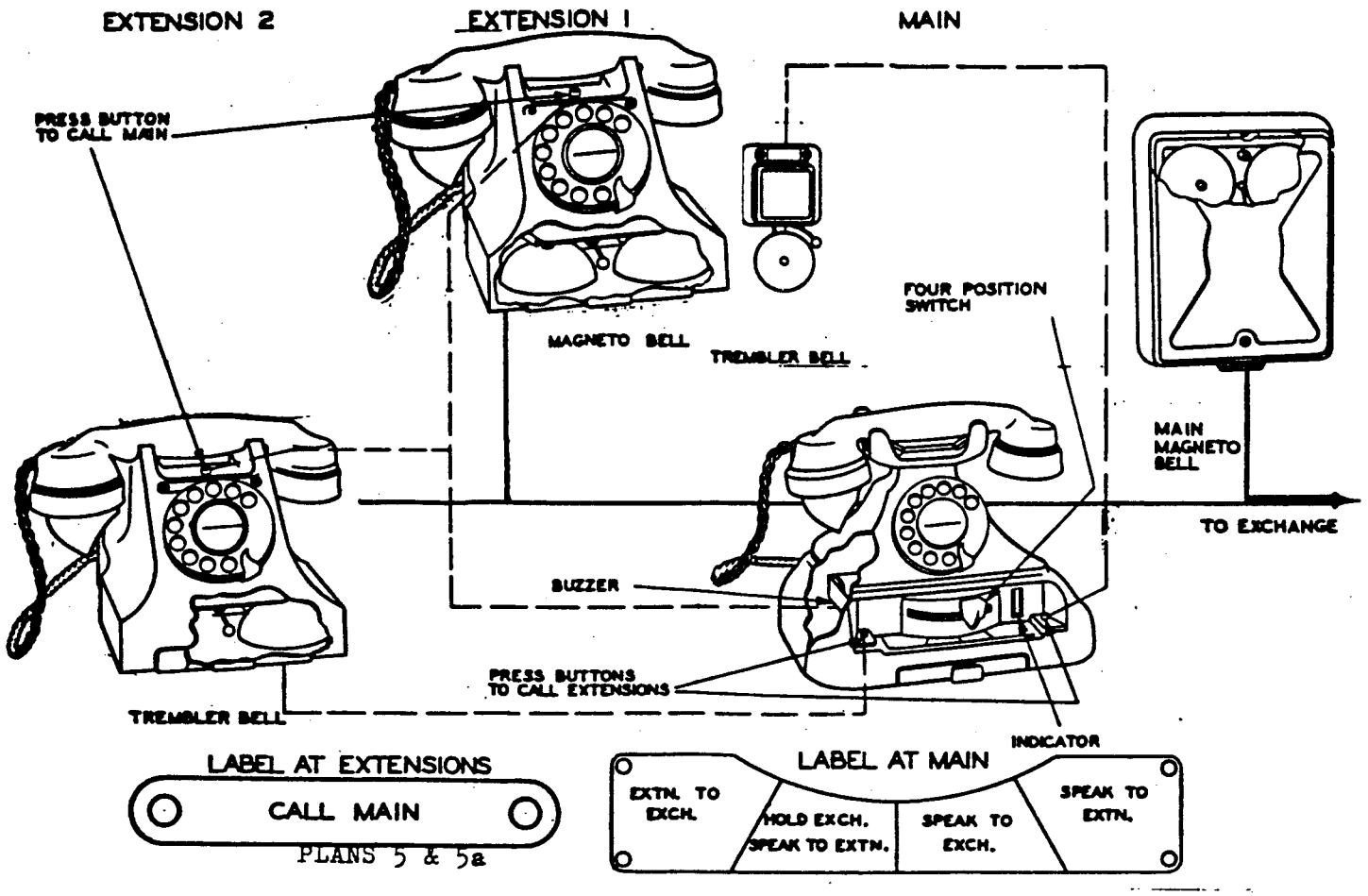
Incoming calls ring the fixed bell and also, any of the telephones connected to a socket, the calls may be answered at any socket.

Neither secrecy nor intercommunication is provided, except by the unofficial methods (see Plan 1a).

The telephones used are TELE's 332, these are connected with either a PLUG 612 and a JACK 64, or a PLUG 404 and a JACK 65, a BELL SET 26 is used for the fixed bell.

The "N" diagrams are :-

N 1427	Facility Diagram.
N 4306 N 4506	Wiring Diagrams.



PLANS 5 & 5a

Plans 5 & 5a consist of a main telephone with a switching key, and two extensions with limited intercommunication, the extensions are connected in parallel

Incoming calls are normally received at the main telephone, but the line can be switched for calls to be received at extension 1, in this condition calls can originate from either extension.

Exchange calls from the main are secret from the extensions, but calls from the extensions are not secret from the main or the other extension, except on Plan 5a where the "Extension to Exchange" calls are secret from the main.

The main can "Hold" an exchange call and speak to an extension without being heard on the exchange line.

When an extension is using the exchange line, an indicator will show on the main telephone.

Signalling between the main and extensions is provided by push buttons and trembler bells.

Limited intercommunication between extensions is possible by calling the main and asking them to ring the other extension, the main then will replace their handset and leave the extensions conversing via an additional set of batteries at extension 2, the main must be rung back when the call is finished.

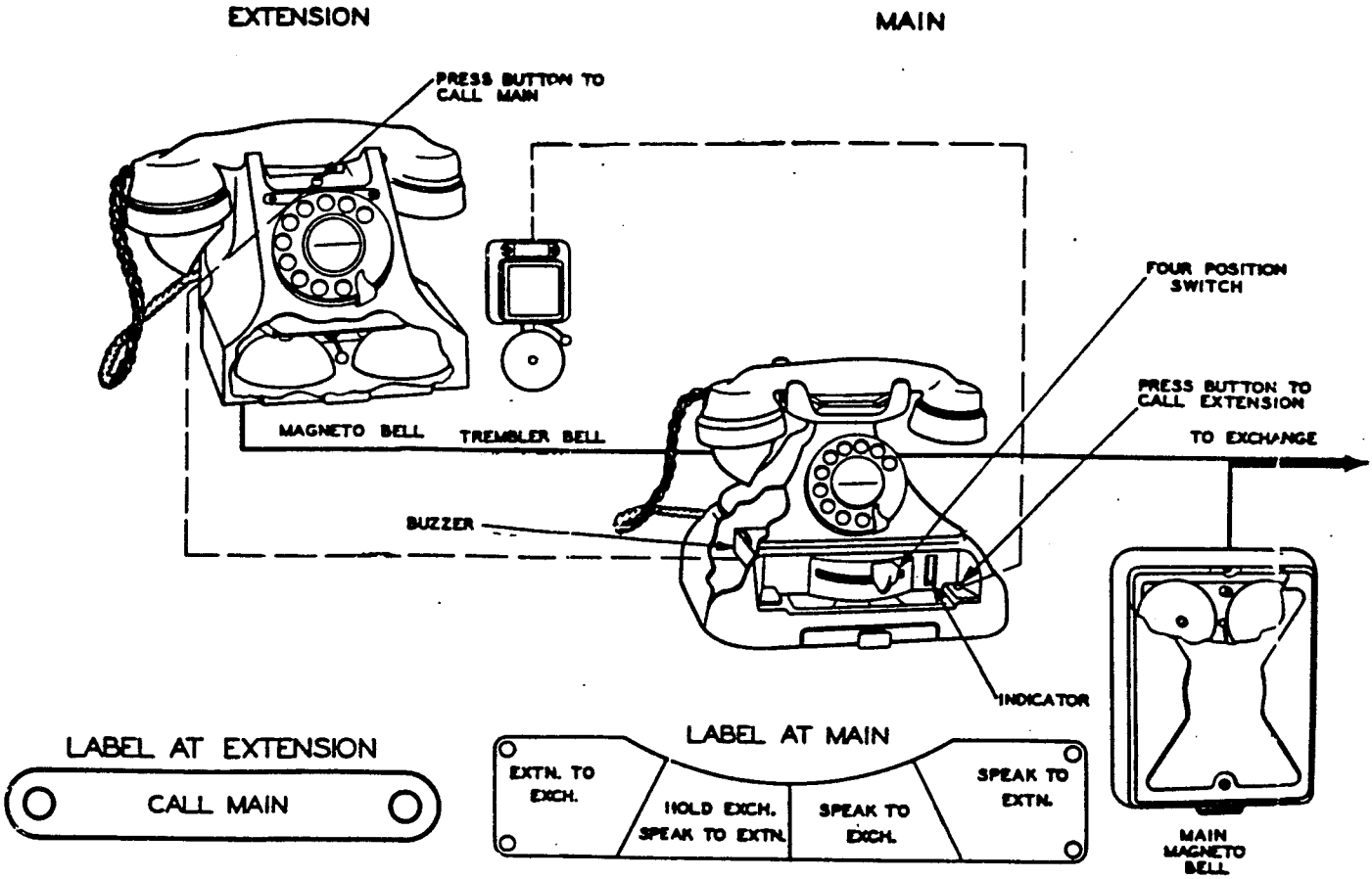
The main is a TELE 248 minus base, mounted on either a BELL SET 39a or a BELL SET 44, with a BELL 64d and 3-CELLS DRY R40.

Extension 1 is a TELE 328 with KEY 302a-1, and a BELL 56a.

Extension 2 is a TELE 326 with a KEY303a-1.

The "N" diagrams are:-

N 1428	Facility Diagram.
N. 4308 N 4508	WIRING Diagrams.



PLANS 7 & 7a

Plans 7 & 7a consist of a main telephone with a switching unit, and one extension with intercommunication.

Incoming calls are normally received at the main but can be received at the extension if switched "Extn to Exch".

Exchange calls from the main are secret from the extension, but exchange calls from the extension are not secret from the main, except on the Plan 7a.

On previous SEP's the extensions were designed for internal use only, but Plans 7 & 7a could have internal or external extensions, In some cases, the external extension could be in separate premises at a distance only limited by the nominal resistance of the line, these would be connected via the public network on private wires.

Press button signalling is used on internal extensions and hand generator signalling for external extensions.

Apart from the above, the facilities are similar to Plans 5 & 5a.

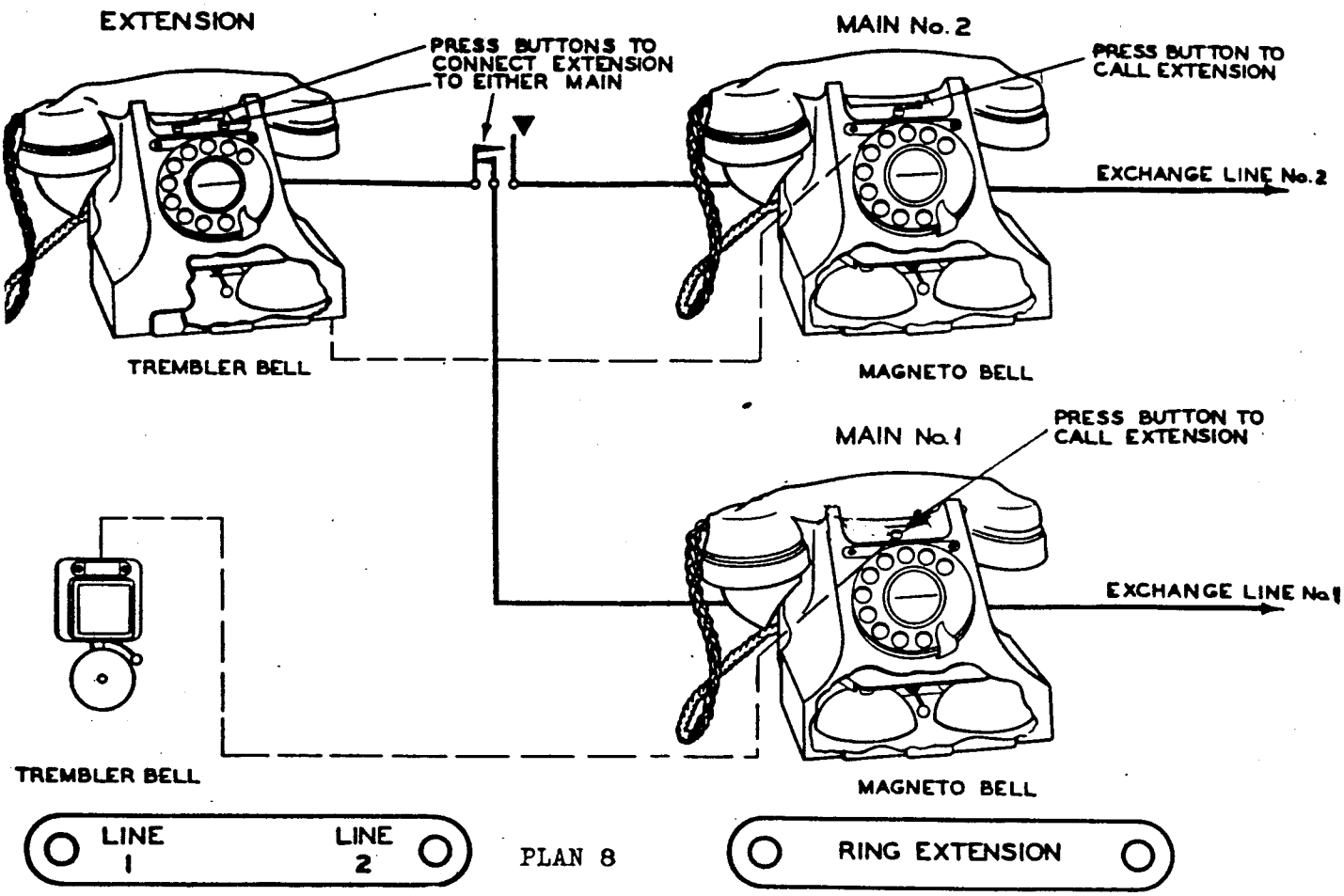
The main telephone is a TELE 248 minus base mounted on either a "BELL SET 39a or a BELL SET 44, with a BELL 64d and 3-CELLS DRY R40.

Internal extensions use a TELE 328 with KEY 302a-1 and a BELL 56a.

External extensions use a TELE 332 and a GENERATOR 26AP, in this system a GENERATOR 26AN is employed at the main.

The "N" diagrams are :-

N 1429	Facility Diagram.
N 4309 N 4310 N 4510	Wiring Diagrams.



PLAN 8

Plan 8 consists of two exchange lines connected to separate main telephones and one extension that can be connected in parallel with either main via a switch at the extension instrument.

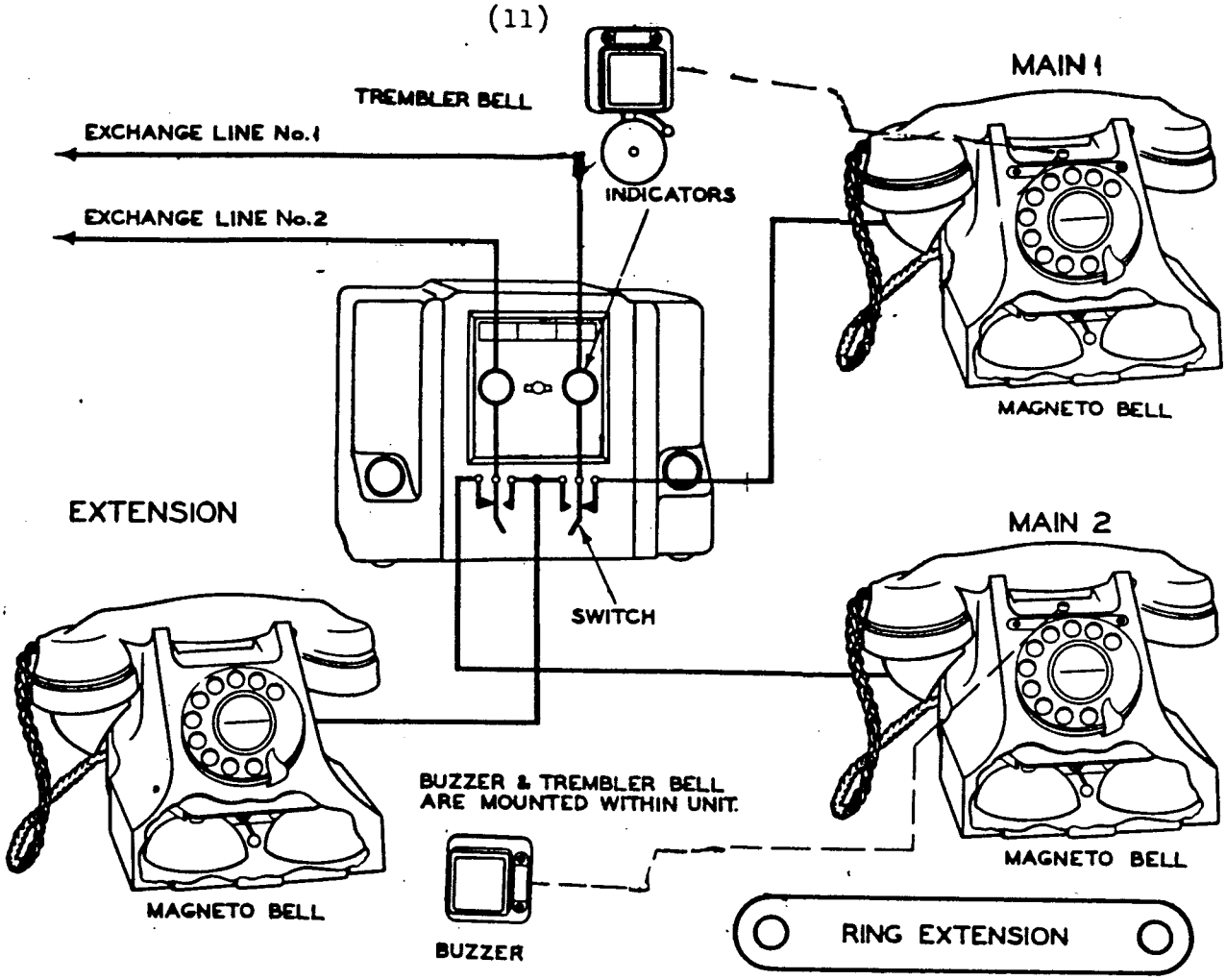
Incoming calls are received at one of the main telephones; each main can call the extension via push buttons that operate either a trembler bell within the extension instrument from one main, or a separate trembler bell from the other main, each of these bells will have it's own distinctive tone, the extension will then answer by pressing the appropriate button.

All of the telephones can originate outgoing calls, and there is no secrecy between main and extension telephones, officially there was also no intercommunication.... but we know different.

Both of the main telephones are TELE's 330 with a LABEL 252a, and the extension is a TELE 326 with a KEY 303a, a LABEL 252g and a separate BELL 56d.

The "N" diagrams are :-

N 1430	Facility Diagram.
N 4311	Wiring Diagram.



PLAN 8a.

Plan 8a consists of two exchange lines and one extension.

This SEP was designed to give a secrecy facility to the Plan 8, this was achieved by terminating the exchange lines on a switch and indicator unit at the extension.

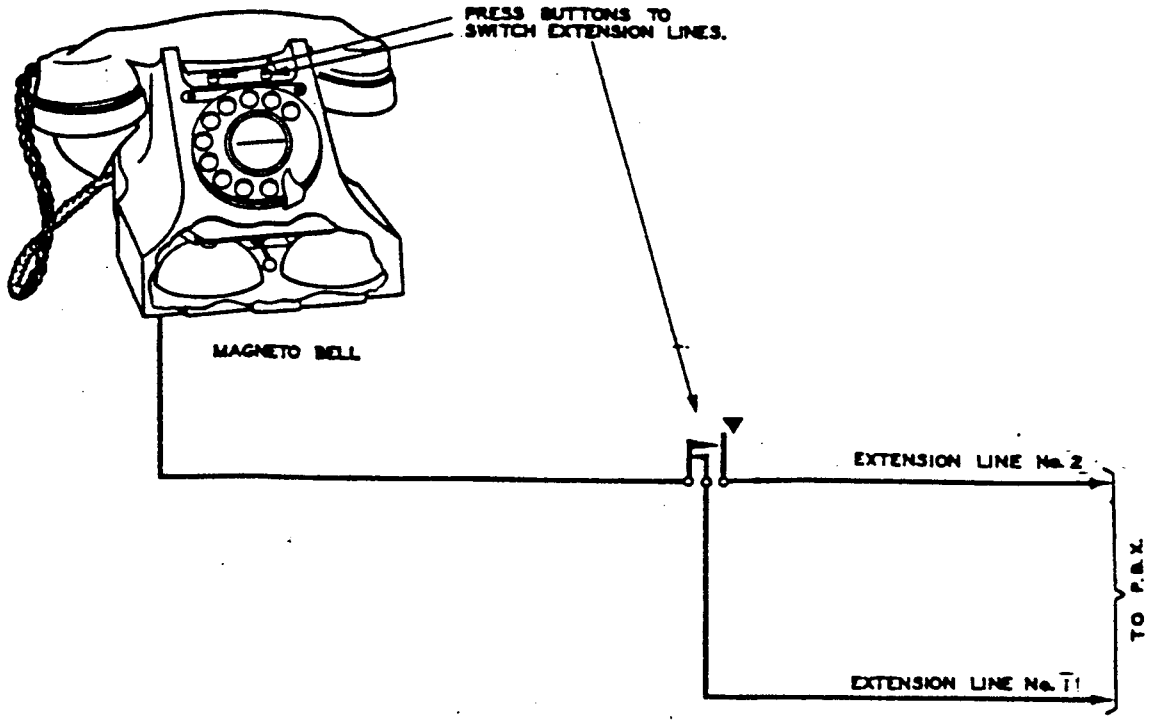
With the unit keys normal, calls are received at the main telephones and transferred by pressing the "Ring Extension" button; the extension would hear a bell or a buzzer and observe an indicator showing, and respond by lifting their handset and operating the key toward the appropriate indicator.

Outgoing calls could normally originate from each main telephone, but the extension could originate calls by switching the unit key toward an unoperated indicator; if the key was left in one of the operated positions, the extension could receive incoming calls on the switched line, but if the extension was unattended, calls on that line would be lost, for this reason the provision of Plan 8a was discouraged.

The main telephones are TELE's 330 with LABEL 252a, the extension is a TELE 332 and a SWITCH, INDICATOR & KEY N601.

The "N" diagrams are :-

N 1431	Facility Diagram.
N 4312	Wiring Diagram.



PLAN 9.

Plan 9 consists of a PBX extension with a second line for outgoing calls, it was designed to meet the needs of an extension user who wished to make an enquiry whilst holding the incoming call.

Incoming calls are connected via the PBX operator to the first line, and the extension normally originates outgoing calls, also on the first line.

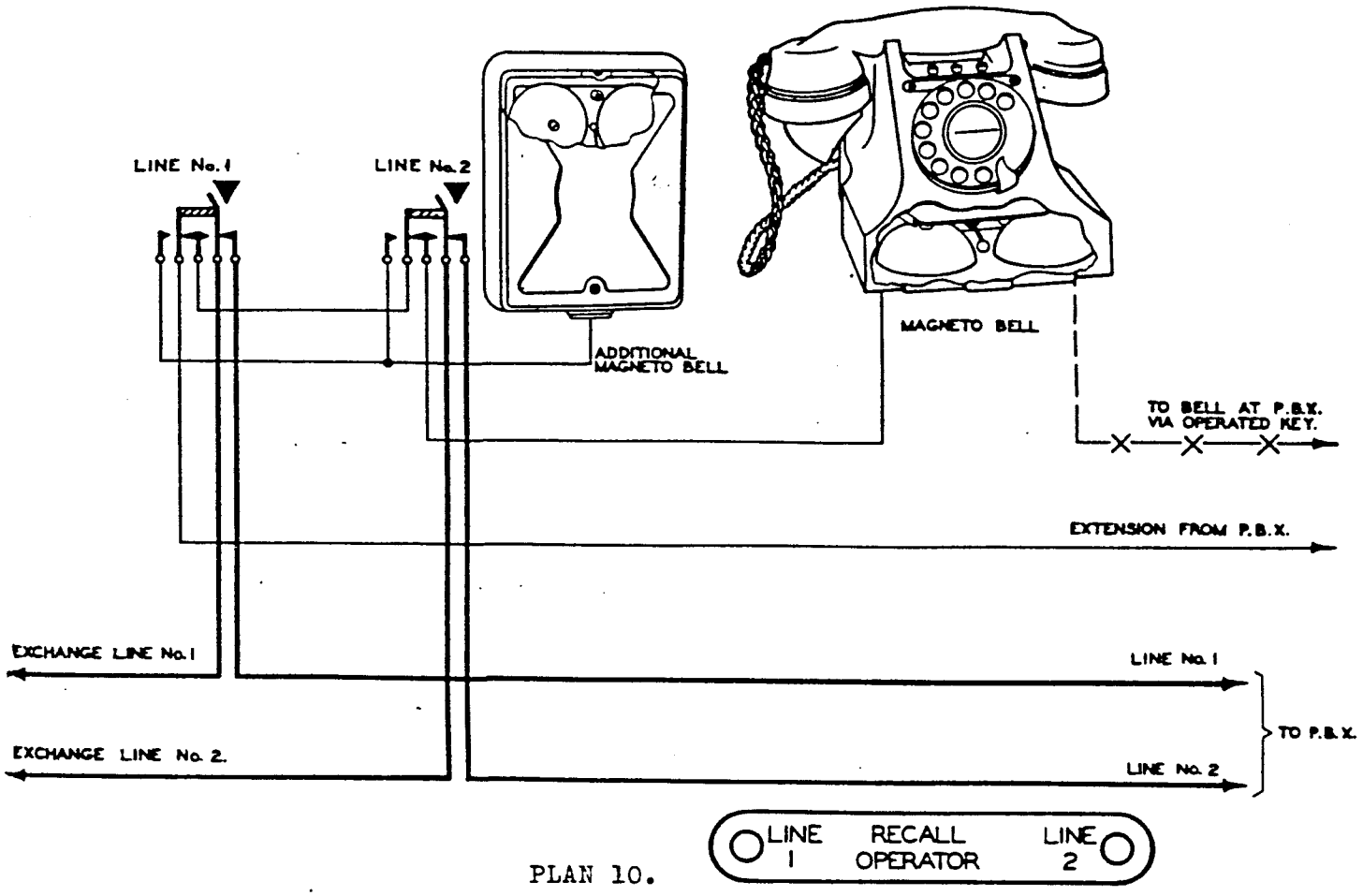
When dealing with a call on the first line, the operation of a press button enables an enquiry to be made on the second line whilst holding the call on the first line, when the enquiry is completed, operation of another press button returns the extension to the first call and releases the second line.

Operation of the receiver rest will also release the second line.

The telephone used on this system is a TELE 328 with a KEY 303a and a LABEL 252L.

The "N" diagrams are :-

N 1432	Facility Diagram.
N 4313	Wiring Diagram.



PLAN 10.

Plan 10 consists of a PBX extension with secrecy from the Switchboard on two exchange lines.

All calls are connected via the PBX operator, if the extension wants secrecy the appropriate press button is operated only after the call is established, this connects the extension directly to the exchange line and disconnects the exchange line from the PBX.

If an exchange is connected in the secrecy mode, the PBX can ring the extension via an additional magneto bell fitted at the extension, this is to attract the extension users attention if they leave the secrecy switch operated when their call is finished, this only applies if a 200 type of telephone is used on the extension, when using 300 or 700 types the secrecy buttons are released by replacing the handset on the receiver rest, the additional bell is still provided, but in this case it is used to attract attention if a call is waiting on another exchange line.

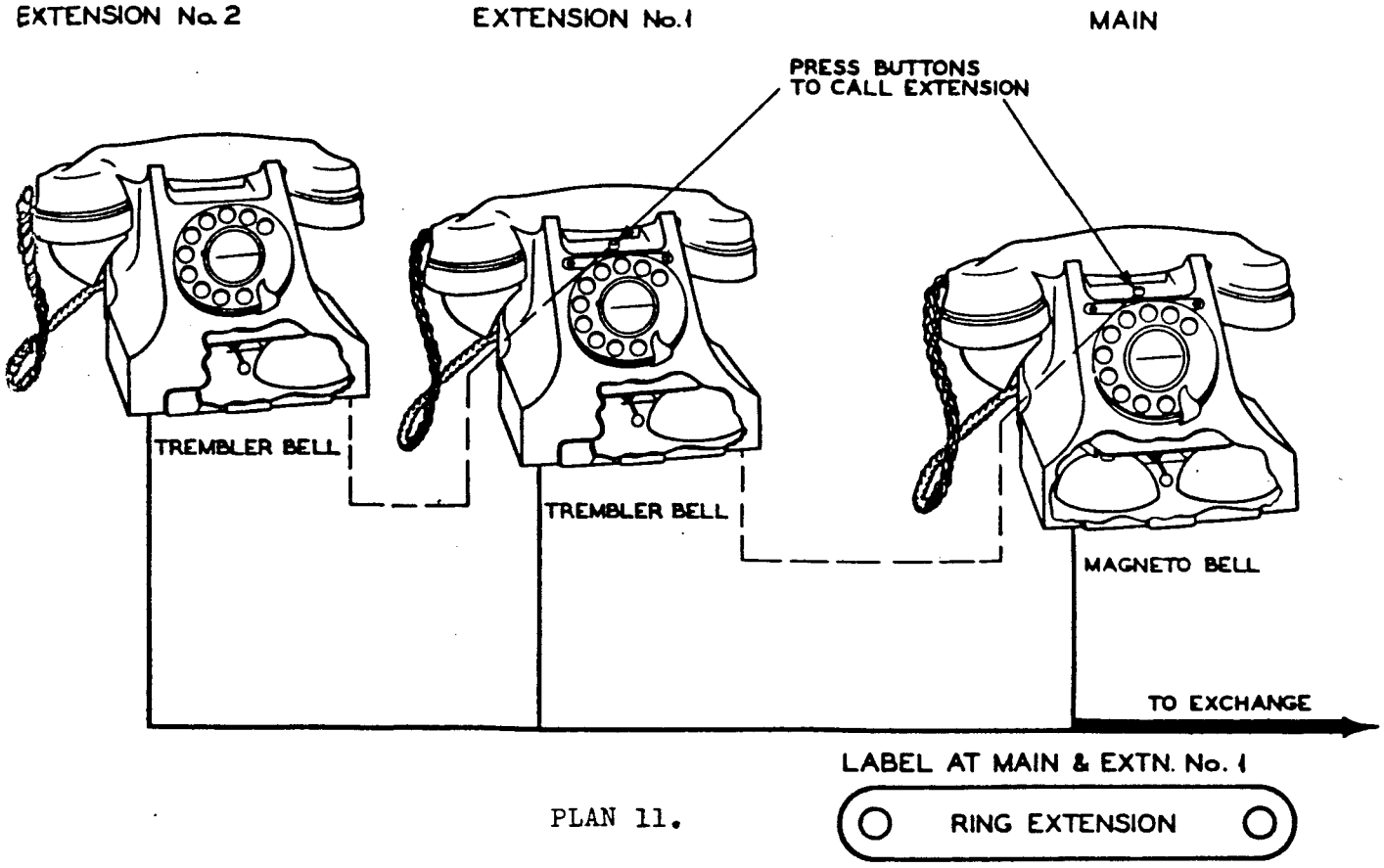
No indication is provided at the extension to show if a line is in use, and the extension could seize a line and interrupt an established call, to prevent this there is a ruling that all calls must be initially connected via the PBX operator; this rule is difficult to enforce and human nature being what it is, Plan 10 facilities are strongly discouraged.

The instrument used on this plan is a TELE 328 minus cord, with a CORD INST 12/039 a KEY 303a and a LABEL 252k.

The"N" diagrams are:-

N 1433 — Facility Diagram.

N 4314
N 4553 — Wiring Diagrams.



PLAN 11.

Plan 11 consists of a main telephone and two extensions with double stage filtering facilities.

In the 1940/50's, as subscribers requested different SEP's to be combined, various methods were devised to accomplish this,and the Plan 11 was then redesignated as Plan 1 off a Plan 1.

Plan 11 is designed for incoming calls to be received at the main and passed to an extension and then, if necessary, passed to a further extension, each stage of filtering is passed by operation of a press button and a trembler bell within the extension telephones.

All of the telephones can access the exchange line direct.

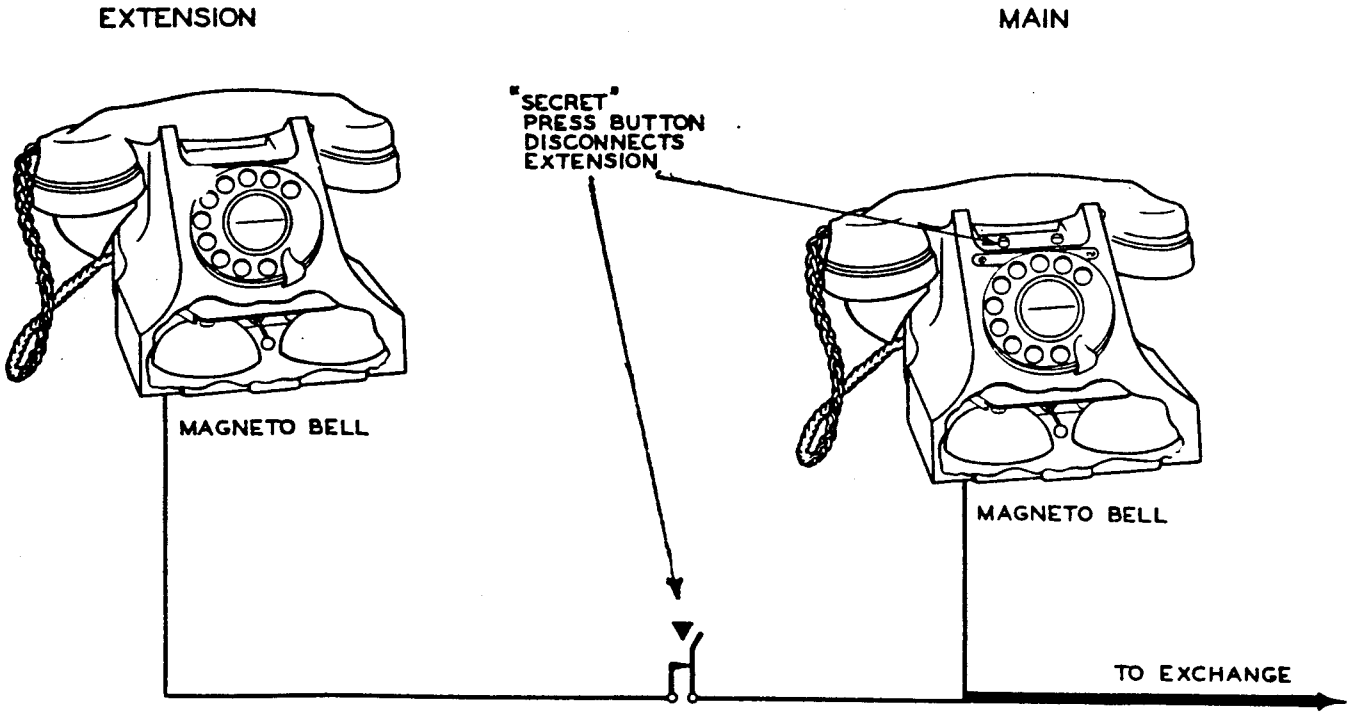
There is no secrecy between the telephones, and officially there was no intercommunication!!!!

The main telephone is a TELE 330 with a LABEL 252a, and the extensions use TELE's 326, Extension 1 has a KEY 304a and a LABEL 252a, Extension 2 does not require these items, but I suppose that someone in planning had considered having multiple filtering by a string of Plan 1's off Plan 1's.

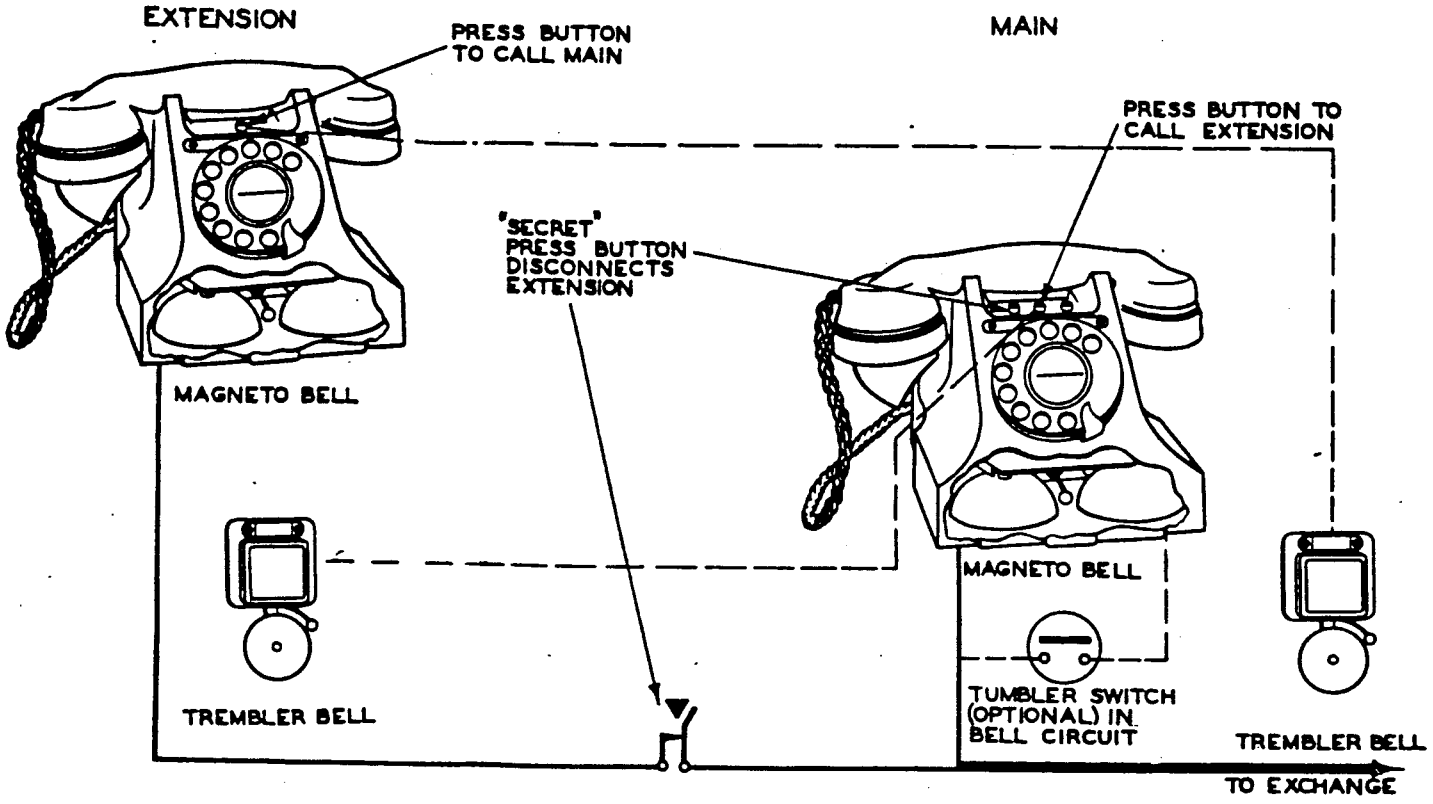
The "N" diagrams are :-

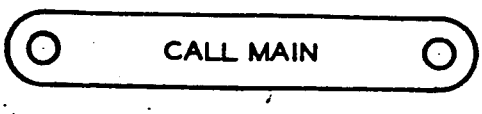
N 1434 Facility Diagram.

N 4315 Wiring Diagram.



PLAN 12.





PLAN 12a.

Plans 12 & 12a consist of a main telephone with secrecy from a single internal extension.

TWO telephones normally in parallel are connected to one exchange line or a PBX extension with a secrecy switch at the main.

Incoming calls ring the bells at both telephones, either telephone can originate outgoing calls.

The main can cut off the extension by pressing the "SECRET" button, and restore by operating the "NORMAL" press button.

There is no intercommunication between the main and extension. !!!

Plan 12a provides the facility of signalling both ways between the main and the extension so that an established call can be transferred, batteries are provided at the extension to ring the trembler bells.

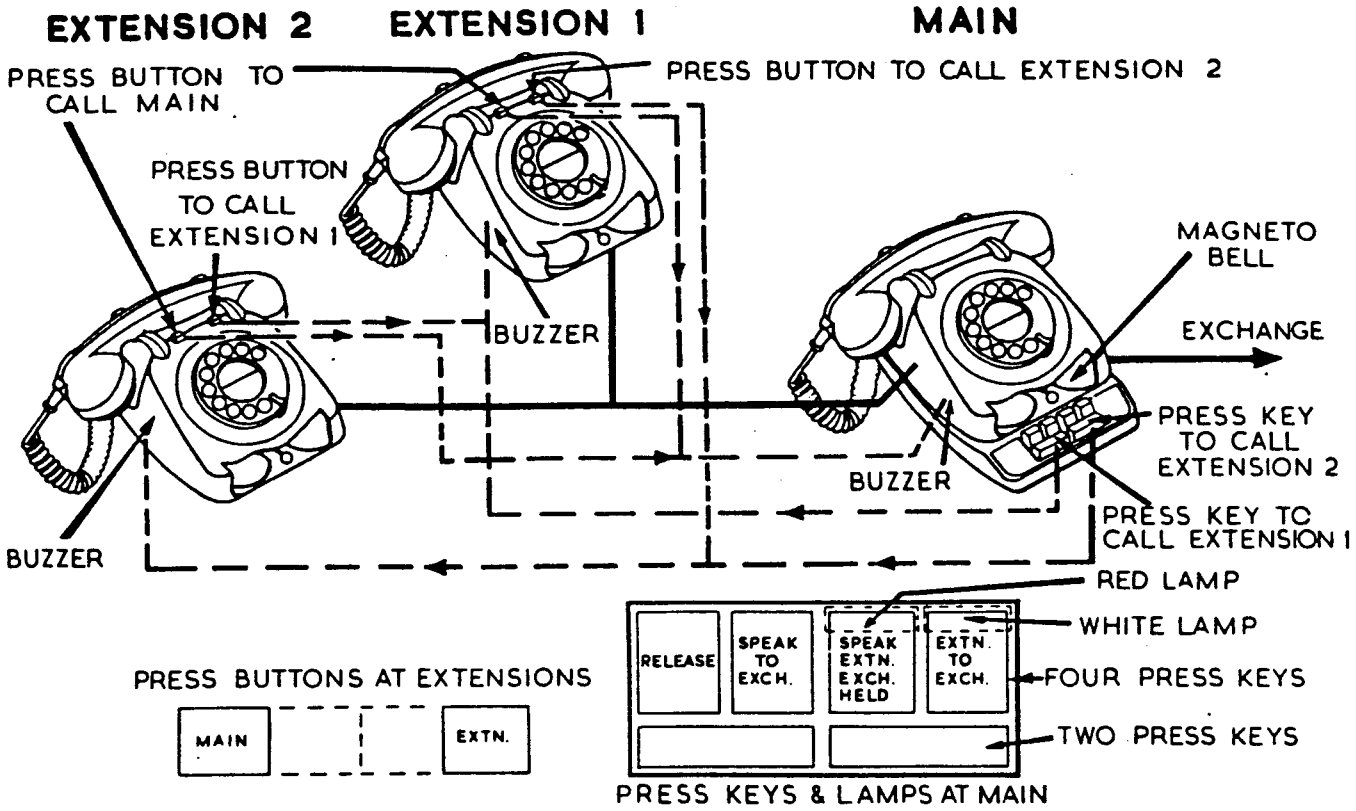
A switch may be fitted at the main to short circuit the magneto bell, if required, on the Plan 12a.

Plan 12 uses a TELE 328 with a KEY 303a and a LABEL 252d, on the main, the extension is a TELE 332.

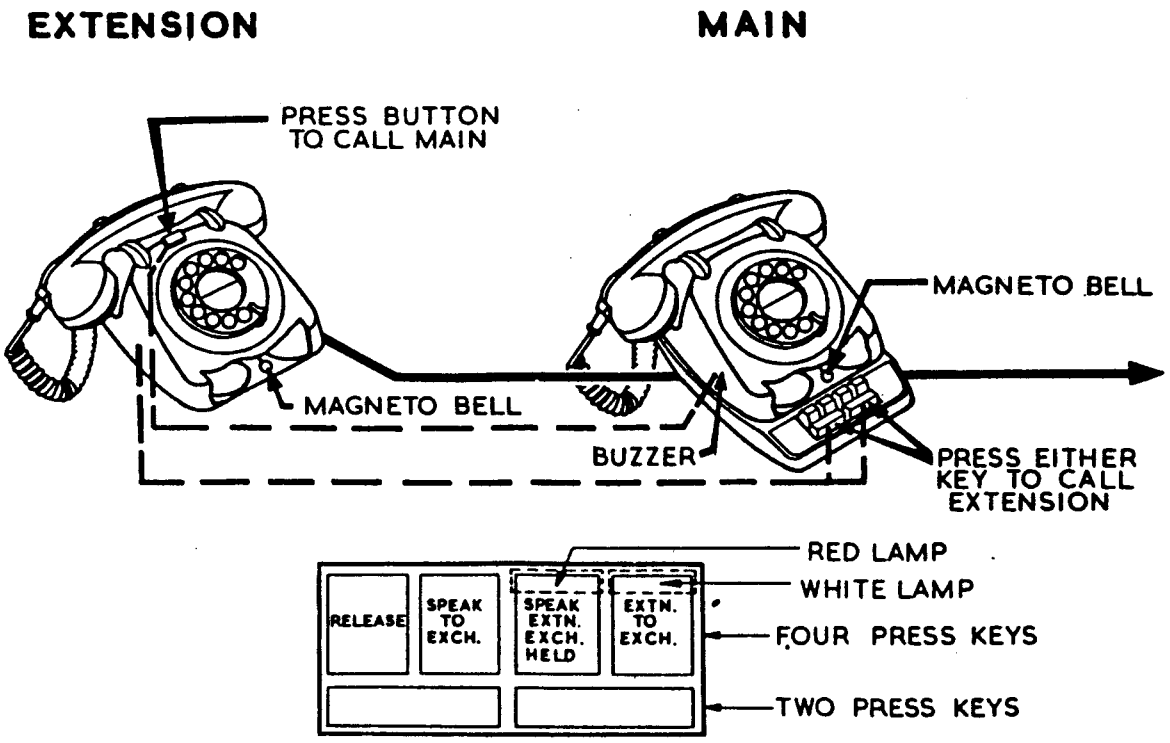
Plan 12a has a TELE 328, a KEY 303a, a LABEL 252p, a BELL 56a, a RECTIFIER ELEMENT 205 for the main, and if required a SWITCH TUMBLER 1m to mute the magneto bell, the extension uses a TELE 328, KEY 302a, LABEL 252e, BELL 56a, RECTIFIER ELEMENT 205 and a BOX BATTERY No 3, with 3 CELLS R40.

The "N" diagrams are :-

N 1437	Plan 12 Facility Diagram.
N 1438	Plan 12a Facility Diagram.
N 4316	Wiring Diagram.



PLANS 105 & 105a.



PLANS 107 & 107a.

PLANS 105, 105a, 107, & 107a.

I will describe the Plan 107 first, as most of the facilities apply to the other SEP's in this group.

Plan 107 consists of a main telephone and switching unit, and an internal or external extension with intercommunication.

Incoming calls are normally received at the main but can be received at the extension if required.
Exchange calls from the main are secret from the extension.

The main can hold an exchange call and speak to the extension without being heard by the exchange line.

A white-lamp at the main indicates that the line is in use by the extension, and a red lamp shows when a call is being held.

Press button signalling is used from main to extension and vice versa.

If the line is switched through to an internal extension, and a call is received the main bell will ring, if the extension is external a buzzer will sound at the main.

Signalling from the main will operate a buzzer at an internal extension, or a bell if the extension is external.

Plan 105 is similar, but has two extensions, press button signalling is provided both ways whether the extensions are internal or external.

Once a call has been set up between an external extension and the exchange line the main cannot be called in by the extension.

Both internal extensions have direct intercommunication, but external extensions must contact each other via the main for extension to extension calls.

The extensions can be, both internal, both external, or one of each, but in the latter case the internal extension must be wired as a two wire external extension.

The necessity of having external extensions,(possibly in different sites) means they must operate on two wires, this means that a special unit must be used to provide ringing over a two wire circuit.

Secrecy from main to extension is only provided on Plans 105a & 107a.

In all these SEP's the main is a TELE 706 with an ADAPTER PLAN SET No. 1, mounted on a PLAN SET 625, powered by a POWER UNIT 53a. and if external extensions were used a CONVERTER RINGING No. 9, was provided.

Internal extensions use a TELE 710, 2 off PARTS 1/DSP/1245, a PART 3/DBU/260, a PART 4/DBU/260, and a BUZZER 32a-1.

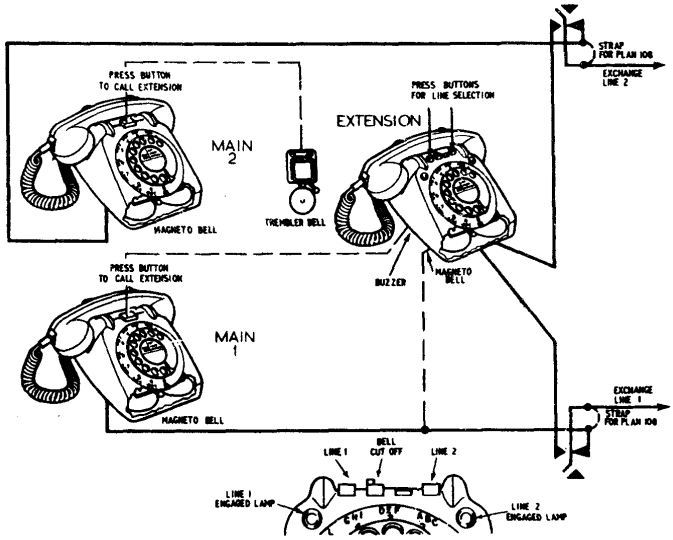
External extensions use TELE 706 with ADAPTER SHARED SERVICE No.3, a PART 1/DSP/1233 and a LABEL 358g.

The "N" diagrams are :-

N 1450	Facility Diagram Plans 105 & 105a.
N 1451	Facility Diagram Plans 107 & 107a.
N 4507	Wiring Diagram Plans 105 & 105a.
N 4509	Wiring Diagram Plans 107 & 107a.

ADDENDUM

Plans 108 and 108a must have escaped Thomas' attention when he prepared this booklet. Thanks to Neil Johannessen for pointing this out. Here is the missing page created in a similar style. [SMH 2010]



Plans 108 & 108A

Plans 108 and 108a consist of two exchange lines with two Main telephones and a common internal Extension. They are not normally provided on extensions of a P.B.X.

FACILITIES:

On Plan 108 the operation of press-buttons at the Extension connect this telephone in parallel with either line. Lamps at the Extension indicate when a line is engaged by the Main

On Plan 108A the operation of press-buttons at the Extension connect this telephone to either line and disconnects the associated Main telephone. The line is restored to normal when the Extension handset is replaced. Lamps at the Extension indicate when a line is engaged by the Main

- Incoming calls are normally received at the Main telephones
- The Mains can call the Extension by press-button, operating for one line a buzzer and for the other a trembler bell
- All telephones call the exchange direct
- Conversation on either Main cannot be overheard by the other Main
- The magneto bell in the Extension telephone is associated with Line 1 and can be switched on
- or off as required
- Intercommunication is not provided

Main telephones are Tele No 746 fitted with a press button and auxiliary gravity switch. Extension telephones are Tele No 740 fitted with three buttons and associated springsets together with indicator lamps. One extension contains an internal buzzer. The other extension has an external trembler bell.

The N Diagrams are:

N 1452	Facilities Diagram
N 4511	Wiring Diagram