



*Etelco*  
LIMITED

22 Lincoln's Inn Fields, LONDON, W.C.2

WORKS: BEESTON, NOTTINGHAM, ENGLAND

WORKS :—  
BEESTON,  
NOTTINGHAM

Telephones:  
BEESTON  
54225 (6 lines)

Telegrams:  
TELEPHONE WORKS  
BEESTON—NOTTINGHAM



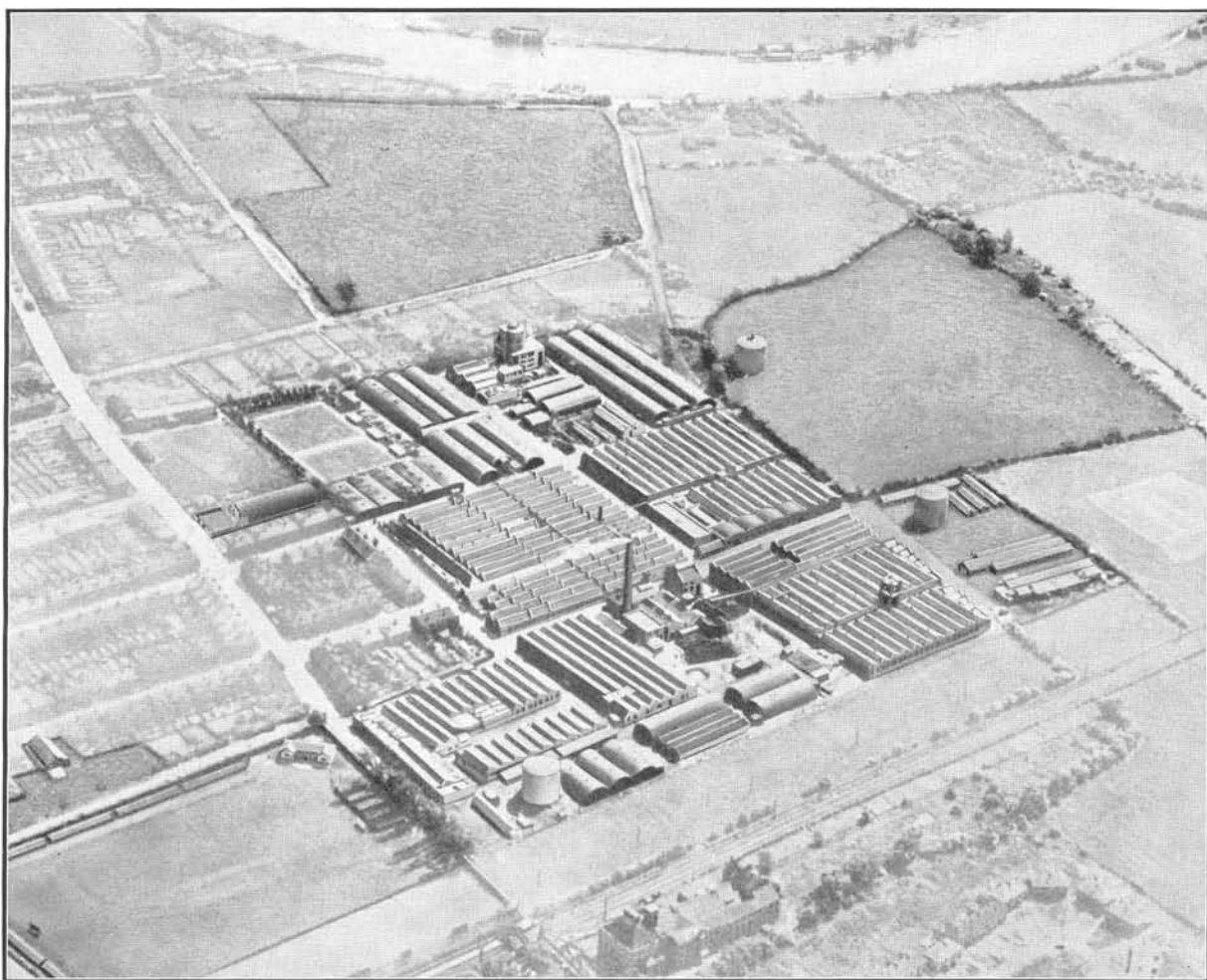
HEAD OFFICE :—  
22 LINCOLN'S INN FIELDS  
LONDON, W.C. 2

Telephones.  
HOLBORN  
6936 (5 lines)

Telegrams:  
ETPHONE  
LONDON

**TELECOMMUNICATION ENGINEERS AND MANUFACTURERS**

**TELEPHONES — SWITCHBOARDS — ACCESSORIES**



Aerial View of Telephone Works, Beeston, Nottingham



## BRANCHES AND AGENTS

### HOME:

ERICSSON TELEPHONES LIMITED  
16/18 Russell Street  
MANCHESTER, 1

NORTH BRITISH ENGINEERING  
EQUIPMENT CO.  
Milburn House, NEWCASTLE-ON-TYNE, 1

E. G. SMITH  
6 Moor Park Avenue  
Headingley, LEEDS 6

LAND, SPEIGHT & CO. LTD.  
73 Robertson Street  
GLASGOW, C.2

J. COPE LTD.  
199 City Road,  
CARDIFF

W.M. THOMAS  
80 Lyndon Road, Olton,  
BIRMINGHAM 27

### OVERSEAS

AUSTRALIA  
ERICSSON TELEPHONE MFG. CO.  
139 Clarence Street, SYDNEY

EGYPT  
W. D. LONG  
P.O. Box 1937, CAIRO

SOUTH AFRICA  
ROGERS JENKINS & CO. (Pty.) LTD.  
Marshall & Nugget Streets, JOHANNESBURG  
23/25 Bree Street, CAPETOWN  
Milne Street, DURBAN

BRANCHES AND AGENTS THROUGHOUT THE WORLD

## MANUFACTURES

### EXCHANGES

Automatic and Manual  
Public, Private and Private Branch

### SWITCHBOARDS

C.B., C.B.S., and Magneto

### TELEPHONES

Domestic	Police
Field	Portable, Testing
Hotel	Public Service
Intercom.	Railway
Loudspeaker	Ships
Mining	Traction

### TRANSMISSION EQUIPMENT

Carrier, Repeater, etc.

### POLICE SYSTEMS

Signalling and Communication

### BURGLAR ALARM SYSTEMS

Fully automatic and adaptable to any building

### SIGNALLING SYSTEMS

For hotel, etc., staffs

### TOTALISATOR EQUIPMENT

For outdoor and/or indoor displays of  
automatically calculated units.

### MISCELLANEOUS

Bells	Protective Apparatus
Headphones	Deep Drawing
Indicators	Press Stampings
Plugs	Turned Parts
Relays	B.A. Screws and Nuts
Terminals	Washers
Office Furniture and Woodwork	
Paints, Varnishes, Lacquers, etc.	
Metallic Powders	





## Terms of Business

ENQUIRIES must be addressed to the Head Office of the Company, 22 Lincoln's Inn Fields, LONDON, W.C. 2.

ILLUSTRATIONS are not binding, owing to improvements made from time to time.

OVERALL DIMENSIONS AND WEIGHTS are given to assist shipping estimates, but must be accepted in all cases as approximate only.

ORDERS should always quote the Catalogue Number (i.e., Code No.) of the article. The standard instruments, which are generally kept in stock, should be ordered if possible, as alterations cause delay in delivery and extra cost.

DELIVERY is made free in Great Britain, or f.o.b. British Port.

PACKING CASES will be credited in full if returned in good condition within 14 days, carriage paid, and duly advised.

RETURN OF GOODS must not be made without our consent.

CLAIMS for shortages or damaged goods must be made on the Carriers or Railway Company within three days of receipt, and our assistance to secure a satisfactory adjustment will be gladly given.

**NOTE.—No goods, except samples, will be received at the London Office.**





## Foreword

Our manufactures are so varied that it would be practically impossible to illustrate and describe all in a publication of this nature. This catalogue therefore, contains illustrations and particulars of the apparatus and parts mostly used and which are generally kept in stock.

Our aim is to furnish such information that customers can readily determine the type of article best suited to their particular needs.

The Company is world-renowned for telephone products which are distinctive and unexcelled for design, workmanship and reliability.

In a modernly-equipped factory we manufacture only the very best equipments from the highest-grade materials. We have a staff of competent engineers who are always ready to assist customers with their problems.

The apparatus is arranged under three main sections, viz. :—

Telephones  
Switchboards  
Accessories

Each of these three sections is preceded by a coloured leaf on which is printed an index of the articles following.

To facilitate the ordering of spares or replacements such as cords, receivers and transmitters, in most cases the code numbers of these parts are given on the same page as the instrument of which they form integral parts, as well as in the "Accessories Section." It is, however, advisable for the customer to state also the code number of the instrument for which the parts are required.

We have had considerable experience and have thoroughly investigated the requirements in manufacturing our products to give long service and withstand the severe climatic conditions of the **Tropics**, and unless stated to the contrary all catalogued items can be supplied for such use.

When ordering goods for use in the **Tropics** or very damp climates the letter "T" must be added to the code numbers given in this catalogue.

Lightning arresters and earth terminal are not generally fitted on telephones, and must be specially ordered ; similarly, batteries are not supplied except when specifically stated.

Where instruments or other apparatus are required for operating on existing systems, the customer should give the important particulars of the system, as this will often save correspondence and thus expedite delivery of the goods.



# Telephones

## INDEX

	PAGE		PAGE
Automatic Telephones .. ..	7 to 16	Intercommunication Telephones ..	29 to 35
Automatic Telephones, Intercom- munication, with Exchange Facilities	13-14	Intercommunication Telephones, Automatic, with Exchange Facilities	13-14
Automatic Telephones, Intermediate and Extension .. ..	11	Intercommunication Telephones, C.B.	31-32
Automatic Telephones, Iron cased, Flameproof, Certified .. ..	15	Intercommunication Telephones, C.B. Loudspeaker .. ..	33-34
Automatic Telephones, Loudspeaker	12	Intercommunication Telephones, C.B. Person Finder .. ..	35
Automatic Telephones, Plan Number Working .. ..	9-10	Intercommunication Telephones, C.B. with Exchange Facilities ..	29-30
Automatic Telephones, Portable ..	16	Intercommunication Telephones, Magneto, with Exchange Facilities	14 (note)
Battery Ringing Telephones ..	17 to 22	Intermediate Telephones, Automatic	11
Battery Ringing Telephones, Mines Rescue, Certified .. ..	21-22	Intermediate Telephones, C.B. ..	27
Battery Ringing Telephones, Mining, Certified .. ..	18	Iron Cased Telephones, Automatic	15
Battery Ringing Telephones, Portable, Mines Rescue .. ..	21-22	Iron Cased Telephones, Battery Ringing .. ..	18
Battery Ringing Telephones, Railway	19-20	Iron Cased Telephones, C.B. ..	28
Call and Reply Telephones ..	36	Iron Cased Telephones, Magneto	43-44
C.B. Telephones .. ..	23 to 36	Loudspeaker Telephones, Automatic	12
C.B. Telephones, Call and Reply ..	36	Loudspeaker Telephones, C.B., Intercommunication .. ..	33-34
C.B. Telephones, Intercommunication	29 to 35	Magneto Telephones .. ..	37 to 45
C.B. Telephones, Intercommunication Loudspeaker .. ..	33-34	Magneto Telephones, Convertible ..	38
C.B. Telephones, Intercommunication, Person Finder .. ..	35	Magneto Telephones, Intercommuni- cation, with Exchange Facilities ..	14 (note)
C.B. Telephones, Intercommunication with Exchange Facilities ..	29-30	Magneto Telephones, Iron Cased, Mining, Certified .. ..	43-44
C.B. Telephones, Intermediate and Extension .. ..	27	Magneto Telephones, Plan Number Working .. ..	39-40
C.B. Telephones, Iron Cased, Flame- proof, Certified .. ..	28	Magneto Telephones, Portable ..	45
C.B. Telephones, Plan Number Working .. ..	25-26	Mine Rescue Telephone, Certified	21-22
C.B. Telephones, Portable .. ..	36	Mining Telephones, Battery Ringing	18
Convertible Telephones .. ..	38	Mining Telephones, Magneto ..	37, 42-44
Extension Telephones, Automatic ..	11	Mining Telephones, Portable ..	45 (note)
Extension Telephones, C.B. ..	27	Person-Finder Telephones .. ..	35
Flameproof Telephones, Automatic	15	Portable Telephones, Automatic ..	16
Flameproof Telephones, C.B. ..	28	Portable Telephones, Battery Ringing	21-22
Flameproof Telephones, Magneto ..	43-44	Portable Telephones, C.B. ..	45
		Portable Telephones, Magneto ..	45
		Portable Telephones, Mining ..	45 (note)
		Railway Telephones .. ..	18 to 20



## Automatic Telephones



**N 1014A Type**

This is our latest automatic telephone and is alternative to the N1002 instrument, the efficiency of which has made it so popular. The new set gives equally satisfactory service and includes the same types of components in a re-designed case, having rounded contours of aesthetically pleasing shape.

The simplicity of outline will have wide appeal and is enhanced by the bakelite micro-telephone which is moulded to conform with the case.

A feature of the instrument is the clean interior arrangement making the components readily accessible for maintenance.

With the exception of the automatic dial and the plunger mechanisms, the equipment is attached to the inside of the baseplate which is fastened by four captive screws.

Components are of standard, proved type, with finishes suitable for temperate or tropical conditions, as specified on the order.

Screw terminals are provided for the connections, and the line wires are attached to a bakelite terminal block connected to the telephone by a flexible cord.

Code No. N1014A Type.      Dimensions  $9\frac{1}{4} \times 7\frac{1}{2} \times 5\frac{1}{2}$  inches.

**Note**—This instrument is not designed to accommodate a directory tray.

The standard B.P.O. micro-telephone, N5875B type, can also be used with this instrument.





## C.B. Telephones



**N 1373A Type**

The simple yet distinctive appearance of this C.B. equivalent of the automatic telephone overleaf will have instant appeal.

It is alternative to the N1365 instrument, and equally efficient in service, the same types of components being used but rearranged to conform with the new shape of the bakelite case. The latter has pleasingly rounded contours and a removable instruction plate to enable an automatic dial to be fitted.

The specially shaped micro-telephone enhances the general appearance of the set and has the same high transmission and reception qualities as the standard H.M.T.

Twin, smoothly operating plungers ensure reliable operation of the cradle-switch springs which, with all other components, including the ringer, are mounted on the inside of the baseplate attached to the case by four captive screws.

The instrument is easy to keep clean and maintenance is facilitated by the accessibility of the parts.

The internal wiring is connected to screw terminals, while a flexible cord and bakelite desk terminal block are provided for the external lines.

Instruments can be supplied with standard or tropical finish.

Code No. N1373A Type.      Dimensions  $9\frac{1}{4} \times 7\frac{1}{2} \times 5\frac{1}{2}$  inches.

**Note**—This telephone is not designed to accommodate a directory-tray.

The standard B.P.O. micro-telephone, N5875B type, can also be used with this instrument.



## Automatic Telephones



**N 1002 Type**

This, the most modern and improved automatic table telephone is embodied in a moulded bakelite case.

The design is distinctive and pleasing and incorporates a form of cradle or micro-telephone rest which is not readily damaged.

The interior apparatus including a magneto bell is mounted on a frame which can be removed as a unit, so that the sets are self-contained.

There is a sliding instruction tray with directory pad accommodation combined in the base plate. Pads are easily inserted and are included only when ordered.

The reception and transmission efficiencies of the bakelite micro-telephone with inset transmitter and detachable receiver are vastly superior to the solid-back type, and the anti-side-tone induction coil in the circuit reduces the reproduction of extraneous noises and side-tone to a minimum.

Terminal blocks have raised ribs to minimize surface leakage.

If required, a radio interference suppression unit can be supplied, for which provision for fitting exists in each set.

This telephone is normally produced in black, but if specially ordered it can be supplied in chinese red, ivory or jade green. Instruments can also be obtained without the sliding tray fitment.

Micro-telephone cord N4021, Inset N7752, Mouthpiece N8634, Receiver N6819, Earpiece N4443, Receiver diaphragm N4400, Terminal block cord N4317.

Overall dimensions  $9\frac{1}{4} \times 8\frac{1}{2} \times 6$  inches. Weight 6 lb.

Code No.	Description	P.O. No.
N1002A	Black bakelite with sliding tray and non-director dial.	} 332 type
N1002L	Black bakelite with sliding tray and director area dial.	
N1002H	Black bakelite without sliding tray, with non-director dial.	



## Automatic Telephones



**N 1071A**

This wall type telephone is a robust, dependable instrument as distinctive in design as the table set.

The moulded bakelite casework is gate-hinged on a metal baseplate, to which it is fastened by one screw, and the cradle is designed to allow the micro-telephone to be suspended vertically over the front of the instrument during the temporary absence of the user.

The interior apparatus is in the form of a self-contained unit which can be readily removed from the case ; alternatively, the case, with equipment unit attached, can be lifted off the hinges for maintenance purposes.

Standard components of proved efficiency, similar to those in the table set, are used throughout and ensure first-class transmission and reception.

These instruments are normally black, but they can be obtained in chinese red, ivory or jade green if specially ordered.

Micro-telephone Cord N4021

Inset N7752

Mouthpiece N8634

Receiver N6819

Earpiece N4443

Receiver Diaphragm N4400

Code No.	Description	Dimensions inches	Weight lb. oz.	P.O. No.
N1071A	Black bakelite case with non-director dial	$8\frac{1}{2} \times 9\frac{1}{4} \times 4\frac{1}{2}$	6 5	333 type





## Automatic Telephones

### PLAN NUMBER WORKING



**N 1003 Type**



**N 1005 Type**

These telephones are for providing economically various extension schemes without the use of separate switches or switchboards.

They are arranged to accommodate key units having from one to nine spring sets of the make-before-break change-over type, i.e., "K" combination. The spring sets are operated by push buttons, and are illustrated overleaf.

For a simple extension or for recalling a P.B.X. operator the instrument N1003 type has a key unit with one set of K springs.

For other extension schemes the key units have a number of K spring sets, the standards being for 4 and 9 sets. The push buttons on a telephone with a 4K spring set operate respectively (left to right) 2K-1K-1K spring sets, while with a 9K set, 4K-1K-4K are operated.

Each contact spring is wired to a separate terminal so that the scheme in hand may be readily connected up.

On the 4K and 9K key units there is a mechanism which can be varied to control the non-lock or locking of the two outer keys, the centre key being non-locking. There is also supplied with each of these key units a T piece which is fixed to the cradle lever when the extension plan necessitates the release of a key on replacement of the micro-telephone.

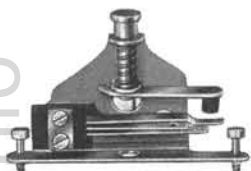
Instruments are also available with battery bells so that plans to suit almost any requirement can be arranged.

The telephones are normally produced in black, but if specially ordered, they can be supplied in chinese red, ivory or jade green. They can also be obtained without the instruction tray and directory pad fitment.

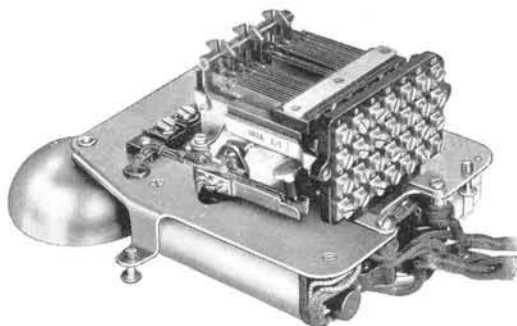


## Automatic Telephones

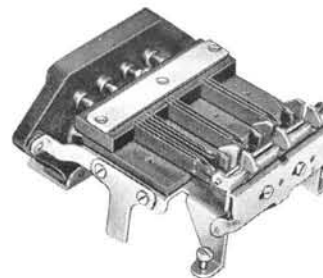
PLAN NUMBER WORKING — *continued*



**N 20629**  
1K Key Unit



**N 20630**  
9K Key Unit Mounted



**N 20631**  
4K Key Unit

For telephones with two or three push buttons the key unit required must be stated.

In the case of plans requiring only two push buttons, chromium finished dummies can be supplied for the third hole.

**The terminal blocks, cords and labels vary according to the plan required, so that full details regarding the scheme to be operated should be supplied when ordering.**

Circuit diagrams of various plans can be supplied on request.

Overall dimensions  $9\frac{1}{4} \times 8\frac{1}{2} \times 6$  inches.

Maximum weight 6 lb. 8 oz.

The instruments in the table below are complete with instruction tray fitment.

Code No.	Description
N1003A	Black bakelite, non-director dial, magneto bell, 1K key unit and button.
N1005A	Black bakelite, non-director dial, magneto bell, three buttons, (key unit to be stated).
N1006A	Black bakelite, non-director dial, battery bell, no buttons or keys.
N1007A	Black bakelite, non-director dial, battery bell, 1 K key unit and button.
N1009A	Black bakelite, non-director dial, battery bell, three buttons, (key unit to be stated).

**Note**—Wall telephones for Plan Number working can also be supplied.



## Automatic Telephones

### INTERMEDIATE AND EXTENSION

This intermediate set allows an extension the use of the exchange line, as well as intercommunication, and is ideal for the executive with secretary.

The switching mechanism consists of four inter-acting push-button keys in the top panel above a window through which "engaged" is displayed by the operation of an indicator-relay during extension-to-exchange conversations.

Other fittings include an "alnico" generator, a ringer for exchange calls (extension calls operate a ringer in the wall case) and a dial, normally of P.O. pattern, but other types can be fitted.

Extension-to-exchange calls can be made secret or non-secret from intermediate and an audible signal at their conclusion can be arranged if desired.

A maximum line loop resistance of 800 ohms ensures satisfactory working.

A small battery is required for speech current during extension-to-intermediate conversations.

Inset N7752	Mouthpiece N8634	Earpiece N4443	Diaphragm N4400
HMT cord N4021	Terminal cord N4337	Condenser N3701B	Genr. handle N70900

Code No. N1046H includes wall case N3114.

Overall dimensions,	Telephone : $12\frac{1}{4} \times 9\frac{1}{4} \times 6\frac{1}{4}$ inches.	Weight $10\frac{3}{4}$ lb.
Overall dimensions,	Wall case : $8\frac{1}{2} \times 6\frac{1}{2} \times 2$ inches.	Weight 3 lb.

### EXTENSION INSTRUMENT

This is a standard auto set adapted to accommodate an "alnico" generator for calling the intermediate station and contains a 1000-ohm ringer. The automatic dial is used for calling the exchange.

Condenser N3679, Genr. handle N71541, Terminal cord N4317. Other codes as above where applicable.

Overall dimensions  $8 \times 9\frac{1}{2} \times 6\frac{5}{8}$  inches.  
Weight  $7\frac{1}{2}$  lb.



**N 1046H Type**



**N 1049H Type**

**Note**—Equivalent sets for short distance working, with one or two extensions, and fitted with push-buttons for battery signalling, in lieu of "alnico" generators, can also be supplied.

Code Nos. N1047H (intermediate). N1048H (extension).





## Automatic Telephones

### LOUDSPEAKER TYPE



**N 8951A**

With N21910 Keybox

This equipment has been specially designed to work in connection with private automatic exchanges, and is primarily for use in an executive's office so that communications may be carried on without engaging either hand, which is necessary when using an ordinary telephone instrument. Reception is by means of a loudspeaking receiver and transmission by means of a sensitive microphone. Should, however, privacy of reception be desired, the loudspeaker can be cut off and the bakelite micro-telephone used.

The polished wood case contains an amplifier suitable for 200—250 volts a.c. supply, a microphone, a loudspeaking receiver and a call buzzer. Switches are provided for connecting power to the amplifier and for cutting off the loudspeaker.

Direct calling on 5, 10 or 20 lines by means of lever keys, can be arranged by the addition of a plinth, as illustrated, and extra keys can be incorporated to provide secretarial, preference or silence facilities, the last-named enabling all incoming calls to be suppressed when the executive wishes to be undisturbed.

When ordering, the facilities required, the number of direct lines and the exchange voltage (24v or 50v) should be stated.

Code No.	Description	Dimensions inches	Weight lb.	
N8951A	Loudspeaking Telephone	$15\frac{1}{2} \times 9\frac{3}{4} \times 5\frac{3}{4}$	21 $\frac{3}{4}$	
N21910	Direct Call Keybox	$15\frac{1}{2} \times 9\frac{3}{4} \times 2\frac{1}{8}$	13 $\frac{3}{4}$	

**Note**—Loudspeaking Telephone equipment is not available at present in a tropical finish.



## Automatic Telephones

### INTERCOMMUNICATION WITH EXCHANGE FACILITIES



**N 1671 Type**

This distinctive and registered design combines all the facilities of a small switchboard and an intercommunication system in one instrument. The case is of moulded bakelite and incorporates a much improved type of micro-telephone rest which has been specially designed with a view to reducing the risk of breakages. The interior mechanisms and apparatus are arranged to give maximum accessibility to all parts and the buzzer is mounted on the connecting plug so that it may be readily adjusted without interfering with the instrument. Each set is connected up to a system on the plug-and-jack principle. If required a directory tray can be fitted under the base.

In order that the instrument should not be unnecessarily complicated, certain facilities were aimed at when designing, and the following have been achieved and standardized.

1. There is only one design of instrument for C.B. and automatic public exchanges, except that for the latter a dial is fitted.
2. Any instrument in an installation may be arranged as the master station.
3. Calls to or from the public exchange are secret. Local calls on the intercommunication system are non-secret.
4. The engaged test is provided on "busy" exchange lines.
5. Exchange lines may be "held," if it is necessary to intervene with another call.
6. Exchange calls can be transferred direct from one station to another.
7. Any selected stations can be arranged to supervise the exchange lines.
8. The master station controls trunk offering facilities.
9. Exchange calls may be barred to any station at the discretion of the master station.
10. The calling and clearing signals, at all types of public exchanges, are given direct from any station.
11. Any number or arrangement of the local stations can be connected for conference purposes.
12. An engaged test is given on stations engaged on exchange lines.



## Automatic Telephones

### INTERCOMMUNICATION WITH EXCHANGE FACILITIES—*continued*



**N 9001A**

13. Simple external extensions working on two lines only can be connected (i.e., useful for stations at considerable distances).
14. To operate from power supply over leads from the nearest exchanges.
15. Exchange lines connected through to a selected station for night service.
16. Exchange line buttons may be released without replacing the micro-telephone.
17. One size of case but two equipments, i.e., 1 exchange and 5 extensions, and 2 exchange and 10 extensions.

The station selected in an installation to act as the master station for the care of incoming exchange calls is fitted with an auxiliary or transfer unit, one of which is illustrated.

Code No.	Description	Dimensions inches	Weight lb.	P.O. No.
N1669	Auto Set for 1 exchange and 5 extensions	$6\frac{1}{4} \times 12\frac{1}{4} \times 9\frac{1}{4}$	10 $\frac{1}{4}$	—
N1671F	Auto Set for 2 exchange and 10 extensions	$6\frac{1}{4} \times 12\frac{1}{4} \times 9\frac{1}{4}$	11 $\frac{1}{8}$	—
N9000A	Transfer unit for 1 exchange line	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	10	1/2
N9001A	Transfer unit for 2 exchange lines	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	12	2/2
N9004	External extension unit	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	13	3
N9005A	Unit for 1 exchange and 1 external extension	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	14	1A/2
N3310	30-way junction box for cabling	$8\frac{3}{8} \times 7\frac{5}{8} \times 2\frac{1}{8}$	3 $\frac{1}{2}$	1
N3311	48-way junction box for cabling	$12 \times 8\frac{1}{8} \times 2\frac{1}{4}$	5 $\frac{1}{4}$	2

The plugs are included in the weights but not in the dimensions.

**Note—For working to magneto exchanges similar equipments can be supplied.**

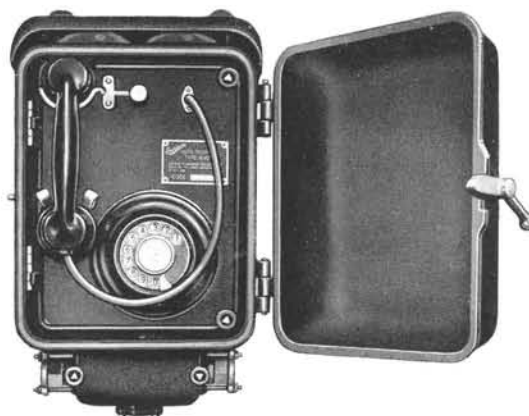




## Automatic Telephones

### IRON CASED, CERTIFIED FLAMEPROOF

CERTIFICATE No. 2378



N 1087C

This instrument is certified Flameproof in Group 2 and Group 3 gases by Ministry of Fuel and Power Certificate No. 2378.

It has been specially designed for outdoor use and will be found to be particularly suitable for railway and ship-yards, docks, chemical factories, petroleum refineries, and other places where it may be exposed to inflammable vapours or atmospheric conditions detrimental to the ordinary type of instrument.

Armoured cable terminating in sealing chambers or wires in sealed screwed conduit must be used throughout a "danger zone."

The cast-iron case is watertight and the inner door is fastened by screw locks requiring a special key for opening. The outer door effectually protects the bakelite micro-telephone and dial when not in use, and the drip-proof cowl fitted on top also protects the ringer gongs without deadening the sound.

The principle of enclosing each contact or switch point in its own flameproof chamber has been adopted, so that the effect of ignition is very small and the volume of gas involved low.

In order to prevent malicious over-rapid dialling, a specially designed coupling is arranged between the finger plate and the dial mechanism.

There is also an isolating switch which disconnects the incoming lines immediately the inner door is opened.

The apparatus, coils and wiring are specially treated to prevent detrimental atmospheric effects.

Overall dimensions  $20\frac{3}{4} \times 12\frac{3}{8} \times 10$  inches. Weight 87 lb.

Code No.	Description	P.O. No.
N1087C	Terminal chamber with sealing glands for armoured cable	—
N1087D	Terminal chamber for terminating sealed screwed conduit	149 type

**Note—Equivalent sets with terminating chamber suitable for Pyrotenax cable can also be supplied.**



## Automatic Telephones

### PORTABLE



N 1845

This is one of the most robust, powerful and compact portable telephones specially designed for use in the field, as a linesman's testing set or a temporary station.

To provide protection against rough usage and weather the cover is constructed of light-gauge steel, partly pressed up and partly fabricated by welding. The various parts are thoroughly cleaned by shot-blast, rust-proofed, and finally treated with a hard-baking synthetic stove enamel. Attached to the case by swivel links there is a strong woven-fabric shoulder strap provided with adjustable buckle fastenings and loops for carrying an earth spike.

In the illustration, the lid of the set is open, the lid protecting the auto dial is partly raised, the micro-telephone removed and the generator handle (which is normally stowed vertically between the protecting projection seen at the right-hand side of the lid), is turned down at right angles and automatically held in either position by a spring loaded slide provided on the crank. The micro-telephone is provided with a press key for closing the battery circuit and the battery compartment with lid closed is in the centre at the back.

The main apparatus comprises a micro-telephone N5874, "alnico" magnet generator N4644 with an output of approximately 3 watts, 2000-ohm magneto ringer N7334, anti-side-tone induction coil N3529, 2 cells N3767 (tropical N3748) and dial N4381F.

The codes of the parts most liable to damage are :— Generator Handle N66862, Earpiece N4443, Mouthpiece N8634, Cord N4053.

**The instruments are suitable for tropical climates if inert dry cells N3748 are fitted.**

Code No.	For use on	Dimensions inches	Weight lb.	
N1845	Auto, C.B., and Magneto	$11\frac{1}{8} \times 5\frac{1}{2} \times 5$	$10\frac{1}{4}$	



## Battery Ringing Telephones



N 1102

This instrument, of moulded bakelite, is specially arranged for use in hotels, factories, shops, small offices or private houses where a simple two-way telephone system is required.

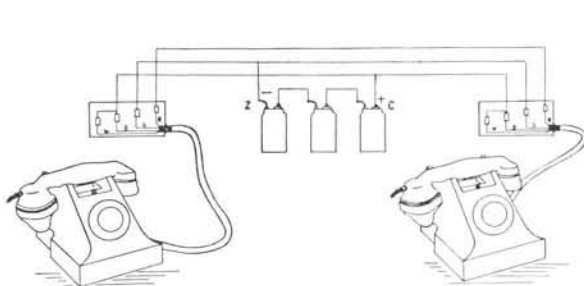
The push button for calling is fitted in front of the micro-telephone, and the interior apparatus comprises a trembler bell, induction coil and connecting terminals.

The diagrams below show the connections for central battery and for separate battery working. When more than two stations are required a code ringing system must be adopted.

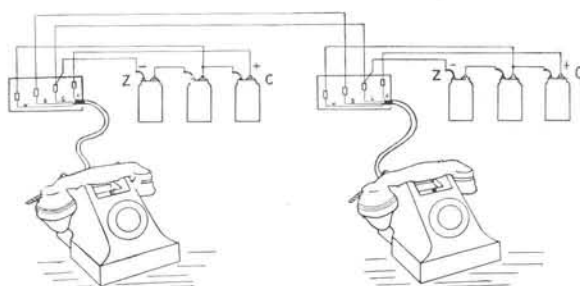
Code No. N1102.

Dimensions  $9\frac{1}{4} \times 8 \times 6$  inches.

Weight 4 lb. 10 oz.



Connections for a central battery.



Connections for separate batteries.



## Battery Ringing Telephones

MINING TYPE, CERTIFIED SAFE FOR MINES

CERTIFICATE T/Tel. 11



N 1150

Suitable for use in mines, ships, engine rooms, railway yards, traction routes and many other exposed positions.

The cast-iron case has a wide machined flange joint between the body and the front, which are clamped together by means of screws having special shaped heads for which a key is provided.

The receiver, of the loud-speaking type, is fitted inside the case and has a flexible metallic listening tube with strain wire and earpiece.

The transmitter is the interchangeable inset type, waterproof and protected by a metal grid.

The induction coil, switch and connecting terminals are mounted on ebonite. The switch, which is very substantial, controls the ringing and speaking currents, and the connecting terminals are large and accessible.

All coils are treated to prevent the detrimental effects of moisture and gases, and the connections are made with special heavily-insulated stout wire.

The instruments are designed for use with a separate bell or relay and bell, and external speaking and ringing battery.

N1149 type is for use in places other than in mines, also N1149A, which is similar but has a relay fitted for long line working.

N1150 is certified by the Mines Department as intrinsically safe when used with an approved bell, or relay and bell, and an approved (authorized) source of current.

Mine Dept. Type	Code No.	Description	Dimensions inches	Weight lb.	
—	N1149	For general use	9×9×6½	22	
—	N1149A	For long line working	10×9×6½	23	
N1150	N1150	Certified for use in mines	9×9×6	20	



## Battery Ringing Telephones

### RAILWAY TYPE



**N 1200 Type**

These instruments are specially designed for the battery signalling systems usually preferred for railway telecommunication and combine neatness with durability and efficiency.

Intended mainly for office use, the table set is arranged for systems requiring from one to three push-button keys the springs of which are wired to terminals which can be strapped to suit various operating requirements.

The instrument, micro-telephone (with or without transmitter cut-off switch in the handle) and terminal block are of moulded bakelite and interior components such as springsets, buzzer, condenser, induction coil, and relay when required, are mounted on a chassis which is readily removable as a unit.

The 100-ohm buzzer is directly operated in single-button telephones and via the contacts of a 5000-ohm polarized or non-polarized relay in the 2 and 3-button sets, provision also being made in the local wiring for the fitment of a differential relay if required.

Terminals are provided for connecting an external bell if desired.

Overall dimensions  $9 \times 11\frac{1}{2} \times 5\frac{1}{4}$  inches. Weight 6 lb. 9 oz.

Code No.	No. of Buttons	Relay	Transmitter Switch	Railway Code No.
N1200	3	Polarized	With	7 RSC. 1000/D/P
N1200A	3	Normal	With	8 RSC. 1000/D/NP
N1200B	3	Polarized	None	5 RSC. 1000/C/P
N1200C	3	Normal	None	6 RSC. 1000/C/NP
N1201	2	Polarized	With	3 RSC. 1000/B/P
N1201A	2	Normal	With	4 RSC. 1000/B/NP
N1201B	2	Polarized	None	1 RSC. 1000/A/P
N1201C	2	Normal	None	2 RSC. 1000/A/NP
N1202	1	None	With	2 RSC. 1003/B
N1202A	1	None	None	1 RSC. 1003/A





## Battery Ringing Telephones

### RAILWAY TYPE



**N 1181 Type**

These wall sets are similar in principle to the N1200 series table telephones and are designed for railway signal cabins, etc., where an efficient and robust instrument is necessary.

The hardwood case is semi-matt polished and the exterior metal fittings are black and bronze.

Instruments with one, two or four plunger keys can be supplied, the illustration showing a 4-key set modified for 2-key working, the inner ones being shrouded. Key springs are wired in the set to terminals which can be strapped to suit various operating requirements.

A high, medium or low tone dome, as specified on order, is fitted on the 100-ohm bell which, in the N1183 type sets, is directly operated and in other sets is actuated via the contacts of a 5000-ohm polarized or non-polarized relay. A differential relay can be fitted, if necessary, an extra wire being included for this purpose.

The instruments contain a 2 mf. condenser for the receiver circuit, anti-side-tone induction coil, hook switch and terminals for wiring a remote bell if required. The bakelite micro-telephone can be supplied with or without a transmitter cut-off switch in the handle, as indicated in the table below.

Overall dimensions  $9 \times 11\frac{1}{2} \times 5\frac{1}{4}$  inches. Weight 6 lb. 6 oz.

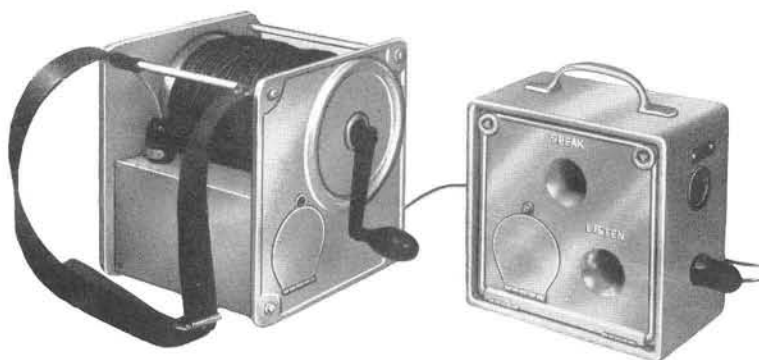
Code No.	No. of Keys	Relay	Transmitter Switch	Railway Code No.
N1181	4	Polarized	With	3 RSC. 1002/B/P
N1181A	4	Normal	With	4 RSC. 1002/B/NP
N1181B	4	Polarized	None	1 RSC. 1002/A/P
N1181C	4	Normal	None	2 RSC. 1002/A/NP
N1182	2	Polarized	With	3 RSC. 1001/B/P
N1182A	2	Normal	With	4 RSC. 1001/B/NP
N1182B	2	Polarized	None	1 RSC. 1001/A/P
N1182C	2	Normal	None	2 RSC. 1001/A/NP
N1183	1	None	With	2 RSC. 1004/B
N1183A	1	None	None	1 RSC. 1004/A



## Battery Ringing Telephones

**MINE RESCUE SET, CERTIFIED SAFE FOR MINES**

CERTIFICATE T/Tel./78



**N 20653**

**N 20649**

This apparatus has been specially designed in collaboration with the Mines Department and Rescue Station Superintendents, so that when an accident occurs in a mine the rescue party shall be provided with a safe and reliable system of communication.

The Base Station Unit N20649 comprises an aluminium-silicon case  $11 \times 10\frac{1}{4} \times 6\frac{1}{4}$  inches containing a transmitter, a loud speaking receiver, a buzzer, a speaking key, a ringing key, a plug socket and under the flap on the left a buzzer test key and adjustment screws.

The Advance Station Unit N20653 is also constructed of aluminium-silicon and is similarly equipped, but in addition a special cable reel is incorporated for paying-out the line wires as the rescue party advances. A transmitter is not fitted in this unit as speech is not practicable since respirators are usually worn by the rescue party. The cable reel holds approximately 280 yards of a specially strong constructed cable. The dimensions of the unit are  $11 \times 11 \times 11$  inches.

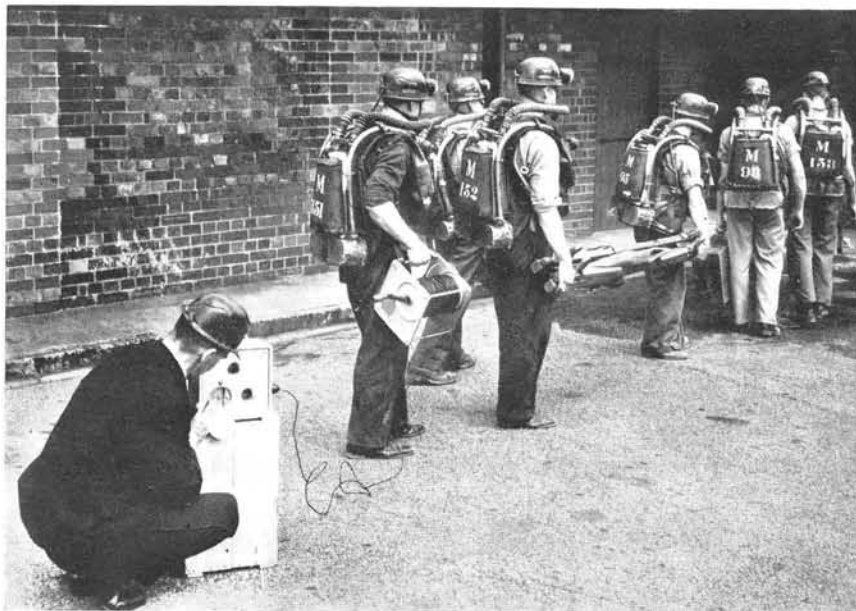
Full communication is maintained uninterrupted during paying-out and reeling-in of the cable.



## Battery Ringing Telephones

MINE RESCUE SET, CERTIFIED SAFE FOR MINES—*continued*

CERTIFICATE T/Tel./78



A Rescue Brigade showing the Advance Party going forward to commence rescue operations.

If during rescue operations it is desired to extend beyond the first cable length, a further advance party instrument can be connected by a simple plug and the circuit transferred from the first to the second unit.

The facilities for communication are as follows :—

The base party can speak or code signal by buzzer and key to the advance party.

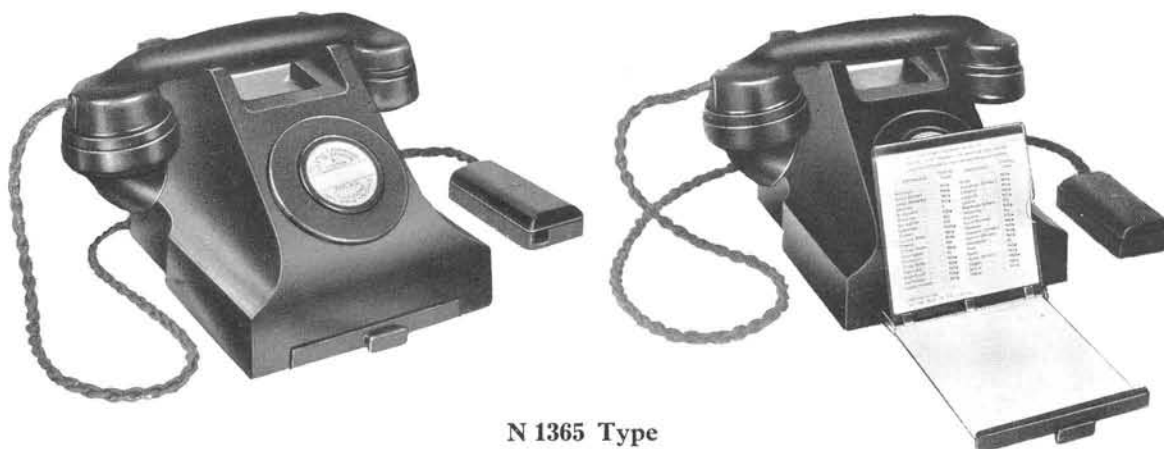
The advance party can receive speech and code signals and communicate to the base party by code signals.

Mines Dept. Type	Code No.	Description	Dimensions inches	Weight lb.	
N20649	N20649	Base Station unit	11 × 10½ × 6½	15	
N20653	N20653	Advance Station unit	11 × 11 × 11	25	

**Note**—The weight for N20653 includes approximately 280 yards of cable on the reel.



# C.B. Telephones



N 1365 Type

This most modern and improved central battery table telephone is completely built into a moulded bakelite case.

The design is distinctive and pleasing and incorporates a form of cradle or micro-telephone rest which is not readily damaged.

In the telephone base there is a sliding tray which will accommodate a writing pad intended for ready reference and will be useful and handy for a directory of the more frequently called numbers, or other memoranda. Pads are very easily inserted and are included only when ordered.

The interior pieces of apparatus including a magneto bell are mounted on a frame which can be removed as a unit so that each instrument is self-contained.

Terminal blocks have raised ribs to minimize surface leakage.

The reception and transmission efficiencies of the bakelite micro-telephone with inset transmitter and detachable receiver are vastly superior to the solid-back type, and the anti-side-tone induction coil in the circuit reduces the reproduction of extraneous noises and side-tone to a minimum.

There is provision for the fitting internally of a radio interference suppression unit, which can be supplied when required.

This instrument is normally produced in black, but if specially ordered it can be supplied in chinese red, ivory or jade green. Instruments can also be obtained without the sliding tray fitment.

Micro-telephone cord N4021  
Receiver N6819

Inset N7750  
Earpiece N4443  
Terminal block cord N4317

Mouthpiece N8634  
Receiver diaphragm N4400

Overall dimensions  $9\frac{1}{4} \times 8\frac{1}{2} \times 6$  inches

Weight 5 lb. 9 oz.

Code No.	Description	P.O. No.
N1365A	Black bakelite case with sliding tray fitment	332 type
N1365H	Black bakelite case without sliding tray fitment	332 type



## C.B. Telephones



N 1421A

This distinctive and pleasing design of wall type telephone follows to a very large extent its prototype the table set, and as it occupies a small amount of space it is ideally suitable where permanent fixing is desired.

The moulded bakelite casework is gate-hinged on a metal baseplate, to which it is fastened by one screw, and the cradle is designed to allow the micro-telephone to be suspended vertically over the front of the instrument during the temporary absence of the user. The interior apparatus, consisting of anti-side-tone induction coil, condenser, ringer, switch and terminals, is mounted as a unit which can be readily removed from the case ; alternatively, the case with equipment unit attached, can be lifted off the hinges for maintenance purposes.

The bakelite micro-telephone is of a type notable for its reception and transmission qualities.

Normally produced in black, these telephones can also be obtained in chinese red, ivory or jade green if specially ordered.

Micro-telephone cord N4021

Inset N7752

Mouthpiece N8634

Receiver N6819

Earpiece N4443

Receiver diaphragm N4400

Code No.	Description	Dimensions inches	Weight lb. oz.	P.O. No.
N1421A	Black bakelite wall telephone	$8\frac{1}{2} \times 9\frac{1}{4} \times 4\frac{1}{2}$	5 13	333 type





## C.B. Telephones

### PLAN NUMBER WORKING



**N 1366 Type**



**N 1368 Type**

These telephones are for providing economically various extension schemes without the use of separate switches or switchboards.

They are arranged to accommodate key units having from one to nine spring sets of the make-before-break change-over type, i.e., "K" combination. The spring sets are operated by push buttons, and are illustrated overleaf.

For a simple extension or for recalling a P.B.X. operator the instrument N1366 type has a key unit with one set of K springs.

For other extension schemes the key units have a number of K spring sets, the standards being for 4 and 9 sets. The push buttons on a telephone with a 4K spring set operate respectively (left to right) 2K-1K-1K spring sets, while with a 9K set, 4K-1K-4K are operated.

Each contact spring is wired to a separate terminal so that the scheme in hand may be readily connected up.

On the 4K and 9K key units there is a mechanism which can be varied to control the non-lock or locking of the two outer keys, the centre key being non-locking. There is also supplied with each of these key units a T piece which is fixed to the cradle lever when the extension plan necessitates the release of a key on replacement of the micro-telephone.

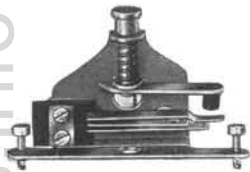
Instruments are also available with battery bells so that plans to suit almost any requirement can be arranged.

The telephones are normally produced in black, but if specially ordered, they can be supplied in chinese red, ivory or jade green. They can also be obtained without the instruction tray and directory pad fitment.

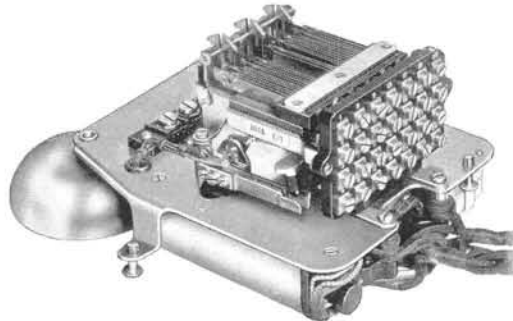


## C.B. Telephones

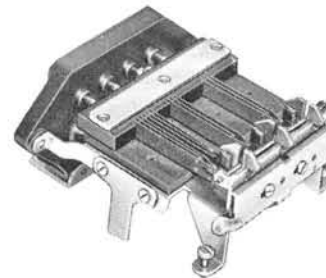
PLAN NUMBER WORKING—*continued*



**N 20629**  
1K Key Unit



**N 20630**  
9K Key Unit Mounted



**N 20631**  
4K Key Unit

For telephones with two or three push buttons the key unit required must be stated.

In the case of plans requiring only two push buttons, chromium finished dummies can be supplied for the third hole.

**The terminal blocks, cords and labels vary according to the plan required, so that full details regarding the scheme to be operated should be supplied when ordering.**

Circuit diagrams of various plans can be supplied on request.

Overall dimensions  $9\frac{1}{4} \times 8\frac{1}{2} \times 6$  inches.

Maximum weight 6 lb.

The instruments in the table below are complete with instruction tray fitment.

Code No.	Description	
N1366A	Black bakelite, magneto bell, 1K key unit and button	
N1368A	Black bakelite, magneto bell, three buttons (key unit to be stated)	
N1369A	Black bakelite, battery bell, three buttons (key unit to be stated)	
N1370A	Black bakelite, battery bell, no buttons or keys	
N1371A	Black bakelite, battery bell, 1K key unit and button	

**Note**—Wall telephones for Plan Number working can also be supplied.



## C. B. Telephones

### INTERMEDIATE AND EXTENSION

This intermediate set allows an extension the use of the exchange line, as well as intercommunication, and is ideal for the executive with secretary.

The switching mechanism consists of four inter-acting push-button keys in the top panel above a window through which "engaged" is displayed by the operation of an indicator-relay during extension-to-exchange conversations.

Other fitments include an "alnico" generator, a 1000-ohm ringer operated from the exchange, induction coil, condensers and micro-telephone, all of standard design and proved efficiency. Calls from extension operate a similar ringer in the bakelite wall case.

Extension-to-exchange calls can be made secret or non-secret from intermediate and an audible signal at their conclusion can be arranged if desired.

A maximum line loop resistance of 800 ohms ensures satisfactory working.

A small battery is required for speech current during extension-to-intermediate conversations.

Inset N7752	Mouthpiece N8634	Earpiece N4443	Diaphragm N4400
HMT cord N4021	Terminal cord N4337	Condenser N3701B	Genr. handle N70900

Code No. N1321H includes wall case N3114.

Overall dimensions, Telephone :  $12\frac{1}{4} \times 9\frac{1}{4} \times 6\frac{1}{4}$  inches.

Weight  $10\frac{1}{4}$  lb.

Overall dimensions, Wall case :  $8\frac{1}{2} \times 6\frac{1}{2} \times 2$  inches.

Weight 3 lb.



**N 1321H Type**

### EXTENSION INSTRUMENT

This is a standard C.B. telephone adapted to accommodate an "alnico" generator for calling the intermediate station and contains a 1000-ohm ringer.

Condenser N3679, Genr. handle N71541, Terminal cord N4317. Other codes as above where applicable.

Overall dimensions  $8 \times 9\frac{1}{2} \times 6\frac{5}{8}$  inches.  
Weight  $7\frac{1}{2}$  lb.



**N 1326H Type**

**Note**—Equivalent sets for short distance working, with one or two extensions, and fitted with push-buttons for battery signalling, in lieu of "alnico" generators, can also be supplied.

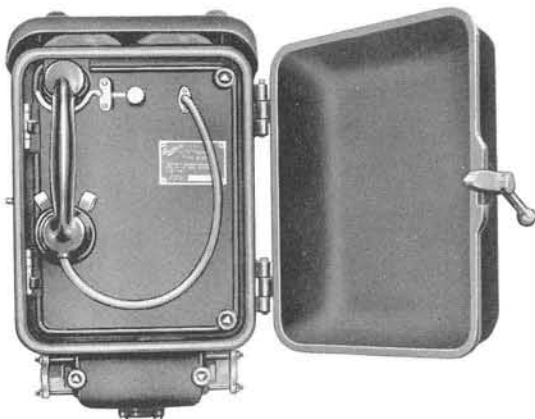
Code Nos. N1322H (intermediate). N1327H (extension).



## C.B. Telephones

### IRON CASED, CERTIFIED FLAMEPROOF

CERTIFICATE No. 2378



**N 1470B**

This instrument is certified Flameproof in Group 2 and Group 3 gases by Ministry of Fuel and Power Certificate No. 2378.

It has been specially designed for outdoor use and will be found to be particularly suitable for railway and ship-yards, docks, chemical factories, petroleum refineries, and other places where it may be exposed to inflammable vapours or atmospheric conditions detrimental to the ordinary type of instrument.

Armoured cable terminating in sealing chambers or wires in sealed screwed conduit must be used throughout a "danger zone."

The cast-iron case is watertight and the inner door is fastened by screw locks requiring a special key for opening. The outer door effectually protects the bakelite micro-telephone when not in use, and the drip-proof cowl fitted on top also protects the ringer gongs without deadening the sound.

The principle of enclosing each contact or switch point in its own flameproof chamber has been adopted, so that the effect of ignition is very small and the volume of gas involved low.

There is an isolating switch which disconnects the incoming lines immediately the inner door is opened.

The apparatus, coils and wiring are specially treated to prevent detrimental atmospheric effects.

Overall dimensions  $20\frac{3}{4} \times 12\frac{3}{8} \times 10$  inches. Weight  $81\frac{1}{2}$  lb.

Code No.	Description	P.O. No.
N1470B	Terminal chamber with sealing glands for armoured cable	—
N1470C	Terminal chamber for terminating sealed screwed conduit	129 C.B. type

**Note—Equivalent sets with terminating chamber suitable for Pyrotenax cable can also be supplied.**



## C.B. Telephones

### INTERCOMMUNICATION WITH EXCHANGE FACILITIES



**N 1670 Type**

This distinctive and registered design combines all the facilities of a small switchboard and an intercommunication system in one instrument. The case is of moulded bakelite and incorporates a much improved type of micro-telephone rest which has been specially designed with a view to reducing the risk of breakages. The interior mechanisms and apparatus are arranged to give maximum accessibility to all parts and the buzzer is mounted on the connecting plug so that it may be readily adjusted without interfering with the instrument. Each set is connected up to a system on the plug-and-jack principle. If required, a directory tray can be fitted under the base.

In order that the instrument should not be unnecessarily complicated, certain facilities were aimed at when designing, and the following have been achieved and standardized.

1. There is only one design of instrument for C.B. and automatic public exchanges, except that for the latter a dial is fitted.
2. Any instrument in an installation may be arranged as the master station.
3. Calls to or from the public exchange are secret. Local calls on the intercommunication system are non-secret.
4. The engaged test is provided on "busy" exchange lines.
5. Exchange lines may be "held," if it is necessary to intervene with another call.
6. Exchange calls can be transferred direct from one station to another.
7. Any selected stations can be arranged to supervise the exchange lines.
8. The master station controls trunk offering facilities.
9. Exchange calls may be barred to any station at the discretion of the master station.
10. The calling and clearing signals, at all types of public exchanges, are given direct from any station.
11. Any number or arrangement of the local stations can be connected for conference purposes.
12. An engaged test is given on stations engaged on exchange lines.





## C.B. Telephones

INTERCOMMUNICATION WITH EXCHANGE FACILITIES—*continued*



**N 9001A**

13. Simple external extensions working on two lines only can be connected (i.e., useful for stations at considerable distances).
14. To operate from power supply over leads from the nearest exchanges.
15. Exchange lines connected through to a selected station for night service.
16. Exchange line buttons may be released without replacing the micro-telephone.
17. One size of case but two equipments, i.e., 1 exchange and 5 extensions, and 2 exchange and 10 extensions.

The station selected in an installation to act as the master station for the care of incoming exchange calls is fitted with an auxiliary or transfer unit, one of which is illustrated.

Code No.	Description	Dimensions inches	Weight lb.	P.O. No.
N1668	C.B. Set for 1 exchange and 5 extensions	$6\frac{1}{4} \times 12\frac{1}{4} \times 9\frac{1}{4}$	$9\frac{5}{8}$	1 C.B.
N1670	C.B. Set for 2 exchange and 10 extensions	$6\frac{1}{4} \times 12\frac{1}{4} \times 9\frac{1}{4}$	$10\frac{1}{2}$	2 C.B.
N9000A	C.B. transfer unit for 1 exchange line	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	10	1/2
N9001A	C.B. transfer unit for 2 exchange lines	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	12	2/2
N9004	External extension unit	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	13	3
N9005A	C.B. unit for 1 exchange and 1 external extension	$7\frac{1}{2} \times 10\frac{1}{4} \times 8$	14	1A/2
N3310	30-way junction box for cabling	$8\frac{5}{8} \times 7\frac{5}{8} \times 2\frac{1}{8}$	$3\frac{1}{2}$	1
N3311	48-way junction box for cabling	$12 \times 8\frac{1}{8} \times 2\frac{1}{4}$	$5\frac{1}{4}$	2

The plugs are included in the weights but not in the dimensions.

**Note—For working to magneto exchanges similar equipments can be supplied.**



# C.B. Telephones

## INTERCOMMUNICATION AUTO-RESET, PUSH BUTTON SELECTOR SINGLE LINE



N 1622A

Push button instruments are extremely convenient to operate because the desired station is rung by simply taking up the micro-telephone and pressing the selector button of the line wanted to its full extent.

The called station has only to take up the micro-telephone to reply.

A selector button having been pressed is retained in an intermediate position to give the correct circuit arrangement and is automatically restored to normal by replacing the micro-telephone or by pressing the button of another station with which communication is desired. It is therefore unnecessary to replace the micro-telephone before calling another station.

When ringing a station : if a buzzing noise is heard in the receiver it indicates line " DISENGAGED," while silence indicates line " ENGAGED."

This instrument has a case of drawn steel finished with a durable black enamel and relieved by chromium-plated fittings.

The buttons are mounted in units of five, which are readily removed for examination or repair.

The moulded bakelite micro-telephone, fitted with an electro-magnetic receiver and an " inset " transmitter, provides a modern refinement.

TABLE SETS

Code No.	No. of Lines	Weight lb.	
N1620A	5	7	
N1621A	10	7½	
N1622A	15	8	
N1623A	20	8½	

Overall dimensions 7½ × 9¼ × 8½ inches.  
The wall set is illustrated overleaf.

WALL SETS

Code No.	No. of Lines	Weight lb.	
N1624A	5	6¼	
N1625A	10	6½	
N1626A	15	6¾	
N1627A	20	7	

Overall dimensions 10½ × 9¼ × 5 inches.  
Call and Reply Sets, see page 36.



## C.B. Telephones

**INTERCOMMUNICATION AUTO-RESET, PUSH BUTTON SELECTOR,  
SINGLE LINE—continued**



**N 1626A**

Although these instruments are supplied as table and wall sets they are “one type sets” being easily converted from one to the other by altering the position of the cradle and changing the back fittings.

Table sets are fitted with feet which give the instrument a slight forward slope so that the button designations are more readily seen. Calls are indicated by means of a buzzer fitted inside the case.

A diagram showing the method of connecting up the instruments, call and reply sets, junction boxes, cables and batteries, is supplied.

### NUMBER OF CELLS REQUIRED

Speaking Battery	Ringing Battery	Maximum distance between stations
4	3	500 feet
5	4	1200 „
6	4	2000 „

If desired these instruments can be operated from an a.c. mains supply where available.

### FIRE ALARM FACILITIES

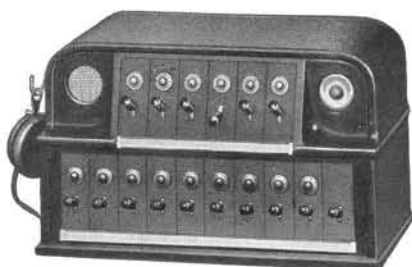
We supply Push Button Selector instruments incorporating reliable Fire Alarm facilities. The system is complete, independent and entirely self-contained, and as the one central battery is continually under observation, due to the daily use of the telephones, this is undoubtedly an important advantage of a combined telephone and fire alarm system. Normal use of the telephones for intercommunication purposes does not in any way interfere with the sending of fire alarm signals, and vice versa.

Fuller information on the above facilities will be sent on application.



## C.B. Telephones

### INTERCOMMUNICATION, LOUDSPEAKER



N 1745A



N 8954

The ordinary telephone limits the movements of the user by necessitating the use of one hand at least. In order to obviate this in the case of persons holding important executive positions, the loudspeaking telephones have been developed.

By operating a key it is possible to move about in an average size office and carry on a conversation with any desired extension on the system. In a quiet office the loudspeaker can be heard 30 to 40 feet away and the microphone will readily respond at that distance. This is accomplished by very careful design of the circuit and components, and without resort to the use of valve amplifiers, which are costly both initially and for future maintenance.

Three systems are standardized :—

- One master station N1740-2 types and the required number of side stations N1594 type, giving communication only between master station and side stations.
- One master station N1740-2 types and a number of side stations N1720, 2 or 4 and/or N1726, 8 or 30 types, giving full intercommunication facilities between the side stations.
- As (b) but two master stations N1743-5 types and side stations N1721, 3 or 5 and/or N1727, 9 or 31 types.

In the case of (c) while ordinary conversations may be carried on between the two master stations it is not practicable to provide for dual loudspeaker communications.

The master station consists of a polished mahogany casework equipped with lamps to indicate when a side station calls, and associated keys for answering or calling the side stations. A low pitched buzzer is fitted internally to attract attention when any station calls. A sensitive microphone is mounted in the top left-hand corner and in the right-hand corner there is a warning lamp which remains lit during a conversation and thereby guards against the leaving of a key in the operated position after a conversation is completed. Connections are made to a terminal box.

Code No.	No. of Lines	Dimensions inches	Weight lb. oz.	
N1740A	5 + 1 master	$7\frac{3}{4} \times 12\frac{3}{8} \times 7\frac{1}{4}$	9 12	
N1741A	10 + 1 „	$7\frac{3}{4} \times 12\frac{3}{8} \times 7\frac{1}{4}$	12 2	
N1742A	15 + 1 „	$7\frac{3}{4} \times 14\frac{1}{2} \times 7\frac{1}{4}$	16 2	
N1743A	5 + 2 „	$7\frac{3}{4} \times 12\frac{3}{8} \times 7\frac{1}{4}$	10 2	
N1744A	10 + 2 „	$7\frac{3}{4} \times 12\frac{3}{8} \times 7\frac{1}{4}$	12 9	
N1745A	15 + 2 „	$7\frac{3}{4} \times 14\frac{1}{2} \times 7\frac{1}{4}$	16 8	

The Loudspeaker is noted for clearness, and is mounted in a wood case of neat design.

Code No. N8954. Dimensions  $9 \times 9\frac{1}{4} \times 4\frac{1}{2}$  inches. Weight  $4\frac{1}{4}$  lb.

**Note—Loudspeaking telephone equipment is not available at present in a tropical finish.**



## C.B. Telephones

### INTERCOMMUNICATION, LOUDSPEAKER—*continued*



N 1594



N 1725

When the side stations are simple call and reply to the master station as system (a) overleaf, N1594 is the instrument used. The design is distinct and pleasing and incorporates a form of cradle or micro-telephone rest which is not readily damaged.

Side station instruments N1720—N1731 with intercommunication facilities are similar to our popular standard intercommunication telephones with the addition of one or two press keys and lamps associated with the master station lines.

The highly efficient bakelite micro-telephone is standard for both types of side station instruments.

The operation of this loudspeaker system is very similar to the ordinary intercom principle, and is briefly as follows :—

A call to the master station is indicated there by a lamp and answered by operating the key associated with the calling lamp.

A call by the master station to a simple side station N1594 type is indicated by buzzer and answered by removing the micro-telephone.

A call by the master station to an intercom type of side station is indicated there by a lamp which will light even if the side station is engaged, the call being answered by removing the micro-telephone and pressing the button associated with the calling lamp.

Conference can be established by the master station operating the keys of the desired side stations.

Code No. N1594  
Dimensions  $9\frac{1}{4} \times 8 \times 6$  inches.  
Weight 4 lb. 10 oz.

Dimensions of N1720 types  
Table Sets  $7\frac{1}{2} \times 9\frac{1}{2} \times 8\frac{1}{2}$  inches.  
Wall Sets  $10\frac{1}{2} \times 9\frac{1}{4} \times 5$  inches.

TABLE SETS		WALL SETS		No. of Lines
Code No.		Code No.		
N1720		N1726		5+1 Master
N1721		N1727		5+2 „
N1722		N1728		10+1 „
N1723		N1729		10+2 „
N1724		N1730		15+1 „
N1725		N1731		15+2 „





## C.B. Telephones

### INTERCOMMUNICATION, PERSON FINDER



N 1632

Large organizations with many ramifications should undoubtedly have some rapid means of locating important personages whose duties may take them into all parts of the building or factory. An ideally convenient method can readily be incorporated into the telephone system.

The instruments are very similar to those used for our standard inter-communication system, but are fitted with two special push buttons marked "Person Finder" and "Reply," the former being also distinguished by a red cap.

In addition to the person finder equipment full intercommunication facilities are provided between the offices in a building up to a maximum of 15.

To operate the finder system, important personages are assigned call codes, which are sent out when required, by pressing the person finder button the requisite number of times and duration. This causes a number of klaxon horns or high frequency buzzers, fitted in various parts of the building, to be operated from the mains supply. A person hearing his code-call proceeds to the nearest telephone, removes the micro-telephone and presses the reply button and is thereby connected to the calling party.

An important feature of this system is that the buzzers can be used for other purposes, such as fire alarm, time signals, etc.

TABLE SETS		WALL SETS		No. of Lines
Code No.		Code No.		
N1630		N1633		5
N1631		N1634		10
N1632		N1635		15

#### Dimensions

Table Set  $7\frac{1}{2} \times 9\frac{1}{4} \times 8\frac{1}{2}$  inches.

Wall Set  $10\frac{1}{2} \times 9\frac{1}{4} \times 5$  inches.



## C.B. Telephones

CALL AND REPLY



N 1107

This instrument has been specially designed and arranged to work in connection with our central battery intercommunication system, pages 31-32.

It is particularly useful and economical for stations at some distance from the main installation, where the length of cable required for full intercommunication would be prohibitive, also, where full facilities are not required, it may be used as a subsidiary set to any of the main instruments.

It can be called by and reply to any main set on the installation, but can only call the station with which it is associated.

The bakelite design is distinctive and pleasing and incorporates a form of cradle or micro-telephone rest which is not readily damaged. The bakelite micro-telephone provides the highest reception and transmission.

Code No. N1107.      Dimensions  $9\frac{1}{4} \times 8 \times 6$  inches.      Weight 4 lb. 12 oz.

### PORTABLE

Portable telephones for C.B. working, see page 45.      Code No. N1845B.



## Magneto Telephones



N 2121A

A one-piece table instrument is at all times preferable to one made up of two or more parts, and the magneto type of telephone has been the most difficult to combine in a neat form.

Hitherto telephones for magneto working have been heavy and cumbersome on account of the size of the generators available. With modern magnetic materials a new and highly efficient magneto generator of very small size and weight has been produced. By incorporating this new generator into our already popular moulded case an instrument of excellent symmetry, light and efficient, is provided for magneto working.

The internal apparatus is mounted on a metal base plate which can be completely detached from the case. The apparatus comprises induction coil, generator, ringer and gongs, switch spring-set and cord connecting block, space being also provided for a condenser when required.

Micro-telephone cord N4021, Inset N7752, Mouthpiece N8634, Receiver N6819, Earpiece N4443, Receiver Diaphragm N4400, Generator handle N71541 and Terminal Block cord N4324.

The sliding tray fitment is not practicable on this telephone.

Code No.	Ringer Ohms	Dimensions inches	Weight lb.	
N2121A	2,000	$9\frac{1}{4} \times 7\frac{1}{4} \times 6\frac{3}{4}$	$7\frac{1}{4}$	

**Mining Type**—A similar instrument intended solely for use on the mine surface under cover, as in offices, etc., can be supplied. Code No. N2121Z.



## Magneto Telephones

### CONVERTIBLE TYPE



N 2185A

This is a one-piece convertible type telephone so arranged that it can be readily altered to work to all kinds of exchange systems, such as, for example, the following :—

Ordinary magneto	Party line, C.B.S. No. 1
Magneto with loop auto clearing	Central battery
Magneto, R.S.A.X. earth clear	C.B. extension to intermediate
C.B.S. Nos. 1, 2 and 3	Automatic

It therefore provides the most economical proposition, especially for telephone operating concerns, because it does not become redundant with a change of system.

Circuit alterations are readily made internally and the only additional apparatus required is an induction coil for C.B. conditions and a dial for automatic.

Micro-telephone cord N4021, Inset N7752, Mouthpiece N8634, Receiver N6819, Earpiece N4443, Receiver Diaphragm N4400, Generator handle N71541 and Terminal Block cord N4324.

Diagrams showing the connections for the above systems are provided with each telephone, and on application customers will be supplied with a booklet containing a photograph as illustration above, diagrams, drawings and lists giving the codes of parts used in the instrument, and which will be found invaluable for reference or for ordering spare parts.

Code No.	Description	Dimensions inches	Weight lb.	
N2185A	Equipped for ordinary magneto	$9\frac{1}{4} \times 7\frac{1}{4} \times 6\frac{3}{4}$	$7\frac{1}{2}$	



## Magneto Telephones

### PLAN NUMBER WORKING



**N 8441 Type**



**N 8486A**

These telephones are for providing economically various extension schemes without the use of separate switches or switchboards.

They are arranged to accommodate key units having from one to nine spring sets of the make-before-break change-over type, i.e., "K" combination. The spring sets are operated by push buttons, and are illustrated overleaf.

For a simple extension the instrument has a key unit with one set of K springs. For other extension schemes the key units have a number of K spring sets, the standards being for 4 and 9 sets. The push buttons on a telephone with a 4K spring set operate respectively (left to right) 2K-1K-1K spring sets, while with a 9K set, 4K-1K-4K are operated.

Each contact spring is wired to a separate terminal so that the scheme in hand may be readily connected up.

On the 4K and 9K key units there is a mechanism which can be varied to control the non-lock or locking of the two outer keys, the centre key being non-locking. There is also supplied with each of these key units a T piece which is fixed to the cradle lever when the extension plan necessitates the release of a key on replacement of the micro-telephone.

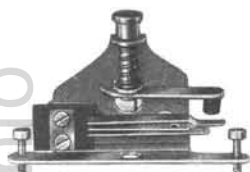
Instruments are also available with battery bells so that plans to suit almost any requirement can be arranged. At each station allowed to call the exchange a separate generator N8486 type is required.

The telephones are normally produced in black, but if specially ordered, they can be supplied in chinese red, ivory or jade green. They can also be obtained without the instruction tray and directory pad fitment.

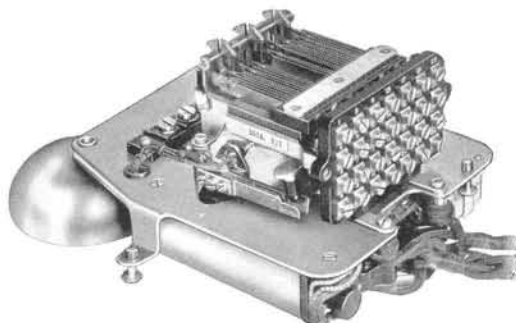


## Magneto Telephones

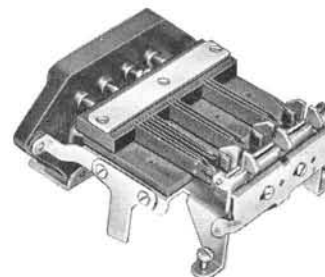
PLAN NUMBER WORKING—*continued*



**N 20629**  
1K Key Unit



**N 20630**  
9K Key Unit Mounted



**N 20631**  
4K Key Unit

For telephones with two or three push buttons the key unit required must be stated.

In the case of plans requiring only two push buttons, chromium finished dummies can be supplied for the third hole.

**The terminal blocks, cords and labels vary according to the plan required, so that full details regarding the scheme to be operated should be supplied when ordering.**

Circuit diagrams of various plans can be supplied on request.

Overall dimensions  $9\frac{1}{4} \times 8\frac{1}{2} \times 6$  inches. Maximum weight 6 lb. 8 oz.

The telephones in the table below are complete with instruction tray fitment.

Code No.	Description	
N8441A	Black bakelite, magneto bell, 1K key unit and button	
N8443A	Black bakelite, magneto bell, three buttons (key unit to be stated)	
N8444A	Black bakelite, battery bell, three buttons (key unit to be stated)	
N8445A	Black bakelite, battery bell, no buttons or keys	
N8446A	Black bakelite, battery bell, 1K key unit and button	
N8486A	Magneto generator in moulded case. Dimensions $5\frac{1}{4} \times 4\frac{1}{4} \times 5$ inches. Approximate weight $3\frac{3}{4}$ lb.	

**Note**—Wall telephones for Plan Number Working can also be supplied.





## Magneto Telephones



**N 2204 Type**

This instrument is the equivalent of the modern bakelite table set but arranged for wall mounting, and is ideal for indoor use where space is limited.

The casework is of the same neat design as that used for the automatic and C.B. sets and embodies the same new features, i.e., the case is gate-hinged and the cradle construction enables the micro-telephone to be suspended vertically over the front of the instrument.

The interior components, consisting of "alnico" generator, anti-side-tone induction coil, condenser, ringer, switch and terminals, are mounted as a unit which can be readily removed from the case ; alternatively, the case with equipment unit attached can be lifted off the hinges for maintenance purposes.

Sets are available with standard generators or, for long line working, with heavy duty generators.

H.M.T. cord	N4021	Receiver N6819
Earpiece	N4443	Receiver Diaphragm N4400
Mouthpiece	N8634	Generator Handle N71936.
Inset	N7752	

Code No.	Generator	Ringer Ohms	Dimensions inches	Weight lb.	
N2204A	Standard	1000	$8\frac{1}{2} \times 9\frac{1}{4} \times 4\frac{1}{2}$	8	
N2204B	Heavy Duty	2000	$8\frac{1}{2} \times 9\frac{1}{4} \times 4\frac{1}{2}$	$8\frac{1}{2}$	



## Magneto Telephones

The casework of this instrument is of polished hardwood and incorporates a handy writing desk and a battery compartment measuring  $7\frac{1}{4} \times 6\frac{1}{2} \times 3\frac{1}{4}$  inches which will accommodate 2 dry or inert cells.

The equipment comprises a compact "alnico" magnet generator, ringer, anti-side-tone induction coil, bakelite micro-telephone and enclosed terminals.

The wiring is arranged so that a condenser may be readily added in the ringer or receiver circuit as desired.



N 2515

Micro-telephone Cord N4021

Inset N7752

Mouthpiece N8634

Receiver N6819

Earpiece N4443

Diaphragm N4400

Generator Handle N56393

Code No.	Generator	Ringer ohms	Dimensions inches	Weight lb.	
N2515	Standard	1000	$15\frac{1}{4} \times 8\frac{3}{4} \times 8\frac{3}{8}$	$9\frac{1}{2}$	
N2516	Heavy Duty	2000	$15\frac{1}{4} \times 8\frac{3}{4} \times 8\frac{3}{8}$	$9\frac{3}{4}$	

### MINING TYPE

#### CERTIFIED SAFE FOR MINE SURFACE USE UNDER COVER

CERTIFICATE T/Tel. 66

This instrument has the same appearance as that illustrated above, but is designed and equipped for mine work, and has been approved by the Mines Department as intrinsically safe, and may, therefore, be connected with the underground circuits.

In common with other certified apparatus its connection and use is governed by the Telephone and Signalling Order S.R. & O. 1938-1407.

It is intended solely for use on the surface and under cover, as in offices, etc., where an ironclad telephone is out of place. It is not suitable for use below ground or in exposed positions.

Mines Department Type N2518

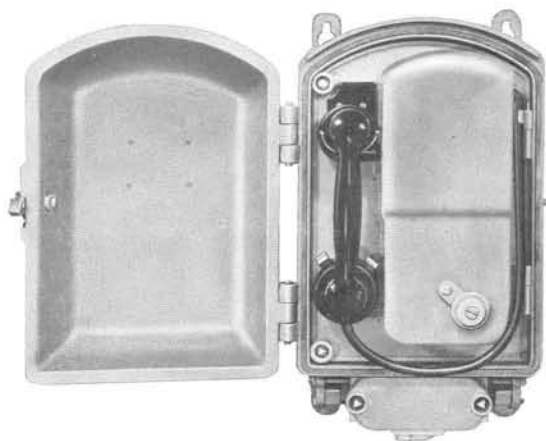


## Magneto Telephones

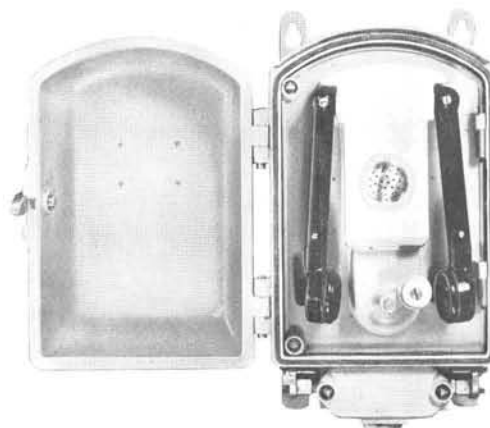
### IRONCLAD, CERTIFIED INTRINSICALLY SAFE

CERTIFICATE T/Tel./84 (methane)

CERTIFICATE No. 78 (petroleum vapour)



**N2976A**  
Open for use



**N2986A**  
Open for use

These telephones are certified intrinsically safe in combustible firedamp mixtures, or in petroleum vapour, and will give satisfactory service under the most arduous conditions either below or above ground.

Any number may be connected in parallel and they may be used with the Company's certified switchboards, relays, bells, etc.

The grey enamelled cast iron case has inner and outer doors and a terminal chamber below, the inner door and terminal chamber cover being locked by special screws, while the outer door, protecting the speaking equipment and generator crank, has a slam catch.

The micro-telephone on the N2976 type instrument has a cast aluminium alloy casing and mouthpiece and is held in position by springs which grip the transmitter.

The N2986 type set has a fixed transmitter with a perforated stainless steel guard, and pivoted twin receivers which move in unison and rest on rubber blocks.

The internal components, excepting batteries and terminals, are mounted on the gate-hinged inner door so that when the wires have been disconnected at the five screw terminals below the ringer, the door can be lifted off, enabling adjustments to be made in any convenient place.

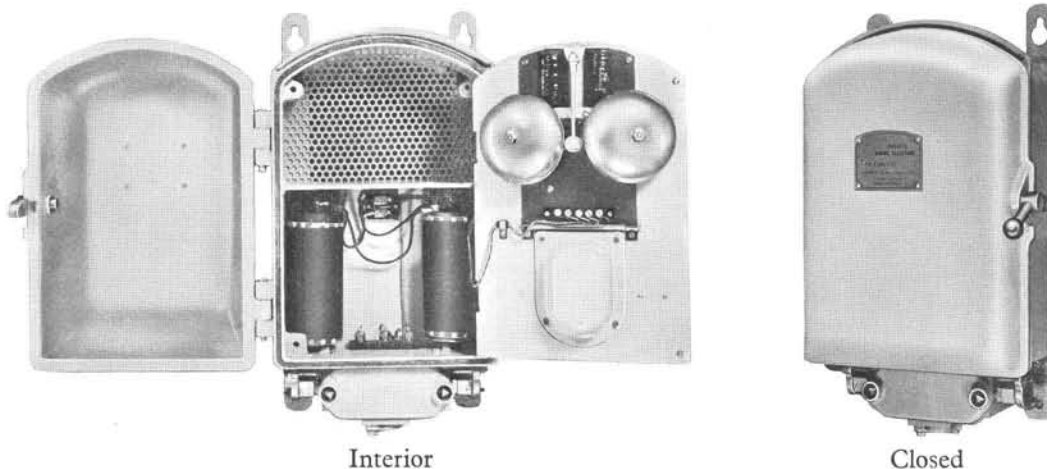
At the rear of the inner door are two covered compartments, one housing a powerful "alnico" generator, and the other the induction coil, capacitors, switch springs and, on N2986, the inset transmitter. The ringer is mounted on the outside of the hinged cover of the upper compartment, so that the sound from the gongs can be heard through the perforated plate at the top rear of the instrument.



## Magneto Telephones

**IRONCLAD, CERTIFIED INTRINSICALLY SAFE**—*continued*

CERTIFICATE T/Tel./84 (methane)  
CERTIFICATE No. 78 (petroleum vapour)



Batteries, type N3752, for speech current, are housed in a separate compartment of the main case but are not supplied unless ordered. They stand on projections formed in the metal case in order to prevent their deterioration by water from condensation collecting in the bottom of the case.

The terminal chamber has three entries for cable, two fitted with sealing glands for armoured cable and the other with a plug. Glands and plug are interchangeable.

Terminal chambers suitable for conduit can also be provided.

All parts, coils, etc., are tropically finished, to withstand the corrosive effect of moisture and gases.

Dimensions :-  $19\frac{3}{8}$  x  $11\frac{1}{2}$  x 8 inches.

Ministry of Fuel & Power Type	Code No.	Terminating Chamber for	Weight without Batteries lb.	
N2976	N2976A	Armoured cable	56	
N2976	N2976B	$\frac{3}{4}$ " screwed conduit	56	
N2986	N2986A	Armoured cable	64	
N2986	N2986B	$\frac{3}{4}$ " screwed conduit	64	

**Note**—The N2976 type instrument can also be supplied with a bakelite micro-telephone.

In order to connect an uncertified telephone to a system of certified telephones, a telephone coupling unit, Ministry of Fuel and Power type N8655, can be supplied.

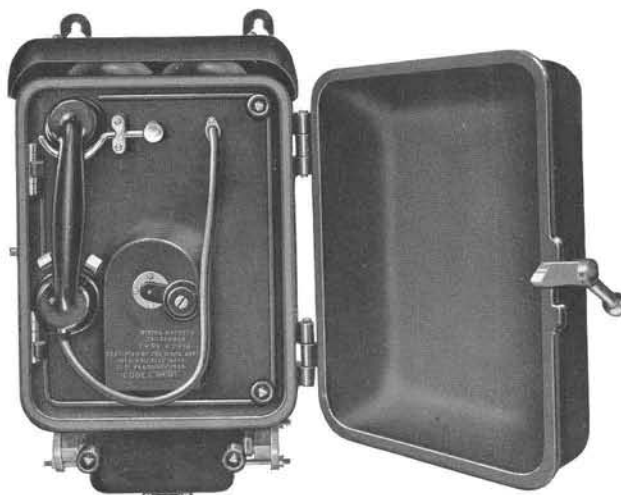
Further particulars on application.



## Magneto Telephones

**IRONCLAD, CERTIFIED INTRINSICALLY SAFE AND FLAMEPROOF**

CERTIFICATES, T/Tel. 2c. ; FLP. 410 and 411



**N2974A**

This instrument is certified intrinsically safe and flameproof and is fitted with a modern bakelite micro-telephone.

It is intended mainly for mines surface use and at harbours, oil fields, petroleum refineries or similar situations where a robust safe type telephone is necessary.

The black enamelled moistureproof cast iron case has an outer door, fitted with a slam catch, protecting the speaking equipment and generator crank from damage. The inner door enclosing the internal apparatus, is fitted with tamper-proof screws for which a key is provided.

The ringer hammer is operated through a greased bearing and the gongs are housed under a protective cowl on top of the case which has two iron bars fitted at the rear for fixing purposes.

Three cable entries are provided in the terminal chamber, one of these usually being fitted with a cap and the others with sealing glands for armoured cable.

Ministry of Fuel & Power Type	Code No.	Dimensions inches	Weight without Battery lb.	
N2974	N2974A	20 $\frac{5}{8}$ x 12 $\frac{3}{8}$ x 9 $\frac{7}{8}$	88	



## Magneto Telephones

### PORTABLE



**N 1845 Type**

This is one of the most robust, powerful and compact portable magneto telephones specially designed for use in the field, as a linesman's testing set or a temporary station.

To provide protection against rough usage and weather the cover is constructed of light-gauge steel, partly pressed up and partly fabricated by welding. The various parts are thoroughly cleaned by shot-blast, rust-proofed, and finally treated with a hard-baking synthetic stove enamel. Attached to the case by swivel links there is a strong woven-fabric shoulder strap provided with adjustable buckle fastenings and loops for carrying an earth spike.

In the illustration, the lid of the set is open, the micro-telephone is removed and the generator handle (which is normally stowed vertically between the protecting projection seen at the right hand side of the lid), is turned down at right angles and automatically held in either position by a spring-loaded slide provided on the crank. The micro-telephone is provided with a press key for closing the battery circuit and the battery compartment with lid closed is in the centre at the back.

The main apparatus comprises a micro-telephone N5874, "alnico" magnet generator N4644 with an output of approximately 3 watts, 2000-ohm magneto ringer N7334, anti-side-tone induction coil N3529 and 2 cells N3767 (tropical N3748).

The codes of the parts most liable to damage are :—Generator Handle N66862 ; Earpiece N4443 ; Mouthpiece N8634 ; Cord N4053.

**The instruments are suitable for tropical climates if inert dry cells N3748 are fitted.**

Code No.	For use on	Dimensions inches	Weight lb.	
N1845A	Magneto only	$11\frac{1}{8} \times 5\frac{1}{2} \times 5$	$9\frac{3}{4}$	
N1845B	C.B. and Magneto	$11\frac{1}{8} \times 5\frac{1}{2} \times 5$	$9\frac{3}{4}$	

**Note—Magneto portable set for use in mines. Code No. N1846.**





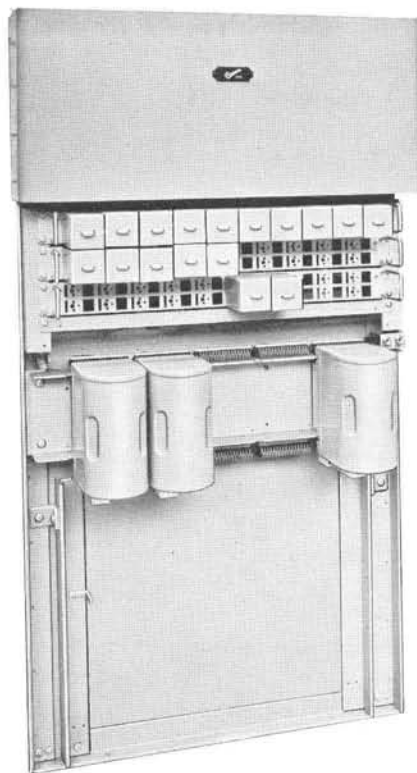
## Switchboards

### INDEX

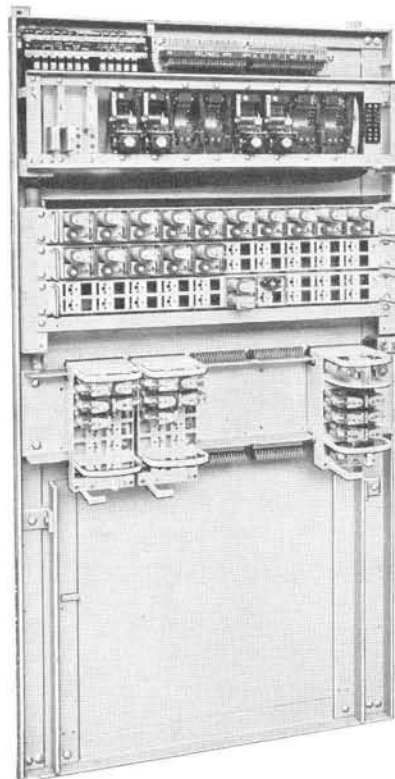
	PAGE
Automatic Private Branch Exchanges .. ..	52
Automatic Private Exchanges .. ..	49-54
Automatic Public Exchanges .. ..	61-62
Automatic Unit Exchanges .. ..	55-60
Automatic Switchboards .. ..	49-62
Battery Mining Switchboards .. ..	(note) 78
Central Battery (C.B.) Cordless Switchboards ..	63
Central Battery Lamp Signalling PMBX. ..	67-68
Central Battery Lamp Signalling Switchboards ..	66
Central Battery Private Branch Exchanges ..	63-69
Central Battery Private Exchanges .. ..	64-66
Central Battery Public Exchanges .. ..	71-74
Central Battery Railway Switchboards .. ..	69
Central Battery Signalling Switchboards ..	70
Central Battery (C.B.) Switchboards .. ..	63-74
Cordless C.B. Switchboards .. ..	63
Cordless Magneto Mining Switchboards ..	77-78
Cordless Magneto Switchboards .. ..	75-78
Keyless Magneto Switchboards .. ..	79
Lamp Signalling Private Branch Exchanges ..	67-68
Lamp Signalling Private Exchanges .. ..	66
Magneto Cordless Mining Switchboards ..	77-78
Magneto Cordless Switchboards .. ..	75-78
Magneto Keyless Switchboards .. ..	79
Magneto Switchboards .. ..	75-83
Mining Battery Switchboards .. ..	(note) 78
Mining Magneto Switchboards .. ..	77-78
No. 1 Type C.B. Section .. ..	71-72
No. 10 Type C.B. Section .. ..	71
Plug-restored Magneto Switchboards .. ..	82-83
Private Automatic Branch Exchanges .. ..	52
Private Automatic Exchanges .. ..	49-54
Private C.B. Branch Exchanges .. ..	63-69
Private C.B. Exchanges .. ..	64-66
Private Manual Branch Exchanges (PMBX.) ..	67-68
Public Automatic Exchanges .. ..	61-62
Public C.B. Exchanges .. ..	71-74
Railway C.B. Private Branch Exchanges ..	69
Unit Auto Exchanges (UAX) Nos. 12, 13 and 14	55-60



## Automatic Switchboards



Front view with covers on  
Equipped for 15 lines and 2 connecting circuits



Front view, covers removed

### **PAX. 25 Type**

The small automatic switchboard illustrated is designed for a maximum of 25 lines and is non-extensible.

The initial equipment may be as low as ten lines, so that it is ideal for small offices, etc. It is arranged for a maximum of four connecting circuits and wiring is provided for the full capacity of the board.

Facilities such as round call or person finder, preference, conference, loudspeaker, tie-line working, party lines, etc., can be readily incorporated.

Special care is taken to ensure a trouble-free system ; all items of equipment are enclosed in dust-proof covers, all relays are of the 3000-type with twin contacts, and the switches are of British Post Office approved design.

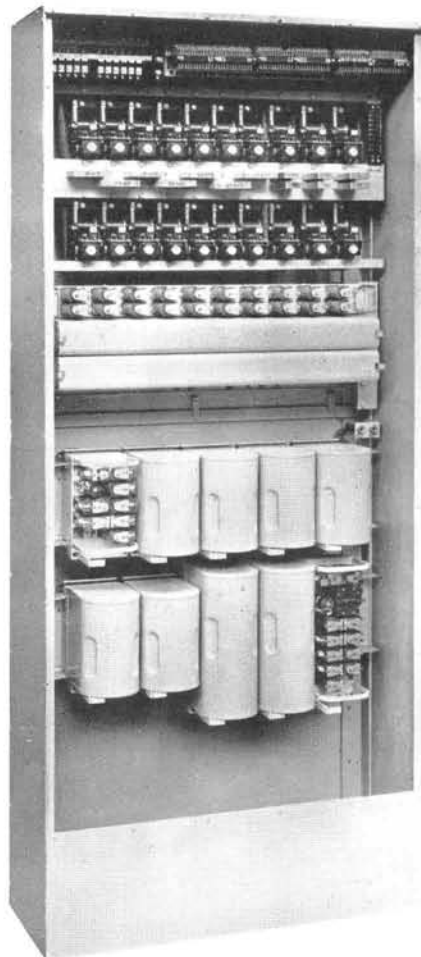
The board operates from 24 volts, which may be from a small capacity battery, or a battery eliminator where a.c. supply is available.

Dimensions :— 4 feet 9 inches high  $\times$  2 feet 7 inches wide  $\times$  10 inches deep.

Further particulars and full description on application.



## Automatic Switchboards



Fully equipped and cover removed  
**PAX. 50 Type**

When the initial equipment required is somewhere about 30 lines and it is anticipated that the ultimate will never exceed 50 lines, the above switchboard is the one to adopt.

PAX. 50 like PAX. 25, is non-extensible and operates on 24 volts from batteries, or battery eliminator where a.c. supply is available. It is self-supporting but wall brackets which act as cable supports are provided.

Two registers are fitted, these receive the dialled impulses and transmit them to the switching apparatus to put the call through. A maximum of seven conversations may take place simultaneously. The whole of the equipment is protected by a dust-proof cabinet.

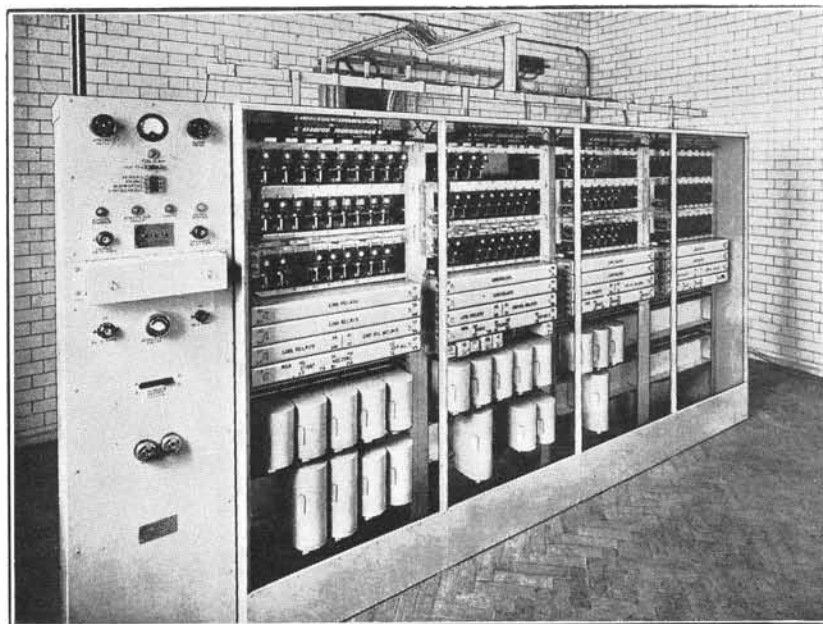
Facilities such as round call or person finder, preference, conference, loudspeaker, tie-line working, party lines, etc., can be readily incorporated.

Dimensions :—5 feet 9 inches high  $\times$  2 feet 7 inches wide  $\times$  12 inches deep.

Further particulars and full description on application.



## Automatic Switchboards



**PAX. 50/200 Type**

PAX. 50/200 is our largest private automatic exchange constructed on the unit dustproof cabinet principle, and is recommended for adoption in establishments where it is known that the ultimate number of lines is unlikely to exceed 200. (If 200 lines will be considerably exceeded PAX. 2000 type should be initially installed).

The illustration shows a power panel and four 50-line units lined up to form a 200-line exchange. The operation is by register control and wiring and mounting facilities are provided for six connecting circuits per 50-line unit, the switches and relay sets being readily mounted in position according to traffic requirements. The exchange operates from 50 volts. This may be from a battery with automatic charging unit, as illustrated, or from a battery eliminator when a.c. supply is available.

The switches, relays and materials used in the construction of our automatic exchanges are of similar design to those supplied to the British Post Office for public exchanges.

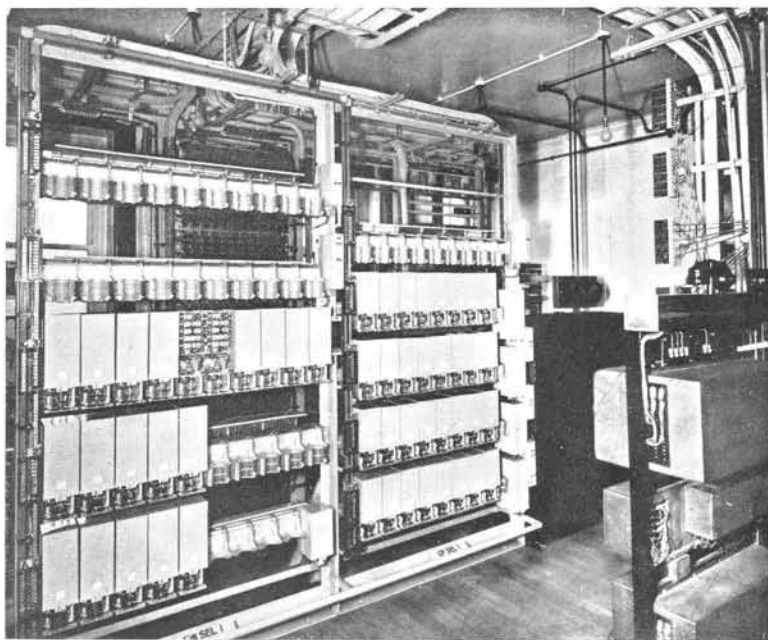
Facilities such as round call or person finder, preference, conference, loudspeaker, tie-line working, party lines, etc., can be provided.

Dimensions of one unit :—5 feet 9 inches high  $\times$  2 feet 6½ inches wide  $\times$  1 foot 6 inches deep.

Further particulars on application.

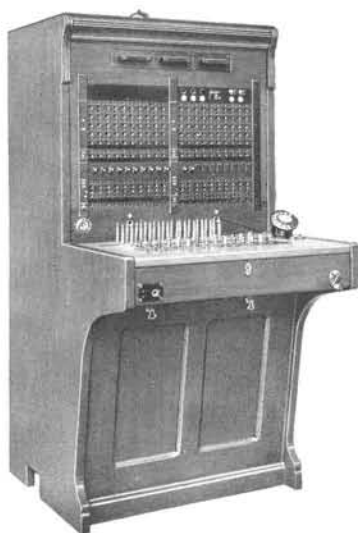


## Automatic Switchboards



Typical Installation  
**PABX**

Where facilities for connections to the public exchange system are required, we manufacture and install Private Automatic Branch Exchange equipments and invite customers to send us their inquiries, when we shall be glad to advise and quote.



Above is illustrated a Private Automatic Branch Exchange initially equipped for 200 extension lines and 15 exchange lines. British Post Office "2000" type selectors, "3000" and "600" type relays are employed.

The other illustration is a typical single position attendant manual board with lamp calling signals and switching keys for connecting the exchange lines to extensions for night calls.

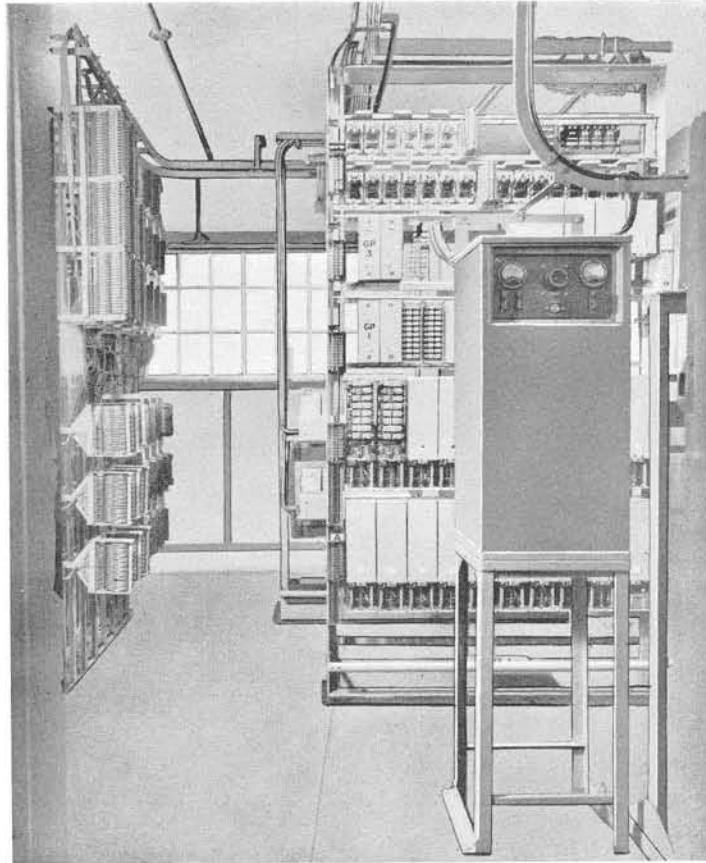
Private Automatic Branch Exchanges can also be supplied in totally enclosed units giving a maximum of 70 to 80 extensions.

Further particulars on application.





## Automatic Switchboards



**PAX. 2000 Type**

For very large establishments where the ultimate requirements will considerably exceed the number of lines that can be accommodated on our smaller PAX. switchboards, PAX. 2000 is used, as it provides for practically unlimited extension.

The apparatus is of the same design as that used in British Post Office public exchanges and is similarly protected from dust by means of covers over the various units or, when specially required, by totally enclosing the racks.

Owing to the wide capacity limits of PAX. 2000, it cannot be standardized to the same extent as those described on the preceding pages, therefore the requirements of each are assessed and met in the most economical manner. A view of a typical 150-line equipment is illustrated above, the combined main and intermediate distribution frame being on the left and the charging panel in the foreground. It will be appreciated, however, that rack equipment arrangements vary considerably in exchanges of differing size.





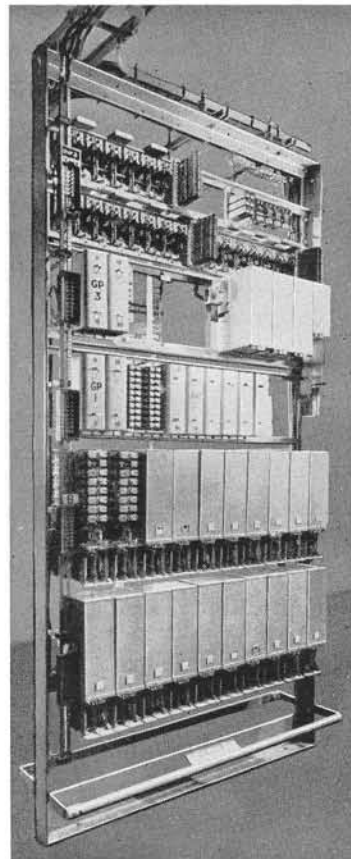
## Automatic Switchboards

As its name implies, PAX. 2000 utilizes British Post Office type "2000" selectors. Uniselectors of the B.P.O. type are also employed either as line switches or line finders according to requirements.

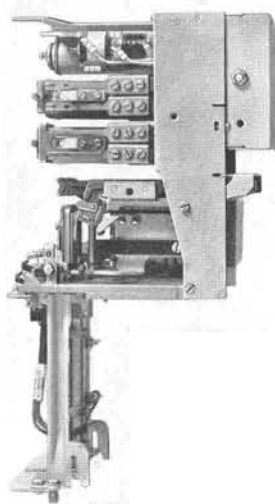
The illustration on the right shows one of the switching racks in the 150-line exchange shown on the previous page.

Long term economy in time and cost is effected if attention is given initially to the ultimate requirements, by the provision of banks and wiring in excess of the immediate needs, so that the equipment can be extended or rearranged to suit traffic fluctuations—a simple matter by virtue of the jack-in feature of the selectors and relay sets.

Balanced tones and pulses of the periodicities standardized for public exchange working are provided, together with suitable supervisory, fault alarm and testing equipment, but special facilities in this connection can be incorporated when required.



Typical Rack Equipment  
**PAX. 2000 Type**



The British Post Office  
Type "2000" Selector

Operating features applicable to PAX switchboards of the smaller types can be provided if desired, these include tie lines, preference, round call or person finder, conference, loudspeaker and party line working.

Further particulars of private automatic exchange equipments will be furnished on request. The Company's organization is at your service to assist in solving telecommunication problems.



## Automatic Switchboards

UNIT AUTO EXCHANGES, No. 12

Unit Auto Exchanges (UAX) of small capacity are specially designed to provide automatic service in country areas and to be installed in unheated and unattended buildings having approximate internal dimensions of 14 feet  $\times$  7 feet 6 inches  $\times$  8 feet 9 inches high for a complete 100-line equipment which is the capacity of UAX, No. 12 inclusive of subscribers' and junction lines.

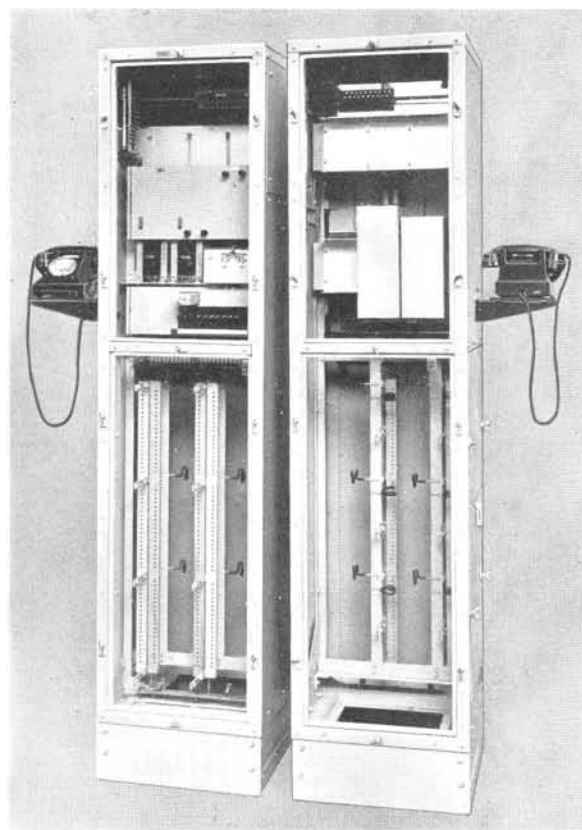
As the name implies, these exchanges are built up from standardized units and in order to provide for various equipments three different units — auxiliary, 12A and 12B — are manufactured.

On account of the position of these exchanges every precaution is taken to ensure, as far as possible, that the equipment is protected from varying atmospheric conditions. However, in damp climates for winter use and in tropical climates it is desirable to arrange for a low consumption heater such as a lamp in the base of each unit. The cabinets are constructed of angle iron, sheet iron and wood on the cavity-wall principle and the doors are clamped against rubber gaskets by means of thumb screws.

To provide easy access for maintenance purposes the apparatus, where necessary, is mounted on swing-out gates.

Auxiliary Unit is 6 feet 10 $\frac{1}{4}$  inches high  $\times$  1 foot 7 $\frac{1}{2}$  inches wide  $\times$  1 foot 9 inches deep and accommodates the main distribution frame, testing, ringing, tones, time pulse and multi-metering equipment.

A telephone for service and testing is fitted externally.

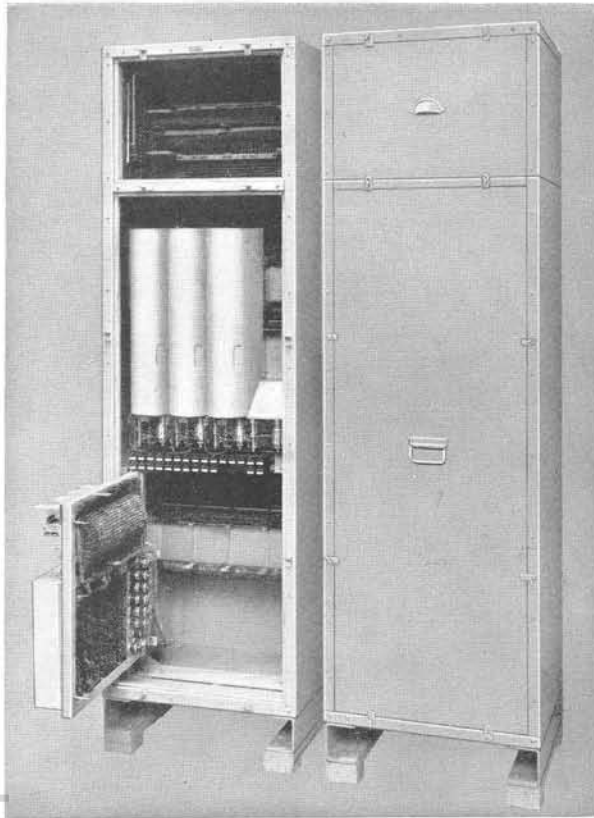


Front and rear view of Auxiliary Unit  
UAX, No. 12 Type



## Automatic Switchboards

### UNIT AUTO EXCHANGES, No. 12



Front view of a 12A Unit with gate open,  
and a view of the Unit totally enclosed.  
**UAX. No. 12 Type**

12A Unit is 6 feet 10 $\frac{1}{4}$  inches high  
 $\times$  2 feet wide  $\times$  1 foot 9 inches deep and  
accommodates line relays, allotter relays,  
routine test relays, finder switches and  
allotter switch mounted on a swing-out  
gate ; subscribers' meters, traffic meters,  
selectors and junction relays.

The maximum capacity is 25 lines,  
4 finder switches, 4 selectors, 1 allotter,  
4 junction relay sets and 4 multi-metering  
relay sets.

In the compartment at the top of  
the units are the terminal strips for  
inter-cabling and cross connection pur-  
poses. Removable panels are arranged  
on both sides of the compartment to  
provide a clear enclosed run for cabling  
between the units when lined-up. Small  
separate doors front and rear complete  
the enclosure.

On the left of the illustration the unit is shown with the gate, on which the line relays and line finders, etc., are mounted, opened out thus giving easy access to the wiring for maintenance purposes ; on the right the unit is seen totally enclosed.

The relay sets for junctions and multi-metering are jacked-in on two shelves provided at the rear, the disposition of which may be seen in the rear view of unit 12B on the opposite page.



## Automatic Switchboards

### UNIT AUTO EXCHANGES, No. 12

Unit 12B has the same dimensions as an auxiliary unit but is equipped on similar lines to a 12A unit and being narrower than the latter its maximum capacity is 20 lines, 2 finder switches, 2 selectors, 2 junction relay sets and 2 multi-metering relay sets.

An exchange for 25 lines comprises one auxiliary unit and one 12A unit.

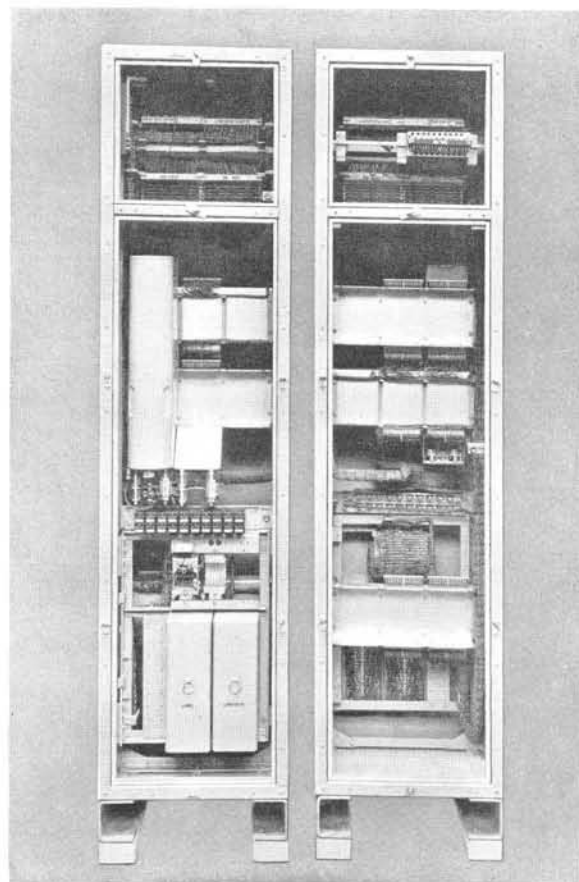
An exchange for 45 lines comprises one auxiliary unit, one 12A unit and one 12B unit.

An exchange for 100 lines, subscribers and junctions inclusive, comprises one auxiliary, one 12A, one 12B, one 12A and one 12B lined up in the order given, this being the full capacity of UAX. No. 12.

The facilities provide for local calls, auto or manual parent exchange in and out calls, auto or manual non-parent exchange in and out calls, multi-metering from 1 to 4 units, and parent exchange testing.

Relays, switches, selectors, etc., are of British Post Office standard and enamelled wire is used for cable conductors and jumpers.

Power may be from an a.c. supply by a single battery with automatic charge and discharge arrangements, a d.c. supply by double battery with dynamotor for charging, or where no electric supply is available, a double battery with petrol engine charging set.



Front and rear view of 12B Unit  
UAX. No. 12 Type



## Automatic Switchboards

### UNIT AUTO EXCHANGES, Nos. 13 and 14

#### UAX. No. 13 Type

Unit Auto Exchange No. 13 is designed on the lines of No. 12 in proofed cabinets and provides similar facilities, but is for areas where the initial requirements are in the neighbourhood of 100 lines and the maximum do not exceed 200 lines.

#### UAX. No. 14 Type

This is the largest exchange built on the unit principle and is designed for a maximum of 800 lines.

In order to provide for a wide range of initial equipments and also for extensions to be readily made, five unit racks have been specially designed and designated Unit 14A, B, C, D and E, which together with other racks and distribution frames on standardized lines constitute a complete exchange.

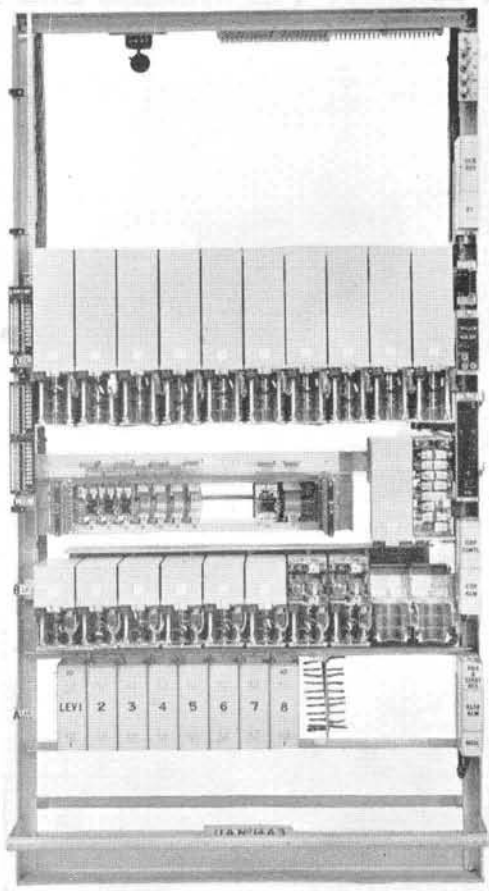
Unit 14A can accommodate the equipments for 100 subscribers' lines, 10 line finders, 7 selector hunters, 2 allotters and 20 final selectors.

Trunking requirements rarely justify the provision of more than 10 final selectors per "A" unit, as illustrated, one being arranged as test final selector on alternate racks. The shelf for additional selectors is added when required.

Unit 14B is the group selector unit and has capacity for 50 selectors on five shelves each of ten selectors.

Each shelf is a complete unit comprising ironwork, banks, jacks, connection strips and

associated wiring and therefore may be fitted as and when required, the number depending upon the trunking requirements. The wiring is arranged so that 1st or 2nd group selectors may be used, the latter being only required for certain junction codes.



Front view of Unit 14A  
UAX. No. 14 Type



## Automatic Switchboards

### UNIT AUTO EXCHANGES, No. 14

Unit 14C carries junction equipments which vary according to the exchange requirements and are arranged as complete units called "strip-mounted sets."

The rack is drilled in a manner which enables various sizes of these sets to be readily fixed.

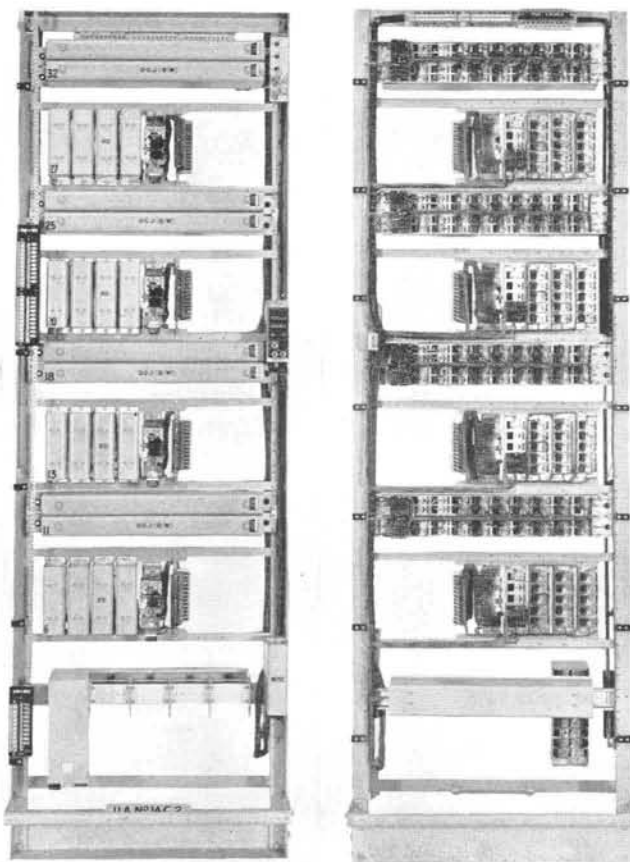
Unit 14D provides for concentrating the apparatus associated with miscellaneous services such as:—service observation, interception, test and plug-up, changed number, tones, alarms, howler, tests, etc. The space at the top of the illustration overleaf is for service observation which is arranged as a unit and only fitted when required, interception also not shown, is variable but wiring is included as standard.

Unit 14E is only fitted in exchanges which have routes to director areas and accommodates the route discriminating relay sets and selectors.

The composition of a UAX. 14 exchange can only be determined after complete data of requirements are supplied.

A fully equipped exchange for 800 lines comprises, A units 8, B units up to 4, C units up to 33, D units 1, E units 0 or up to 2 for director access, together with standardized meter, meter pulse machine and test racks, trunk distribution frames, combined main and intermediate frame and power equipment.

The special units and other racks mentioned are 8 feet 6½ inches high, A and B units 4 feet 6 inches wide and C, D and E units 2 feet 9 inches wide. The units and racks are all of open type construction similar to those in large main exchanges, therefore buildings for UAX. 14 must be provided with heating arrangements.



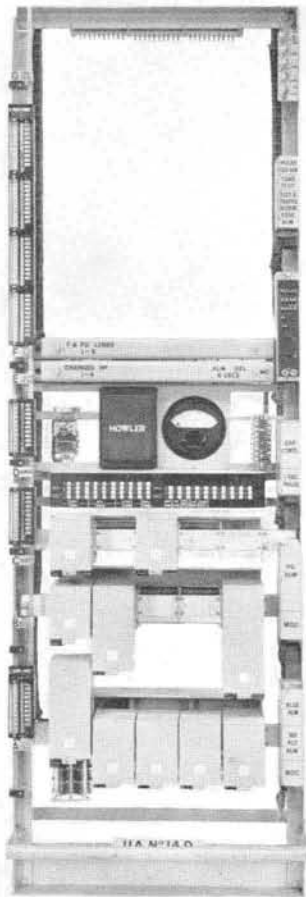
Front and rear view of Unit 14 C  
UAX. No. 14 Type





## Automatic Switchboards

### UNIT AUTO EXCHANGES, No. 14



Front view of Unit 14D  
UAX. No. 14 Type

Selectors, relay sets and line and cut-off relays are of the British Post Office 2000, 3000 and 600 types respectively.

The power supply plant, standardized for all UAX. 14 equipments, is the parallel battery float type with automatic charging and voltage regulation. The principal items are two main batteries, one counter E.M.F. battery for voltage regulation, one counter E.M.F. battery for PBX. 30 V. ; two rectifiers for a.c. or two motor generators (one being stand-by) for d.c. charging ; a control panel with the necessary meters, contactors, relays, etc., for controlling the automatic charging ; and a ringer panel mounting two tone inductor type ringing machines and miscellaneous equipment.

For UAX. 14 a four-digit numbering scheme is employed, the first digit being discriminating is absorbed by the 1st selectors, a typical range is 2000-2399 and 3000-3399. Junctions can be arranged as bothway or unidirectional.

Facilities provide for local calls, calls to and from auto or manual parent exchange, calls to and from dependent or non-dependent exchanges, PBX.s, route discriminating and multi-metering, operating control relay sets in pairs to eliminate failure, and miscellaneous services as stated above in the description of Unit 14D.

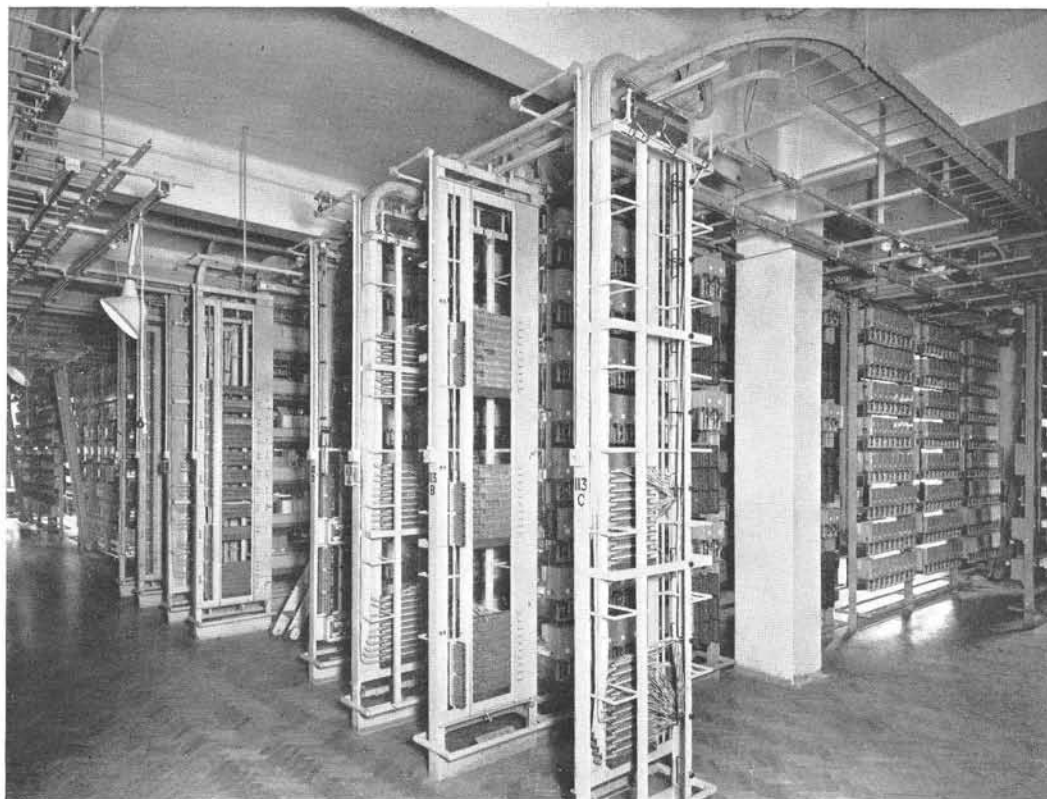
Test facilities enable tests to be made from the parent exchange.

Further information regarding the equipment or a detailed description of the operation of any of our Unit Auto Exchanges will be supplied on application.



## Automatic Switchboards

### PUBLIC EXCHANGES



Some of the Apparatus Racks in a Public Automatic Exchange

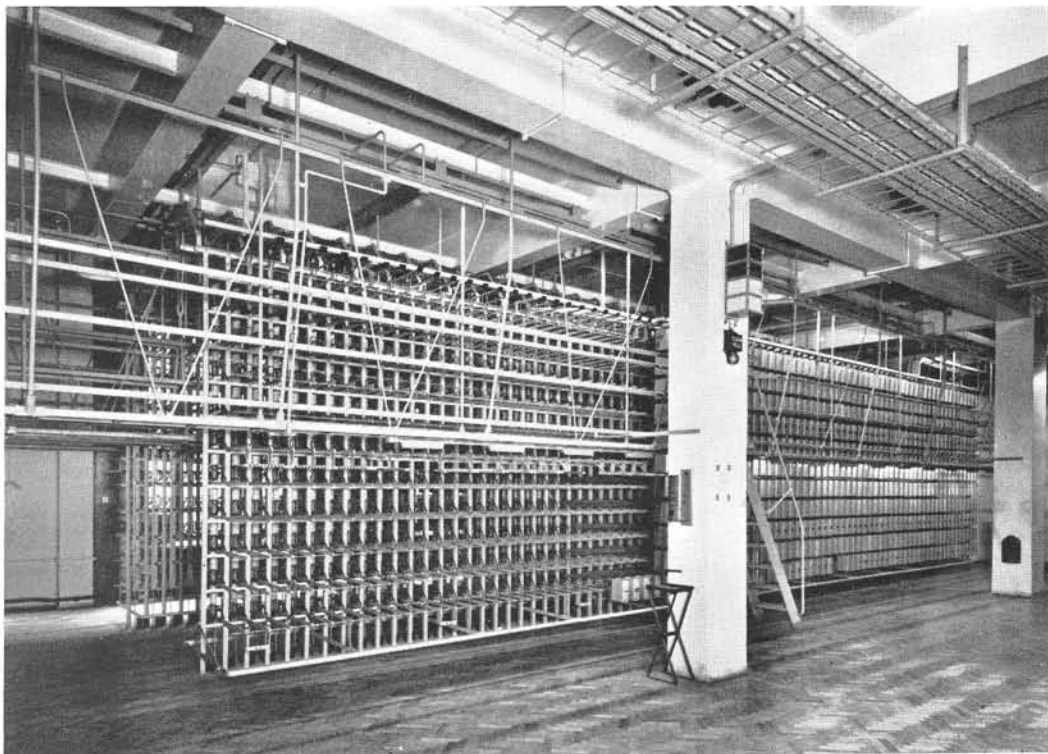


Part suite of the Auto-Manual Switchboard in a large Public Automatic Exchange



## Automatic Switchboards

### PUBLIC EXCHANGES



Main Distributing Frame (M.D.F.) in a Public Automatic Exchange



Part suite of Test Desks in a Public Automatic Exchange



## C.B. Switchboards

CORDLESS, PRIVATE BRANCH EXCHANGES



N 140A

These switchboards are very compact and are designed to be placed on a table or shelf.

They are for use as private branch exchanges in connection with the larger C.B. and automatic public exchanges, when for the latter a dial is fitted.

They can also be supplied without exchange lines for private installations.

The woodwork is matt polished and the metal fittings are finished in black and copper bronze.

All connections are made by means of keys. Broad lines of colour extending across the key mountings indicate clearly the different connecting circuits and simplify operating procedure.

The extension lines are fitted with self-restoring disc indicators N4754M, which also act to give positive supervision. The exchange line indicators N4780 are similar, but are restored by means of push-buttons.

A hand generator is provided for calling the extension telephones and a buzzer gives an alarm when any indicator is actuated.

A special feature of these and our larger Branch Exchange Switchboards is the totally enclosed indicators which prevent damage by operators and also render the boards dust-proof.

For operating purposes a bakelite micro-telephone is supplied.

Code No.	Extension Lines	Exchange Lines	Connecting Circuits	Dimensions inches	Weight lb.	
N100A	3	1	2	12 × 12 $\frac{1}{4}$ × 11 $\frac{3}{4}$	35	
N120A	4	2	3	12 × 14 $\frac{1}{2}$ × 11 $\frac{3}{4}$	39	
N140A	9	3	5	14 $\frac{1}{2}$ × 20 $\frac{1}{4}$ × 11 $\frac{3}{4}$	60	
N154A	16	4	7	17 $\frac{1}{2}$ × 26 $\frac{1}{2}$ × 13 $\frac{1}{2}$	85	

**Note—Standard British Post Office Switchboards can be supplied if desired, also larger sizes can be provided on application.**



## C.B. Switchboards

### PRIVATE BRANCH EXCHANGES



**N 203B**

This switchboard is designed to occupy small space and although it stands on the floor it should be installed where it can be fastened to the wall or to supports from the wall.

The woodwork is matt polished and the front is hinged so that access to the interior is facilitated.

The extension indicators, N4755M, are the self-restoring totally enclosed type mounted in sets of five, and the circuit is so arranged that these indicators also give positive supervision.

The exchange lines are fitted with totally enclosed, push-button-restored indicators, N4781, and facilities are provided for holding exchange lines.

A bakelite micro-telephone and an "alnico" generator are fitted, also an alarm which operates when any indicator is actuated, and night switching keys so that the exchange lines may be put through at night to any of the extension telephones.

Extension line and cord circuit relays are N20379 type (P.O. 500).

This switchboard can be supplied partially equipped, but wired for the full capacity.

It can also be supplied without exchange lines for private installations.

For automatic working a dial is fitted.

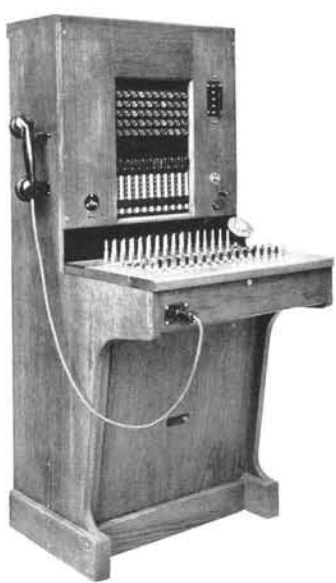
Code No.	Extension Lines	Exchange Lines	Cord Circuits	Dimensions inches	Weight lb.	
N203B	20	5	10	$53 \times 18\frac{1}{2} \times 20\frac{1}{2}$	150	

**Note**—Facsimile boards but with drop indicators N4816D for the exchange lines and eyeball indicators N4798B for the extensions, i.e., P.O. pattern, can be supplied if desired. Code No. N203A type.

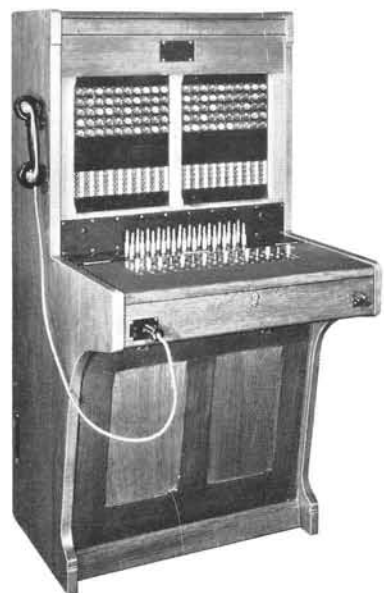


# C.B. Switchboards

## PRIVATE OR PRIVATE BRANCH EXCHANGES



N 308A



N 307A

Designed for use as a private branch exchange, the N308A 50-line switchboard is similar to British Post Office type AT3796.

Drop type, hand-restored indicators, N4816D, are used for the exchange lines, and disc type, self-restoring indicators N4755M, for the extensions. Similar disc indicators N4752M in the key-board give double negative supervision.

Exchange lines may be C.B. manual or auto, a dial being fitted for the latter.

Two keys—"speak/ring" and "dial/ring-back"—are provided for each cord circuit.

The board is matt polished and has a bakelite micro-telephone with plug and jack connection ; also an "alnico" generator, a bell with cut-off key, and night extension keys.

Similar boards, N306A and N307A (illustrated) normally used as private exchanges, are wired for exchange lines and have a common "dial/ring-back" key so that there is only a "speak/ring" key per cord circuit.

Code No.	Extension lines	Exchange lines	Cord Circuits	Dimensions inches	Weight lb.
N306A	50	10 Wiring	12	54 × 21 × 29	245
N307A	100	10 20 only	14	54 × 27 × 29	325
N308A	50	10	15	55½ × 24 × 26	285

**Note**—Partially equipped boards can be supplied, and type N308A with up to 15 exchange lines.



## C.B. Switchboards

### LAMP SIGNALLING



N 360

Switchboards employing lamp signalling throughout have become very popular for private installations.

The framework is matt polished and smaller than that required for magnetic indicator signals.

The line lamps are in strips of 10, and the supervisory lamps mounted individually on the keyboard give double positive supervision. Extensions having a line resistance not exceeding 200 ohms are not fitted with line relays, but provision is made for connecting line relays in long circuits.

An alarm bell, to attract attention when a lamp glows, is provided and may be cut off when not required by means of a key.

Hand generator and switching key for power ringing.

A 24-volt battery is required to operate this switchboard, and where a.c. supply is available the battery is floated by a rectifier.

Partially equipped boards in multiples of 10 lines can be supplied.

Code No.	Line Circuits	Cord Circuits	Dimensions inches	Weight lb.	
N340	50	10	46 × 22 × 29	240	
N360	100	15	46 × 27½ × 29	320	





## C.B. Switchboards

### PRIVATE MANUAL BRANCH EXCHANGES

#### MULTIPLE AND LAMP SIGNALLING



Suite of Four Sections  
**PMBX. 1A**

PMBX. 1A with multiple and lamp signalling is designed to cater for very large establishments and comprises a main distributing frame, a suite of two or more switch sections, one or more apparatus racks and a power plant.

The main distributing frame is of conventional design, that shown in the illustration overleaf being of the wall type, and is extensible.

The switch sections, constructed of wood, are of modern design, being free from panelling and cornices, and have iron supports at the rear for mounting, cord, pilot, cord test and operator's circuit apparatus only, thereby ensuring accessibility to the interior equipment. The dimensions of each section are :—4 ft. 6 in. high, 2 ft. 2 in. wide, and 2 ft. 6 in. deep over the keyboard which is 2 ft. 6 in. high, so that special chairs for the operators are unnecessary.

The jack field is divided into two panels, the multiple being complete over four panels, i.e., two sections. Strips of 10 jacks and lamps are used for the exchange and inter-switchboard multiple and strips of 20 for the extension multiple, the lamp strips being dispersed throughout the respective multiples according to the loading of each section. The maximum capacity of a fully equipped PMBX. 1A is :—exchange and inter-switchboard lines 160, extension lines 800.

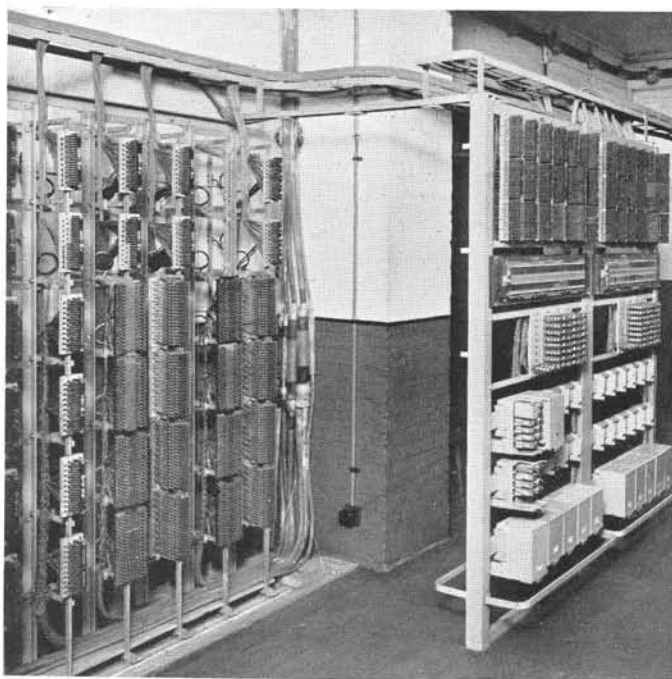
The keyboard is initially equipped with 12 cord circuits, the maximum capacity being 16, each circuit comprising two supervisory lamps, speaking and ringing key, and dialling and ring-back key. Miscellaneous circuit apparatus, such as hand generator keys, coupling keys and night service jacks are suitably mounted at the top of the jack field.



## C.B. Switchboards

### PRIVATE MANUAL BRANCH EXCHANGES

#### MULTIPLE AND LAMP SIGNALLING



M.D.F. and Two Apparatus Racks No. 1



Two No. 1 and One No. 1/35 Apparatus Racks

The apparatus racks are of two types, PMBX. No. 1 and No. 1/35, each constructed of an angle iron framework 7 ft.  $\times$  2 ft. 9 in.  $\times$  1 ft. 5 in.

Apparatus rack No. 1 accommodates terminal strips for terminating the apparatus and cables from the switchboard and M.D.F. ; a fuse panel for battery feed to all circuits ; sleeve resistor coils ; extension line relays when required and relay sets for exchange and inter-switchboard lines.

Apparatus rack No. 1/35 is provided when a large number of inter-switchboard lines is required and accommodates up to 35 lines.

Power supply is normally a 24 V. battery floated from a.c. mains by a rectifier, but where a.c. supply is not available double batteries with suitable charging equipment would be used.

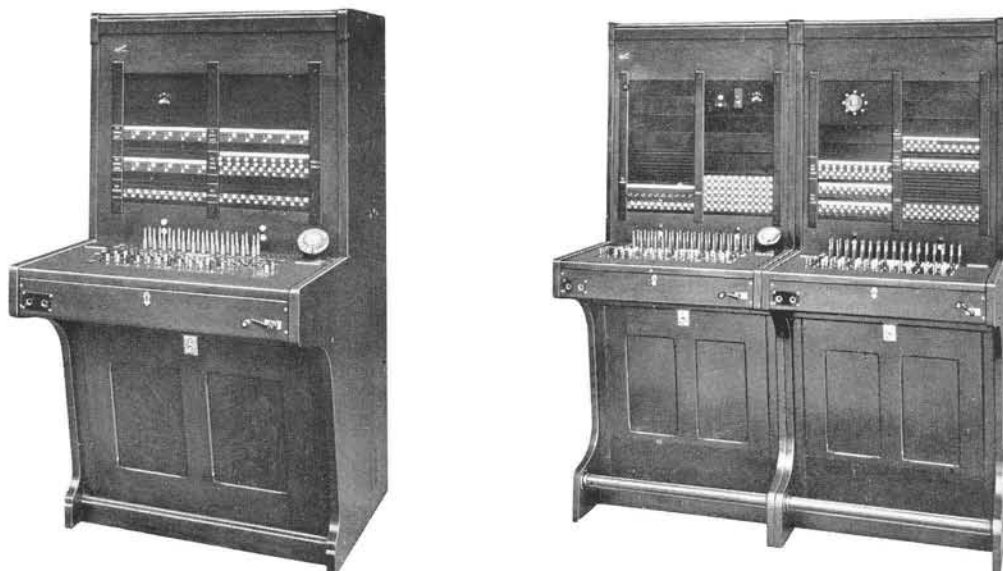
Line relays for extensions up to 200 ohms line resistance are omitted ; over 200 ohms, provision is made on racks No. 1 for the inclusion of P.O. 600 type relays ; all other relays are P.O. 3000 type.

Further particulars on application.



## C.B. Switchboards

### PRIVATE BRANCH RAILWAY EXCHANGES



**PBRX**

These switchboards are specially designed to meet the particular requirements of railways.

The sections are constructed of hard wood with ironwork fastened thereto for mounting apparatus.

The keyboard is covered with fibre and has capacity for 17 cord circuits.

Lamps are used for line and supervisory signals.

The jack field is arranged to accommodate a variety of circuits peculiar to railway work, and the stile bars are clearly engraved to indicate the circuit, e.g., "Rly. Trunks T2218."

When the public exchange is automatic a dial and dialling facilities are provided for the exchange lines.

A 24-volt battery floated by rectifier on a.c. mains is recommended for power supply.



## C.B.S. Switchboards



N 420

The "central battery signalling" system is developed to meet the case where, owing to the small size of the installation, it is not considered economical to install a full C.B. system.

These switchboards embody the very latest improvements, afford the advantages of automatic call and clear and provide standard operating facilities which are very desirable in areas where the larger exchanges are C.B. or automatic.

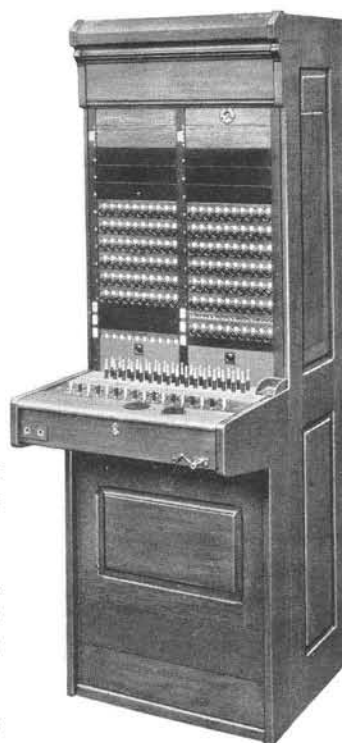
The woodwork is matt polished and the metal fittings are finished in black and copper bronze.

The totally enclosed type of indicator is fitted throughout and a 22-volt battery of large type primary cells will operate these switchboards.

The floor type switchboard is eminently suitable where an ultimate of three operators' positions is anticipated. It has capacity for 20 incoming junctions, 40 outgoing junctions, 10 miscellaneous circuits, 180 subscribers' lines and 200 multiple.

The local cable supplied and fitted is arranged for 10 incoming junctions, 20 outgoing junctions and 120 subscribers' lines, so that if wiring is required for a greater ultimate equipment, it must be specially ordered. Space is provided on the keyboard for an automatic dial.

Part of the top panel (at the side) is removable, so as to provide cabling space when two or more sections are lined up. A cable rack for supporting the cables is also incorporated in the top panels.



N 450

Code No.	Type	Extension Lines	Exchange Lines	Cord Circuits	Dimensions inches	Weight lb.	
N400	Table	3	1	2	$14\frac{1}{2} \times 14\frac{1}{4} \times 10\frac{1}{8}$	35	
N410	"	4	2	3	$14\frac{1}{2} \times 16\frac{1}{4} \times 13$	40	
N420	"	9	3	5	$17 \times 22\frac{3}{4} \times 13$	85	
N450	Floor	120	20 out 10 in	16	$77 \times 25 \times 35\frac{1}{4}$	560	
N451	"	60	20 out 10 in	14	$77 \times 25 \times 35\frac{1}{4}$	520	

Other sizes are also manufactured, particulars on request.



## C.B. Switchboards

### PUBLIC EXCHANGES

We manufacture and install two types of C.B. equipments viz.:— No. 10 type and No. 1 type.

**No. 10 Type** is designed for an ultimate capacity of 2000 subscribers' lines, and the switchboard consists of 1-position, 2-panel sections, having the lines multiplied every 4 panels, i.e., every 2 sections, so that each operator has access to any subscriber's line.

The sections are constructed of mild steel, faced with polished woodwork and closed in at the rear by a lift-out door. The pilot lamp rails, plug shelves, and keyboards are covered with hard fibre.

Each section has capacity for 200 calling lamps and answering jacks, 160 outgoing junction and miscellaneous circuit jacks, 1000 multiple jacks and 17 cord circuits on subscribers' sections, or 33 plug-ended junction cord circuits on incoming junction sections.

Dimensions of section :—

Height 6 ft. 4 $\frac{3}{8}$  in. ; width 1 ft. 11 in. ; depth 3 ft. 5 $\frac{1}{2}$  in.

For this type of equipment it is the standard practice to supply a combined main and intermediate distribution frame, which is more economical in cabling and occupies less floor space than separate frames. The latter can, however, be supplied if desired.

Note—Where an ultimate equipment of more than 2000 subscribers' lines is anticipated, but local conditions do not permit the use of the No. 1 type, the subscribers' lines are multiplied every 6 panels, thereby giving an ultimate capacity of 3000 lines.



**No. 10 Type Section**

**No. 1 Type** is designed for exchanges where the equipment desired is over 2000 subscribers' lines, or where the equipment is anticipated to exceed 2000 lines within a certain number of years.

The switchboard consists of 3-position, 8-panel sections, and the subscribers' lines are multiplied every 8 or 9 panels, as desired, while the outgoing junctions are usually multiplied every 6 panels.

In exchanges where the number of incoming junctions is comparatively small, the sections accommodating them are lined up with the subscribers' sections, but in very large exchanges the incoming junction sections form a separate line of boards having a 6-panel multiple.

The sections are constructed of mild steel faced with high-class polished woodwork and are closed in at the rear by sliding doors. The pilot lamp rails, plug shelves and keyboards are covered with hard fibre.

The normal capacity is 7200 subscribers' lines with an 8-panel multiple, but the top moulding is so arranged that part can be removed (when required) and thus increase the capacity by 1600 lines. With a 9-panel multiple the total ultimate capacity is 9900 lines.



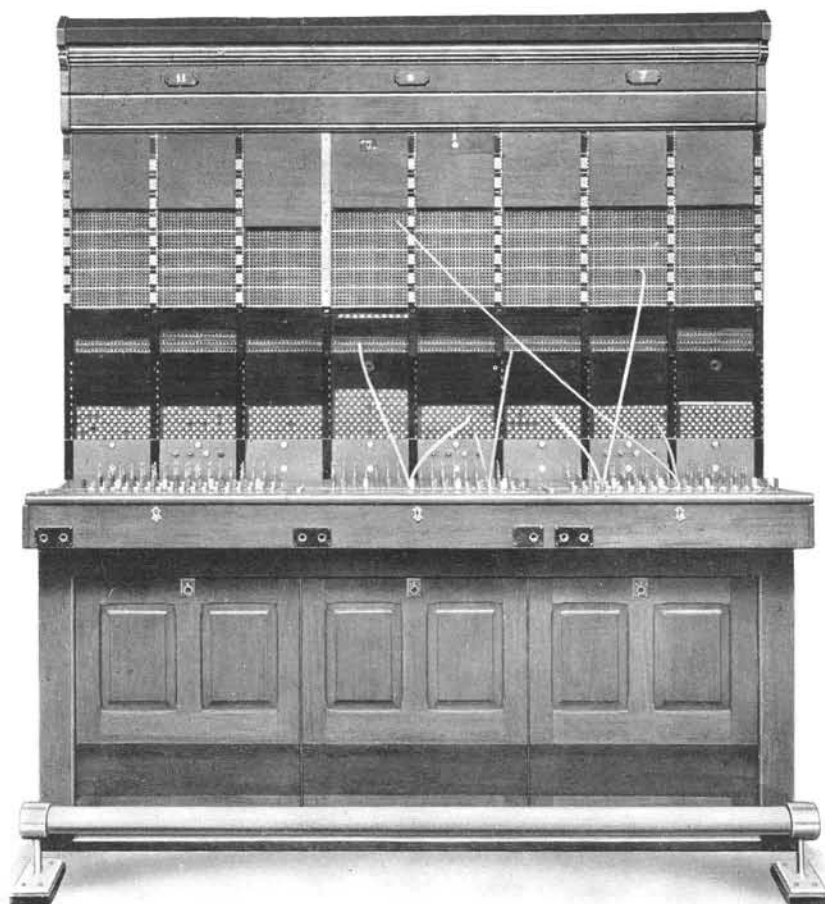
## C.B. Switchboards

### PUBLIC EXCHANGES

Fireproof bulkheads and partitions are fitted when desired and ordered.

Dimensions of section :—Height 6 ft. 8 in. ; width 5 ft. 8 in. ; depth 4 ft. 0 in.

Separate main and intermediate distribution frames are supplied with this type of equipment.



**No. 1 Type Section**

The sections, frames, racks and desks are designed on the expanding principle, so that additions may be readily added from time to time without interrupting the service.

We manufacture and supply all types of desks, suitably equipped, to meet all services.

The necessary miscellaneous circuits and apparatus, such as night alarm, pilots, order wires, tones, service, listening-in taps, etc., are provided.

A complete power plant is supplied with each exchange. The machines and batteries are of the first-grade and highest efficiency, being made to our specifications. The power boards and fuse boards are made by us and embody only the highest-grade and latest types of instruments, switches, etc.

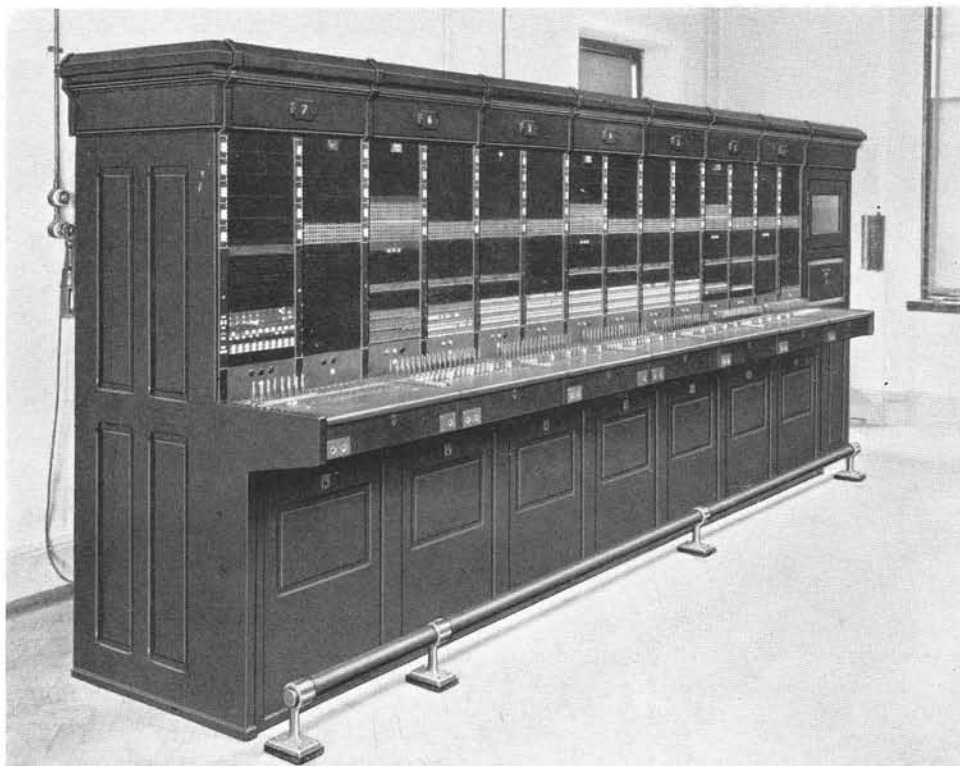
Complete equipments are made for either 24-volt or 40-volt working, but the summation of advantages is in favour of the latter which we strongly recommend.





## C.B. Switchboards

### PUBLIC EXCHANGES



View of a No. 10 Public C.B. Exchange



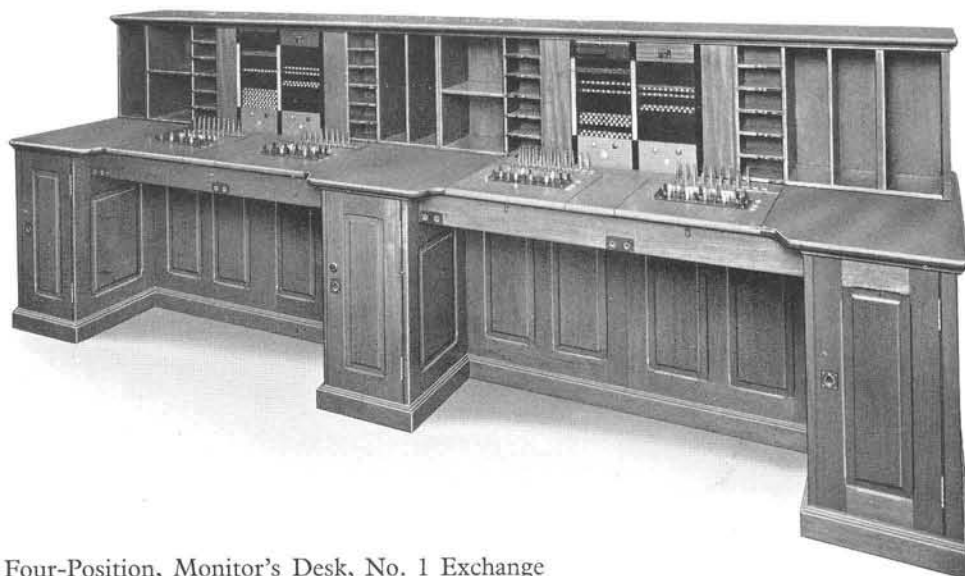
View of a No. 1 Public C.B. Exchange



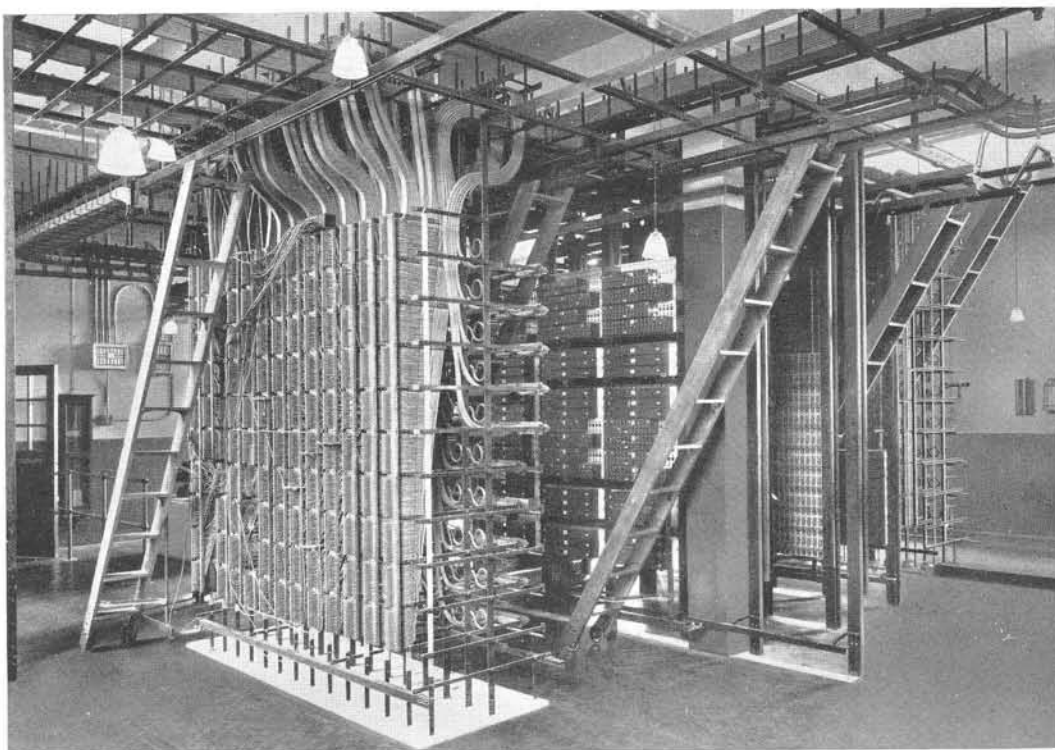


## C.B. Switchboards

### PUBLIC EXCHANGES



Four-Position, Monitor's Desk, No. 1 Exchange

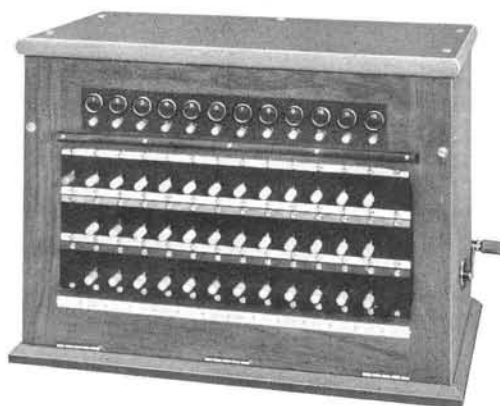


Frames and Racks, No. 1 Exchange



## Magneto Switchboards

CORDLESS



N 536A

The cases of these switchboards are identical in size to those of the C.B. N 120/140 types shown in this catalogue, so that they may be utilized for future conversion.

Totally enclosed, push-button restored disc indicators, N 4780, are used and are also suitable for C.B. and C.B.S. exchange lines, moreover, with small modification the indicators can be adapted for the extension lines. The necessary additional central battery apparatus and ready-made local cables can be supplied for conversion to 2 + 4 or 3 + 9 type boards.

The hardwood casework has a hinged front and is matt polished and connections are made by means of lever keys.

Broad coloured lines extending across the rows of keys serve to indicate clearly the connections made and thereby minimize operating errors.

The equipment includes anti-side-tone induction coil, "alnico" generator and night alarm with cut-off key.

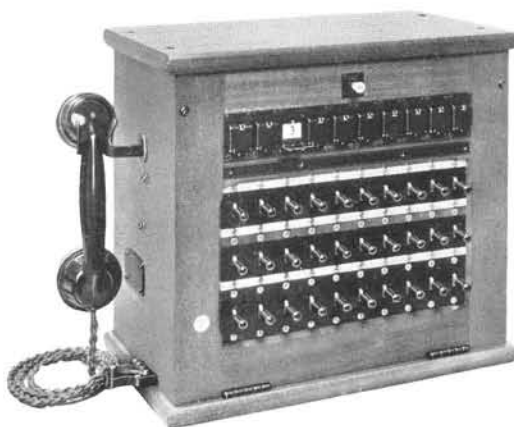
A bakelite micro-telephone fitted with a press key for disconnecting the microphone battery is wired to terminals inside the board.

Code No.	No. of Lines	Connecting Circuits	Dimensions inches	
N536	6	3	12 × 14½ × 11¾	
N536A	12	5	14½ × 20¼ × 11¾	



## Magneto Switchboards

### CORDLESS



**N 539A**

These boards are designed for small factories, offices, etc., requiring a telecommunication system of 6 to 20 lines. Simple to operate and occupying very little space, they may be placed on a table or shelf or, if necessary, fitted with wall battens.

The casework of hardwood has a hinged front and is matt polished.

Connections are made by means of lever keys. Broad lines in different colours extending right across the rows of keys indicate clearly the connections made and thereby minimize operating errors.

Drop type hand-restored indicators, N4816F, are used for the extension lines and also act for clearing purposes.

An "alnico" generator, night bell and key are fitted and a hook switch for disconnecting the microphone battery.

The operator's bakelite hand-set is plugged into a jack in the board and the circuit is arranged for direct connection to each line.

An acoustic shock absorbing device is incorporated in the operator's circuit.

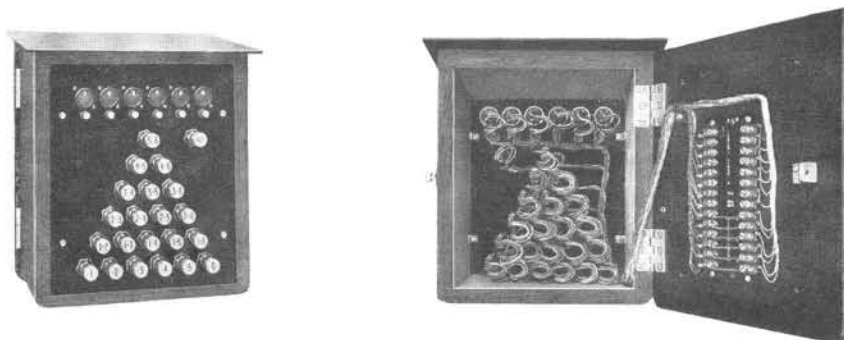
Code No.	No. of Lines	Connecting Circuits	Dimensions inches	Weight lb.	
N538A	6	3	$11\frac{1}{2} \times 14\frac{1}{2} \times 9\frac{1}{2}$	21	
N539A	10	4	$16 \times 14\frac{1}{2} \times 9\frac{1}{2}$	29	
N545A	15	5	$21\frac{3}{4} \times 16\frac{3}{4} \times 9\frac{1}{2}$	46	
N546A	20	6	$27\frac{1}{4} \times 16\frac{3}{4} \times 9\frac{1}{2}$	60	



## Magneto Switchboards

**CORDLESS, CERTIFIED INTRINSICALLY SAFE**

CERTIFICATE T/TEL. 83 (METHANE)  
CERTIFICATE No. 73 (PETROLEUM VAPOUR)



**N 513B**

These switchboards have been specially designed to meet the demand for an economical article for mines and other places where cast-iron explosion-proof cases are not essential. They are certified intrinsically safe for Group I, and for petroleum vapour in Group II gases and are therefore suitable for use in fiery mines or the petroleum industry.

The casework is constructed of hardwood of robust proportions and the sloping top is reinforced by a heavy-gauge steel plate which provides ample protection against falling roof material and water. A special triangle-headed screw lock is fitted and a suitable key for same is provided.

The indicators N4781N, mounted on the steel front plate, are totally enclosed and push-button restored.

The connecting keys N5202A, comprised of stout metal plungers fitted with metal tops, will withstand a considerable amount of rough usage. The tops are engraved to indicate the connections made when the keys are depressed.

The terminals are mounted on ebonite strips screwed to the backboard and are very accessible, two of these terminals are for connecting an alarm bell of the N3033 type.

This form of cordless switchboard is widely known as the "Pyramid" on account of the design formed by the keys. The simplicity of operating and obvious low maintenance costs have made them the general favourites for small magneto systems.

A separate telephone is required for operating purposes and any make of certified-safe telephones which have a safety condenser fitted may be used.

A diagram of the connections is supplied with each board.

Ministry of F & P Type	Code No.	No. of Lines	Dimensions inches	Weight lb.	
N513	N513A	4	$10\frac{5}{8} \times 8\frac{7}{8} \times 8\frac{1}{8}$	15	
N513	N513B	6	$12\frac{5}{8} \times 11\frac{1}{8} \times 8\frac{1}{8}$	21	

We can supply a Certified Ringing Delay Unit, N8656, which allows of code ringing, between stations on a line, without actuating the switchboard indicators. Connecting facilities are provided on the backboard.



## Magneto Switchboards

**CORDLESS, CERTIFIED INTRINSICALLY SAFE**

CERTIFICATE T/TEL. 83 (METHANE)  
CERTIFICATE No. 73 (PETROLEUM VAPOUR)



**N 555A**

These boards are certified intrinsically safe for Group I, and for petroleum vapour under Group II gases and are therefore suitable for use in fiery mines or the petroleum industry.

They are designed to meet the case where a larger ultimate capacity than six lines is required.

Constructed on very similar lines to the N513 type overleaf but a micro-telephone with battery switching key and induction coil are fitted so that a separate instrument is not required for operating purposes.

The indicators N4781N and keys N5202A are mounted on a hinged steel front plate which is locked by means of special triangle-headed screws. The keys are of exactly the same design as those used on the "Pyramid" mining boards but are arranged to provide a limited number of connecting circuits as given in the table below. The indicators are totally enclosed and push-button restored. The alnico generator is inside the board, except in the case of the 30-line switchboard, when it is in a separate box screwed to the bottom, in order to keep the overall size of the case to a minimum.

These switchboards may be used with any make of certified-safe telephones having safety condensers fitted.

A stand built of angle iron and having a hardwood top, can be supplied for mounting any of these switchboards.

Ministry of F & P Type	Code No.	No. of Lines	Connecting Circuits	Dimensions inches	
N555	N555A	10	3	$16\frac{1}{4} \times 15\frac{1}{4} \times 8$	
"	N555B	15	4	$16\frac{1}{4} \times 25 \times 8$	
"	N555C	20	4	$16\frac{1}{4} \times 25 \times 8$	
"	N555D	30	5	$21 \times 34\frac{1}{2} \times 8$	

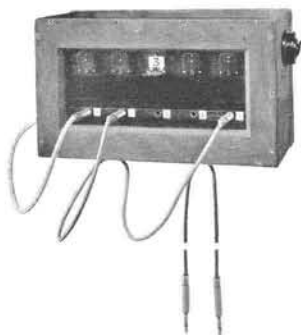
A certified Ringing Delay Unit N8656 can be supplied for use with these switchboards.

Similar switchboards can also be supplied for use with certified battery call telephones.

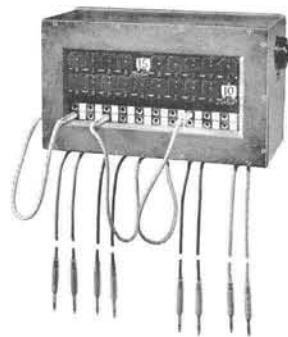


## Magneto Switchboards

### KEYLESS



**N 613**



**N 610**

A very popular type of switchboard, being so simple in build, apparatus and operation.

The case is made of fine hardwood matt polished, and the size is standardized for all equipments up to 20 lines.

The N4815D hand-restored drop indicators in the lines are 1000 ohms and are mounted in strips.

The indicators are permanently bridged across the lines so that they also give the clearing signal, their impedance is high and prevents any appreciable loss of speech currents.

The jacks are in strips fitted with removable labels numbered to correspond with the indicators.

The connecting cords are fitted with a plug at each end, thus providing "straight through" connections so that conversations cannot be interfered with by the operator.

A single cord and plug is provided for operating purposes.

For the operator's use a separate magneto telephone is required and should be installed by the side of the switchboard, a suitable instrument being telephone N2204, illustrated on page 41.

The night alarm is fitted inside and the "on" and "off" switch outside the case.

Code No.	No. of Lines	Cord Circuits	Dimensions inches	Weight lb.	
N610	20	5	$10 \times 15 \times 6\frac{1}{2}$	$16\frac{3}{4}$	
N611	15	4	$10 \times 15 \times 6\frac{1}{2}$	$14\frac{1}{2}$	
N612	10	3	$10 \times 15 \times 6\frac{1}{2}$	13	
N613	5	2	$10 \times 15 \times 6\frac{1}{2}$	$11\frac{1}{2}$	

These switchboards may also be used for earth circuits.



## Magneto Switchboards



**N 660A3**

Designed to give full operating facilities and constructed to occupy small space, these switchboards are particularly suitable where a high-grade magneto installation is desired.

The woodwork is matt polished and the metal parts are finished in durable black.

Equipped with line indicators and jacks, clearing indicators, speaking and ringing keys and a "ring back" key to ring on the answering cords should it be necessary, also night bell, switch, generator and micro-telephone so that these switchboards are complete and do not require a separate telephone for the operator.

The case is standardized for all equipments, dummies being fitted in the spaces of partially equipped boards.

All boards are wired for the full capacity of 30 lines and 6 cord circuits so that those having part equipments can be considerably and readily extended as required.

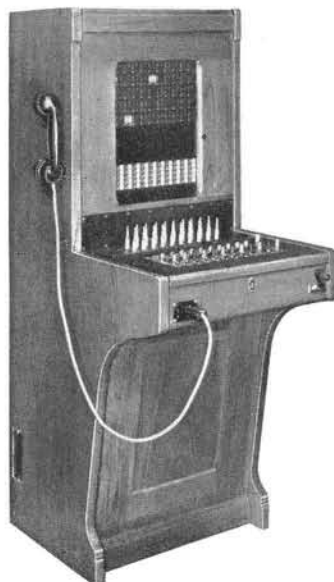
The layout of a fully equipped front panel from the top is :— three rows of 10 indicators, N4815D ; spacing strip ; clearing indicators, N4815D ; speaking, ringing and alarm keys ; spacing strip ; three rows of 10 jacks with numbered labels ; and a spacing strip.

Code No.	No. of Lines	Cord Circuits	Dimensions inches	Weight lb.	
N660A1	10	3	$20 \times 14\frac{1}{2} \times 11\frac{1}{2}$	41	
N660A2	20	5	$20 \times 14\frac{1}{2} \times 11\frac{1}{2}$	49	
N660A3	30	6	$20 \times 14\frac{1}{2} \times 11\frac{1}{2}$	54	

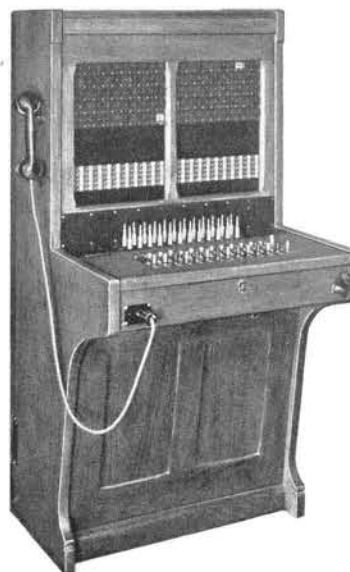




## Magneto Switchboards



**N 706A1**



**N 707A1**

For magneto installations these switchboards are suitable as private exchanges, private branch exchanges or small community public exchanges.

The capacities of the two standard sizes of boards are as follows :—

N706A type :— 50 extension lines, 10 exchange lines, 12 cord circuits.

N707A type :—100 extension lines, 10 exchange lines, 14 cord circuits.

In all cases, wiring for the full capacity is provided, but unless specially ordered, apparatus for exchange lines is not fitted. Extension line and cord circuit equipment figures are given below.

Equipped with strips of 10 drop indicators N4815D, strips of 10 jacks with numbered labels for the lines and enclosed type push-button restored indicators for clearing on the keyboard.

Associated with each pair of cords and the clearing indicator there is a speaking and ringing key, and in addition a common “ ring back ” key is fitted for ringing on the answering cords.

The night alarm is mounted inside and a key on the keyboard for switching it on or off as desired. A hand generator and a bakelite micro-telephone are provided for the operator.

Two sections can be lined up and bolted together to provide from 50% to 100% increase.

Code No.	No. of Lines	Cord Circuits	Dimensions inches	Weight lb.	
N706A1	50	10	54 × 21 × 27	169	
N706A2	30	6	54 × 21 × 27	150	
N707A1	100	12	54 × 27 × 27	216	
N707A2	70	10	54 × 27 × 27	196	

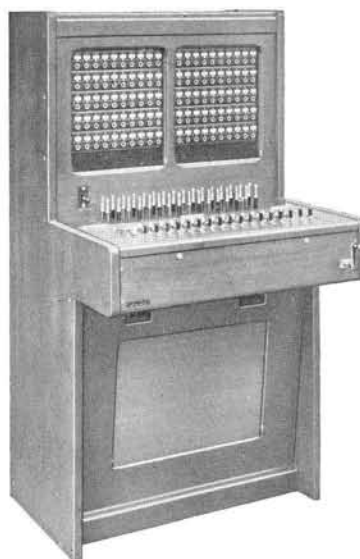


## Magneto Switchboards

### PLUG-RESTORED INDICATORS



**N 745A Type**



**N 765**

Plug-restored drop-indicators N4817 and jacks N5030 combined are employed for the line circuits of these switchboards, so that the insertion of a plug into a jack automatically restores the indicator flap to its normal position.

The clearing indicators N4817 on the wall board—the top row—are the same pattern as used in the combination but are hand restored, while those on the floor board are mounted on the key-board, and are the push-button restored totally enclosed disc type N4782.

The wall board is supplied with a bakelite micro-telephone and the floor board with either a micro-telephone or a head and breast set as ordered.

A hand generator and night bell with cut-off key are provided, also on the floor board a coupling key to enable two boards to be operated when lined-up together.

Standard boards have 1000-ohms line and clearing indicators. Floor boards can be supplied with 2000-ohms line and 2500-ohms clearing indicators if desired.

All the N745A type boards are wired for 50 line and 10 cord circuits so that extension up to the full capacity can be speedily effected.

Code No.	Type	Equipment		Dimensions inches	Weight lb.	
		Line Circuits	Cord Circuits			
N745A1	Wall	20	6	$24\frac{1}{2} \times 16\frac{1}{2} \times 11\frac{1}{2}$	66	
N745A2	„	30	8	$24\frac{1}{2} \times 16\frac{1}{2} \times 11\frac{1}{2}$	72	
N745A3	„	40	8	$24\frac{1}{2} \times 16\frac{1}{2} \times 11\frac{1}{2}$	77	
N745A4	„	50	10	$24\frac{1}{2} \times 16\frac{1}{2} \times 11\frac{1}{2}$	84	
N765	Floor	100	16	$50\frac{1}{2} \times 27\frac{1}{2} \times 24\frac{3}{4}$	218	



## Magneto Switchboards

### MULTIPLE TYPE WITH PLUG-RESTORED INDICATORS

This magneto multiple switchboard section is designed for extension up to 8 or 9 sections. It may be used as a single position switchboard up to 120 lines and extended by additional sections when required.

The multiple field per section is arranged for 600 lines, so that a 3-panel multiple will provide for a maximum of 900 lines, i.e., 100 line calling equipments per section giving an ultimate of 9 sections.

Combined plug-restored drop-indicators N4817 and answering jacks N5030 are employed for the line circuits and push-button restored totally enclosed disc indicators N4782 mounted on the keyboard and associated with the cord circuits for clearing.

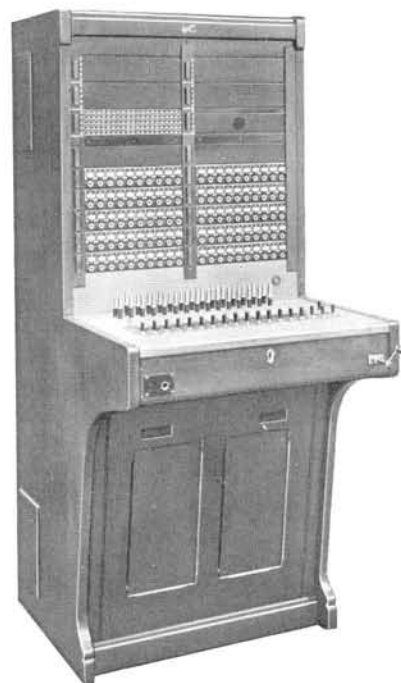
All boards are equipped with 15 cord circuits.

A hand generator with arrangements for connecting power ringing, a ringing indicator and night bell and key are fitted.

Operator's equipment includes a micro-telephone and/or a head and breast set, a listening key and a switch for connecting either one of two transmitter batteries. Batteries are not normally supplied. Multiple jack strips N5158 must be ordered when required.

The N781A type switchboards have a position meter fitted above the multiple field and a meter key on the keyboard. If desired, subscribers' meters can be operated in conjunction with this board.

Further information will be given on application.



**N 780A Type**

Code No.		Line Circuits		Dimensions inches	Weight lb.	
Without Metering	With Metering	Equipped	Wired			
N780A1	N781A1	20	100	$61 \times 26\frac{1}{4} \times 32$	212	
N780A2	N781A2	40	100	$61 \times 26\frac{1}{4} \times 32$	223	
N780A3	N781A3	60	100	$61 \times 26\frac{1}{4} \times 32$	235	
N780A4	N781A4	80	100	$61 \times 26\frac{1}{4} \times 32$	246	
N780A5	N781A5	100	100	$61 \times 26\frac{1}{4} \times 32$	258	
N780A6	N781A6	120	120	$61 \times 26\frac{1}{4} \times 32$	270	



## Accessories

### INDEX

	PAGE		PAGE
Automatic Charging Units ..	122	Contact Rods .. ..	132
Batteries .. ..	87	Convertors, Ringing .. ..	103-104
Battery Boxes .. ..	91	Cords, Dial .. ..	99
" Charging Units .. ..	122	" Instrument .. ..	100
" Eliminators .. ..	122	" Micro-telephone .. ..	99
Bells, Battery .. ..	87-89	" Receiver .. ..	100
" " Mining .. ..	88	" Switchboard .. ..	100
" " Watertight .. ..	89	" Terminal Block .. ..	100
Bell Sets .. ..	89	Covers, Relay .. ..	127, 129
Bells, Magneto .. ..	89-90	Dials .. ..	101
" " Loud Ringing .. ..	90	Diaphragms .. ..	101
" " Mining .. ..	90	Distributing Rings .. ..	132
Blocks for Protector .. ..	123	Distribution Blocks .. ..	91
Blocks, Commoning .. ..	91	" Boxes .. ..	92
" Distribution .. ..	91	Earpieces .. ..	101
" Terminal .. ..	90-91	Earth Clamp .. ..	94
Boxes, Battery .. ..	91	" Spike .. ..	101
" Distribution .. ..	92	Eliminators, Battery .. ..	122
" Junction .. ..	92	Fasteners, Cord .. ..	101
Breast Transmitter .. ..	136	" Jack .. ..	101
Buzzers .. ..	93	Fuse Mountings .. ..	123-125
Cables .. ..	93	Fuses .. ..	102
Cable Terminals .. ..	123	Generators, Hand .. ..	103
Caps, Lamp .. ..	94	" Mounted .. ..	103
Carbons, Granules .. ..	94	" Power .. ..	104
" Protector .. ..	94	" Ringing and Tone Sets .. ..	103
Cells .. ..	87	" " Syncycle," Static .. ..	104
Chairs, Operators' .. ..	94	Gongs .. ..	104
Chargeable Time Indicators .. ..	95	Granules, Carbon .. ..	94
Charging Units .. ..	122	Heat Coils .. ..	96
Clamp, Earth .. ..	94	Hooks .. ..	104
Clips, Test .. ..	94	Indicator-Jacks .. ..	108
Clocks .. ..	95	" -Relays .. ..	109
Coils, Bridging .. ..	95	Indicators, Chargeable Time .. ..	95
" Discharge .. ..	96	" Disc .. ..	105-106
" Heat .. ..	96	" Drop .. ..	107
" Induction .. ..	96		
" Repeating .. ..	97		
" Resistance .. ..	97		
" Retardation .. ..	97-98		
Condensers .. ..	98		





## Accessories

### INDEX—continued

	PAGE		PAGE
Indicators, Eyeball .. .. .	107	Protector Blocks .. .. .	123
„ Ringing .. .. .	109	Protectors, Cable Terminal .. .. .	123
Jack-Indicator .. .. .	108	„ Fuse Mounting .. .. .	123-125
Jacks, Instrument .. .. .	110	„ Single Unit .. .. .	124
„ Lamp, Single .. .. .	110	„ Strip .. .. .	125
„ Lamp, Strips .. .. .	110	Pulley Weights .. .. .	126
„ Switchboard, Single .. .. .	111	Receivers, “Inset” .. .. .	126
„ Switchboard, Strips .. .. .	111	„ Operators’ .. .. .	126
Junction Boxes .. .. .	92	„ Radio .. .. .	126
Keys, Lever .. .. .	112-113	„ Watch .. .. .	126
„ Plunger .. .. .	113-115	Relay Covers .. .. .	127, 129
„ Strips .. .. .	114	Relay-Indicator .. .. .	109
Labels .. .. .	116	Relays .. .. .	127-131
Lamp Caps .. .. .	94	„ Flameproof .. .. .	130
Lamp Jacks .. .. .	110	„ Mining .. .. .	130
Lamp Socket .. .. .	110	„ Power .. .. .	131
Lamps .. .. .	116	„ Telephone .. .. .	127-129
Meters .. .. .	116	Ringers .. .. .	131
Micro-telephones .. .. .	119	Ring and Tone Sets .. .. .	103
Mountings, Bridging Coil .. .. .	95	Ring and Tone Convertors .. .. .	103-104
„ Fuse .. .. .	123-125	Rings, Distributing .. .. .	132
„ Indicator .. .. .	105-108	Rods, Contact .. .. .	132
„ Key .. .. .	113-115	Signals, see Indicators .. .. .	—
„ Meter .. .. .	116	Strips, Terminal, see Blocks .. .. .	90-91
„ Protector .. .. .	123-125	Switches, Extension .. .. .	133
„ Relay .. .. .	127-129	„ Hook .. .. .	133
Mouthpieces .. .. .	119	„ Lever .. .. .	133
Number Plates, see Labels .. .. .	116	Tags .. .. .	134
Operators’ Chairs .. .. .	94	Terminal Blocks .. .. .	90-91
„ Sets .. .. .	120	Terminals .. .. .	134
„ Transmitters .. .. .	136	Test Clips .. .. .	94
Plugs, Instrument .. .. .	120	„ Plugs .. .. .	121
„ Switchboard .. .. .	121	Testing Sets .. .. .	133
„ Test .. .. .	121	Tone Generators .. .. .	103
Power Equipments .. .. .	122	Tools .. .. .	135
		Transmitters, Breast .. .. .	136
		„ “Inset” .. .. .	136
		Units Auxiliary Apparatus .. .. .	137-138
		Weights, Pulley .. .. .	126



## Batteries and Cells

The dry cells for telephone purposes have low internal resistance, inherent recuperative powers and a large output, and when connected up provide current immediately.

Inert cells are in a perfectly dry state when supplied and require the addition of water before they produce current, therefore they are particularly suitable for use in the tropics where they may be stored dry for any length of time.

The E.M.F. of both dry and inert cells is approximately 1.5 volts.



N 3748



N 3752

Code No.	Type and Use	Dimensions inches	Weight lb.	B.S.S.
N3748	Inert, for portable sets	$4\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$\frac{1}{2}$	IS 6
N3752	Dry	$6\frac{1}{2} \times 2\frac{5}{8}$	2	DS 3
N3754	Inert	$5\frac{1}{2} \times 2 \times 2$	$1\frac{1}{2}$	IS 5
N3755	Inert	$6\frac{1}{2} \times 2\frac{5}{8}$	$1\frac{7}{8}$	IS 3
N3767	Dry, for portable sets	$4\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$	$\frac{5}{8}$	DS 6

## Bells, Battery (D.C.)

### COMPACT TREMBLER TYPE

This type of bell consists of a moulded bakelite base, a metal cover, a  $2\frac{1}{2}$  inches diameter gong and terminals for series or parallel connections.

The terminals are accommodated in a recess at the back of the base where a non-inductive shunt resistance of 1200 ohms or 2200 ohms and/or interference suppressors can be fitted as required.

Interference suppressors cannot be supplied with tropical finish.

Dimensions :  $6 \times 3\frac{1}{4} \times 2\frac{1}{2}$  inches ; Weight  $13\frac{1}{2}$  oz.



N 3050  
Type

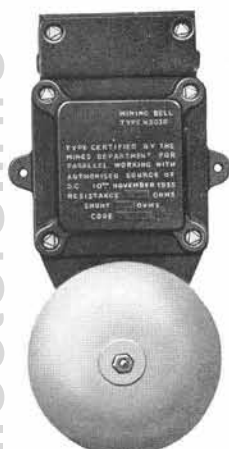
Code No.	Resistance ohms	Code No.	Resistance ohms	P.O. No.
N3050A	12.5 + 12.5	N3050C	250 + 250	56
N3050B	50 + 50	N3050D	1000 + 1000	type



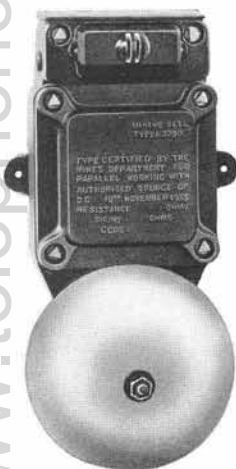
## Bells, Battery (D.C.)—*continued*

### CERTIFIED SAFE FOR MINES

CERTIFICATES T/BR.63 AND LIGHTS APPROVAL No. 13/10



**N 3033H**



**Bell with  
Lamp Signal**

Intrinsically safe 30-ohm mining bell, type approved by the Mines Department for use in fiery mines with bare wire or open switch signalling up to the maximum pressure of 25 volts and for any number in parallel, using porous pot Leclanche cells not larger than 3 pint size, or other certified source of current as advised in the Mines Department Circular No. 69 of 14th June, 1934.

The base and cover are made of fine quality cast iron and have wide machined flanges which give ample cooling surfaces. The cover is fixed by means of special triangle-headed screws sunk into the casting to prevent removal except by a special key. The terminals are housed in a separate compartment fitted with a drip-proof cover. The frame is arranged to take either a 6-inch or 8-inch gong. The hammer operates on the under-side of the gong and is protected from malicious interference.

The coils are treated to prevent the detrimental and corrosive effects of moisture and provision is made for testing the anti-spark winding which is 100 ohms.

The bells operate on 12 volts through 45 ohms, i.e., three miles of No. 8 G.I. wire and on 4 volts direct and may be used as single stroke or trembling.

The terminal compartment of the bells listed below is fitted with a plain cover, but where two or more bells are adjacent a distinguishing visual signal is an advantage, therefore, an interchangeable cover having a lamp and lens which give a bright green light can be supplied according to the voltage in use, i.e., 6 or 12 volts.

These may be requisitioned when ordering as :—

Terminal cover with 6 volt lamp, Code No. N55818.

or Terminal cover with 12 volt lamp, Code No. N55819.

Code No.	Size of Gong inches	Suitable for Voltages	Dimensions inches	Weight lb.	Mines Dept. Type	
N3033H	6	4 to 25	$13\frac{3}{4} \times 7\frac{1}{2} \times 3\frac{5}{8}$	$11\frac{1}{8}$	N3030	
N3034H	8	4 to 25	$15\frac{3}{4} \times 8 \times 3\frac{5}{8}$	$12\frac{1}{2}$	N3030	





## Bells, Battery (D.C.)—*continued*

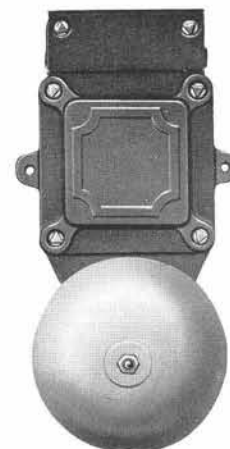
### WATERTIGHT TYPE

For use in engine rooms, railway yards, ships or any exposed positions ; these bells are of exactly the same design as the mining type opposite, except that the anti-spark device is not fitted.

The coils are specially treated to prevent the detrimental and corrosive effects of moisture.

The windings in series have a resistance of 12 ohms and the bells will operate on 4 volts direct up to 12 volts through 20 ohms.

Code No.	Size of Gong inches	Dimensions inches	Weight lb.	
N3036B	6, Brass	$13\frac{3}{4} \times 7\frac{1}{2} \times 3\frac{5}{8}$	10 $\frac{1}{2}$	
N3039	6, Bell metal	$13\frac{3}{4} \times 7\frac{1}{2} \times 3\frac{5}{8}$	11 $\frac{1}{2}$	
N3040	8, Bell metal	$15\frac{3}{4} \times 8 \times 3\frac{5}{8}$	12 $\frac{1}{2}$	



N 3039

## Bells, Magneto (A.C.)

### BELL SET

This bell set comprises a moulded bakelite cover and a metal base plate mounting a ringer and connecting terminals ; for use with intermediate telephones.

Code No.	Resistance ohms	Dimensions inches	Weight lb.	
N3114	1000	$8\frac{3}{16} \times 6\frac{1}{2} \times 2\frac{1}{16}$	2 $\frac{3}{4}$	



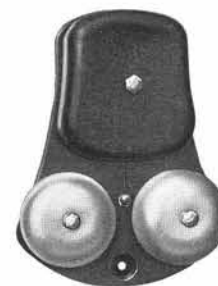
N 3114

### EXTENSION BELL

All-metal magneto extension bell, normally for indoor use but can be supplied with metal cowl for sheltered outdoor positions.

It has two coils which can be wired in series or parallel by strapping screw terminals, and 2 $\frac{1}{2}$  inches diameter gongs. Larger gongs are available if required.

Code No.	Resistance ohms	Dimensions inches	Weight oz.	P.O. No.
N3113D	500+500	$7\frac{1}{2} \times 5\frac{1}{2} \times 2\frac{1}{2}$	29	64D



N 3113D

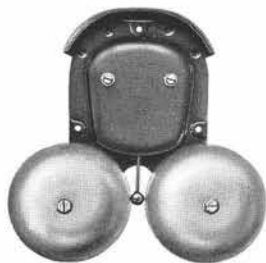


## Bells, Magneto (A.C.)—continued

### EXTENSION BELL, IRON CASE, LOUD-RINGING

An all-metal case, moisture-proof, loud-ringing magneto extension bell, suitable for factories, warehouses, railway yards, mines, etc.

Gongs : 6 inches diameter. Resistance : 1000 ohms.

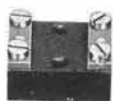


N 3111

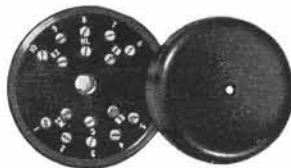
Code No.	Dimensions inches	Weight lb.	P.O. No.
N3111	$12\frac{1}{2} \times 13\frac{7}{8} \times 3\frac{1}{2}$	8	67 A

Similar bells can be supplied certified for use in mines and in petroleum vapour, operated from certified telephone magnetos, also from a.c. 50-cycle mains by certified transformers only.

## Blocks, Terminal



N 3144



N 3171



N 3191

Code No.	Terminals	Description and Use	Dimensions inches	Weight oz.	P.O. No.
N3144	2	Ebonite base ; terminating lines	$1\frac{3}{8} \times 1\frac{1}{8} \times \frac{3}{4}$	1	
N3171	16	Wood base and metal cover ; intercommunication table tele- phones, connecting flexible multi- cords to multi-cables	$4\frac{1}{4} \times 2\frac{1}{8}$	11	
N3172B	21		"	12	
N3180	11		"	10	
N3181	26		"	13	
N3183	14		"	10 $\frac{1}{2}$	
N3184	17	Wood base and metal cover as above ; intercommunication side-station and loud-speaker equipments, connecting flexible multi-cords to multi-cables	"	11	
N3185	19		"	11 $\frac{1}{2}$	
N3186	22		"	12	
N3187	24		"	12 $\frac{1}{2}$	
N3188	27		"	13	
N3191	4	Bakelite base and cover ; con- necting flexible multi-cords to C.B. magneto and special table telephones	$3\frac{1}{2} \times 1\frac{3}{4} \times 1$	3 $\frac{1}{2}$	20/4
N3192	8		$6 \times 1\frac{7}{8} \times 1$	6	20/8
N3193	12		$5\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{8}$	9	20/12



## Blocks, Terminal—*continued*

### COMMONING TYPE

These brass bars, fitted with tags, screws and washers are used as a convenient means for commoning leads such as "night alarm," "battery feed," etc., and they also provide a ready means of disconnection for testing purposes.

They are made from  $\frac{1}{2}$  inch wide bar,  $\frac{1}{8}$  inch thick, and can be supplied with any number of tags from 2 to 14. When ordering quote Code No. N7470 and state the number of tags required, as illustrated.



N 7470/6 tags

### DISTRIBUTION TYPE

For use on distribution frames, connecting racks, etc., these terminal blocks consist of bases with fanning holes and soldering tags bayoneted through insulating strips. They can be mounted from either the centre or the ends. The bases are  $2\frac{9}{16}$  inches wide, and  $6\frac{1}{2}$  inches long, and the insulating strips accommodate rows of 20 or 25 tags, double sided.

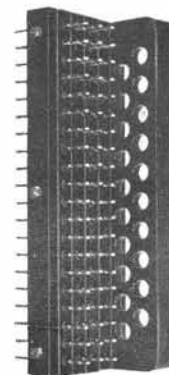
Code No. N7420 type ; in rows of 20 and multiples from 40 to 200 tags.

Code No. N7438 type ; in rows of 25 and multiples from 75 to 250 tags.

Similar blocks but single sided and for centre fixing only can also be supplied :—

Code No. 7460 type ; in rows of 20 and multiples from 60 to 140 tags.

When ordering, the Code No. and the number of tags required must be stated, as illustration.



N 7420/60 tags

## Boxes

### BATTERY BOXES

Battery boxes of varnished wood or other material for use with battery and magneto telephones, intercommunication systems and general purposes.

N3239 has a removable front, 2 terminals and mirror plates for fixing.

Code No.	Capacity	Dimensions inches	Weight lb.	
N3230	5-N3752 Cells	$13\frac{1}{4} \times 5\frac{1}{4} \times 9$	3	
N3231	7-N3752 Cells	$17\frac{1}{4} \times 5\frac{1}{4} \times 9$	$3\frac{1}{2}$	
N3239	2/3-N3752 Cells	$8\frac{5}{8} \times 5 \times 10\frac{3}{8}$	$2\frac{5}{8}$	
N3245	10-N3752 Cells	$14\frac{1}{2} \times 6\frac{1}{4} \times 8\frac{3}{4}$	$4\frac{1}{8}$	



N 3230

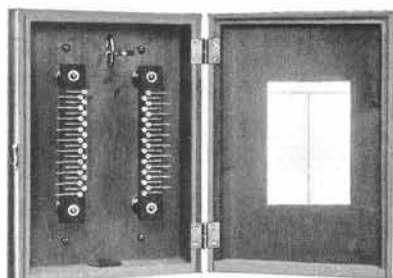


## Boxes—continued

### DISTRIBUTION BOXES—INDOOR

Used for terminating cables and distributing the lines to the various points, as required.

The terminals, with soldering tag at one end and screw connection at the other, are mounted on ebonite strips.

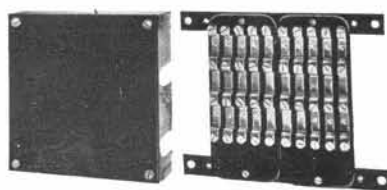


N 3290

Code No.	Terminals No. of pairs	Dimensions inches	Weight lb.	
N3290	20	$13\frac{1}{8} \times 9\frac{1}{4} \times 3\frac{5}{8}$	5	
N3291	40	$15\frac{1}{8} \times 14\frac{1}{4} \times 3\frac{3}{4}$	7	
N3292	80	$19\frac{3}{4} \times 15\frac{1}{4} \times 3\frac{7}{8}$	12	
N3293	160	$33\frac{5}{8} \times 16\frac{1}{8} \times 5\frac{7}{8}$	32	
N3294	240	$33\frac{1}{8} \times 21\frac{1}{8} \times 6$	37	

If specially ordered, similar distribution boxes can be supplied in metal cases.

### DISTRIBUTION BOXES—OUTDOOR, see Protector, Cable Terminal



N 3300B

### JUNCTION BOXES

Specially designed for indoor distribution in connection with intercommunication systems. The terminals are mounted on bakelite bases and are of brass, nickel plate finished. They are of a special shape so that individual connection with four cables can be made.

The bases are mounted on two iron bars and a cover is provided.

Code No.	Terminals	For use with Instruments	Dimensions inches	Weight lb.	
N3300B	10	N1620A and N1624A	$7\frac{1}{4} \times 6 \times 1\frac{7}{8}$	$2\frac{1}{4}$	
N3305B	15	N1621A, N1625A, N1720 and N1721	$9\frac{3}{4} \times 6 \times 1\frac{7}{8}$	3	
N3306B	20	N1622A, N1626A, N1722 and N1723	$12\frac{1}{2} \times 6 \times 1\frac{7}{8}$	4	
N3307B	25	N1623A, N1627A, N1724 and N1725	$14\frac{3}{4} \times 6 \times 1\frac{7}{8}$	$4\frac{3}{4}$	



N 3310

These junction boxes have been specially designed for the House Exchange System, see telephone section of this catalogue.

They are made of bakelite in two sizes, 30 and 48-way and provide for terminating up to four cables on individual terminal strips which are removable for connecting purposes. Commoning is carried out by means of square-section bare wires.

Code No.	Terminals	Dimensions inches	Weight lb.	P.O. No.
N3310	Four 30-way	$8\frac{9}{16} \times 7\frac{9}{16} \times 2\frac{1}{4}$	4	1
N3310A	Three 30-way	$8\frac{9}{16} \times 7\frac{9}{16} \times 2\frac{1}{4}$	$3\frac{3}{8}$	1A
N3311	Four 48-way	$12 \times 8\frac{1}{16} \times 2\frac{3}{8}$	6	2
N3311A	Three 48-way	$12 \times 8\frac{1}{16} \times 2\frac{3}{8}$	$5\frac{1}{8}$	2A



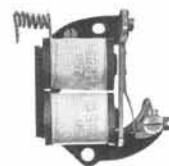
## Buzzers

For use in battery call and intercom. telephones, small switchboards, etc., the mechanism is similar to that employed in the N3050 type bell.

N3329 type has fixing holes for insulating collets for metal mountings.

N3340 type mounts on wood, bakelite, etc.

Dimensions :  $2\frac{5}{16} \times 2\frac{1}{8} \times 1\frac{1}{8}$  inches ; Weight :  $4\frac{1}{4}$  oz.



**N 3329**

Code No.	Resistance ohms	Code No.	Resistance ohms	Code No.	Resistance ohms	Code No.	Resistance ohms
N3329	50	N3340	20	N3340B	50	N3340D	500
N3329A	100	N3340A	25	N3340C	100	N3340E	2000

A similar buzzer to the above, for use on the instrument plug of the House Exchange telephone.

Code No.	Resistance ohms	P.O. No.
N3341	50 + .4 + 1000 NI	21

### BUZZERS, MOUNTED

This comprises N3340 type buzzer mounted on a moulded bakelite base with metal cover. Non-tropical interference suppressors can be fitted, also, on N3348D a 2200 ohms non-inductive resistance.

Dimensions :  $3\frac{1}{4} \times 3\frac{1}{4} \times 1\frac{3}{4}$  ins.  
Weight :  $9\frac{1}{2}$  oz.

Code No.	Resistance ohms	P.O. No.
N3348A	20	18 Type
N3348B	25	
N3348C	50	
N3348D	500	



**N 3348B**

## Cables

We supply single wire, twin wires and cables for indoor and outdoor use ; flameproof cross-connecting wires ; indoor and outdoor cables for intercommunication systems ; flameproof switch-board cables and lead-covered cables for exchanges.

Particulars and specifications on application.



## Caps, Lamp

Lamp caps can be supplied with various markings on the lenses ; particulars on application.



N 3400



N 3406A



N 3412

Code No.	Colour	Used with	Dimensions inches	Weight per 100	P.O. No.
N3400 N3401 N3402	Opal Red Green	Line Lamp Jacks	$\frac{1}{2} \times \frac{3}{8}$	5 oz.	1/1A 1/1C 1/1B
N3406A N3407A N3408A	Opal Red Green	Supervisory Lamp Jacks	$\frac{1}{2} \times \frac{13}{32}$	6 oz.	2/1A 2/1C 2/1B
N3412 N3413 N3414	Opal Red Green	Pilot Lamp Jacks	$\frac{27}{32} \times \frac{21}{32}$	22 oz.	69/1A 69/1C 69/1B

## Carbons

Finest hard burnished carbon granules for transmitters, packed in containers of 4 oz., 8 oz., 16 oz. and 5 lb.

Code No. N8544 for C.B. ; Code No. N8546 for L.B.

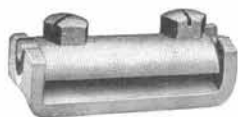
### PROTECTOR CARBONS

Superseded by " Blocks " for protectors, *see under " Protectors."*

## Chairs

Chairs for switchboard operators are supplied. Designs and prices on application.

## Clamp, Earth



N 8509

For making an earth connection by attaching to a water pipe. The earth lead is wound and fastened round the pipe and clamp ; then the screws are tightened up.

Code No. N8509. Dimensions :  $1\frac{7}{8} \times \frac{3}{4} \times \frac{7}{8}$  inches. Weight :  $2\frac{1}{4}$  oz.

## Clip, Test *see also Plugs, Test*

Test clip used on fuse mountings and supplied in pairs engraved "A" and "B" respectively.



N 20621

Code No.	Dimensions inches	Weight oz.	P.O. No.
N20621	$2\frac{1}{8} \times \frac{11}{16} \times \frac{11}{32}$	1	2



## Clocks

Timing clocks or chargeable time indicators are used where a charge is made according to the duration of a conversation, and are usually arranged to give a warning signal at intervals of three minutes. Provision is made for the operator to be warned by lamp, bell or buzzer.

N8537 "Telur" clock operation : Lever to the centre "starts," to the right "stops," and to the left "resets to zero and rewinds," the mechanism. Similar "Zenith" clocks can be supplied if desired.

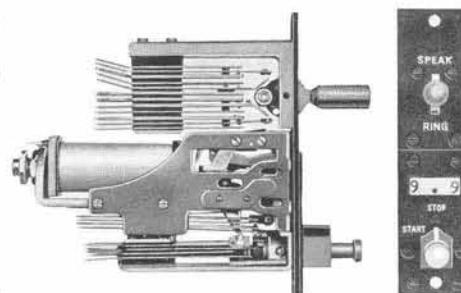


N 8537

N8538 type clock mechanism with "start" and "reset" key, operated from a master clock at 6-second intervals, can be supplied in various assemblies, that illustrated having incorporated a cord circuit "speak" and "ring" key. The maximum time display without resetting is 9.9 minutes.

Code No.	Dimensions inches	Weight oz.	P.O. No.
N8537	$3 \times 2\frac{3}{4} \times 1$	5	
N8538A	$4\frac{1}{4} \times 1\frac{1}{16} \times 5\frac{3}{8}$	10	44A
N8538B	$4\frac{1}{4} \times 1\frac{1}{16} \times 5\frac{3}{8}$	10	44B

N8538A for 24V, and N8538B for 40-60V.



N 8538 Type

## Coils

### BRIDGING COILS

Resistance ohms	For Mounting on Wood		For Mounting on Plates	
	Code No.	P.O. No.	Code No.	P.O. No.
50	N3481	1K	N3483	6K
100	N3481A	1A	N3483A	6A
200	N3481C	1C	N3483C	6C
300	N3481E	1E	N3483E	6E
400	N3481F	1F	N3483F	6F
500	N3481G	1G	N3483G	6G
600	N3481H	1H	N3483H	6H
750	N3481J	1J	N3483J	6J
1000	N3481K	1K	N3483K	6K
2000	N3481M		N3483M	
200+200	N3486	4A	N3487	7A
500+500	N3486A		N3487A	7C
600+600	N3486B	4B	N3487B	7B

Other resistances can be supplied on application.



N 3481 Type



N 3483 Type

Dimensions :  
N3481 and N3486— $3\frac{1}{4} \times 1\frac{9}{16} \times \frac{7}{8}$  inches  
N3483 and N3487— $3\frac{1}{4} \times \frac{7}{8}$  inches.  
Weight :  $3\frac{3}{4}$  oz.

### BRIDGING COIL MOUNTINGS

Code No.	Mounting for	Dimensions inches	Weight lb.	P.O. No.
N6220	20 Bridging Coils N3483 type	$19 \times 1\frac{1}{2}$	$1\frac{1}{2}$	84/20B
N6221	60 " " N3483 type	$22\frac{1}{2} \times 2\frac{3}{4}$	$3\frac{1}{4}$	84/60A
N6222	20 " " N3483 and N3487 type	$22\frac{1}{2} \times 1$	1	85/20A
N6223	20 " " N3483 and N3487 type	$19 \times 1\frac{1}{2}$	$1\frac{1}{2}$	85/20B
N6224	20 " " N3483 type	$22\frac{1}{2} \times 1$	$1\frac{1}{8}$	84/20A





## Coils—continued

### DISCHARGE COILS

When a telephone line is run on the same poles as high-tension conductors, the disturbance, due to induction from the latter, can be reduced by fitting discharge coils at various points along the telephone line. N8529 has a weatherproof metal case suitable for exposed positions.



N 8529

Code No.	Description	Dimensions inches	Weight lb.	
N8518	For indoor use	$6\frac{1}{4} \times 3\frac{3}{4} \times 2\frac{7}{8}$	3	
N8529	For outdoor use	$9 \times 6\frac{1}{8} \times 3$	$8\frac{1}{4}$	

### HEAT COILS

N3495 type, breaks the circuit on operation.

N3497 type, earths the circuit on operation.



N 3495 Type



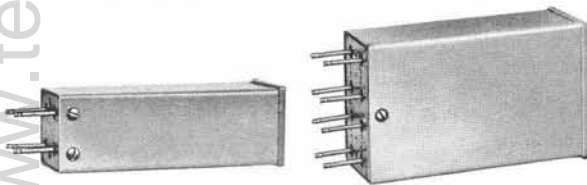
N 3497

Code No.	Resistance ohms	Colour of cover	Carrying capacity amps	Operating		Dimensions inches	Weight per 100	P.O. Code
				Amps.	Seconds			
N3495	5.05	Green	.3	.5	15—60	$\frac{4}{8} \times \frac{5}{16}$	7 oz.	A
N3495A	15.75	Light Blue	.15	.25	15—60	"	"	
N3495B	47.5	Blue	.08	.2	8	"	"	
N3495C	8.0	Pink	.3	.5	30	"	"	
N3495D	25.0	Black	.16	.25	30	"	"	
N3495E	22.5	Brown	.25	.5	10	"	"	
N3495F	4.15	Red	.35	.5	210	"	"	
N3495G	.5	Yellow	1.33	2.0	15—60	"	"	A
N3495H	.65	Brown	.9	1.5	15—60	"	"	A
N3497	4.0	Black	.35	.5	210	$\frac{13}{16} \times \frac{3}{8}$	6 oz.	BB

### INDUCTION COILS

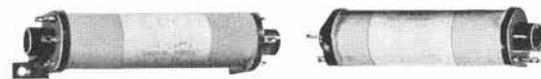
This selection of induction coils represents a range suitable for all ordinary transmitter circuits.

N3529 mounts on metal and N3529A on wood.



N 3505

N 3506



N 3529 Type

N 3530

Code No.	Resistance ohms	Used on	Dimensions inches	Weight oz.	P.O. No.
N3505	26+17	Supervisors' circuits	$5\frac{3}{16} \times 1\frac{13}{16} \times 1\frac{9}{16}$	16	9
N3506	18+130/18+490	C.B. Switchboards	$5\frac{3}{16} \times 1\frac{13}{16} \times 2\frac{11}{16}$	24	8
N3529	1+17+33	L.B. Telephones	$4 \times 1\frac{1}{16} \times \frac{15}{16}$	$4\frac{1}{2}$	21
N3529A	1+17+33	L.B. Telephones	$4\frac{3}{16} \times 1\frac{1}{8} \times 1\frac{1}{16}$	$4\frac{3}{4}$	21A
N3530	35+75+30+30+30	Telephones; Switchboards	$3\frac{5}{8} \times 1\frac{1}{8} \times \frac{15}{16}$	$4\frac{1}{2}$	27
N3531	1+19	Battery telephones	$4 \times 1\frac{1}{16} \times \frac{15}{16}$	$4\frac{1}{2}$	
N3532	4+20+440	C.B. Switchboards	$3\frac{3}{4} \times 2\frac{3}{8} \times 2$	$18\frac{1}{2}$	3/16
N3533	1+17+33+900	L.B. Telephones, etc.	$4 \times 1\frac{1}{16} \times \frac{15}{16}$	$4\frac{3}{4}$	



## Coils—continued

### REPEATING COILS

Toroidal type repeating coils, for use in the cord circuits and junction circuits on C.B. switchboards; arranged on hardwood bases for mounting on racks.



**N 3540**

Code No.	Description and Resistances	Dimensions inches	Weight lb.	P.O. No.
N3540	Primary 18 to 24, Secondary 18 to 24	$10\frac{3}{4} \times 4 \times 2\frac{9}{16}$	6	4001A
N3541	As N3540 but only one coil on same size base	$10\frac{3}{4} \times 4 \times 2\frac{9}{16}$	$3\frac{1}{4}$	4003A
N3543	One coil, Primary 37, Secondary 31	$6\frac{3}{4} \times 4 \times 2\frac{9}{16}$	3	4006A
N3544	Two coil, Primary 33-44, Secondary 28-34	$10\frac{3}{4} \times 4 \times 2\frac{9}{16}$	6	4009A
N3546	As N3540 but one coil on short base	$5\frac{3}{4} \times 4 \times 2\frac{9}{16}$	3	4008A

### RESISTANCE COILS

The range of resistances supplied is so great that it is not possible to give a detailed list here, nevertheless any resistance, within the ranges given in the table, may be ordered by stating the Code No. of the type and resistance required, e.g., N3552/4000 ohms.

N3570 spark quench type is vitreous enamel finished and coloured according to the resistances, which are limited to 10, 20, 40, 50, 100, 200 and 250 ohms.

Code No.	Bobbin	Range ohms	Accuracy	Dimensions inches	Weight oz. per 10	P.O. No.
N3552	Bakelite	3 to 50,000	$2\frac{1}{2}\%$	$1\frac{1}{4} \times 1 \times \frac{5}{8}$	8	12
N3556	Bakelite	4 to 20,000	1%	$1\frac{1}{4} \times 1 \times \frac{5}{8}$	8	12A
N3570	Ceramic	10 to 250	10%	$\frac{9}{16} \times \frac{3}{8} \times \frac{2}{3}\frac{1}{2}$	$\frac{1}{2}$	6
N3584A	Bakelite	.9 to 10,000	1%	$1 \times \frac{7}{8} \times \frac{9}{32}$	$2\frac{1}{2}$	15A
N3584B	Bakelite	.9 to 10,000	$2\frac{1}{2}\%$	$1 \times \frac{7}{8} \times \frac{9}{32}$	$2\frac{1}{2}$	15
N3590	Ceramic	.5 to 2,000	10 to $2\frac{1}{2}\%$	$1\frac{5}{8} \times 1 \times 1$	$12\frac{1}{2}$	9



**N 3552**



**N 3570**



**N 3584**



**N 3590**

### RETARDATION COILS

For operators' telephone circuits on C.B. Switchboards.  
Dimensions:  $5\frac{1}{8} \times 1\frac{13}{16} \times 1\frac{1}{2}$  inches; Weight 16 oz.

Code No.	Resistance ohms	Description	P.O. No.
N3606	165	These retards mount on plates and are for the operators' circuits on 24, 40 and 48-volt C.B. Switchboards and desks	13A
N3606A	250		13C
N3606B	325		13B
N3606C	400		13D



**N 3606**



## Coils—continued

### RETARDATION COILS

For battery feed on C.B. private branch exchange switchboards.  
Dimensions :  $4 \times 1\frac{5}{8} \times 2\frac{1}{8}$  inches ; Weight  $18\frac{1}{2}$  oz.



**N 3616**

#### DOUBLE WOUND

#### SINGLE WOUND

Code No.	Resistance ohms	P.O. No.	Code No.	Resistance ohms	P.O. No.
N3616	80 + 80	39A	N3622	20	40A
N3616A	120 + 120		N3623	48	40E
N3616B	200 + 200		N3624	50	40B

## Condensers

The table below is a list of the principal condensers used in telephony ; other sizes and types can be supplied.



**N 3652A**



**N 3679**

Code No.	Capacity mfd.	Used on	Dimensions inches	Weight oz.	P.O. No.
N3650	10	P.B.X. Switchboards	$4\frac{3}{4} \times 3\frac{1}{8} \times 2\frac{1}{2}$	28	20
N3651A	4	General purposes	$3\frac{7}{8} \times 1\frac{5}{8} \times 2$	9	103
N3651C	4	„ „	$3\frac{7}{8} \times 1\frac{5}{8} \times 1$	$4\frac{3}{4}$	103A
N3652A	2	„ „	$3\frac{7}{8} \times 1\frac{5}{8} \times 1$	$4\frac{3}{4}$	102
N3653A	1	„ „	$3\frac{7}{8} \times 1\frac{5}{8} \times \frac{1}{2}$	$2\frac{3}{4}$	101
N3654A	.5	„ „	$3\frac{7}{8} \times 1\frac{5}{8} \times \frac{1}{2}$	$2\frac{1}{2}$	100
N3656A	.25	„ „	$3\frac{7}{8} \times 1\frac{5}{8} \times \frac{1}{2}$	$2\frac{1}{2}$	115
N3657	2	P.B.X. Switchboards	$4\frac{3}{4} \times 3\frac{1}{8} \times \frac{9}{16}$	6	1
N3658	1	„ „	$4\frac{3}{4} \times 3\frac{1}{8} \times \frac{5}{16}$	5	14
N3673	.01	Mining Telephones, magneto	$2 \times \frac{5}{8}$	$\frac{1}{2}$	
N3679	2+.1	Auto and C.B. Telephones	$3\frac{7}{16} \times 1 \times 1$	3	97
N3684	2	General purposes	$3\frac{7}{16} \times 1 \times 1$	3	99
N3692	.5	N2121 type telephones as required	$3\frac{7}{16} \times 1 \times 1$	3	
N3696	1		$3\frac{7}{16} \times 1 \times 1$	3	

Spark quench condensers for the magnet circuits of auto switches and selectors, also mica condensers from 100 to 200,000 pico-farads for high frequency circuits, can be supplied.



## Cords

Owing to the great variety of cords, it is not practicable to give herein a complete list of them all, but the selection given comprises those used with the standard instruments and switchboards appearing in this catalogue.

Moisture-proof cords are fitted, as standard, on all instruments excepting tropical, portable and mining sets.

Waterproof cords, which are fitted on tropical, portable and mining instruments, have each conductor rubber insulated. The outer covering for portable and mining sets is V.I.R., and for other tropical sets close overall braiding.

Switchboard cords, for small wall and floor boards, are made in two colours, black and red, and for large exchange equipments in four colours, black, red, green and neutral. The colours required should be specified when ordering and it will greatly assist us in supplying the correct article, if the code number or other information of the instrument or switchboard, for which cords are required, is also stated.

In all cases the length of cord stated is the measurement between the main bindings.

### DIAL CORDS

Code No.	Conductors	Used on dials for	Length inches	P.O. No.
N4129	5	Cordless switchboards	5	4/33E
N4131	4	N1046 and N1049 type telephones	8	
N4137	5	N306A type switchboards	3	
N4181	5	House Exchange auto telephones	5	
N4183	5	N1002 type telephones	5	5/28E

### MICRO-TELEPHONE CORDS

Colours and finish of cords for black instruments are ; normal, brown plaited ; tropical, brown braided ; and for portable and mining sets, rubber.

Code No.	Conductors	Type	Micro-telephones	Length ft. in.	P.O. No.
N4021	3	Plaited	Standard, with 3-way cords	3 6	3/63A
N4028	4	Rubber	Reinforced, mining and rough usage	1 7	
N4039	4	Plaited	Standard, with 4-way cords	3 6	4/42A
N4045	4	Plaited	Standard, with press key	4 0	
N4053	3	Rubber	With press key, for portable telephones	4 0	
N4055	4	Rubber	For iron-cased telephones and damp places	1 7	



## Cords—*continued*

### RECEIVER CORDS

Code No.	Conductors	Used on	Length ft. in.	
N4064	2	Headgear receivers N6810B type	1 9	
N4065	3	Headgear receivers N6811 type	1 9	
N4069	1	Magneto Mining Telephone N2984 type,	1 2	
N4070	1	one of each per receiver	1 2	

### SWITCHBOARD CORDS

Code No.	Conductors	Used on switchboards	Length ft. in.	P.O. No.
N4201	3	N450, N451 types	6 0	328
N4202	3	Small switchboards	2 0	341
N4205	2	N306, N340, N706 types	4 0	
N4207	2	N765 type	4 6	
N4215	2	N660 type	2 3	
N4219	3	For public exchanges No. 1 and No. 10 types and PMBX.1A	9 9	323
N4230	3		7 6	350
N4232	3		9 9	331
N4244	3		6 0	335
N4245	3		11 6	354
N4247	2		2 6	
N4254	3	N610 type	5 6	
N4264	2	N780 type	2 6	
		N745 type		

### TERMINAL BLOCK AND INSTRUMENT CORDS

Code No.	Conductors	Used on	Length ft. in.	P.O. No.
N4100	11	Intercommunication telephone N1620A	6 0	
N4101	16	Intercommunication telephone N1621A, N1630	6 0	
N4102	21	Intercommunication telephone N1622A, N1631	6 0	
N4103	26	Intercommunication telephone N1623A, N1632	6 0	
N4120	17	Intercommunication telephone N1720, N1721	6 0	
N4122	22	Intercommunication telephone N1722, N1723	6 0	
N4124	27	Intercommunication telephone N1724, N1725	6 0	
N4142	4	Operator's breast set N8575, N8576 types	4 0	
N4317	3	Auto and C.B. telephones	4 6	3/62B
N4318	5	Call and reply telephones	4 6	5/14B
N4319	4	Battery telephone N1102	4 6	4/57B
N4320	6	Side Station telephone N1594	4 6	
N4321	8	Railway telephone N1202 type	6 0	
N4324	4	Magneto telephone N2121, N2185 types	4 6	
N4337	10	Intermediate telephones N1046, N1321 types	5 0	
N68780	10	Railway telephones N1200, N1201 types	4 6	



## Dials

Stainless steel, plastic coloured, and black finger-plates can be supplied, also a cover N50466 to protect the rear mechanism from damage and dust. Standard speed 10 impulses per second with a break period of  $66\frac{2}{3}\%$ . Other rates supplied on request.

Code No.	Type	Dimensions inches	Weight oz.	P.O. No.
N4381F	Non-director areas	$3\frac{1}{8} \times 1\frac{9}{16}$	8	SS.10FA/4A
N4381H	Director areas	$3\frac{1}{8} \times 1\frac{9}{16}$	8	SS.10LA/4A



**N 4381F**

## Diaphragms

Code No.	Material	Used on	Diameter inches	Weight per 100	P.O. No.
N4400	Stalloy	Receivers and bakelite micro-telephones	2.062	14 oz.	12
N4410	Stalloy	Receivers on magneto mining telephones	2.110	$14\frac{3}{4}$ oz.	18
N4413	Permandur	Bakelite micro-telephone receivers	2.062	15 oz.	25

## Earpieces

Code No.	Used on	Dimensions inches	Weight oz.	P.O. No.
N4443	Bakelite micro-telephone receivers	$2\frac{9}{16} \times \frac{15}{16}$	$1\frac{1}{8}$	18
N4447	Receiver N6831	$2\frac{9}{16} \times \frac{15}{16}$	$1\frac{1}{2}$	23



**N 4443**

## Earth Spike

This spike is used for making the earth connection for a single line field or temporary telephone circuit.

Code No.	Length inches	Weight oz.
N8516	$10\frac{1}{8}$	8



**N 8516**

## Fasteners



**N 8580**



**N 8590**

Code No.	Used for	Dimensions inches	Weight per 100	P.O. No.
N8580	Connecting switchboard cords	$1\frac{5}{16} \times \frac{11}{16} \times \frac{1}{4}$	$1\frac{1}{4}$ lb.	1
N8590	Fastening $\frac{3}{8}$ in. or $\frac{1}{2}$ in. jack strips	$1\frac{5}{16} \times \frac{4}{8} \times \frac{7}{4}$	$2\frac{1}{2}$ lb.	17



## Fuses

Below is a range and variety of fuses to cover telephone and many other requirements.

R.C. is the "Rating Current" and represents the current that the fuse wire will carry safely.

F.C. is the "Fusing Current" and represents the current at which the wire will fuse.



**N 4534 and N 4570 Types**

**N 4580**

**N 4590**

**N 4593**

Code No.	R.C. Amps	F.C. Amps	Description	Length inches	Weight per 100	P.O. No.
N4534	2.75	3.75	Glass tube with metal end caps for clip type holders, straight wire fuse, used on instrument and switch-board protectors	$2\frac{1}{8}$	15 oz.	
N4535	1.2	1.75		$2\frac{1}{8}$	15 oz.	
N4536	.65	1.3		$2\frac{1}{8}$	15 oz.	
N4537	.3	.6		$2\frac{1}{8}$	15 oz.	
N4538	.28	.4		$2\frac{1}{8}$	15 oz.	
N4539	.15	.3		$2\frac{1}{8}$	15 oz.	
N4540	.3	.5		$2\frac{1}{8}$	15 oz.	
N4541	.5	.75		$2\frac{1}{8}$	15 oz.	
N4542	.7	1.0		$2\frac{1}{8}$	15 oz.	
N4543	.75	1.5		$2\frac{1}{8}$	15 oz.	
N4544	1.4	2.0		$2\frac{1}{8}$	15 oz.	
N4545	1.75	2.5		$2\frac{1}{8}$	15 oz.	
N4546	2.1	3.0		$2\frac{1}{8}$	15 oz.	
N4547	2.8	4.0		$2\frac{1}{8}$	15 oz.	
N4548	3.5	5.0		$2\frac{1}{8}$	15 oz.	
N4550	5.3	8.0		$2\frac{1}{8}$	15 oz.	
N4570	1.5	3.0	Porcelain tube	$2\frac{1}{8}$	17 oz.	1/2
N4571	.5	1.0	Glass tube	$2\frac{1}{8}$	15 oz.	1/1
N4573	1.5	3.0	Glass tube	$2\frac{1}{8}$	15 oz.	
N4574	.5	1.0	Glass tube with yellow band	$2\frac{1}{8}$	15 oz.	1/1C
N4575	.25	.5	Glass tube with brown band	$2\frac{1}{8}$	15 oz.	1/1D
N4579	3.0	6.0	Porcelain tube	$2\frac{1}{8}$	17 oz.	
N4596	3.0	6.0	Glass tube with white band	$2\frac{1}{8}$	15 oz.	1/3B
N4597	1.0	2.0	Glass tube with blue band	$2\frac{1}{8}$	15 oz.	1/1E
N4580	1.2	2.4	Yellow bead	$1\frac{3}{8}$	10 oz.	5/1
N4584	2.0	4.0	Green bead	2	11 oz.	6/2
N4588A	.5	1.0	Blue bead	2	11 oz.	31/1
N4588B	1.5	3.0	Red bead	2	11 oz.	31/2
N4588C	3.0	6.0	Black bead	2	11 oz.	31/3
N4590	1.2	2.4	Yellow	$1\frac{11}{32}$	5 oz.	9/1
N4591	2.0	4.0	Green	$1\frac{11}{32}$	5 oz.	9/2
N4592	3.0	6.0	Black	$1\frac{11}{32}$	5 oz.	9/3
N4593	1.0	2.0	Yellow	2	$7\frac{1}{2}$ oz.	35/1
N4593A	2.0	4.0	Green	2	$7\frac{1}{2}$ oz.	35/2
N4593B	3.0	6.0	Black	2	$7\frac{1}{2}$ oz.	35/3
N4595	2.5	5.0	Hexagon porcelain tube, knife edge contacts	$1\frac{13}{16}$	16 oz.	37/3
N4600	3.0	6.0	Glass tube, metal end caps, straight wire fuse supported in tube. For high tension protection	$8\frac{3}{4}$	$7\frac{1}{2}$ lb.	
N4601	.75	1.5		$8\frac{3}{4}$	$7\frac{1}{2}$ lb.	

**FUSE MOUNTINGS**—see *Protectors*





## Generators

### HAND GENERATORS

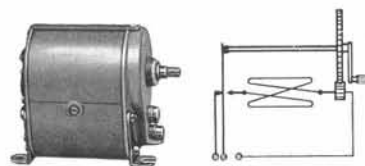
The compactness, light weight, and remarkably high output of these one-magnet generators are due to the magnetic alloy, aluminium-nickel-cobalt known as "alnico."

The standard output is equal to the old multi-magnet types up to four magnets and heavy output up to five magnets.

There are two methods, "X" and "Y," of fixing the handles to the driving spindles, "X" being simply screwed on and "Y" slid on to engage a pin and fastened by a screw or hexagon-headed bolt.

The Code Nos. of the generators do not include the handles, which must be ordered separately from the table below, and which are primarily for use with the telephones indicated. Handles for generators for use on switchboards vary with the position of the generators and must be specially ordered according to the length of spindle required, i.e., dimension "B."

Dimensions : Length, see table ; width  $2\frac{3}{16}$  in. ; height 3 in. Average weight  $2\frac{1}{4}$  lb.



N 4649



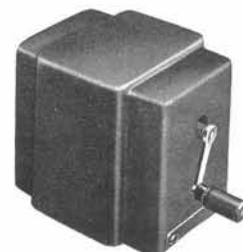
Code No.	Output	Used on Telephones	Length inches	Drive	P.O. No.	Code of Handle
N4644	Standard	Portable, N1845 type	$4\frac{3}{4}$	Y	26A	N66862
N4649	Standard	Wall N2515 type, Switchboards, etc.	$3\frac{5}{16}$	X		N56393
N4649A	Limited	Mining Wall N2518 type	$3\frac{5}{16}$	X		N56393
N4655	Heavy	Wall N2516 type, Switchboards, etc.	$3\frac{7}{8}$	X		N56393
N4658	Heavy	Wall N2204B type	$3\frac{7}{8}$	X		N71936
N4667	Standard	Wall N2204A type	$3\frac{5}{16}$	X		N71936
N4670	Standard	Table, various	$3\frac{5}{16}$	Y		N71541
N4670	Standard	Intermediate	$3\frac{5}{16}$	Y		N70900

### MOUNTED GENERATORS

The case for this set comprises a metal base, insulated terminals and a bakelite cover. It is arranged to accommodate a standard or heavy duty generator, also a 2 mf condenser.

Handle N71153. Dimensions,  $5\frac{1}{4} \times 4\frac{1}{4} \times 5$  inches.

Code No.	Generator	Condenser	Weight lb.	P.O. No.
N8486A1	N4649	Without	$3\frac{3}{4}$	26AN
N8486A2	N4649	With	4	26AP
N8486B1	N4655	Without	$4\frac{1}{4}$	
N8486B2	N4655	With	$4\frac{1}{2}$	



N 8486A

### RINGING AND TONE SETS

These sets are primarily designed for small automatic switchboards as an economical method of providing ringing current and tones by means of vibrating reeds and controlling relays. Ringing sets can also be supplied for manual switchboards. For 24 volts the apparatus is mounted on a single plate and for 50 volts the vibrating reed equipment is on one plate and the controlling relays on another. The mounting plates with dust-proof covers are of the jack-in type.

Code No.	Description	Dimensions inches
N43804	Single Unit Set, 24 v.	$11\frac{1}{2} \times 4\frac{1}{2} \times 8\frac{1}{2}$
N43805	Ringing and tone unit	$8 \times 4\frac{1}{2} \times 8\frac{1}{4}$
N42082A	Controlling relays unit	$9 \times 4\frac{1}{2} \times 8\frac{1}{4}$



N 43804



## Generators—continued

### POWER GENERATOR



N 8495

This set comprises a motor and an alternating current generator combined, and is used for supplying ringing current for manual switchboards and exchanges.

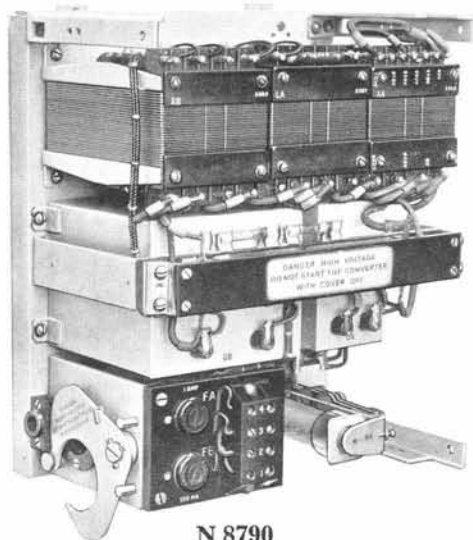
When ordering state supply voltage.

Code No.	Dimensions inches	Weight lb.	
N8495	$11 \times 6\frac{1}{2} \times 6\frac{1}{2}$	36	

### "SYNCYCLE" STATIC RINGING CONVERTER

This converter is used as an alternative to the ringing motor-generator, for providing  $16\frac{2}{3}$  c.p.s. ringing current from 50 c.p.s. mains.

The output is 5 watts at 75 volts and the input transformer has tapplings suitable for all the normal supply voltages between 90 and 260.



N 8790

Sets suitable for wall, batten or rack mounting can be supplied, also converters having an output of 20 watts at 90 volts. That illustrated is for batten or wall mounting.

Code No.	Output	Dimensions inches	P.O. No.
N8790	75v, 5w, $16\frac{2}{3}$ c/s	$10\frac{1}{8} \times 8\frac{3}{8} \times 5\frac{3}{8}$	2B

## Gongs

It is not practicable to enumerate the large variety of gongs manufactured in high, low and medium tones.

Replacements may be ordered by stating the particulars of the telephone or bell for which gongs are required and the tones desired.

## Hooks



N 8598



N 8605



N 8606B



N 8608



N 8600



N 8505

Code No.	Use	Dimensions inches	Weight oz.	P.O. No.
N8505	With N8513 contact rods	$2\frac{5}{8} \times 2\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{4}$	N
N8598	L.H. Supporting bakelite micro-	$3\frac{1}{16} \times 1\frac{11}{16} \times 1\frac{5}{8}$	$1\frac{3}{4}$	
N8598A	R.H. telephone on switchboards	$3\frac{1}{16} \times 1\frac{11}{16} \times 1\frac{5}{8}$	$1\frac{3}{4}$	
N8600	Supporting switchboard cords	$1\frac{1}{2} \times \frac{9}{16} \times \frac{1}{8}$	$\frac{1}{10}$	8
N8605	Bakelite micro-telephone on	$3\frac{1}{8} \times 2\frac{1}{2} \times 2$	$2\frac{1}{2}$	
N8606B	wall sets	$2 \times 4 \times \frac{9}{16} \times 1\frac{1}{8} \times \frac{3}{2}$	3	
N8608	R.H. Supporting bakelite	$4 \times 1 \times 1\frac{5}{8}$	2	S
N8608A	L.H. micro-telephones on	$4 \times 1 \times 1\frac{5}{8}$	2	
	switchboards and wall sets			M



## Indicators

### DISC INDICATORS



Normal

Operated

N 4755L

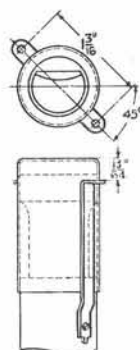


Fig. 1

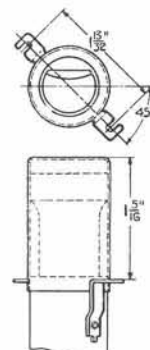


Fig. 2

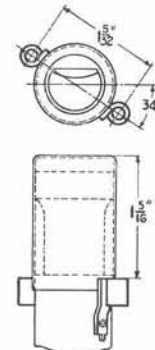


Fig. 3

These indicators have been designed to provide a universal type for C.B. and C.B.S. systems and embody the following features and advantages. Totally enclosed, no external moving parts, robust, sensitive, cross-talk proof, spring adjustment, operate in any position and can be fitted with any of three different fixing lugs which are interchangeable. Fig. 1, fixing lugs for supervisory mounting N5901, Fig. 2 for mounting on wood, and Fig. 3 for jack panel mounting N5900.

Indicators of other resistance values can be supplied, fitted with any of the three types of fixing lugs.

Solder connection tags are fitted as standard ; screw connections only when specially ordered. Dimensions :  $4\frac{1}{2}$  inches long. Weight :  $5\frac{1}{2}$  oz.

Code No.	Resistance ohms	Terminals	Fixing Lugs	Description	P.O No.
N4750L	50+(100)	2	Fig. 2	Supervisory ; no local contacts	600A
N4750M	33	2	Fig. 2	Supervisory ; no local contacts	600C
N4750P	65	2	Fig. 2	Visual ringing	
N4751L	33	2	Fig. 1	Supervisory ; no local contacts	2700A
N4752L	2500	4	Fig. 1	Supervisory ; insulated local contacts	3300A
N4752M	33	4	Fig. 1	Supervisory ; insulated local contacts	3300B
N4754L	1000	4	Fig. 2	Line ; with local contacts	
N4754M	500	4	Fig. 2	Line ; with local contacts	
N4755L	1000	3	Fig. 3	Line ; with local contacts	3000A
N4756L	1000	4	Fig. 1	Supervisory ; with local contacts	2900A
N4756M	2500	4	Fig. 1	Supervisory ; with local contacts	2900B
N4759L	1000+(1000)	5	Fig. 3	Line ; with local contacts	2800A
N4763L	500	4	Fig. 3	Line ; with local contacts	

### DISC INDICATOR, MOUNTINGS



N 5900



N 5901

Code No.	Mounting for	Dimensions inches	Weight oz.	P.O. No.
N5900	10 indicators with Fig. 3 lugs	$11\frac{3}{16} \times 1 \times 1\frac{5}{8}$	$8\frac{1}{2}$	130/10A
N5901	2 indicators with Fig. 1 lugs	$3 \times 1\frac{1}{8} \times \frac{5}{16}$	$\frac{3}{4}$	127/2A
N5901A	As N5901 but wider plate	$3 \times 1\frac{1}{4} \times \frac{5}{16}$	1	127/2B



## Indicators—continued

### DISCRIMINATING AND LINE INDICATORS



N 4781 on Plate N 16108



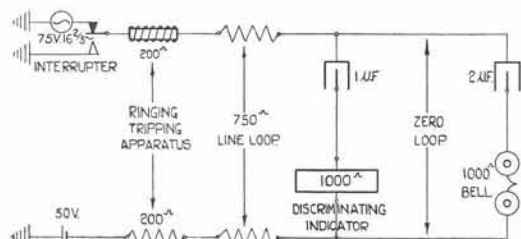
Front Cover and Coil Removed

In small branch exchange switchboards such as the cordless type it is usual to bridge the indicator in series with a condenser across the exchange line. When these switchboards are used in automatic areas an ordinary drop indicator would operate when the main exchange is being dialled. The Discriminating Indicator is arranged so that it will readily respond to ringing current but not to dialling impulses. It is also used as line and supervisory indicators on magneto switchboards.

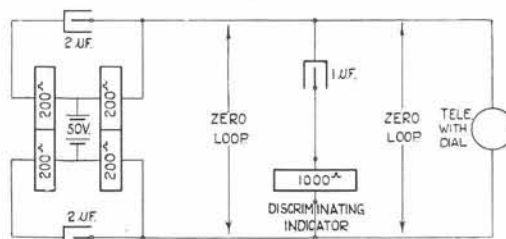
The indicator is totally enclosed, thus preventing the adjustments from being interfered with by unauthorized persons. To replace the flap the operator presses the button.

Whilst the indicator is fixed in position the coil can be readily extracted by means of the tool N8031 and the cover by tool N8052.

Diagrams show limiting conditions within which the indicator is designed to function.



Indicator operates with ringing current



Indicator does not operate with dial impulses

Dimensions unmounted :  $1\frac{3}{4} \times 1 \times 4\frac{7}{8}$  inches. Weight :  $6\frac{1}{2}$  oz.

Resistance : 1000 ohms. Other resistances supplied to order.

Code No.	Description and use
N4781	Discriminating and/or line indicator for C.B. and Magneto Switchboards
N4781N	Line and clearing indicator for Mining Switchboards
N4782	Supervisory for keyboard of magneto floor switchboards

### INDICATOR MOUNTINGS



N 5910



N 18855

Code No.	Mounting for	Dimensions inches	Weight oz.
N5910	10 Indicators N4781	$11\frac{3}{16} \times 1\frac{7}{8} \times 1\frac{1}{8}$	9
N16108	1 Indicator N4781	$2 \times 1\frac{1}{8} \times \frac{7}{64}$	1
N18855	1 Indicator N4782	$3 \times 1\frac{1}{8} \times \frac{7}{64}$	$1\frac{1}{2}$



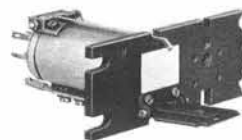
## Indicators—continued

### DROP INDICATORS

These indicators are fitted with cross-talk proof tubular iron shells and can therefore be used as line or clearing signals.

The alarm contacts for N4815-6 types are integral ; for N4817 type they are on the mounting plate.

Code No.	Resistance ohms	Dimensions inches	Weight oz.	P.O. No.
N4815D	375 + 550	$1\frac{5}{16} \times 1\frac{1}{4} \times 2\frac{7}{8}$	$3\frac{3}{4}$	2200A
N4816D	1000	$1\frac{5}{16} \times 1\frac{1}{4} \times 2\frac{7}{8}$	$3\frac{3}{4}$	
N4816F	2000	$1\frac{5}{16} \times 1\frac{1}{4} \times 2\frac{7}{8}$	$3\frac{3}{4}$	
N4817	1000	$1\frac{1}{4} \times 1\frac{1}{4} \times 4\frac{1}{4}$	5	
N4817A	2000	$1\frac{1}{4} \times 1\frac{1}{4} \times 4\frac{1}{4}$	5	



N 4815D



N 4817

### DROP INDICATOR MOUNTINGS



N 5909



N 5921

Code No.	Mounting for	Dimensions inches	Weight oz.	P.O. No.
N5909	10 Indicators N4815—6 types	$11\frac{3}{16} \times 1\frac{5}{16} \times 1\frac{1}{4}$	$14\frac{1}{4}$	95/10E
N5915	5 Indicators N4815—6 types	$11\frac{3}{16} \times 1\frac{5}{16} \times 1\frac{1}{8}$	17	95/5E
N5921	10 Indicators N4817 type	$11\frac{3}{16} \times 1\frac{5}{16} \times 1\frac{1}{4}$	16	

### EYEBALL INDICATORS

Code No.	Resistance ohms	Dimensions inches	Weight oz.	P.O. No.
N4797A	1000 + 1000	$1\frac{3}{8} \times 1\frac{1}{8} \times 4\frac{13}{16}$	$6\frac{3}{4}$	3100A2
N4798	500	$1\frac{3}{8} \times 1\frac{1}{8} \times 4\frac{13}{16}$	$6\frac{3}{4}$	400B
N4798A	1000	$1\frac{3}{8} \times 1\frac{1}{8} \times 4\frac{13}{16}$	$6\frac{3}{4}$	400K
N4798B	500	$1\frac{3}{8} \times 1\frac{1}{4} \times 4\frac{13}{16}$	$6\frac{3}{4}$	400E
N4798C	1000	$1\frac{3}{8} \times 1\frac{1}{4} \times 4\frac{13}{16}$	$6\frac{3}{4}$	400C
N4798D	3500	$1\frac{3}{8} \times 1\frac{1}{4} \times 4\frac{13}{16}$	$6\frac{3}{4}$	400L



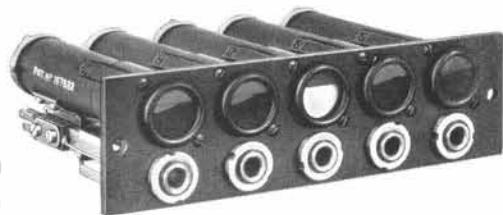
N 4798

The mountings for rows of eyeball indicators consist of straight bars.



## Indicators—continued

### INDICATOR-JACKS



Indicators and Jacks N 4855 on Plate N 5981

The indicators of this combination are, similar to the discriminating indicators, arranged for magneto working and combined with the line jacks so that when a plug is inserted the indicating disc is restored to normal. A coil can be removed by means of tool N8031 without disturbing the whole row.

The resistance of the indicators is 1000 ohms and various jack combinations are fitted as shown by the diagrams below and take "B" gauge plugs.

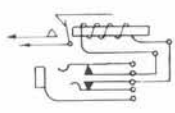


Fig. 1

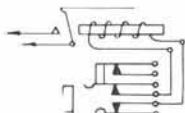


Fig. 2

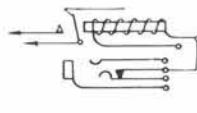


Fig. 3

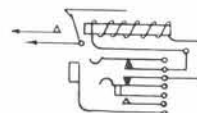
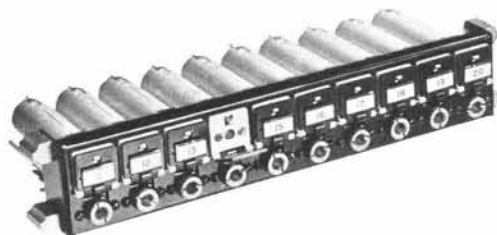


Fig. 4

Indicator-jacks		Mounting Plates		Complete Strips	
Code No.	Fig.	Code No.	Mounting for	Dimensions inches	Weight lb.
N4855	1	N5981	5 Indicator-jacks	$6\frac{1}{2} \times 1\frac{1}{16} \times 4\frac{5}{16}$	$2\frac{5}{8}$
N4856	2	N5982	10 Indicator-jacks	$11\frac{3}{16} \times 2 \times 4\frac{5}{16}$	$5\frac{1}{4}$
N4857	3	Tool N8031 : Removes lock-ring and extracts coil. Mounting N5981 is fixed by screws ; N5982 by jack-fasteners			
N4858	4				



N 4817 Indicators and N 5030 Jacks on Plate N 5983

This combination comprises a drop indicator N4817 type and jack N5030 mounted on a plate which incorporates the alarm contacts. The jack takes "B" gauge plugs and the spring set is as Fig. 1 above.

Mounting N5983 is fixed by jack-fasteners and N5984 by screws.

Indicator		Jack	Mounting Plates		Complete Strips	
Code No.	Resistance ohms	Code No.	Code No.	Mounting for	Dimensions inches	Weight lb.
N4817	1000	N5030	N5983	10 indicators and jacks	$11\frac{3}{16} \times 2 \times 4\frac{1}{4}$	$5\frac{1}{2}$
N4817A	2000	N5030	N5984	5 indicators and jacks	$7\frac{3}{4} \times 2 \times 4\frac{1}{4}$	3





## Indicators—continued

### INDICATOR-RELAYS

Indicator-relays are used to indicate when a call has been made during the absence of an attendant and also to act as a relay and close a local circuit for a loud-ringing extension bell. The bell will continue to ring until the disc or shutter is replaced.

The disc is replaced by button.

N8652 is approved by the Mines Department for use with certified mining magneto telephones, bells and batteries.

The indicators are 1000 ohms and with connection terminals are mounted in wood cases.



N 8652

Code No.	Description	Dimensions inches	Weight oz.	
N8652	Mines department approved type	$3\frac{3}{8} \times 2\frac{3}{4} \times 5\frac{3}{4}$	18	
N8652A	As N8652 but for ordinary use	$3\frac{3}{8} \times 2\frac{3}{4} \times 5\frac{3}{4}$	18	

The basis of this indicator is a standard relay which operates a flap displaying "Engaged," on a white ground, through a slot in the mounting. It has a single change-over spring set and a 50-ohm coil, and is used on intermediate telephones and switches.



N 4820

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N4820	For intermediate telephones	$4\frac{3}{16} \times 2\frac{1}{16} \times 1\frac{13}{16}$	11	3800A
N8142	Mounted on plate for wall switches	$5 \times 2\frac{5}{8} \times 4\frac{5}{16}$	15	

### RINGING INDICATOR

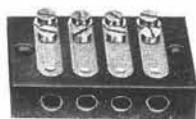
For use in the ringing circuit on switchboards to indicate that ringing current is being sent out on the line. It comprises: disc indicator N4750P, rectifier N60478, bracket N53084 and two fixing screws.

Code No. N4840. Resistance 65 ohms.

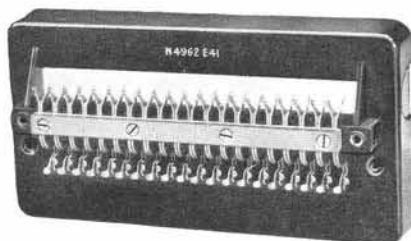


## Jacks

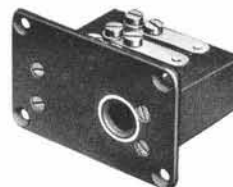
### INSTRUMENT JACKS



N 4952



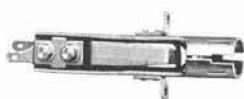
N 4962



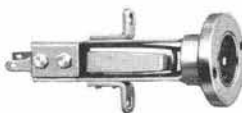
N 4970

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N4950	2-way ; flat ; takes plug N6400	$1\frac{1}{2} \times \frac{11}{16} \times 1\frac{9}{16}$	$1\frac{1}{4}$	
N4952	4-way, flat ; takes plug N6402	$2\frac{5}{16} \times \frac{11}{16} \times 1\frac{9}{16}$	$2\frac{1}{4}$	8
N4953	5-way, flat ; takes plug N6403	$2\frac{3}{4} \times \frac{11}{16} \times 1\frac{9}{16}$	$2\frac{3}{4}$	10
N4954	6-way, flat ; takes plug N6404	$3\frac{5}{32} \times \frac{11}{16} \times 1\frac{9}{16}$	$3\frac{1}{4}$	NT.4
N4961	24-way, spring sets, takes plugs N6411-12	$6\frac{1}{8} \times 1\frac{5}{8} \times 3\frac{7}{16}$	$7\frac{1}{2}$	53
N4962	40-way, spring sets, takes plugs N6413-14	$6\frac{1}{8} \times 1\frac{5}{8} \times 3\frac{7}{16}$	8	54
N4970	4-way, concentric, single ; takes plug N6419	$2\frac{5}{8} \times 1\frac{3}{4} \times 1\frac{7}{8}$	3	19/2
N4971	4-way, concentric, twin ; takes plug N6419	$3\frac{5}{16} \times 1\frac{3}{4} \times 1\frac{7}{8}$	4	20/2

### LAMP JACKS, SINGLE



N 4980

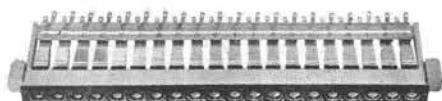


N 4987



N 4990

Code No.	Takes Lamp	Takes Cap	Description	Dimensions inches	Weight oz.	P.O. No.
N4980	N8611-14	N3406	Supervisory lamp jack	$2\frac{7}{8} \times \frac{1}{2} \times 1\frac{1}{16}$	$\frac{3}{4}$	10
N4986	N8611-14	N3412	Pilot lamp jack	$2\frac{7}{8} \times \frac{1}{2} \times 1\frac{1}{4}$	1	25
N4987	N8611-14	N3412	Fuseboard lamp jack	$2\frac{7}{8} \times 1\frac{1}{8} \times 1\frac{1}{4}$	$1\frac{1}{2}$	16
N4990	N8618-19	—	Resistance lamp socket	$2 \times 2$	3	12



N 5006

### LAMP JACKS, STRIPS

These strips of lamp jacks are arranged to line up with the strips of answering jacks, on lamp signalling switchboards.

The face of the strips may be numbered or plain, as required.

Code No.	Jacks	Takes Lamp	Takes Cap	Dimensions, inches		Weight oz.	P.O. No.
				Face	Overall		
N5005	10	N8611 to N8614	N3400 to N3402	$7\frac{2}{3} \times \frac{1}{2}$	$8\frac{1}{8} \times \frac{7}{16} \times 3\frac{1}{8}$	10	5A/2
N5006	20			$10\frac{5}{16}$	$11\frac{3}{16} \times \frac{1}{2} \times 3\frac{1}{4}$	14	17A/2
N5007	10			$10\frac{5}{16}$	$11\frac{3}{16} \times \frac{1}{2} \times 3\frac{1}{4}$	10	19A/2
N5008	5			$10\frac{5}{16}$	$11\frac{3}{16} \times \frac{1}{2} \times 3\frac{1}{4}$	8	21A/2



## Jacks—continued

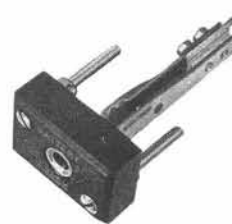
### SWITCHBOARD JACKS, SINGLE



N 5030



N 5035



N 5058

Code No.	Diagram	Description	Takes Plug	Dimensions inches	Weight oz.	P.O. No.
N5030	Fig. 3	Used with indicator N4817 type	N6452C	$3\frac{7}{16} \times 1 \times \frac{11}{16}$	2	
N5034	Fig. 1	Jack N5061 with Socket Mounting	N6452C	$3\frac{5}{8} \times 1 \times \frac{11}{16}$	$1\frac{3}{4}$	301BN
N5035	Fig. 3	Jack N5063 with Socket Mounting	N6452C	$3\frac{5}{8} \times 1 \times \frac{11}{16}$	2	501BO
N5036	Fig. 5	Jack N5066 with Socket Mounting	N6452C	$3\frac{5}{8} \times 1 \times \frac{11}{16}$	$2\frac{1}{4}$	801BN
N5058		"Batt. Jack" on wood block (2 pt.)	N6452C	$3\frac{7}{16} \times 1\frac{5}{8} \times 1\frac{1}{8}$	$2\frac{1}{4}$	201BN

### SWITCHBOARD JACKS, STRIPS



Fig. 1



Fig. 2



Fig. 3

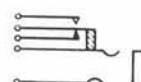


Fig. 4



Fig. 5

These jacks are mounted in strips of 5, 10 or 20, and unless otherwise ordered, strips of 5 and 10 have the front face recessed to accommodate removable labels, and strips of 20 have the front face numbered 0—9, 0—9 and spotted.

N5070 to N5073 take "C" gauge plugs and N5150 to N5157 take "B" gauge plugs.



N 5070



N 5153

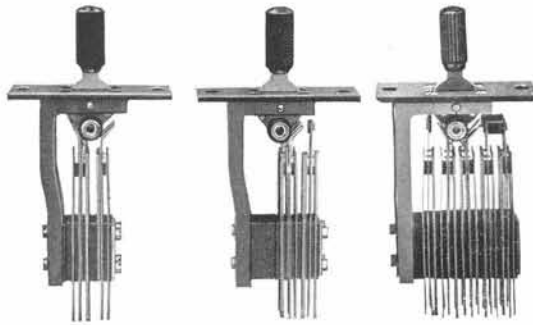
Code No.	Diagram	No. of Jacks	Takes Plug	Takes Label	Dimensions, inches		Weight oz.	P.O. No.
					Face	Overall		
N5070	Fig. 1	10	N6450	N5760	$7\frac{3}{8}$	$8\frac{1}{8} \times \frac{3}{8} \times 3\frac{1}{8}$	8	310CP
N5071	Fig. 1	20	N6450	N5760	$7\frac{3}{8}$	$8\frac{1}{8} \times \frac{3}{8} \times 3\frac{1}{8}$	$9\frac{1}{2}$	320CP
N5072	Fig. 3	10	N6450	N5760	$7\frac{3}{8}$	$8\frac{1}{8} \times \frac{3}{8} \times 3\frac{5}{16}$	$8\frac{3}{4}$	
N5073	Fig. 5	10	N6450	N5760	$7\frac{3}{8}$	$8\frac{1}{8} \times \frac{3}{8} \times 3\frac{5}{16}$	10	
N5150	Fig. 2	10	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	$12\frac{3}{4}$	310BN
N5151	Fig. 2	20	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	16	320BN
N5152	Fig. 3	10	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	$13\frac{3}{4}$	510BO
N5153	Fig. 3	20	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	$17\frac{3}{4}$	520BP
N5154	Fig. 5	10	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	16	810BN
N5155	Fig. 3	5	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	12	
N5156	Fig. 5	5	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	$12\frac{1}{2}$	
N5157	Fig. 4	10	N6452C	N5762	$10\frac{5}{16}$	$11\frac{1}{8} \times \frac{1}{2} \times 3\frac{1}{2}$	15	



## Keys

Owing to the large number of spring combinations, mountings, and types of keys manufactured by us, it is only possible to list and illustrate here a few typical examples of those mostly used in modern telephone instrument and switchboard work.

### LEVER TYPE KEYS



N 5311

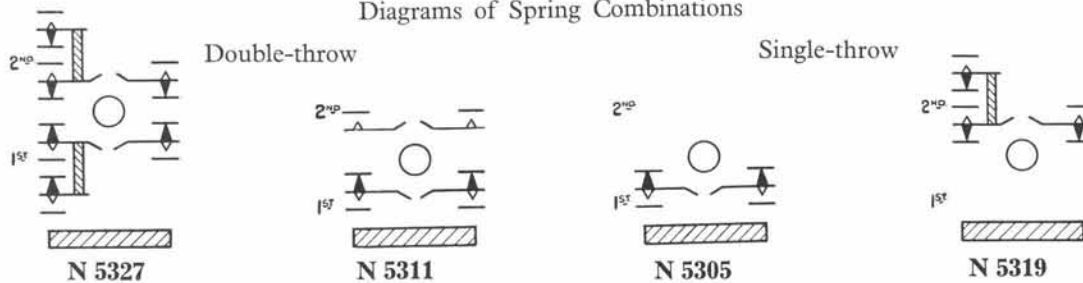
N 5319

N 5420

The vertical pattern lever key is of strong construction, consisting of a metal frame and a pivoted lever which is fitted with rollers for actuating the springs. Double-throw keys have a locating device which prevents clicks due to the rebound of the rollers against the opposite set of springs.

Handles : White, Red, Black, Yellow, Blue or Green, and the mounting plates required, should be specified when ordering. The table on the opposite page gives particulars of mounting plates and their code letters.

Diagrams of Spring Combinations



In the "Description and Combinations" column below, the following terms and abbreviations are used so that any required key not listed may be readily ordered by giving similar information.

"1st" means the set of springs or the space next the frame, "2nd" the set of springs or the space remote from the frame ; "Stop," the lever is fitted with a stop pin as there are no springs to be actuated on that particular side ; "Locking," the lever remains in the position to which it is moved ; "Non-locking," the lever returns automatically to the normal position on release ; "B" breaks ; "M" makes, and numerals indicate the number of contacts broken and made.

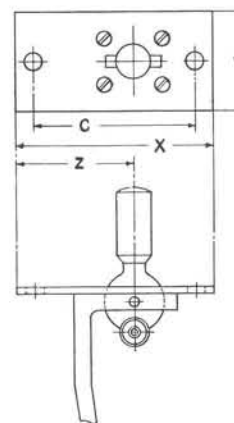
Code No.	Description and Combinations	Weight oz.	P. O. No.
N5301	1st, stop ; 2nd, locking, B2 then M2	3 <sup>3</sup> / <sub>8</sub>	68
N5303	1st, locking, B2 then M2 ; 2nd, locking, B2 then M2	3 <sup>3</sup> / <sub>4</sub>	212
N5305	1st, non-locking, B2 then M2 ; 2nd, stop	3 <sup>3</sup> / <sub>8</sub>	72
N5311	1st, non-locking, B2 then M2 ; 2nd, locking, M2	3 <sup>3</sup> / <sub>4</sub>	
N5319	1st, stop ; 2nd, locking, B3 then M3	3 <sup>1</sup> / <sub>2</sub>	207
N5327	1st, locking, B3 then M3 ; 2nd, locking, B3 then M3	4 <sup>3</sup> / <sub>4</sub>	236
N5333	1st, non-locking, B3 then M3 ; 2nd, locking, B3 then M3	4 <sup>3</sup> / <sub>4</sub>	206
N5420	1st, non-locking, B4 then M4 ; 2nd, locking, B6 then M6	5	295



## Keys—continued

### LEVER TYPE KEY MOUNTING PLATES

Code Letters	Dimensions in inches			
	X	Y	Z	C
J	2	1 $\frac{1}{8}$	1	1 $\frac{5}{8}$
K	2 $\frac{1}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{16}$	1 $\frac{3}{4}$
L	2 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{3}{16}$	1 $\frac{3}{4}$
N	2 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{9}{32}$	1 $\frac{3}{4}$
P	2 $\frac{1}{8}$	1	1 $\frac{1}{16}$	1 $\frac{3}{4}$
Q	2 $\frac{5}{8}$	1 $\frac{1}{8}$	1 $\frac{5}{16}$	2 $\frac{1}{4}$
R	2 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{3}{16}$	1 $\frac{3}{4}$
S	2 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{5}{16}$	2 $\frac{1}{4}$
SG	2 $\frac{1}{8}$	1 $\frac{3}{4}$	1 $\frac{1}{16}$	1 $\frac{3}{4}$
U	2 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	1 $\frac{3}{4}$
V	2 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{3}{4}$
Y	2 $\frac{5}{8}$	1 $\frac{1}{16}$	1 $\frac{5}{16}$	2 $\frac{1}{4}$
Z	2 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{16}$	1 $\frac{3}{4}$
NA	2 $\frac{1}{8}$	1 $\frac{3}{4}$	1 $\frac{9}{32}$	1 $\frac{3}{4}$
NB	2 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{9}{32}$	1 $\frac{3}{4}$



N, NA and NB plates are off-centre mounting, primarily for straight frame keys.  
Q, S and Y plates are for straight frame keys with large spring sets in 2nd position.  
Dimensions : Height with handles 4  $\frac{3}{16}$  inches ; other dimensions, see diagram and table above.  
Method of ordering keys with plates and handles : N5311.L Black.

### PLUNGER TYPE KEYS

This key is used for miscellaneous circuits on switchboards. It mounts through holes  $\frac{27}{64}$  in. diameter in wood 1  $\frac{3}{16}$  in. thick.

Locking keys, when depressed, partly revolve to indicate operation.

If required, the tops can be engraved and other spring combinations supplied.

Code No.	Description	Dimensions inches	Weight oz.	
N5200	Non-locking, B2 then M2	4 $\frac{3}{4}$ × 1 × $\frac{3}{4}$	2 $\frac{1}{8}$	
N5201	Locking, B2 then M2	4 $\frac{3}{4}$ × 1 × $\frac{3}{4}$	2 $\frac{1}{8}$	



N 5200

Primarily designed for use on mining switchboards this key is similar to N5200 type above but is more robust and has a metal top.

It mounts on  $\frac{5}{32}$  in. thick metal plates through holes  $\frac{17}{32}$  in. diameter with recess for locating pin. Other particulars as N5200 type above.

Code No.	Description	Dimensions inches	Weight oz.	
N5202A	Locking, B2 then M2	4 $\frac{1}{2}$ × $\frac{7}{8}$	3	
N5204A	Non-locking, B2 then M2	4 $\frac{1}{2}$ × $\frac{7}{8}$	3	
N5212A	Locking, B2 then M3	4 $\frac{1}{2}$ × $\frac{7}{8}$ × 1 $\frac{1}{8}$	3 $\frac{1}{2}$	



N 5202A



## Keys—continued

### PLUNGER TYPE KEYS



**N 5220**

A meter key for registering subscribers' calls and traffic data in manual exchanges.

It mounts through holes  $\frac{5}{8}$  in. diameter in wood  $\frac{7}{8}$  in. thick, and the insert label in the top can be supplied in black, blue, green, red, white, yellow or grey.

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N5220	Non-locking, M1	$4 \times \frac{15}{16} \times \frac{5}{8}$	$1\frac{1}{8}$	5

These keys are intended to mount on strips for use in the jack-field and key-shelf of manual switchboards.

Locking keys N5222 type are fitted with push-pull tops. The non-locking N5230 type has an insert label which can be supplied in black, blue, green, red, white and yellow.



**N 5222**

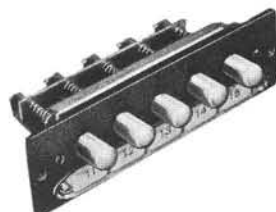


**N 5230**

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N5222	Locking, B2 then M2	$3\frac{13}{16} \times \frac{15}{32} \times \frac{17}{32}$	$\frac{7}{8}$	279
N5229	Locking, B3 then M3	$3\frac{13}{16} \times \frac{15}{32} \times \frac{25}{32}$	1	308
N5230	Non-locking, B2 then M2	$3\frac{9}{16} \times \frac{15}{32} \times \frac{17}{32}$	$\frac{7}{8}$	228
N5231	Non-locking, M3	$3\frac{9}{16} \times \frac{15}{32} \times \frac{17}{32}$	$\frac{7}{8}$	229
N5232	Non-locking, M2	$3\frac{9}{16} \times \frac{15}{32} \times \frac{17}{32}$	$\frac{3}{4}$	230

### MOUNTING STRIPS FOR N5222 AND N5230 TYPES

Code No.	Used in	Mounting for	Dimensions inches	Weight oz.	P.O. No.
N6103A	Jack-field	10 Keys	$11\frac{1}{8} \times \frac{1}{2} \times 1\frac{1}{8}$	8	PD
N6106	Key-shelf	10 Keys	$6\frac{7}{8} \times \frac{1}{2} \times \frac{7}{16}$	4	PG
N6108	Key-shelf	15 Keys	$10\frac{7}{16} \times \frac{1}{2} \times \frac{7}{16}$	6	PF



**N 14016**

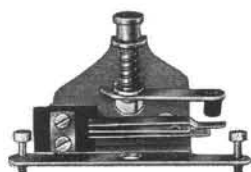
Unit of 5 plunger type keys for intercommunication telephones. The label is supplied blank or numbered from 1 to 20 in groups of 5 numbers, as ordered.

Code No.	Dimensions inches	Weight oz.	
N14016	$3\frac{15}{16} \times 1\frac{3}{16} \times 2$	4	

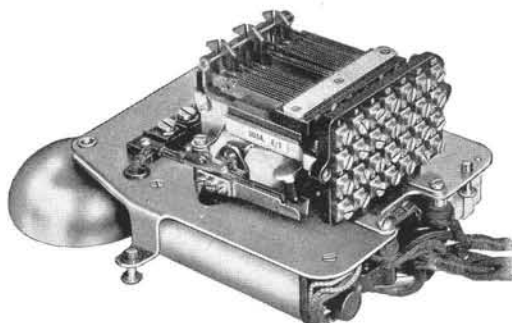


## Keys—continued

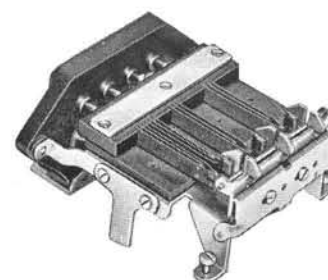
### PLAN NUMBER WORKING



**N 20629**  
1K Unit



**N 20630 Mounted**  
4K-1K-4K Unit



**N 20631**  
2K-1K-1K Unit

For working Plan Number systems and providing other facilities these key units are designed to mount in our automatic, battery call, C.B. and magneto telephones : see telephone section of this catalogue.

The key units have from one to nine spring sets which may be make, break, make then break or break then make, or a combination of these, denoted by the letters M, B, K and C respectively.

The telephones accommodate a maximum of three plunger buttons and the number and type of spring sets operated by the buttons are given in the table below, for the principal combinations in use ; other sets supplied according to the Plan No. Circuits.

On two and three button units there is a mechanism which can be varied to control the locking or non-locking of the outer buttons, the centre one being non-locking. A " T " piece is also provided for release of a key on replacement of the micro-telephone. On telephone N1107 both spring sets of N20704 are operated by a centre button.

Code No.	No. of Buttons	Spring Sets			Used on Telephones	Dimensions inches	Weight oz.	P.O. No.
		1	2	3				
N20629	1	—	1K	—	Plan No.	$2\frac{1}{3}\frac{7}{2} \times 1\frac{3}{4} \times \frac{2}{3}\frac{3}{2}$	1 $\frac{1}{2}$	302A
N20630	3	4K	1K	4K	Plan No.	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	7	303A
N20630A	2	5K	—	4K	Plan No.	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	7	303B
N20631	3	2K	1K	1K	Plan No.	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	7	304A
N20700	1	—	1C	—	N1102	$2\frac{1}{3}\frac{7}{2} \times 1\frac{3}{4} \times \frac{2}{3}\frac{3}{2}$	1 $\frac{1}{2}$	302B
N20704	1	2C	1M	—	N1107	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	4 $\frac{1}{2}$	
N20713	1	—	2C	—	N1202	$2\frac{1}{3}\frac{7}{2} \times 1\frac{3}{4} \times \frac{2}{3}\frac{3}{2}$	1 $\frac{5}{8}$	
N20737	2	2C	—	2C1M	N1104	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	6 $\frac{1}{2}$	
N68778	3	2C1M	3C	2C	N1200	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	7	
N68793	2	2C1M	—	2C	N1201	$3\frac{1}{4} \times 2\frac{1}{8} \times 3\frac{1}{2}$	7	





## Labels

For use with jack strips ; any numbering or other markings should be specified when ordering.



N 5762

Code No.	Description	Dimensions inches	Weight per 100	P.O. No.
N5760 N5761 N5762 N5763	Metal frame with removable white celastoid insert	$\frac{3}{8} \times \frac{1}{4} \times \frac{5}{16}$ $\frac{7}{16} \times \frac{5}{16} \times \frac{5}{16}$ $\frac{1}{2} \times \frac{3}{8} \times \frac{5}{16}$ $\frac{11}{16} \times \frac{5}{16} \times \frac{5}{16}$	2 oz. 3 oz. 4 oz. 4 $\frac{1}{4}$ oz.	41A 87 86A 105
N5762M N5763M	Label moulded on metal pin	$\frac{1}{2} \times \frac{3}{8} \times \frac{5}{16}$ $\frac{11}{16} \times \frac{5}{16} \times \frac{5}{16}$	2 oz. 2 $\frac{1}{8}$ oz.	86A 105

## Lamps



N 8614



N 8618

Code No.	Volts	Normal amperes	Description	Dimensions inches	Weight oz.	P.O. No.
N8611	12	.107	Supervisory, 24-volt systems	$1\frac{3}{4} \times \frac{9}{32}$	8 $\frac{1}{2}$ per 100	2/12
N8612	24	.107	Line, 24-volt systems	$1\frac{3}{4} \times \frac{9}{32}$	8 $\frac{1}{2}$ per 100	2/24
N8613	36	.075	Supervisory, 40-volt systems	$1\frac{3}{4} \times \frac{9}{32}$	8 $\frac{1}{2}$ per 100	2/36
N8614	40	.068	Line, 40-volt systems	$1\frac{3}{4} \times \frac{9}{32}$	8 $\frac{1}{2}$ per 100	2/40
N8618	—	—	660 $\Omega$ } For ringing circuits,	$6 \times 1\frac{1}{4}$	1 $\frac{1}{2}$ each	2
N8619	—	—	330 $\Omega$ } fits lamp jack N4990	$6 \times 1\frac{1}{4}$	1 $\frac{1}{2}$ each	

## Meters

For recording the number of calls and traffic data in telephone exchanges.

Dimensions :  $4\frac{1}{2} \times 1\frac{1}{32} \times 1\frac{1}{32}$  inches. Weight 6 oz.



N 5786C

Code No.	Description	P.O. No.
N5786C	Coil wound with 9500 turns to 500 ohms	100A/2
N5786D	Coil wound with 9000 turns + resistance winding to 2300 ohms	100B/2
N5786E	Coil wound with 21,000 turns to 2300 ohms	100C/2
N5787C	As N5786E but with " make " contact	101A/2

### METER MOUNTING PLATES

Code No.	For Mounting	Dimensions inches	Weight lb.	P.O. No.
N5996	100 Meters (5 rows of 20) and test jack	$29\frac{1}{8} \times 6\frac{1}{4} \times 2\frac{3}{8}$	8 $\frac{3}{4}$	154/100A
N5999	20 Meters (2 rows of 10)	$13\frac{3}{4} \times 2\frac{7}{16} \times \frac{1}{16}$	1	F154/20AH
N5999B	As N5999 but longer plate	$15\frac{1}{2} \times 2\frac{7}{16} \times \frac{1}{16}$	1	F154/20BH
N6000	40 Meters (2 rows of 20)	$27\frac{1}{2} \times 2\frac{9}{16} \times \frac{3}{4}$	2 $\frac{1}{4}$	F154/40AH
N6000B	40 Meters as above + test jack	$30\frac{1}{2} \times 2\frac{9}{16} \times \frac{3}{4}$	2 $\frac{1}{4}$	F154/40BH



## Micro-telephones

### HISTORICAL

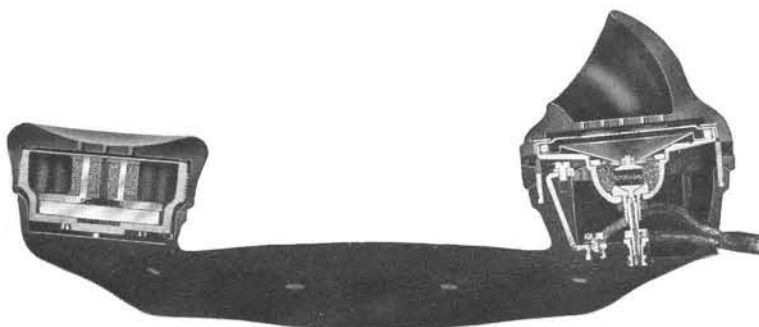
The idea of joining together a receiver and transmitter by means of a common handle originated with two Swedish engineers who constructed the first model in 1884. An illustration of the original model, together with that of a modern micro-telephone is shown below.



The first Micro-telephone



A modern Micro-telephone

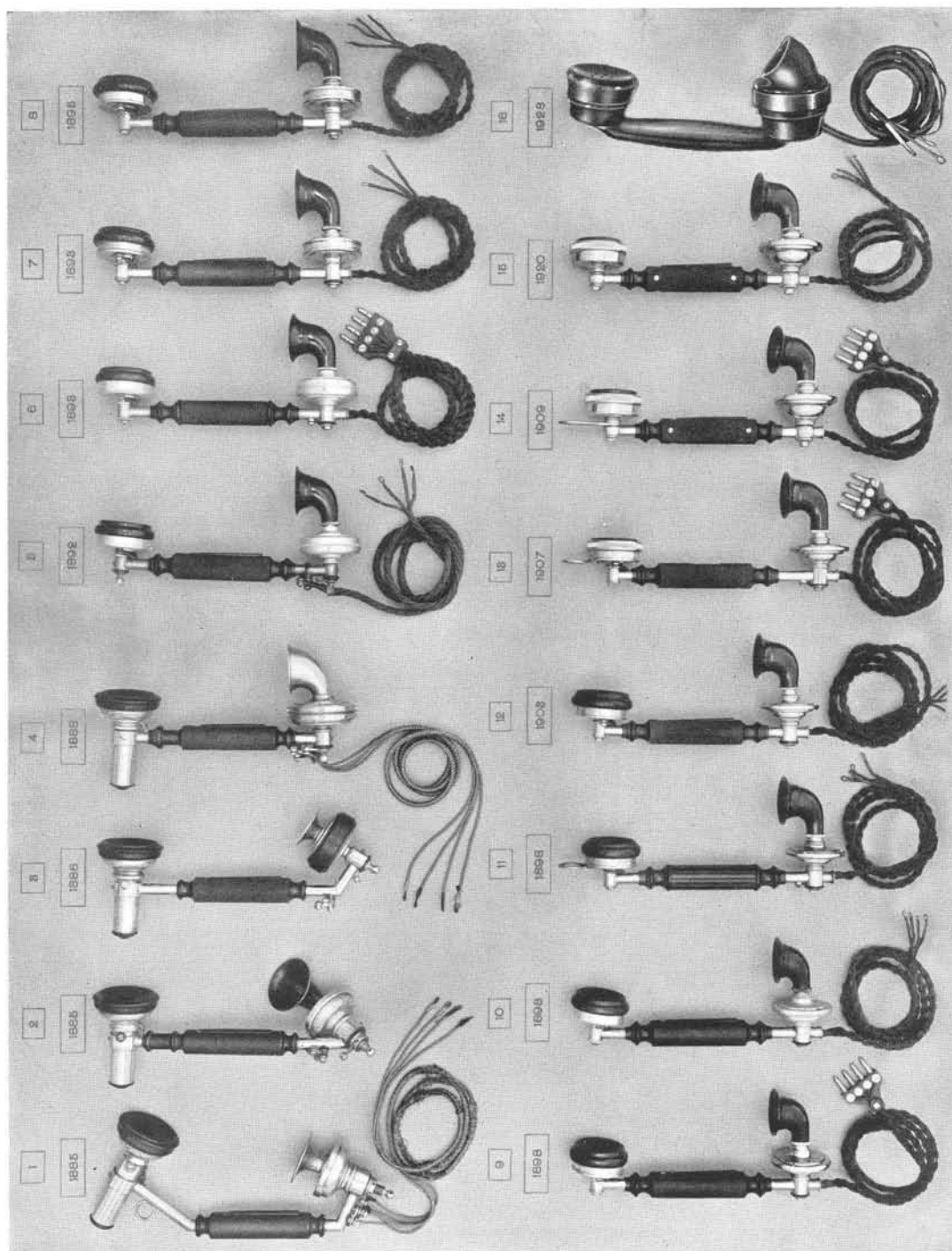


A cross section of a modern Micro-telephone



## Micro-telephones

HISTORICAL



The evolution of the Micro-telephone



## Micro-telephones

### BAKELITE TYPE

The bakelite type micro-telephone is now well established by most telephone users throughout the world.

The table below gives the micro-telephones most commonly used. N5866 and N5874 have a press key. Cords are fitted but plugs must be specially ordered when required.

Dimensions :  $9 \times 4 \times 2\frac{3}{4}$  inches. Weight 20 oz.



**N 5875B1**

Code No.	Cord	Trans.	Usually used on
N5866	4 way	N7752	Railway type telephones (includes press key)
N5874	3 way	N7753A	Portable telephone N1845 (includes press key)
N5875B1	3 way	N7752	General table and wall telephones
N5876B1	4 way	N7752	General table and wall telephones
N5876B3	4 way	N7753A	Auto and C.B. flameproof telephones
N5876B4	4 way	N7752	Railway type telephones
N5877B1	3 way	N7752	Intercommunication telephones

### REINFORCED TYPE

This micro-telephone is specially designed to withstand rough usage and particularly for mine work.



**N 5829**

Code No.	Description and use	Dimensions inches	Weight oz.
N5829	4-way rubber-covered cord, for Magneto Mining Telephones	$10\frac{1}{4} \times 2\frac{1}{2} \times 2\frac{5}{8}$	26
N5829A	As above, but with loop for hanging on Magneto Mining Switchboards	$11\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{5}{8}$	$26\frac{1}{2}$

## Mountings

See respectively :—Coils Bridging, Indicators, Keys, Meters, Relays, etc.

### Mouthpieces



**N 8634**



**N 8639**

Code No.	Used with	Dimensions inches	Weight oz.	P.O. No.
N8634	Standard bakelite micro-telephones	$2\frac{11}{16} \times 2\frac{3}{16}$	$1\frac{3}{4}$	15
N8637	Operators' head and breast sets	$4\frac{1}{8} \times 2 \times 2\frac{3}{4}$	$1\frac{1}{4}$	19
N8639	Micro-telephones on flameproof auto and C.B. sets	$2\frac{11}{16} \times 1\frac{1}{4}$	2	



## Operators' Sets

This set complete, comprises headgear receiver, breastplate transmitter, two cords and a plug. The weight is  $1\frac{1}{4}$  lb. approx.



N 8575

Code No.	Description
N8573	Without switch, with plug N6402A
N8574	With switch and plug N6402A
N8575	Without switch, with plug N6419B
N8576A	With switch and plug N6419B
N8577	Differential receiver, plug N6403, no switch
N8578	As N8577 but with switch

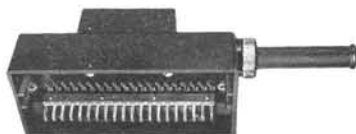
## Plugs

We manufacture plugs to meet every requirement of the telephone service, and the number of different types is so great that it is practically impossible to list them all here, but we give a selection of those most commonly used.

### INSTRUMENT PLUGS



N 6402A



N 6414



N 6419B

Code No.	Conductors	Used with	Dimensions inches	Weight oz.	P.O. No.
N6400	2	Instrument jack N4950	$2\frac{9}{16} \times 1 \times \frac{15}{16}$	1	
N6402A	4	Instrument jack N4952	$2\frac{9}{16} \times 1\frac{3}{4} \times \frac{13}{16}$	$1\frac{1}{2}$	406
N6403	5	Instrument jack N4953	$2\frac{9}{16} \times 2\frac{3}{16} \times \frac{15}{16}$	$1\frac{3}{4}$	501
N6404	6	Instrument jack N4954	$2\frac{9}{16} \times 2\frac{3}{8} \times \frac{15}{16}$	2	NT.3
N6411	24	Instrument jack N4961 (without buzzer)	$9\frac{5}{16} \times 3\frac{1}{8} \times 1\frac{1}{2}$	16	2404
N6412	24	Instrument jack N4961 (with buzzer)	$9\frac{5}{16} \times 3\frac{1}{8} \times 2\frac{5}{8}$	24	2404A
N6413	40	Instrument jack N4962 (without buzzer)	$9\frac{5}{16} \times 3\frac{1}{8} \times 1\frac{1}{2}$	16	4001
N6414	40	Instrument jack N4962 (with buzzer)	$9\frac{5}{16} \times 3\frac{1}{8} \times 2\frac{5}{8}$	24	4001A
N6419B	4	Instrument jack N4970 or N4971	$3\frac{3}{4} \times 1\frac{1}{8}$	$3\frac{1}{2}$	404/5



## Plugs—continued

### SWITCHBOARD PLUGS



N 6452



N 6454



N 6462



N 6466



N 6483



N 6486

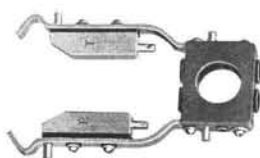
These switchboard plugs are manufactured by a patented process whereby the insulation is forced between the conductors, thus giving solid construction, maximum stability and efficiency.

Add to the Code No. suffix " Q " for black, and " R " for red covers.

Code No.	Point	Gauge	Usually used on	Dimensions inches	Weight per 10	P.O. No.
N6452	3	B	No. 10 and small C.B. Switchboards	$3\frac{7}{32} \times \frac{7}{16}$	6 $\frac{3}{4}$ oz.	310B
N6454	3	A	Small Switchboards	$3\frac{3}{16} \times \frac{1}{2}$	7 $\frac{1}{4}$ oz.	301
N6462	3	F	C.B. Switchboards	$3\frac{3}{16} \times \frac{3}{8}$	4 $\frac{5}{8}$ oz.	NT.7
N6466	2	D	Magneto Switchboards	$3\frac{5}{32} \times \frac{15}{32}$	6 $\frac{1}{4}$ oz.	NT.2
N6468	3	D	Magneto Switchboards	$3\frac{5}{32} \times \frac{15}{32}$	6 $\frac{1}{4}$ oz.	NT.4
N6483	3	C	Large C.B. No. 1 Switchboards	$3\frac{5}{32} \times \frac{3}{8}$	4 $\frac{1}{2}$ oz.	309C
N6486	3	B	As N6452 (different cover length)	$3\frac{7}{32} \times \frac{7}{16}$	5 $\frac{1}{2}$ oz.	316

### TEST PLUGS

For interception, service observation and fault testing in telephone exchanges.



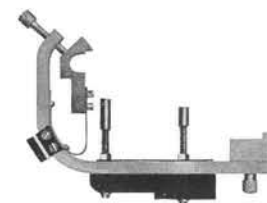
N 6491



N 6492



N 6495



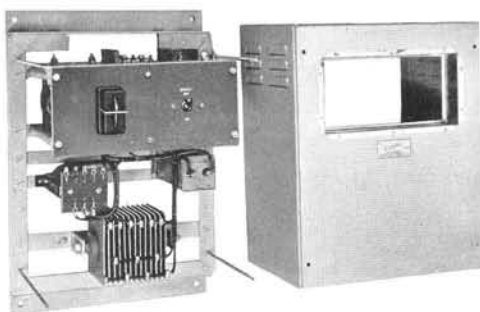
N 6750

Code No.	Use	Dimensions inches	Weight oz.	P.O. No.
N6491	On main frame protectors	$3\frac{1}{2} \times 2\frac{3}{8} \times \frac{3}{8}$	2 $\frac{1}{2}$	222 21
N6492	On main frame protectors with test	$3\frac{1}{4} \times 3\frac{1}{8} \times \frac{5}{16}$	1 $\frac{3}{4}$	
N6495	Pairs, black and red, main frame protectors	$1\frac{7}{8} \times \frac{15}{32}$	$\frac{1}{3}$	
N6750	I.D.F. terminal blocks, 2 point (3 and 4 points also supplied)	$4\frac{7}{8} \times 3\frac{3}{4} \times \frac{5}{16}$	4	



## Power Equipments

### AUTOMATIC CHARGING UNITS



**N 21911**

Automatic charging units are designed to maintain small switchboard batteries "floating" in a fully charged condition when supplying intermittent and erratic loads.

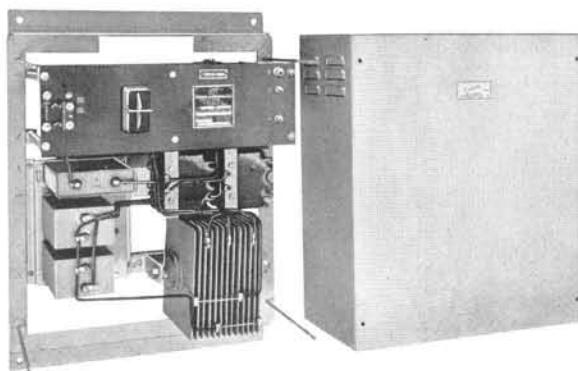
Connection is normally to 200/250 volts, single phase, 50-cycles a.c. supply but operation from other voltages and frequencies can be arranged when specially requested.

A switch is provided so that a boost charge may be given when required.

The units can be supplied for wall or floor mounting, as specified.

Code No.	Output	Dimensions inches	Weight lb.	
N21124	50 V., 6 A.	$69 \times 15\frac{3}{4} \times 14$	139	
N21911	24 V., 3 A.	$21\frac{1}{2} \times 15\frac{1}{2} \times 9\frac{1}{2}$	99	

### BATTERY ELIMINATORS



**N 21790**

Where a.c. supply is available, PAX. switchboards as listed, also small PABX. and C.B. switchboards, can be operated without batteries by the use of a battery eliminator, the principal parts of which are dry-plate metal rectifier, transformer, smoothing condensers and coils. These units are economical and do not require any regular maintenance.

Connection is normally to 200/250 volts, single phase, 50-cycles a.c. supply but operation from other voltages and frequencies can be arranged when specially requested.

Code No.	For PAX. Switchboards	Output	Dimensions inches	
N21790	Up to 25 lines	24 V., 3 A.	$21\frac{1}{2} \times 15\frac{1}{2} \times 9\frac{1}{2}$	
N21790A	Up to 50 lines	24 V., 5 A.	$21\frac{1}{2} \times 15\frac{1}{2} \times 9\frac{1}{2}$	
N21912	Up to 50 lines	50 V., 5 A.	$28\frac{1}{2} \times 15\frac{1}{2} \times 9\frac{1}{2}$	
N21913	Up to 100 lines	50 V., 10 A.	$48\frac{1}{2} \times 19 \times 14\frac{1}{2}$	
N21919	Up to 150 lines	50 V., 15 A.	$48 \times 19 \times 14\frac{1}{2}$	
N21920	Up to 200 lines	50 V., 20 A.	$48 \times 27 \times 14\frac{1}{2}$	





## Protectors

### BLOCKS

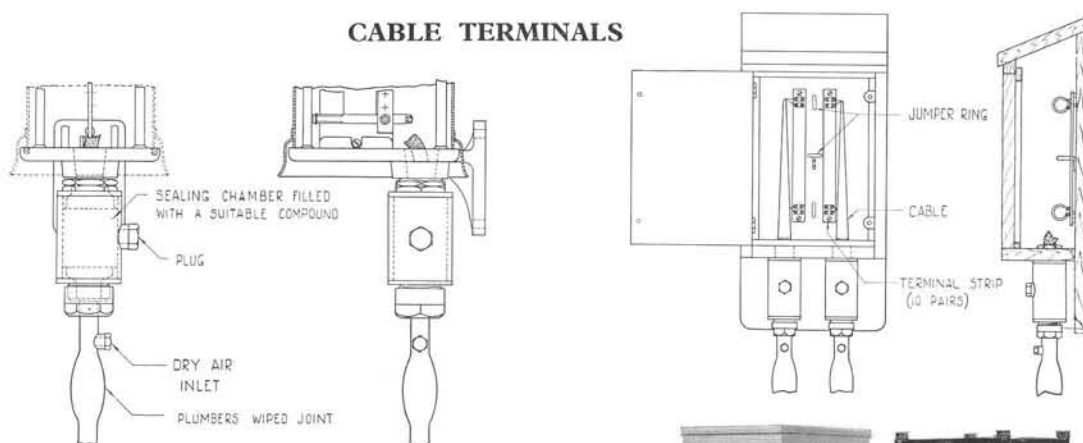
Carbons for arresting high voltages on protectors are now discontinued and replaced by this protector block which is moulded from a special conducting compound and treated with a thin coat of varnish to break down between pairs at from 500 to 900 volts.



N 3458

Code No.	Use	Dimensions, inches	Weight per 100	P.O. No.
N3458	Used in pairs on protectors	$1\frac{1}{4} \times \frac{3}{8} \times \frac{7}{32}$	12 $\frac{3}{4}$ oz.	14/2

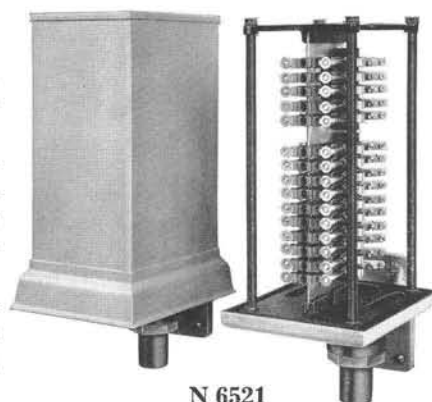
### CABLE TERMINALS



These cable terminals or junction boxes are designed for making the connection between overhead lines and underground cables.

They provide facilities for testing the lines, and protection from lightning and high voltage power circuits, and can be attached to poles or walls. The table below gives protectors with carbons and fuses, but protectors with carbons and heat coils can also be supplied.

The base of the bracket has a groove into which the cover fits, and the latter being double-shed provides additional protection against moisture creepage. **When ordering, state the external diameter of the cable.**



N 6521

Code No.	Type	Metallic Circuits	Dimensions, inches	Weight, lb.
N6520		10	$12\frac{5}{8} \times 8\frac{3}{4} \times 6\frac{3}{4}$	13
N6521		15	$16 \times 8\frac{3}{4} \times 6\frac{3}{4}$	16
N6522		20	$18\frac{5}{8} \times 8\frac{3}{4} \times 6\frac{3}{4}$	18
N6523		25	$22\frac{1}{8} \times 8\frac{3}{4} \times 6\frac{3}{4}$	21
N6524		30	$18\frac{1}{8} \times 14\frac{1}{4} \times 10\frac{5}{8}$	43
N6525		40	$20\frac{3}{4} \times 14\frac{1}{4} \times 10\frac{5}{8}$	47
N6526		50	$24 \times 14\frac{1}{4} \times 10\frac{5}{8}$	51
N6527		60	$26\frac{3}{4} \times 14\frac{1}{4} \times 10\frac{5}{8}$	59
N6528		70	$30 \times 14\frac{1}{4} \times 10\frac{5}{8}$	64
N6529		80	$32\frac{3}{4} \times 14\frac{1}{4} \times 10\frac{5}{8}$	69

Weather-proof wooden case junction boxes as drawing above, for 10 to 60-pair cables can also be supplied.

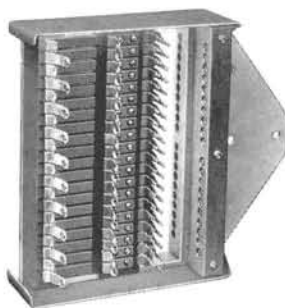


## Protectors—continued

### FUSE MOUNTINGS



N 6506



N 6510



N 6511

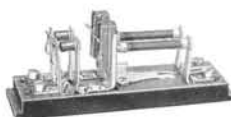
Unless specially ordered, we supply the fuses stated in the table below. For other fuse values see under "Fuses."

Code No.	No. of Fuses	Fuse	Description and use	Dimensions inches	Weight lb.	P.O. No.
N6506	2	N4570	General purposes	$3\frac{7}{8} \times 1\frac{1}{8} \times 1\frac{5}{8}$	$\frac{3}{8}$	4001
N6510	40	N4570	For main distributing frames	$9\frac{7}{8} \times 8\frac{9}{16} \times 2\frac{3}{4}$	$3\frac{1}{2}$	
N6511	2	N4600	With wood base ) telephones on H.T. circuits	$16 \times 5\frac{3}{4} \times 4\frac{1}{4}$	$7\frac{3}{4}$	
N6511A	2	N4601	Without wood base	$11\frac{3}{4} \times 4\frac{1}{2} \times 3$	6	

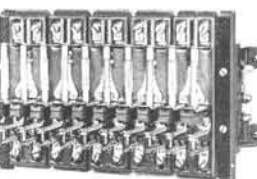


N 6543

### SINGLE UNITS



N 6546



N 6547

These protectors are for use with telephone instruments and small switchboards. They are designed as units for one metallic circuit.

N6543 and N6546 accommodate protector blocks, fuses and heat coils. N6544 and N54823 are similar to N6543 but for protector blocks and fuses only.

On N6547 and N6549, protector units N6546 are mounted side by side on a light metal frame which is provided with a terminal for the earth wire, a dust-proof cover and a paper label fixed inside the cover for the purposes of designating the respective lines.

Unless specially ordered, protector blocks N3458, fuses N4570 (on N6544, fuses N4595) and heat coils N3495D, are fitted as standard.

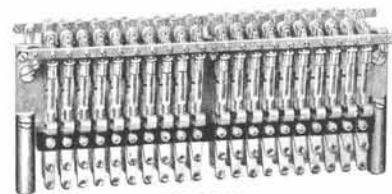
Code No.	Circuits	Dimensions, inches	Weight, lb.	P.O. No.
N6543	1	$4\frac{7}{16} \times 2\frac{5}{8} \times 3$	$1\frac{1}{8}$	2/2
N6544	1	$4 \times 1\frac{1}{2} \times 1\frac{3}{4}$	$\frac{7}{8}$	$1\frac{3}{8}$
N6546	1	$5\frac{5}{8} \times 1\frac{1}{2} \times 2\frac{7}{16}$	$\frac{1}{2}$	
N6547	5	$10\frac{1}{4} \times 6\frac{1}{8} \times 4\frac{1}{8}$	$6\frac{3}{4}$	
N6549	10	$18\frac{1}{8} \times 6\frac{1}{8} \times 4\frac{1}{8}$	$10\frac{3}{4}$	
N54823	1	$4\frac{7}{16} \times 2\frac{5}{8} \times 3$	1	



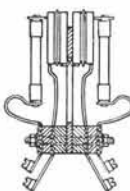
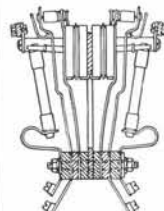
## Protectors—continued

### STRIPS

These protector strips can be supplied unmounted for direct fixing to the main frame in exchanges, or mounted in wood box with glass front. N6612/N6622 types are fitted with heat coils and common alarm bars. Protector blocks N3458, fuses N4546, heat coils N3495D are fitted as standard.



N 6612

UNMOUNTED				Type	No. of Metallic Circuits	MOUNTED in wood box with glass front			
Code No.	Length inches	Weight lb.				Code No.	Length inches	Weight lb.	
N6570	7 $\frac{1}{8}$	2 $\frac{1}{4}$			10	N6580	12 $\frac{1}{4}$	5 $\frac{1}{4}$	
N6571	10 $\frac{1}{2}$	3 $\frac{1}{8}$			15	N6581	15 $\frac{1}{4}$	7	
N6572	13	3 $\frac{3}{8}$			20	N6582	18 $\frac{1}{8}$	8 $\frac{7}{8}$	
N6573	16 $\frac{3}{8}$	4 $\frac{7}{8}$			25	N6583	21 $\frac{1}{8}$	10 $\frac{1}{4}$	
N6574	19	5 $\frac{5}{8}$			30	N6584	24 $\frac{1}{8}$	12 $\frac{1}{8}$	
N6575	24 $\frac{7}{8}$	7			40	N6585	30	15	
N6576	30 $\frac{3}{4}$	8 $\frac{7}{8}$			50	N6586	36	18 $\frac{1}{8}$	
N6577	60	17			100	N6587	36	31 $\frac{1}{2}$	
N6612	13	5 $\frac{1}{4}$			20	N6622	18 $\frac{1}{8}$	10 $\frac{1}{4}$	
N6613	16 $\frac{3}{8}$	6 $\frac{3}{8}$			25	N6623	21 $\frac{1}{8}$	12	
N6614	19	7 $\frac{1}{2}$			30	N6624	24 $\frac{1}{8}$	14 $\frac{1}{8}$	
N6615	24 $\frac{7}{8}$	9 $\frac{1}{2}$			40	N6625	30	17 $\frac{5}{8}$	
N6616	30 $\frac{3}{4}$	11 $\frac{3}{4}$			50	N6626	36	21	
N6617	60	23			100	N6627	36	37 $\frac{1}{2}$	

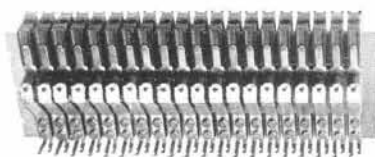
Designed for mounting on the main distributing frame in telephone exchanges, these protectors provide facilities for making tests on the lines and protection against lightning and sneak currents.

The N6555 type requires the heat coils to be removed for testing purposes.

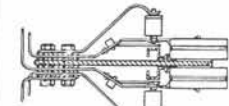
The N6556 type takes test plug N6492 without the removal of heat coils.

The N6557 is fitted with common alarm contacts so that when a heat coil operates, it earths the line and also closes the alarm circuit ; otherwise it is similar to N6556.

Unless specially ordered we fit, as standard, protector blocks N3458, heat coils N3497.



N 6555

Code No.	Type	Metallic Circuits	Dimensions inches	Weight lb.	P.O. No.
N6555		20	11 × 2 $\frac{1}{2}$ × 4 $\frac{9}{16}$	3 $\frac{1}{2}$	P. & H.C.40B
N6556		20	11 × 3 × 4 $\frac{9}{16}$	4	H.C. & T.40B
N6557		20	11 × 3 × 4 $\frac{9}{16}$	4 $\frac{1}{8}$	



## Pulley Weights

Pulley cord weights for use in all types of cord connecting switchboards.



N 8642

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N8642	Single pulley weight	$4 \times 2 \times \frac{7}{16}$	9	16
N8643	Double pulley weight	$7\frac{3}{8} \times 4\frac{1}{2} \times \frac{7}{16}$	24	14A
N8649	Jockey pulley used with N8643	$2\frac{1}{2} \times 2\frac{9}{32} \times \frac{7}{16}$	$2\frac{3}{4}$	1

## Receivers

### INSET TYPE

Inset type receivers for use with bakelite micro-telephones. N6824 is electromagnetic for use on intercom. telephones.

Dimensions,  $2\frac{1}{2} \times 1\frac{5}{8}$  inches.



N 6831

Code No.	Resistance ohms	Used on	Weight oz.	P.O. No.
N6819	80	C.B. or L.B. micro-telephones	$4\frac{1}{4}$	IL
N6824	30	Intercom. micro-telephones	$4\frac{1}{4}$	
N6831	52	C.B. or L.B. micro-telephones	$4\frac{1}{2}$	2P

### OPERATORS' TYPE

For use with C.B. or L.B. operators' telephone sets. Comprises high quality, light receiver with wire headband and carpad.



N 6810B

Code No.	Resistance ohms	Used on	Weight oz.	
N6810B	80	Head and breast sets	$5\frac{3}{4}$	
N6811	40 + 40	As N6810B but differential	$5\frac{3}{4}$	

### RADIO TYPE

Radio type receivers having phosphor-bronze adjustable headbands with twin receivers attached by ball joint, ensuring comfortable fitting, include 2-way cord 45 inches long, with pin tag ends.



N 6828 Type

Code No.	Resistance ohms	Weight oz.	
N6828	120 the pair	17	
N6828C	2000 the pair	17	
N6828F	4000 the pair	17	

### WATCH TYPE

Watch type receivers for C.B. or L.B. circuits; with suspension loop and cord can be supplied.



## Relays

Owing to the number of types of relays manufactured and the wide range of variations in each type, it is not practicable to list them in detail in this catalogue, therefore, typical illustrations and general details of each type are given.

Inquiries should provide as much information as possible, including existing conditions and desired results, on the lines of the following where they apply :—type of relay ; voltage ; resistance of winding/s ; operating, non-operating, holding, releasing currents ; number and type of contact combinations ; heavy current contacts ; slow operating ; slow releasing ; shunt field ; marginal ; polarized ; two-step ; alternating current, etc.

Types of contact combinations are denoted by “ B ” for break, “ M ” make, “ C ” break then make and “ K ” make then break, each preceded by a numeral to indicate the number required, e.g., 3B, 1C, 3M, 1K, which represents a maximum build-up for a N30000 type relay, i.e., two spring sets each containing nine springs.

### RELAY N20379 TYPE (P.O. 500)

This is a small type relay designed and used mainly for line and supervisory circuits on small C.B. switchboards.

The yoke is arranged to take one or two springset units, and the springs are split at the tip for double contacts which are silver.

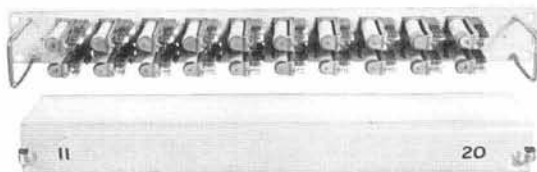
The armature is pivoted on a knife-edge and held in position by a bridge piece.

The relays are usually mounted with the springs at the top, and horizontal mountings for various numbers of relays are available and arranged to accommodate individual covers.



N 20379 Type

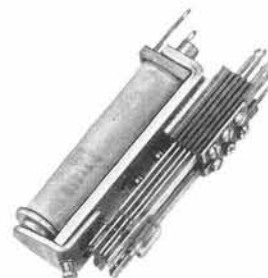
### RELAY N45000 TYPE (P.O. 600)



Mounting and Common Cover



Individual Cover



N 45000 Type

This relay is of similar construction to the N30000 type but of smaller dimensions, and is the standard “ minor ” Post Office No. 600 type.

It is principally used as a line and cut-off relay in telephone exchange systems, and also for circuit operations in instruments, test sets, etc., where mounting space is limited.

It accommodates two spring sets for a maximum of 12 double contact springs which are supported by a buffer block. The normal contacts are silver but other contact metal can be fitted on request.

Mountings for this relay are available in both horizontal and vertical strips. The strips are made to take different numbers of relays, and an individual cover or a common cover for a group can be supplied according to requirements.



## Relays—*continued*

### RELAY N30000 TYPE (P.O. 3000)

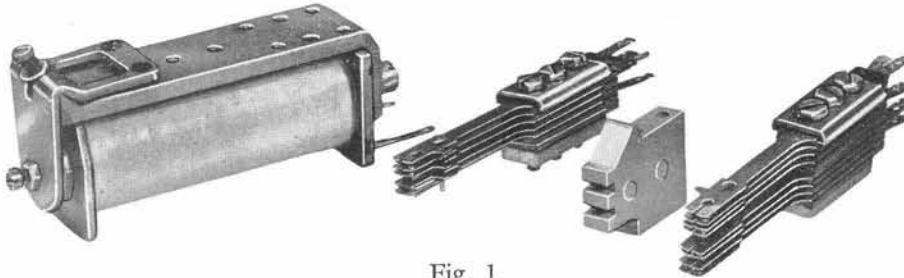


Fig. 1

Fig. 1 shows the main components of the standard "major" Post Office No. 3000 type relay, primarily designed for telephone purposes, but eminently suitable for a very wide range of application, such as totalizers, adding machines, railway indicators, etc.

The general design is conventional—round core, L-shaped frame or yoke with knife edge for an angular armature, and spring sets mounted on the yoke.

The coil check accommodates a maximum of five connecting tags, thus providing for a large variety of windings. Sleeves for high impedance, or copper slugs for prolonging operate and release times are fitted on the core as required.

The yoke is tightly pressed on the tag end of the core and firmly held by a nut. It is provided with screwed holes for mounting purposes, fixing spring sets and buffer block, and retaining the armature on a knife-edge fulcrum by means of a spiral compression spring.

There are two differently shaped armatures available—the plain and the isthmus; the latter is cut away at the sides to limit magnetic saturation, and is used for impulsing relays. Some armatures are fitted with "fixed residual" studs while others have an "adjustable residual" screw with locknut, according to actuating requirements.

The contact springs of nickel silver are slit at the ends to give flexibility to the double contacts which are normally silver, but other contact metal can be fitted, such as, platinum for impulse circuit relays. Contact combinations are assembled as detachable spring sets, two of which can be accommodated on a relay, with a maximum of 18 springs. The buffer block limits spring movement, assists adjustments, and thereby operating characteristics are extremely uniform. Contacts to carry up to 5 amperes can also be fitted.

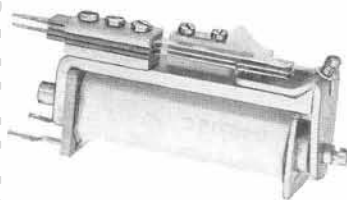


Fig. 2

The relay in Fig. 2 is a typical single-coil, plain armature with adjustable residual screw and nut and carries a 1C combination springset.

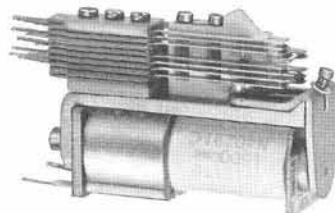


Fig. 3

Fig. 3 has a single winding with a copper slug at the heel end for prolonging release time, a plain armature with fixed residual stud and two spring sets, one set comprising 1B, 1M, 1C, and the other 1C, 1K combinations. Slugs vary in length and may be fitted at heel or fore end according to operating requirements.





## Relays—*continued*

Relays which have to respond to dial or other trains of impulses are provided with an isthmus armature (Fig. 4) which limits the saturation of that part of the armature opposite the core, to ensure constant release lags. These relays are usually provided with adjustable residual as illustrated, and when incorporated in a transmission circuit the core coil is fitted with nickel-iron sleeves to give high impedance.

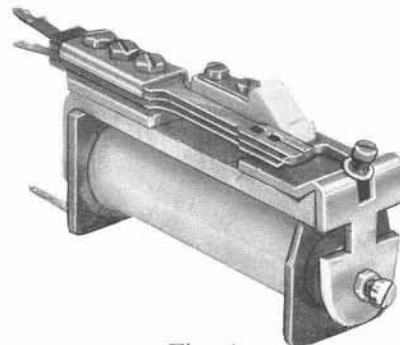


Fig. 4

As stated above, the maximum number of springs which can be accommodated on the N30000 (P.O. 3000) relay is 18, and may be seen in Fig. 5 showing two spring sets each having three 1C contact combinations, i.e., 9 springs in each set. The position of the coil tags and the holes for fixing these relays to the mounting plate are also visible.

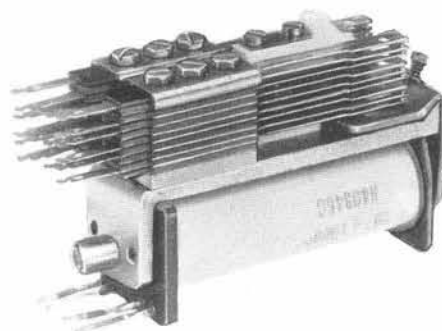


Fig. 5

Plates for horizontal mounting, having capacity for 8, 16, 18 or 20 relays are available with common covers as illustrated in Fig. 6, or pair covers, Fig. 7.

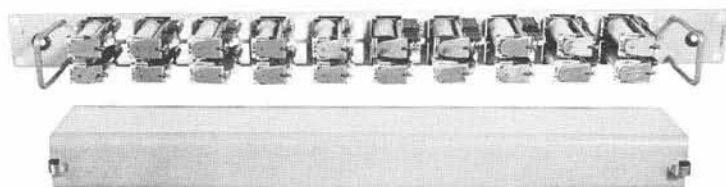


Fig. 6



Fig. 7



Fig. 8

Similar plates are made for the vertical mounting of 5 or 10 relays and utilize common covers or, for the smaller plate, individual covers, Fig. 8.

Relay mountings fitted with common covers and switch plugs for jacking-in on channel shelves are made to take from 8 to 32 relays in the manner shown in Fig. 9 which has capacity for 8, but is equipped with 5 relays.

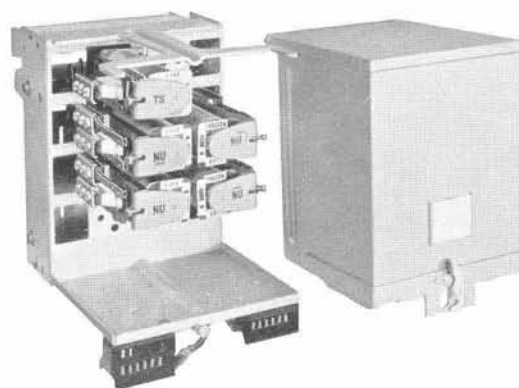


Fig. 9

It will be noted that the N30000 type relays are generally mounted with the spring sets at the side, thus minimizing the risk of dust lodging on the contacts.





## Relays—*continued*

### MINING RELAYS, CERTIFIED SAFE FOR MINES

CERTIFICATE T/Tel. 12 and T/BR 55

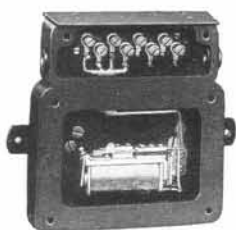
These relays are certified safe by the Mines Department for use in mines. N7236 type operates from magneto telephone current, and N7240 type from direct current, as certified by the Mines Department.

They may be used singly or any number in parallel.

Dimensions :  $7\frac{3}{8} \times 8\frac{1}{2} \times 3\frac{1}{4}$  inches. Weight 11 lb.



**N 7236 or N 7240**



**N 7240**  
(without cover)

Code No.	Resistance ohms	Contacts	Used with	Mines Dept. type
N7236A1	1600+(10000)	1M	Magneto mining telephones and battery bells	N7236
N7236A2	1600+(10000)	2M		N7236
N7236A3	1600+(10000)	3M		N7236
N7240A1	250+(500)	1M	Battery mining telephone and bells	N7240
N7240A2	250+(500)	2M		N7240
N7240A3	250+(500)	3M		N7240

Similar relays, but without the shunt winding and, therefore, more sensitive, can be supplied for other purposes, such as railways and other traction routes, etc.

### MINING RELAYS CERTIFIED FLAMEPROOF

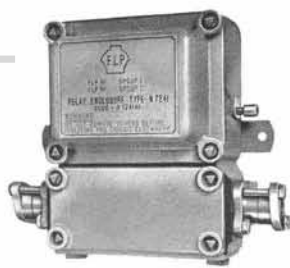
CERTIFICATE No. 2219 (Group 1, methane)

CERTIFICATE No. 2220 (Group 2, industrial vapours)

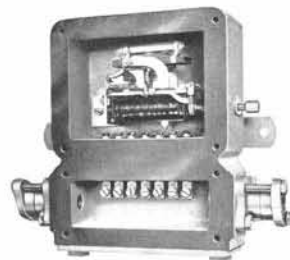
Certified flameproof for currents up to approximately 1.4 amps. The strong cast-iron case has separate chambers for relay and terminal equipment, with covers fixed by tamper-proof screws.

The N7241 type includes a mercury tube relay. Other types of relay can be supplied if required.

The terminating chamber can be arranged for screwed conduit, armoured cable or pyrotanax.



**N 7241 Type**



**N 7241 Type**  
(without cover)

Code No.	Suitable for	Dimensions inches	Weight lb.	
N7241A	Screwed conduit	$11\frac{3}{8} \times 9\frac{3}{4} \times 4$	25	
N7241B	Armoured cable	$11\frac{3}{8} \times 9\frac{3}{4} \times 4$	25	
N7241C	Pyrotanax	$11\frac{3}{8} \times 9\frac{3}{4} \times 4$	25	

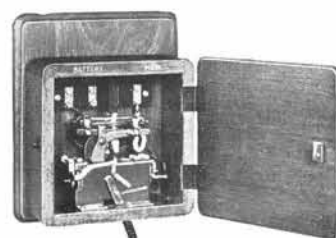


## Relays—*continued*

### POWER RELAYS

We manufacture a large variety of mercury-contact relays for making and breaking circuits carrying currents up to 25 amperes at 250 volts and operating from telephone ringing supply or from d.c. not exceeding 50 volts. They can be supplied unmounted, or mounted in wood or metal case, also with or without hand resetting device. The relay illustrated is in a wood case, has a resetting mechanism, and the contact tube is rated for 2 amperes at 110 volts.

Code No.	Resistance ohms	Dimensions inches	Weight lb.	
N6872	1010	$7\frac{3}{8} \times 6\frac{3}{4} \times 3\frac{5}{8}$	3	



**N 6872**

### RELAY-INDICATOR—see *Indicator-Relay*

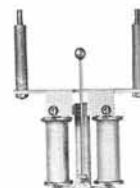
## Ringers



**N 7303F**



**N 7328**



**N 7335 Type**

The table below gives a list of the principal ringers used, but when ordering replacements, state the Code No. of the instrument for which the ringer is required, also state if gongs, pillars and fixing screws are to be supplied.

Code No.	Resistance ohms	Used on	Dimensions inches	Weight oz.	
N7303F	2000	Wood case mining magneto wall telephones	$5\frac{3}{8} \times 5\frac{1}{8} \times 2\frac{1}{2}$	18	
N7307	2000	Iron case mining magneto telephones	$4 \times 5\frac{1}{4} \times 2$	$8\frac{1}{2}$	
N7307A	1000	Iron case auto and C.B. telephones	$4 \times 5\frac{1}{4} \times 2$	$8\frac{1}{2}$	
N7327A3	2000	Bakelite magneto table telephones	$2\frac{1}{2} \times 3\frac{3}{4} \times 1$	6	
N7327B3	1000	Bakelite auto and C.B. extension telephones	$2\frac{1}{2} \times 3\frac{3}{4} \times 1$	6	
N7328	1000	Bakelite auto, C.B. and magneto table and wall telephones	$2\frac{1}{8} \times 3\frac{3}{4} \times 1\frac{1}{8}$	5	
N7334	2000	Portable telephones	$2\frac{1}{8} \times 2\frac{7}{8} \times 1$	$5\frac{3}{4}$	
N7335A1	2000	Wood case magneto wall telephones	$3\frac{3}{8} \times 4\frac{7}{8} \times 1\frac{3}{8}$	$7\frac{1}{2}$	
N7335B1	1000	Wood case magneto wall telephones	$3\frac{3}{8} \times 4\frac{7}{8} \times 1\frac{3}{8}$	$7\frac{1}{2}$	
N7337	1000	Bakelite intermediate table telephones	$2\frac{5}{8} \times 2\frac{7}{8} \times 1\frac{1}{8}$	6	



## Rings, Distributing



N 8660



N 8668

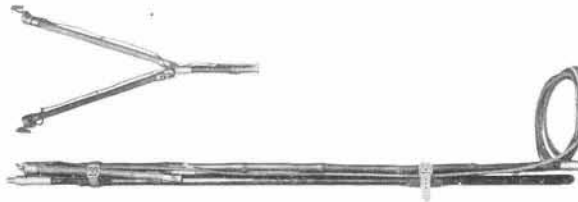


N 8861

In addition to the distributing rings illustrated and listed, there are many other designs available. A rough sketch will assist us in supplying a ring to meet requirements.

Code No.	Used on	Dimensions inches	Weight oz.	P.O. No.
N8660	Main distributing frames	$4\frac{1}{2} \times 2\frac{1}{4} \times \frac{7}{8}$	$3\frac{1}{4}$	10
N8668	Small frames for P.A.B.X.s, etc.	$6\frac{1}{4} \times 4\frac{1}{8} \times \frac{7}{8}$	10	25
N8861	Main and intermediate distributing frames	$6\frac{3}{8} \times 4\frac{3}{4} \times 1\frac{1}{8}$	20	27

## Rods, Contact



N 8534

These rods are used for making contact with overhead line wires and can be dismantled into 5-foot units, strapped together for carrying purposes. N8513 consists of 3 units, with straps and hook. N8534 similar but with two extra 18-inch rods for attaching in "V" form to make simultaneous contact on two wires up to 30 inches apart.

Code No.	Description	Extended length	Weight lb.
N8513	Single-wire contact rod with 1 hook N8505	15 feet (approx.)	7
N8534	Double-wire contact rod with 2 hooks N8505		$8\frac{3}{4}$



## Switches

### EXTENSION SWITCHES

These switches provide a ready means of adding economically an extension which can communicate with the main telephone and the exchange, and also facilitate switching the exchange line through to the extension at night where desired.

Code No.	Type	Description	Dimensions inches	Weight lb.	
N7557C	Magneto	Lever key switch, and listening key	$9\frac{5}{8} \times 6\frac{3}{4} \times 6\frac{1}{2}$	$4\frac{1}{4}$	
N7557D	Magneto	As N7557C but without listening key	$9\frac{5}{8} \times 6\frac{3}{4} \times 6\frac{1}{2}$	4	



N 7557D

Extension switches for C.B. working can also be supplied

### HOOK, SWITCHES

For use with wood-cased wall telephones, these switches are designed to take a removable hook for micro-telephone suspension.

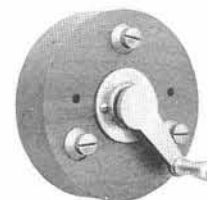
Code No.	Spring combination	Dimensions inches	Weight oz.	
N7581	1C, 1M	$4 \times 1 \times 1\frac{1}{16}$	3	
N7599	2C, 1M	$4 \times 1 \times 1\frac{1}{4}$	$3\frac{1}{4}$	



N 7581

### LEVER SWITCHES

Code No.	Description	Dimensions inches	Weight oz.	P.O. No.
N7611	Circular, 2-way and "off"	$3\frac{1}{4} \times 1\frac{7}{8}$	$4\frac{1}{4}$	3

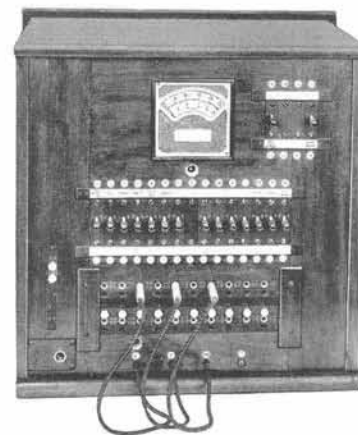


N 7611

## Testing Sets

We supply testing sets and desks for all types of telephone exchanges, small and large ; equipment drawings and testing facilities supplied on application.

The N7655 type is the Post Office standard test case for use with small C.B. exchanges. It can be mounted on a wall or table and provides all the testing facilities given by a complete test desk.



N 7655



## Terminals and Tags



N 8700



N 8701



N 8702



N 8703



N 8704



N 8705



N 8706



N 8707



N 8720



N 8721



N 8722



N 8723

These illustrations show the actual size of the tags and terminals, but this list gives only a very small proportion of the several hundreds of different types which we manufacture.

In order to assist us in supplying the correct article, a sample should be sent with the inquiry.

Code No.	Used for	Weight per 100	P.O. No.
N8700	Switchboard cords, plug end, hole for No. 8 B.A.	$\frac{1}{4}$ oz.	1/STA/9
N8701	Flexible leads and wires, hole for No. 5 B.A.	$\frac{3}{4}$ oz.	
N8702	Flexible leads and wires, hole for No. 4 B.A.	$\frac{7}{8}$ oz.	1/STA/21
N8703	Flexible leads and wires, slot for No. 6 B.A.	$\frac{1}{2}$ oz.	1/STA/15
N8704	Flexible leads and wires, slot for No. 2 B.A.	$1\frac{7}{8}$ oz.	1/STA/14
N8705	Flexible leads and wires, slot for No. 3 B.A.	$3\frac{3}{8}$ oz.	
N8706	Strain cord on switchboard cords	$4\frac{1}{4}$ oz.	
N8707	Switchboard cords, fastener end	$4\frac{3}{4}$ oz.	1/STA/16
N8708	As N8700 but hole for No. 6 B.A.	$\frac{1}{4}$ oz.	1/STA/10
N8720	General purpose terminal, screw connection each end	14 oz.	1
N8721	General purpose terminal, soldering tag one end and screw connection the other end	14 oz.	3
N8722	General purpose terminal, soldering tag one end and screw connection the other end	$10\frac{1}{2}$ oz.	7
N8723	General purpose terminal, soldering tag one end and screw connection the other end	17 oz.	6



## Tools



N 8000



N 8004



N 8006



N 8007



N 8014

These tools are specially designed for use in the installation and maintenance of our exchange equipment.

Code No.	Description and use	P.O. No.
N8000	Screwdriver ; jack fastener	
N8004	Screwdriver ; general purposes	
N8006	Wrench ; circular nuts on relays	6
N8007	Wrench ; O.W. and meter key tops	
N8008	Wrench, similar to N8007 ; meter keys	
N8011	Box spanner ; hexagon nuts $\frac{1}{4}$ in. across flats	14
N8012	Box spanner ; hexagon nuts $\frac{9}{32}$ in. across flats	
N8013	Box spanner ; hexagon nuts $\frac{5}{16}$ in. across flats	
N8014	Box spanner ; hexagon nuts $\frac{3}{8}$ in. across flats	
N8015	Box spanner ; hexagon nuts $\frac{7}{16}$ in. across flats	
N8017	Bent box spanner ; $\frac{1}{4}$ in. Whit. hex. nuts	
N8018	Bent box spanner ; $\frac{5}{16}$ in. Whit. hex. nuts	
N8019	Bent box spanner ; $\frac{3}{8}$ in. Whit. hex. nuts	
N8020	Pliers ; skinning and wiring	2
N8021	Pliers ; cutting, general purposes	1
N8022	Pliers ; inserting and removing heat coils	
N8025	Extractor ; jack labels	
N8026	Extractor ; lamp caps	
N8028	Adjuster ; relay and key springs	14
N8029	Soldering iron, $\frac{1}{2}$ lb.	
N8030	Soldering iron, 1 lb.	
N8031	Coil extractor	
N8036	Extractor ; meter cover	40
N8052	Extractor ; indicator cover	7
N8057	Extractor ; micro-mouthpiece	15
N8079	Spring adjuster ; 3000 type relays	1
N8087	Tension gauge, 3000 type relays	
N8091	Spring adjuster, 3000 type relays	2
N8219	Extractor ; lamp	5
N8303	Contact cleaner ; 3000 type relays	



N 8018



N 8020



N 8021



N 8022



N 8025



N 8026



N 8028



N 8219



N 8052



N 8031



N 8030



## Transmitters



**N 7736B**

### BREAST TRANSMITTERS

This breast transmitter forms part of the operators' sets on page 120, and is arranged for suspension from the operator's neck by means of an adjustable neckband.

The mouthpiece is adjustable so that the correct speaking position can be readily obtained.

Code No.	Description	Weight oz.	
N7736B	C.B. or L.B. transmitter with inset, without switch	9½	
N7737B	Same as N7736B but with switch for disconnecting the transmitter circuit	9½	

### "INSETS," TRANSMITTER



**N 7743**



**N 7752**



**N 7753A**



**N 7753C**

Code No.	Description and use	Dimensions inches	Weight oz.	P.O. No.
N7743	L.B. for battery mine telephones	$2\frac{1}{4} \times \frac{5}{8}$	1½	13
N7752	C.B. and L.B. bakelite micro-telephones	$2\frac{5}{16} \times 1\frac{1}{8}$	2	
N7753A	C.B. and L.B. bakelite micro-telephones	$2\frac{5}{16} \times 1\frac{1}{16}$	2½	
N7753B	Operator's breast transmitter N7737B	$2\frac{5}{16} \times 1\frac{1}{16}$	2½	
N7753C	Operator's breast transmitter N7736B	$2\frac{5}{16} \times 1\frac{1}{16}$	2½	





# Units Auxiliary Apparatus

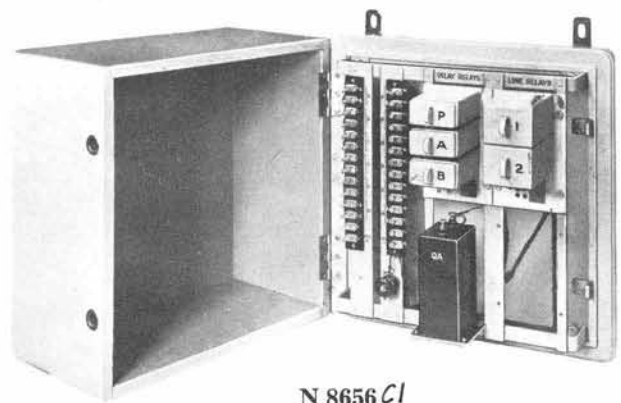
## CODE RINGING DELAY UNITS, CERTIFIED SAFE FOR MINES

CERTIFICATE T/Tel. 48

This unit has been specially designed to allow code ringing between stations on a line connected to a switchboard and is so arranged that the indicator on the switchboard is not actuated unless the exchange operator's attention is required. This is most useful on lines along the haulage roads and ensures that an emergency call to the switchboard operator gets prompt attention.

One delay unit can be used with two or more lines, depending upon the code ringing arrangements and the frequency of the calls. A maximum of six lines can under certain conditions be accommodated, but all particulars of requirements should be stated.

Dimensions : 17½ × 16 × 10 inches.



N 8656 C1

Code No.	Lines	For Magneto Swbds Code No.	Mines Dept. Type
N8656 C1	2	N550A	N8656
N8656 C2	4	N551A, N552A	N8656
N8656 C3	6	N553A, N554A	N8656

## COUPLING UNITS FOR TELEPHONES, CERTIFIED SAFE FOR MINES

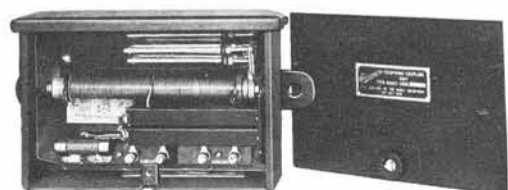
CERTIFICATE T/Tel. 41

This patented telephone coupling unit permits connections to be made between any certified magneto telephone system and an uncertified one.

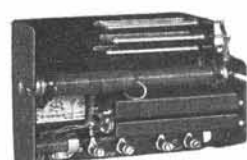
It consists of an arrangement of metal rectifiers, condensers and impedances which when connected in a line circuit has little or no effect on the speech currents and absorbs the correct amount of ringing energy to render the circuit safe.

One unit per unsafe telephone line connected to a certified telephone or switchboard, and one unit per junction line between an uncertified surface switchboard and a certified switchboard should be fitted.

The coupling unit is housed in a strong iron case which is rust-proofed and heavily enamelled or can be supplied without case if desired, as illustrated, also the case can be fitted with a coupling gland. See table.



N 8655 C (Cover off)



N 8654 B

Code No.	Description	Dimensions inches	Weight lb.	Mines Dept. Type
N8654B	Without case	5¼ × 8½ × 3	3¾	N8655
N8655C	With case	6¼ × 11½ × 3¾	8¾	N8655
N8655D	With case and gland	9 × 11½ × 3¾	11½	N8655



## Units Auxiliary Apparatus—*continued*

### TRANSFER UNITS FOR INTERCOMMUNICATION TELEPHONES



**N 9001A**

This auxiliary unit is used with our intercommunication telephones with exchange facilities to serve the purpose of a manual switchboard without the necessity for a special operator.

It is associated with the master station, to which it is connected by a cord and plug, and accommodates either one or two exchange line equipments. Units can also be supplied for working to external extensions, as indicated in the table.

The neat black bakelite casing can be lifted off, exposing the equipment which is mounted on a metal front panel and baseplate.

L.B. or C.B. units are available for use with magneto, C.B.S., C.B. or automatic systems and contain indicators, keys, bell or buzzer, relays, etc., in accordance with the particular requirements. Voltage limiters are also fitted.

When an exchange call is received, the required extension is called by depressing the appropriate button on the master station telephone and the call is then put through direct by the operation of the particular exchange line button on the extension instrument.

Facilities for alarm cut-off and night extension can be provided.

Full information on our intercommunication system with exchange facilities is obtainable on request.

Dimensions :  $7\frac{1}{2} \times 10\frac{1}{4} \times 8$  inches.

Code No.	Type of Unit	Unit for	Weight lb.	P.O. No.
N9000A	C.B.	One exchange line	10	1/2
N9001A	C.B.	Two exchange lines	12	2/2
N9002	L.B.	One exchange line	10	
N9003	L.B.	Two exchange lines	12	
N9004	C.B.	One external extension line	13	3
N9005A	C.B.	One external extension and one exchange line	14	1A/2

### AUXILIARY UNITS FOR EQUIPPING SPECIAL JUNCTIONS

We can supply units for equipping special junctions between exchanges of differing types or for long extension and private lines.

The units are designed for 22, 40 or 50-volt working.

Further particulars given on request.