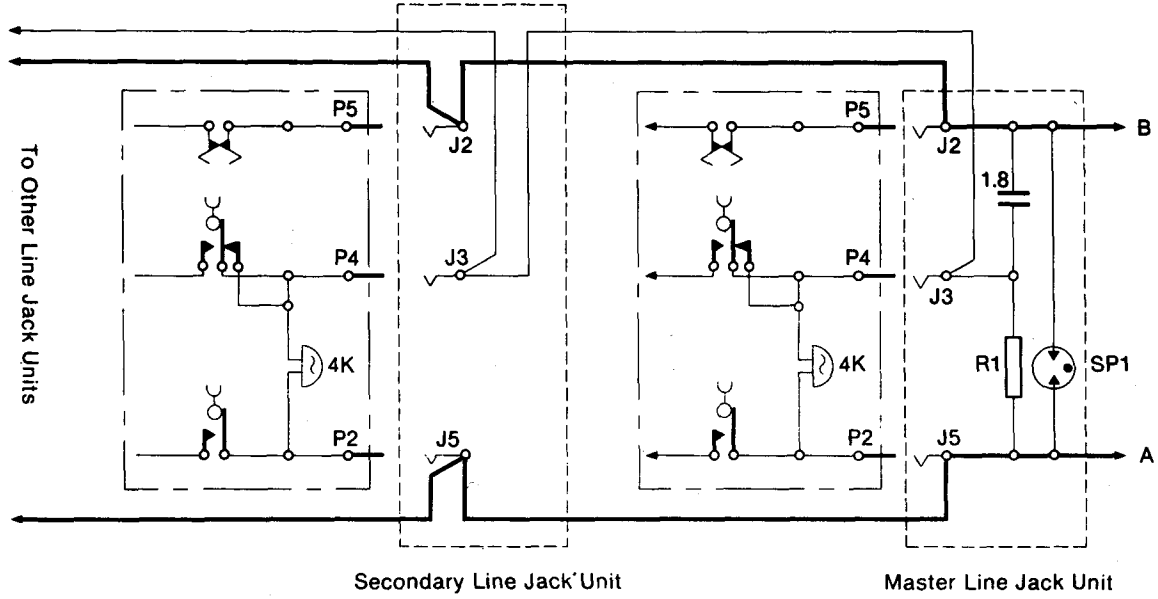
NEW TELEPHONE WIRING SYSTEM

Contents

Phone Socket — The Principle of Bells in Parallel and Opt Out of Service **Fig 1**



SPI High Voltage Surge Protection

R1 Opt Out of Service Resistor (470K)

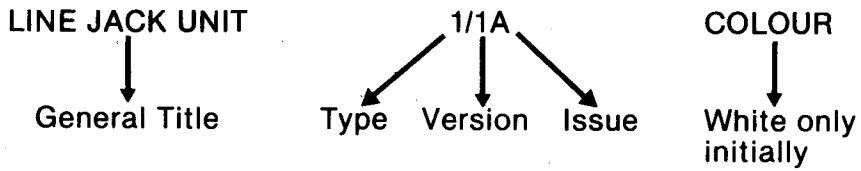
1.8 μF Capacitor (Bell Circuit)

SECTION 2

TYPES OF LINE JACK UNIT

In order to identify a particular type of line jack a standard code has been introduced.

This code is broken down as follows:—



Version

1. Most Line Jack Units are currently supplied in two versions:—

   /1 — Master Line Jack Unit

   Contains: Strips Connexions 238A, 1.8 μF Capacitor, 470K Resistor, Protector 11A and Jack all mounted on a printed circuit board.

   /3 — Secondary Line Jack Unit

   Contains: Strips Connexion 238A, and Jack all mounted on printed circuit board.

2. The following versions are obsolescent.

   /2 — PBX Master Line Jack Unit

   Contains: Strips Connexions 238A, 1.8 μF Capacitor and Jack all mounted on a printed circuit board. This is superseded by the /1 version.

/4 — Master Line Jack Unit

Contains: Screw Terminals, 1.8 μF Capacitor, 470K Resistor, Protector 11A and Jack all mounted on a printed circuit board. Superseded by /1 version.

/6 — Secondary Line Jack Unit

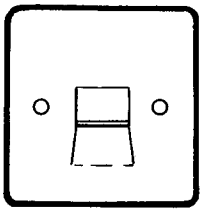
Contains: Screw Terminals and Jack all mounted on a printed circuit board. Superseded by /3 version.

NOTES

1. Strips Connexion 238A provide the internal wiring connexion point to the jack by means of insulation displacement terminations.

2. On any single line only one master line jack unit must be used. It is preferable for this to be fitted immediately following the lead in. All other jacks must be of the secondary type.

Line Jack Units that are currently available are illustrated and described in the following pages



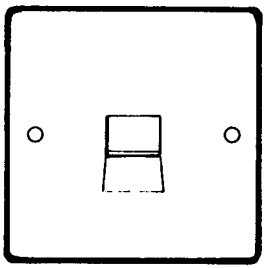
1. Surface Mounted Box

LINE JACK UNIT (LJU)

1/1A (Colour) — Master Version
1/3A (Colour) — Secondary Version

Description

Spring loaded shutter
Cover clips to base (A version — obsolescent)
Cover screws to base (B version)
Dimensions 55 mm × 55 mm × 25 mm
Base supplied



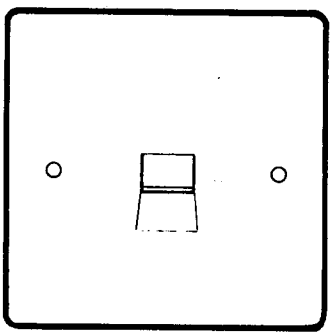
2. "Mini Logic" Outlet

LINE JACK UNIT (LJU)

2/1A (Colour) — Master Version
2/3A (Colour) — Secondary Version

Description

Spring loaded shutter
Surface or flush fitting
Dimensions 68 mm × 68 mm
Base supplied for surface fitting



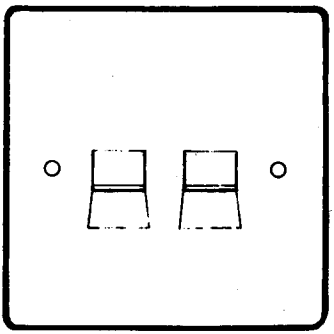
3. Single Outlet BS Box Fitting

LINE JACK UNIT (LJU)

3/1A (Colour) — Master Version
3/3A (Colour) — Secondary Version

Description

Spring loaded shutter
Surface or flush fitting
Standard BS fitting
Dimensions 85 mm × 85 mm
Base supplied as a separate unit



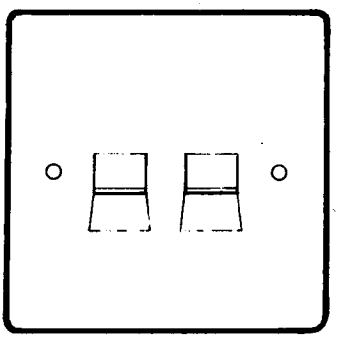
4. Double Outlet BS Box Fitting

LINE JACK UNIT (LJU)

4/1A — Master Version
4/3A — Secondary Version

Description

Spring loaded shutter
Surface or flush fitting
Standard BS fitting
Dimensions 85 mm x 85 mm
Base supplied as a separate unit
Two separate circuits



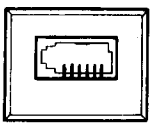
5. Double Outlet BS Box Fitting

LINE JACK UNIT (LJU)

5/1A — Master Version
5/3A — Secondary Version

Description

Spring loaded shutter
Surface or flush fitting
Standard BS fitting
Dimensions 85 mm x 85 mm
Base supplied as a separate unit
One circuit — jacks connected in parallel



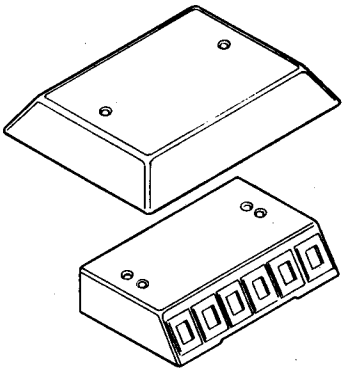
6. Panel Mounted Outlet

LINE JACK UNIT

6A

Description

Single socket outlet for mounting in office furniture, trunking or panels
Dimensions 28 mm x 22 mm
One circuit — associated mastering components to be mounted in a separate unit



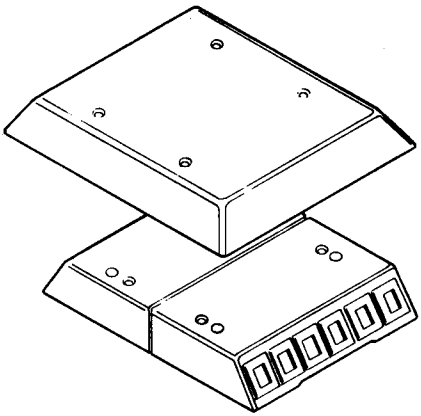
7. Multi Socket Outlet

LINE JACK UNIT (LJU)

7A

Description

Six socket outlets wired from 226 connector.
For use with under carpet cabling systems or similar applications
Dimensions 165 mm x 120 mm x 25 mm (including cover)
Associated mastering components to be mounted in a separate unit



8. Multi Socket Outlet

LINE JACK UNIT (LJU)

8A

Description

Twelve socket outlets wired from 226 connector.
For use with under carpet cabling systems or similar applications
Dimensions 215 mm x 165 mm x 25 mm
Associated mastering components to be mounted in a separate unit

NB. The units are under review and a new version will be available in early 1983.

9. Single Socket Outlet

LINE JACK UNIT

9A

Description

Single socket outlet wired into back of 226 connector for connecting telephones to multi wired systems

10. Specialised Attachment Adaptors

LINE JACK UNIT

10/1A

Description

Converts socket outlet to single jack and six screw terminals for cable
Terminals and jack wired in parallel

LINE JACK UNIT

10/3A

Description

Jack doubler for converting single socket outlet to double Jacks wired in parallel

LINE JACK UNIT

10/4A

Description

Converts socket outlet to single jack and 4-way cord with Plug No. 431A. Wired in series

LINE JACK UNIT

10/5A

Description

Converts socket outlet to single jack and 4-way cord with spade terminals. Wired in series

LINE JACK UNIT

10/6A

Description

Converts socket outlet to single jack and 6-way cord with Plug No. 631A. Wired in series

LINE JACK UNIT

10/7A

Description

Converts socket outlet to single jack and 6-way cord with spade terminals. Wired in series

11. Line Jack Unit

11A

Description

Surface fitting
Captive or non-captive capability
Plug-in mastering component facility.
Unit under development.

NOTE All Master Line Jack Units have a 'master circuit' mounted on a Printed Circuit Board (PCB). Development is now under way to have the 'master circuit' mounted on a separate 'plug in master board'.

SECTION 3

THE INSULATION DISPLACEMENT TERMINATION (IDT)

The insulation displacement termination differs fundamentally from the present BT methods of terminating wires. Unlike the solder, screw or some wire wrapped terminations the IDT does not require the wire insulation to be removed as a separate operation. The principle of the IDT method of wire termination is that the wire is placed between tag forks, downwards pressure is applied to the wire to force it between the closed tag forks. The mechanical resistance of the tag forks to opening is sufficient to crush and cut through (displace) the insulation at the two points where the wire is in contact with the tag.

The resulting contact between the conductor and tag is a sound mechanical and electrical joint.

The wire to be terminated is laid in the tag slot (from the opposite side to the step in the strips connexion) leaving approximately 20 mm of surplus wire to be cut off.

The head of the tool has been designed to prevent it being used the wrong way round and cutting the wire on the wrong side of the tag.

The tool must be held over the wire so that the scissor blades are on the same side as the step on the strips connexion see Fig 3.

Pressure applied to the tool forces the wire into the tag slot. When the wire is fully inserted on the tag the scissor action cutting blades cut off the surplus wire close to the tag housing.

Strips Connexion 23 ..... series

A feature of the design is that the wire is held in the tag slot at an angle of 45 degrees by the tag housing.

This allows for variations in wire size and increases the number of re-terminations that are possible without damage to the tag or reduction in performance of the termination.

This design also allows for the termination of up to two wires of the same diameter and insulation material in the same tag slot.

Two three-way connexion strips (Strips Connexion 238A) are used in Line Jack Units, a typical strips connexion is shown in Fig 2.

Terminating Technique

Wires are connected to the strips connexion tags using an Inserter Wire No. 2A (Fig 3).

Phone Socket Insulation Displacement Terminations (IDT) **Fig 2**

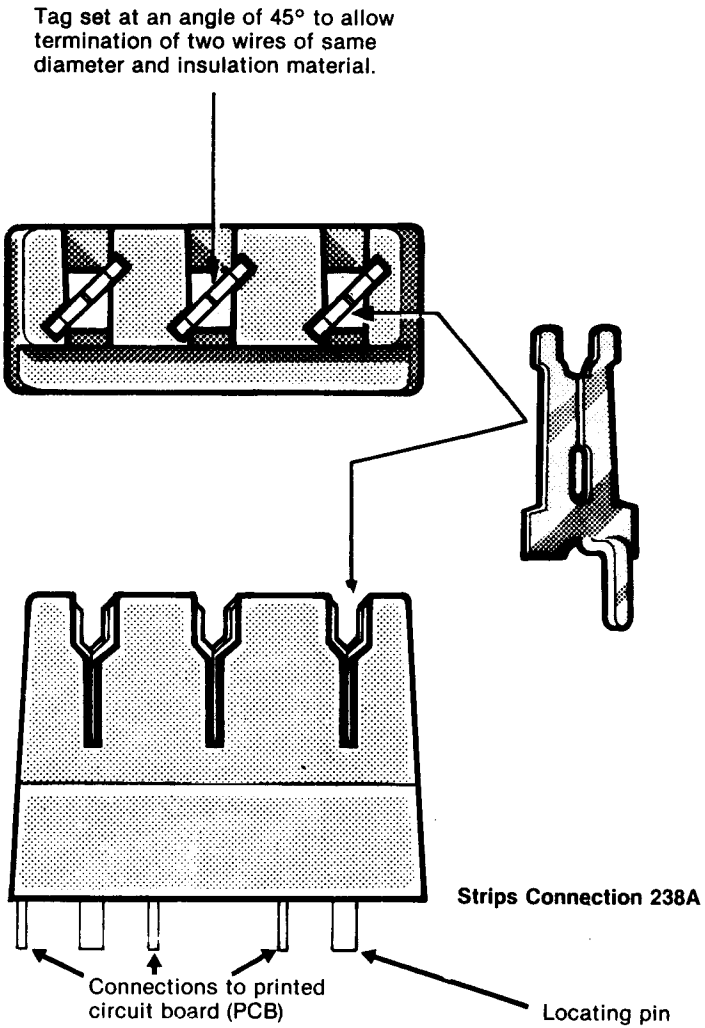
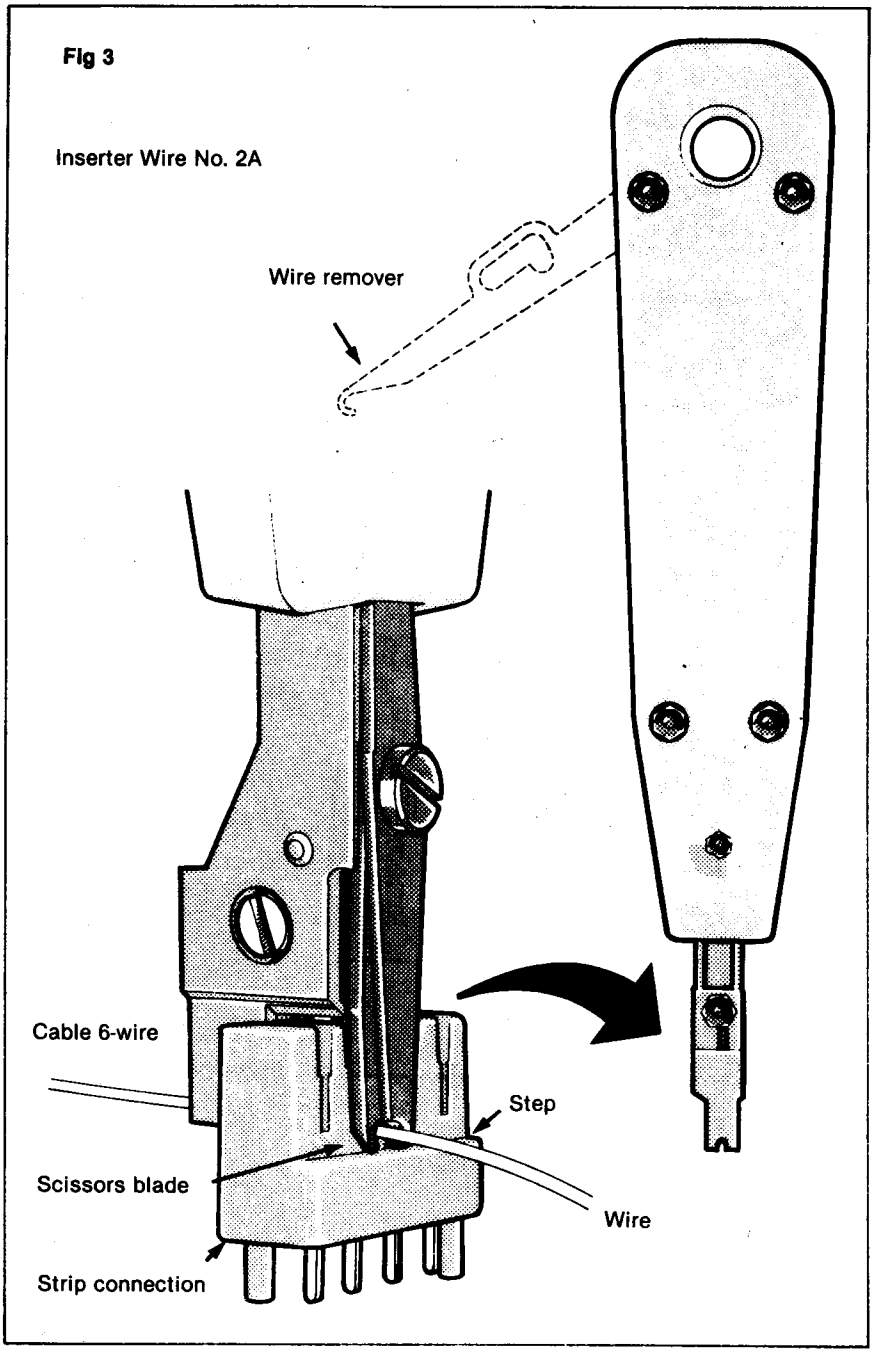


Fig 3


Inserter Wire No. 2A
Wire remover
Cable 6-wire
Step
Scissors blade
Wire
Strip connection

SECTION 4

CABLE EQUIPMENT 2000 SERIES

To overcome the problem of wire identification a new Cable Equipment 2000 Series, has been introduced.

In the new cable every wire is marked throughout its length with two colour bands, a base colour and a ring colour, in the ratio 3 : 1 repeated over a 25 mm length. Each wire of a pair uses the same two colours but the base and ring colours are reversed to permit identification of the "A" and "B" wires. Using the colours BLUE, ORANGE, GREEN, BROWN, GREY, with WHITE, RED, BLACK, YELLOW, VIOLET a discrete identification of 50 wires in a make up of 25 pairs can be achieved. SEE TABLE 1. For larger cables a unit construction is used with groups of pairs being repeated in each cabling unit.

Cables in sizes commonly used for distribution wiring purposes use the first 20 pairs as a unit repeated as necessary. In addition, to simplify the connexion of the signalling earth to points throughout the distribution scheme a 1.5 mm earth wire is included in these cables.

To cater for the interconnexion of modern electronic call connect systems, cables have been introduced based on 16 pair units. These cables use the first four pairs from each of the first four colour groups. Cables will be available in 64, 128, 256 pair sizes.

The cables will be available with a black or white sheath, the black sheath cable being used for external cables within a customers distribution scheme. This will make it unnecessary to change to external type cable with aluminium conductors that require 'copper tails' for termination on BDFs etc.

TABLE 1

Pair Colour of insulation (Wide band, base colour in capitals)

	a — wire	b — wire
1	WHITE — Blue	BLUE — White
2	WHITE — Orange	ORANGE — White
3	WHITE — Green	GREEN — White
4	WHITE — Brown	BROWN — White
5	WHITE — Grey	GREY — White
6	RED — Blue	BLUE — Red
7	RED — Orange	ORANGE — Red
8	RED — Green	GREEN — Red
9	RED — Brown	BROWN — Red
10	RED — Grey	GREY — Red
11	BLACK — Blue	BLUE — Black
12	BLACK — Orange	ORANGE — Black
13	BLACK — Green	GREEN — Black
14	BLACK — Brown	BROWN — Black
15	BLACK — Grey	GREY — Black
16	YELLOW — Blue	BLUE — Yellow
17	YELLOW — Orange	ORANGE — Yellow
18	YELLOW — Green	GREEN — Yellow
19	YELLOW — Brown	BROWN — Yellow
20	YELLOW — Grey	GREY — Yellow
21	VIOLET — Blue	BLUE — Violet
22	VIOLET — Orange	ORANGE — Violet
23	VIOLET — Green	GREEN — Violet
24	VIOLET — Brown	BROWN — Violet
25	VIOLET — Grey	GREY — Violet

SECTION 5

INSTALLATION

1. Cabling

The cabling scheme will generally employ serial wiring using Cable Equipment 2503, in accordance with Fig 4.

(a) Spur Cabling

Where it would be more economical to cable spur fashion, a BT 35A should be used in accordance with Fig 5. A maximum of 3 wires may be terminated under a screw connexion and a total of six wires may radiate from the BT.

(b) For all new installations Cable Equipment 2503 should be used. However, where it is possible/ desirable to utilise the existing 4 wire cable, it should be connected in accordance with Fig 6.

2. Telephone Connections

(a) Compact Telephones

(i) Bell and Telephone adjacent, connected via cord inst 4/127AX.

Telephone is connected directly to bell unit. Bell unit is connected to a LJU via a cord connecting 4/505 (250 mm) which should be cleated to the wall immediately adjacent to the bell unit using cleats wiring 4D. Leave sufficient uncleated cord to enable the plug to be removed from the line jack.

(ii) Bell and Telephone are remote from each other

Telephone is connected via cord inst 4/127AX to a block terminal, this then being wired to the bell unit. The bell unit is then connected to a LJU, via a cord connecting 4/505 (250 mm), which should be cleated to the wall immediately adjacent to the bell unit using cleats wiring 4D. Leave sufficient uncleated cord to enable the plug to be removed from the line jack. As an alternative, the telephone can be connected to a LJU via a cord connecting 4/502. The Bell Unit being 'hard wired' to a LJU and fitted with a Bell on-off switch to provide "opt out of service" facility.

(iii) Bell and Telephone wall mounted

Telephone is connected to bell unit via cord inst 4/127AX, the bell unit is then connected to the LJU via a cord connecting 4/505 (250 mm), which should be cleated to the wall immediately adjacent to the bell unit using cleats wiring 4D. Leave sufficient uncleated cord to enable the plug to be removed from the line jack.

(b) Wall Type Telephones

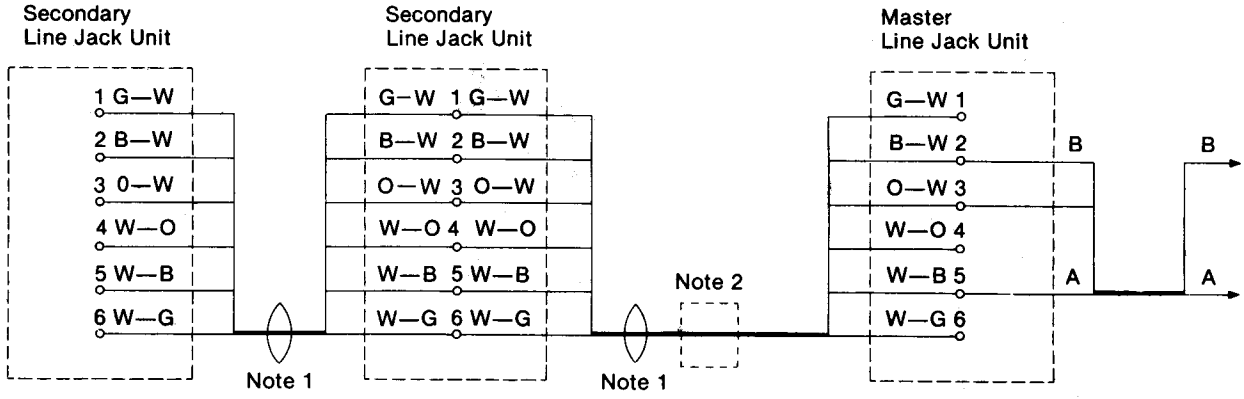
These should be plug and socketed using a cord connecting 4/505 (250 mm) or 4/502 (250 mm). The cord should be cleated to the wall immediately beneath the telephone leaving sufficient slack so

that the customer can unplug and "opt out of service".

(c) C Wire Signalling

Where C wire signalling facilities are required telephones should be connected in accordance with Fig 14.

Phone Socket — Cabling Arrangements (Cable Equipment 2503) **Fig 4**



NOTES

1 Cable Equipment 2503

2 See Fig 5 for spur cabling or extension bell

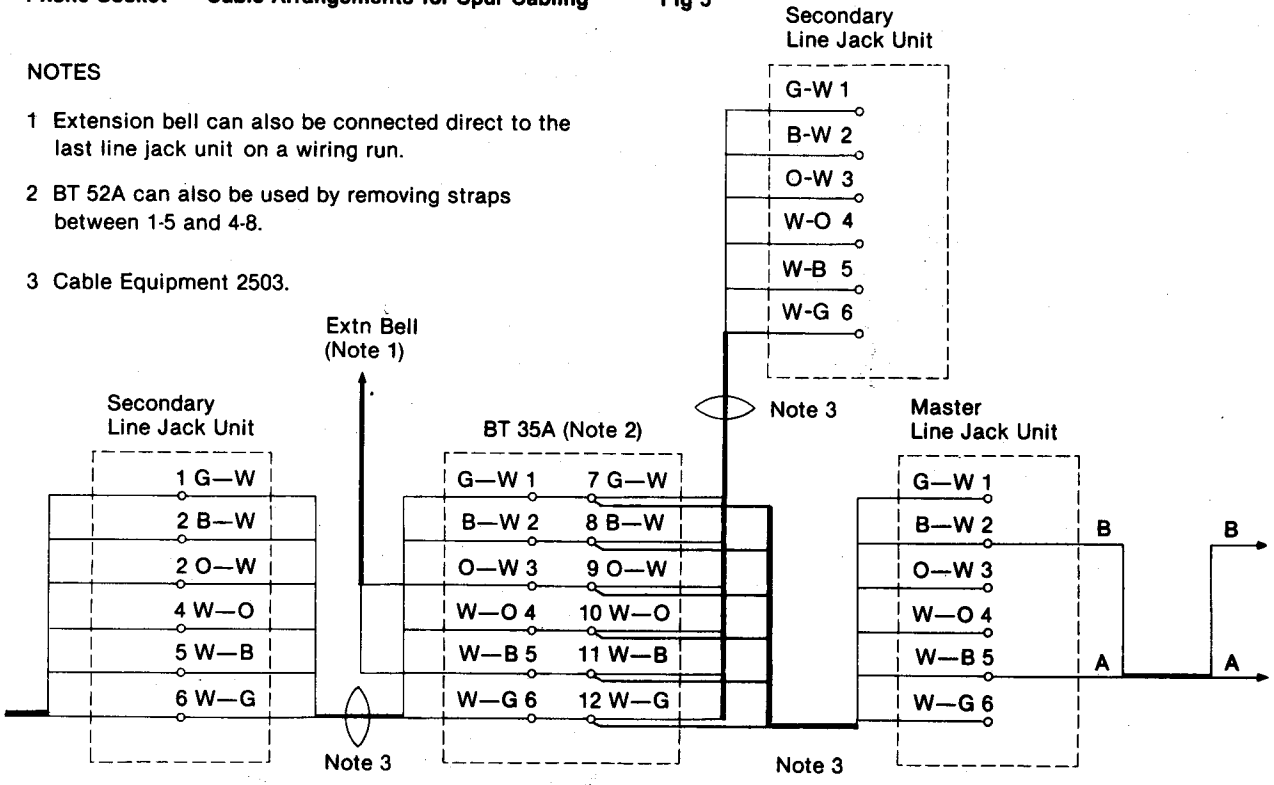
Phone Socket — Cable Arrangements for Spur Cabling **Fig 5**

NOTES

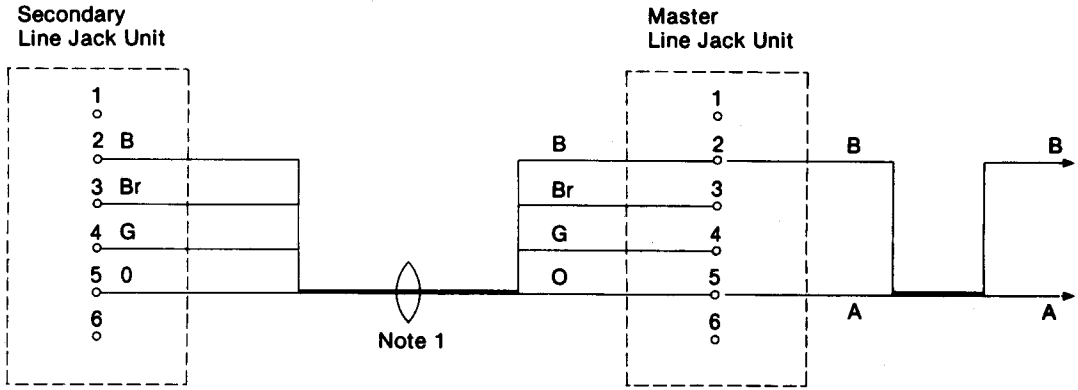
1 Extension bell can also be connected direct to the last line jack unit on a wiring run.

2 BT 52A can also be used by removing straps between 1-5 and 4-8.

3 Cable Equipment 2503.



Phone Socket — Cable Arrangements for Existing Cable **Fig 6**



NOTE

1 Cable 4W

SECTION 6

RINGING DEVICE ARRANGEMENT

1. All new ringing devices will be of the high impedance type with a maximum of four being connected in parallel without enhancement of the ringing circuit being required.

2. Where more than four ringing devices are required they may be provided in accordance with Fig 7.

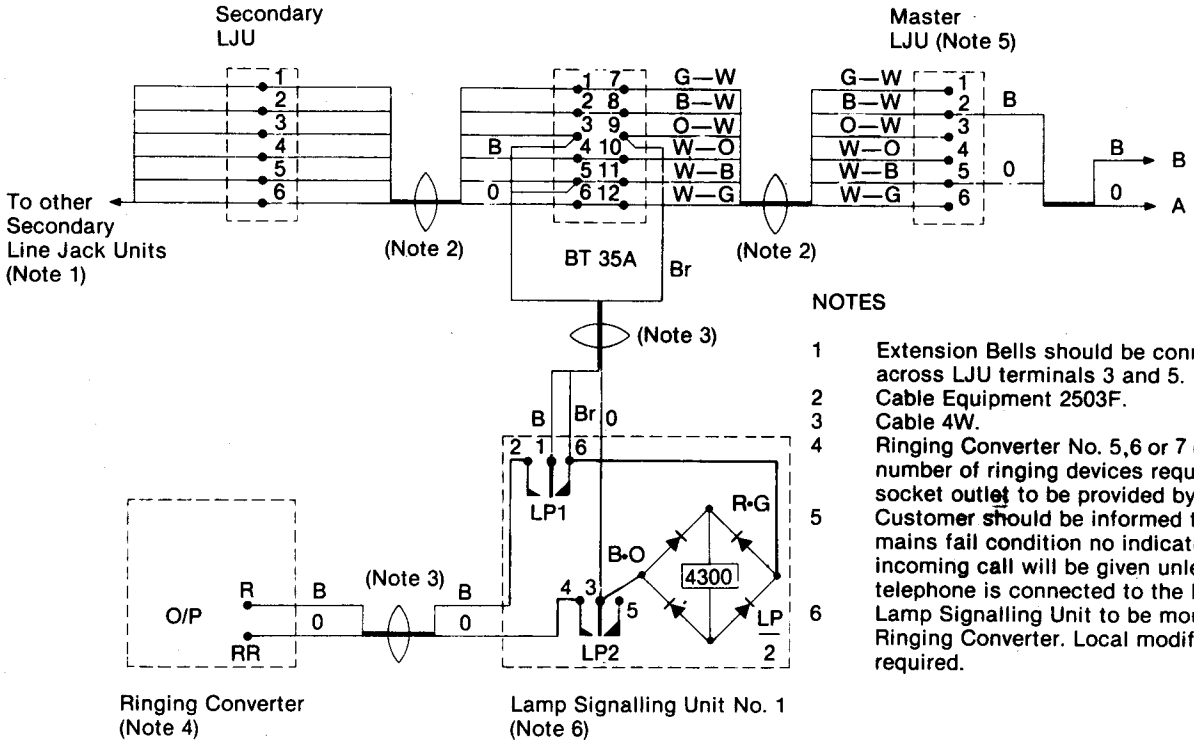
3. When high impedance ringing devices are not available then low impedance versions may be provided up to a maximum of two in parallel.

4. If an EXTENSION BELL is required it should be connected (hard wired) in parallel with line jack unit terminals 3 and 5 (see Fig 5) up to a total number of ringing devices as detailed in paragraph 6.1.

5. Low impedance telephones in the TRIMPHONE range may be modified to high impedance by connecting a 3.3K ohms resistor (91E F3K3) in series with its tone caller (ie between T4 and T5). Fig 9 refers.

6. Low impedance telephones in the 8700 series may be modified to high impedance by the substitution of a Bell 59D-1 unmounted for the existing low impedance bell coil.

Phones Socket — Provision of Ringing Devices in Excess of Four **Fig 7**



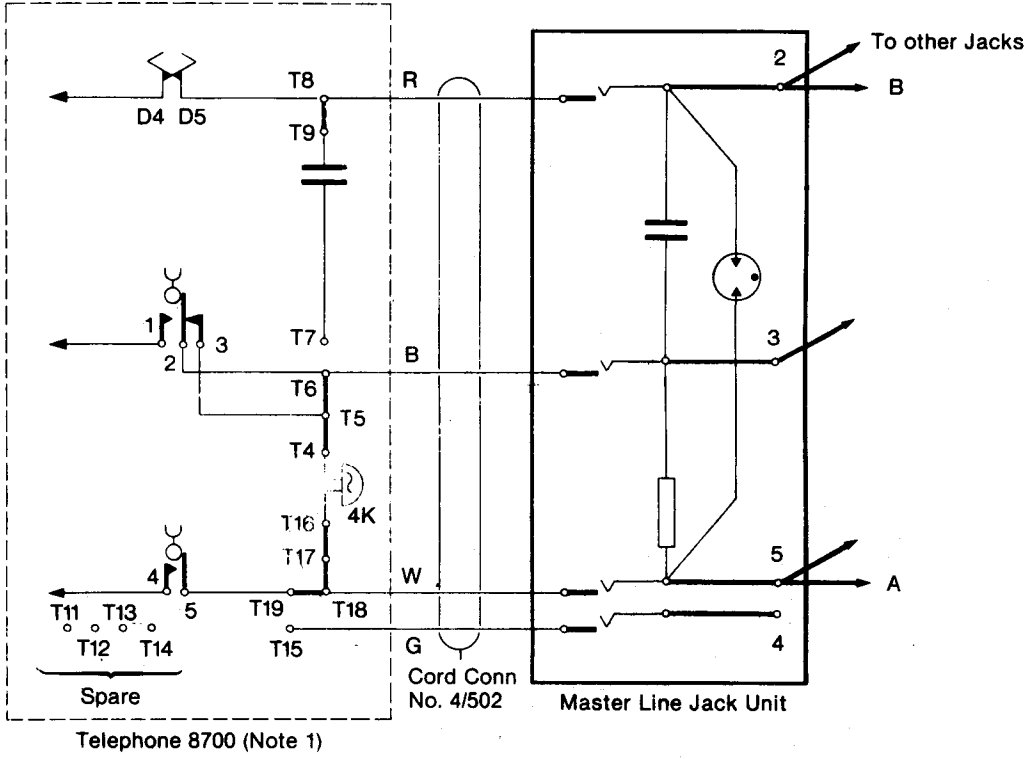
NOTES

1. Extension Bells should be connected across LJU terminals 3 and 5.
2. Cable Equipment 2503F.
3. Cable 4W.
4. Ringing Converter No. 5,6 or 7 depending on number of ringing devices required. Mains socket outlet to be provided by customer.
5. Customer should be informed that under mains fail condition no indication of an incoming call will be given unless a telephone is connected to the Master LJU.
6. Lamp Signalling Unit to be mounted with Ringing Converter. Local modification required.

SECTION 7

TELEPHONE INSTALLATION DIAGRAMS

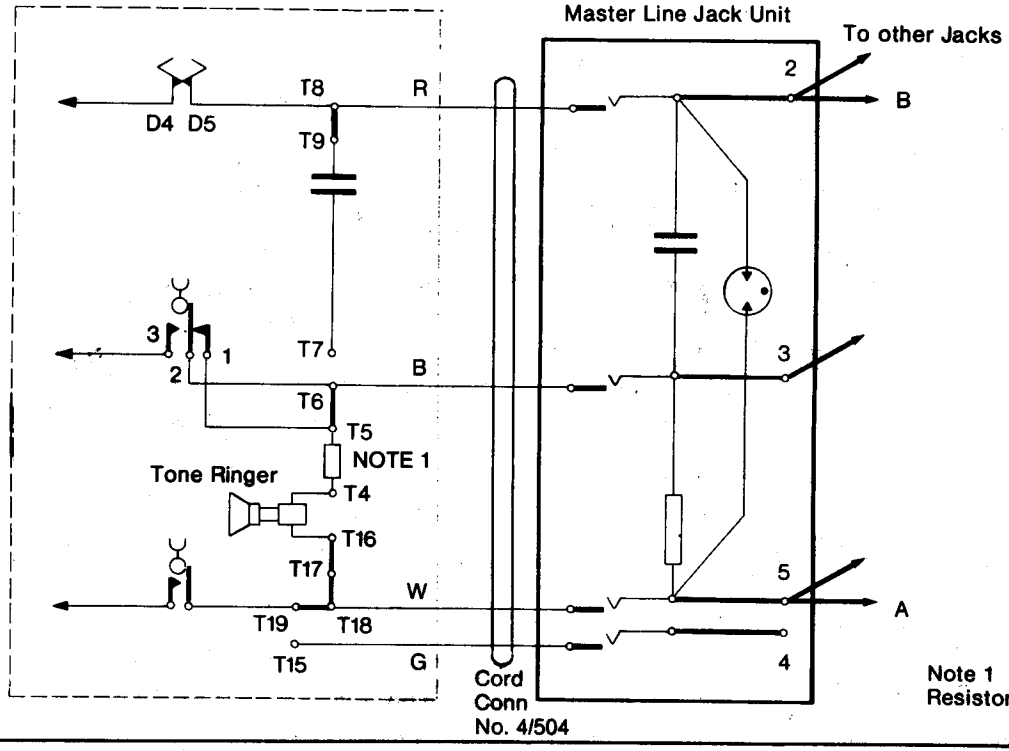
Phone Socket — Standard Wiring 8700 Type Telephones **Fig 8**



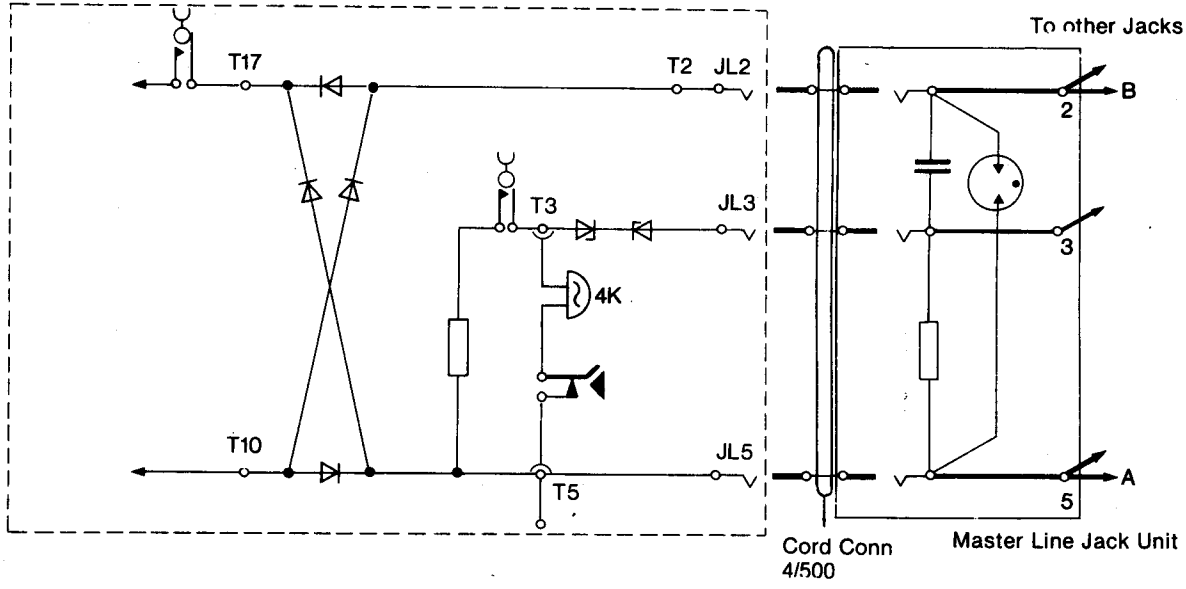
(Note 1) If an Earth is required connect to terminal 4 of the line jack

Phone Socket — Telephone 8722 Dial
8766 Push Button SC
8786 Push Button MF4

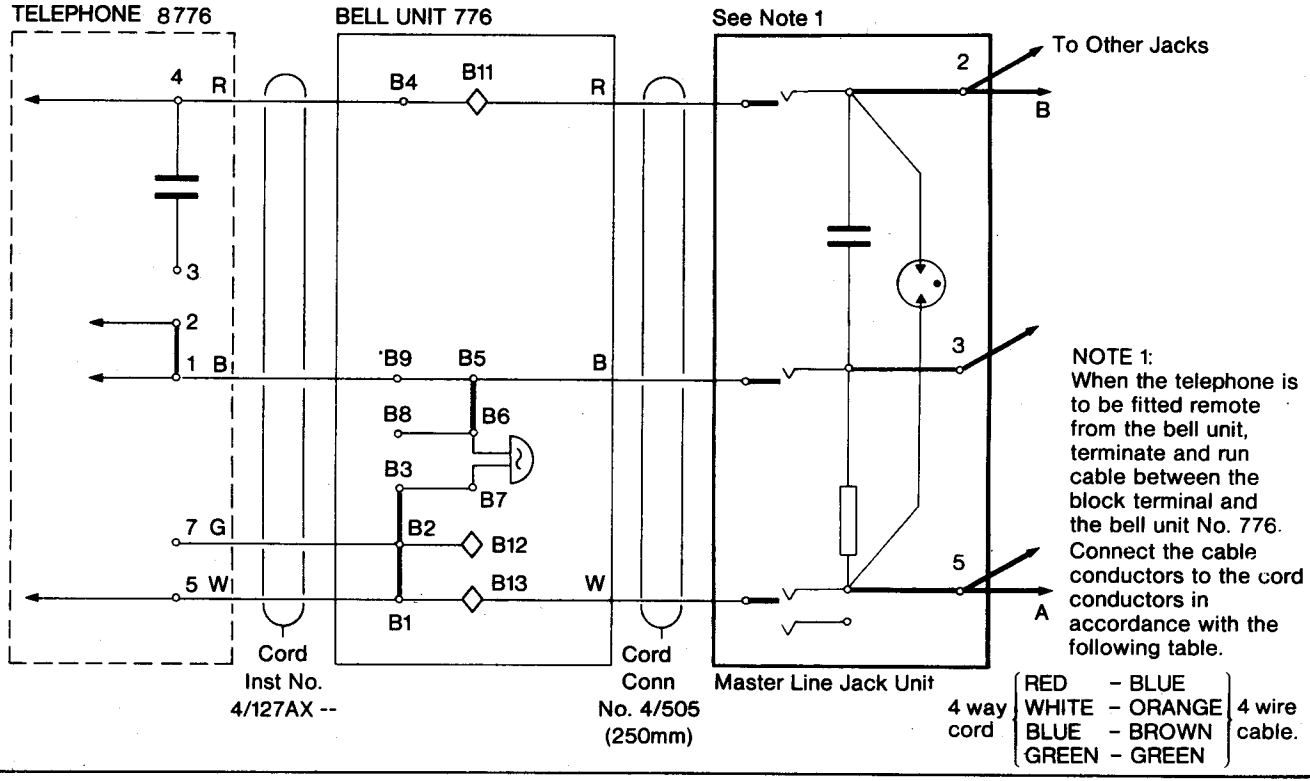
Fig 9



Phone Socket — Telephone 81—, 82—, 83—, 84— (Ambassador) **Fig 10**



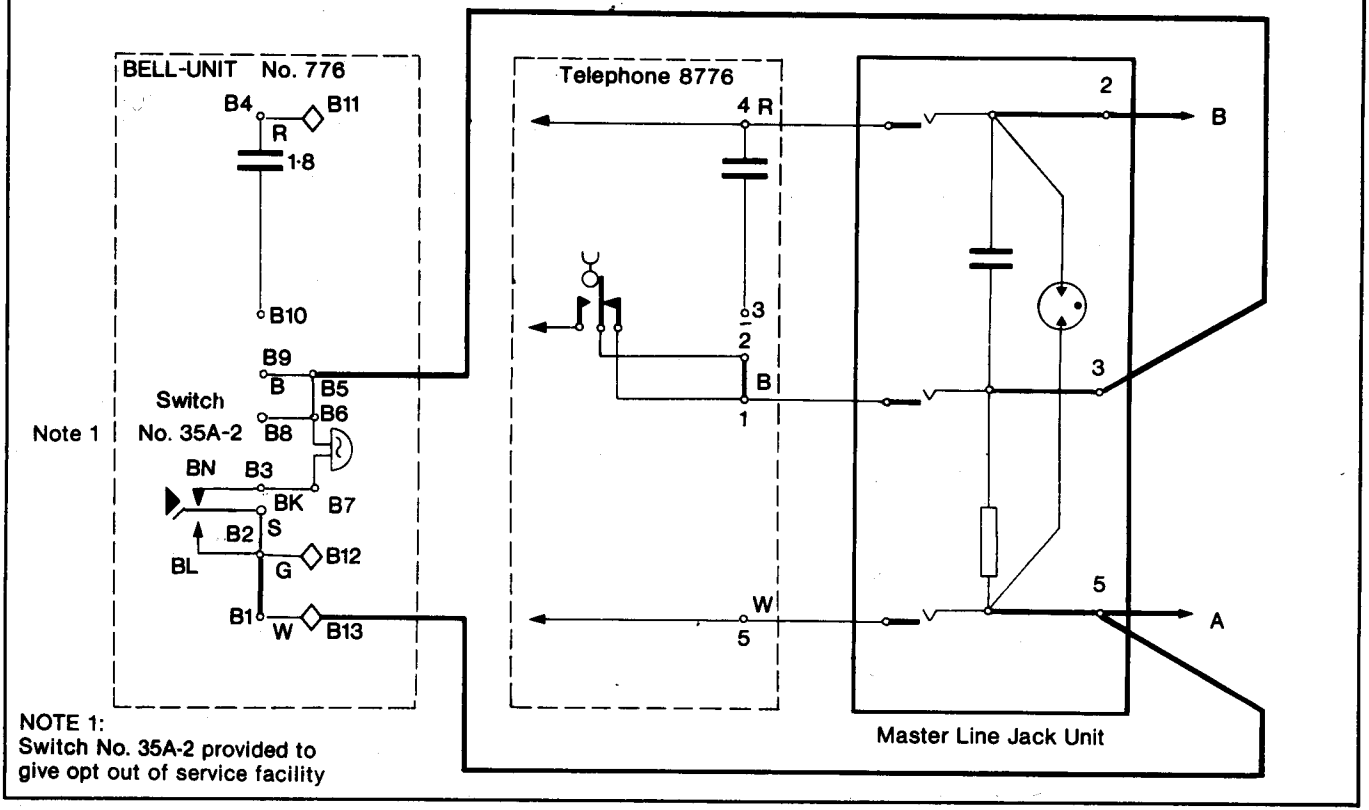
Phone Socket — Compact Telephone 8776 **Fig 11** Wall Mounted or Bell Unit & Telephone Adjacent



NOTE 1:
When the telephone is to be fitted remote from the bell unit, terminate and run cable between the block terminal and the bell unit No. 776. Connect the cable conductors to the cord conductors in accordance with the following table.

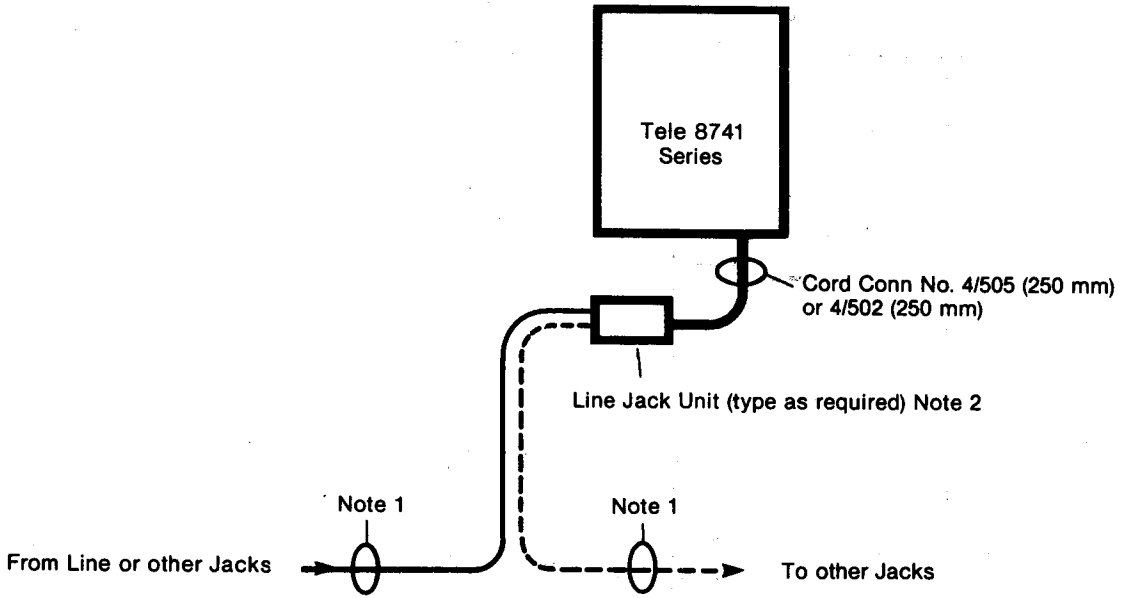
4 way cord		4 wire cable.
RED	– BLUE	
WHITE	– ORANGE	
BLUE	– BROWN	
GREEN	– GREEN	

Phone Socket — Compact Telephone 8776 **Fig 12** Telephone 'Portable', Bell Fixed



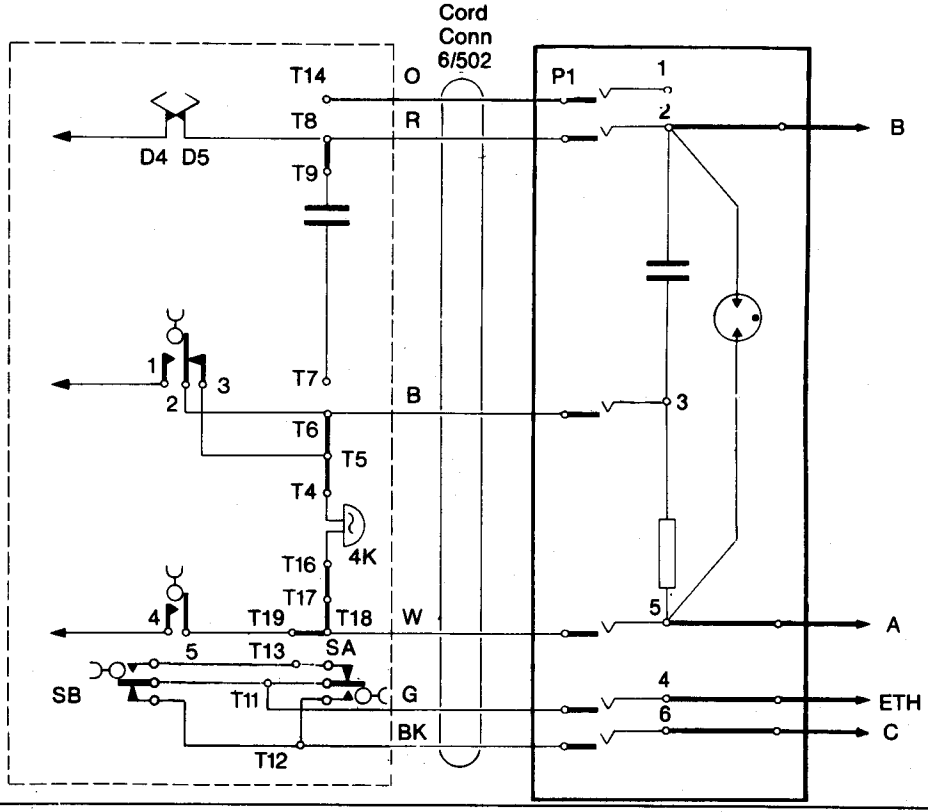
NOTE 1:
Switch No. 35A-2 provided to give opt out of service facility

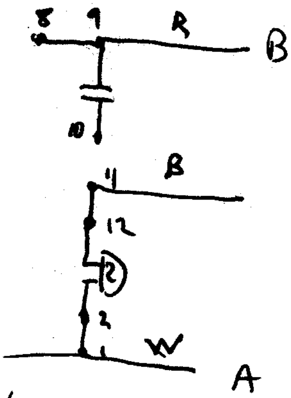
Phone Socket — Provision of Wall Mounted Telephone 8700 Series **Fig 13**



NOTE
1 Cable Equipment 2503
2 For Wiring of Line Jack Unit & Telephone see Fig

Phone Socket — Telephone 8700 A Series for C Wire Signalling **Fig 14**





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