

# 17-LINE, PUSHBUTTON DIAL, HANDSFREE TELEPHONES

## GENERAL DESCRIPTION

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### 1. GENERAL DESCRIPTION

**1.01** This document covers the 17-line, pushbutton dial, handsfree telephone. (See Figure 1.) A general description plus information peculiar to 17-line, pushbutton dial, handsfree telephones is included.

**1.02** This section is reissued to reflect changes in the 17-line, pushbutton dial, handsfree telephone and to incorporate the changes listed in the Telephone Apparatus Practices Change Notice, Section 11-510-100. Whenever this section is reissued, reason for reissue will be listed in this paragraph.

**1.03** For additional information on replacement parts and for an exploded-view drawing for the telephones, refer to Section 50-843-104. The circuit labels appear in Section 50-843-105. Related documents of the ITT Telephone Apparatus Practices Manual provide information on components.



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Figure 1: 17-Line, Pushbutton Dial, Handsfree Telephone

**1.04** The Model 2843 handsfree telephones are 17-line, pushbutton dial, anti-sidetone type units that operate efficiently over a wide range of loop resistances and line impedances. They offer the advantage of handsfree application and are designed to be used with key systems such as the ITT 1A2 System where several telephones have access to the same CO/PBX lines or intercom lines.

**1.05** The Model 2843 handsfree telephones are identified by a code number stamped in ink on the bottom of the base plate. Refer to ordering information in Table A for an explanation of each code number.

**1.06** Handsfree telephones are equipped with a microphone and loudspeaker that combine with the telephone circuitry to permit their use without having to hold the handset. This feature may be switched ON or OFF. When OFF, the telephone is used in the normal manner. When ON, a user may converse on the telephone from any direction at a distance of several feet.

**1.07** There are twenty pushbutton keys on the telephone. The red key on the far left is used as a hold key and allows any selected line or trunk to be placed in a hold condition. The seven pickup keys

TABLE A  
ORDERING INFORMATION – TELEPHONES

CODE NUMBERS									
TELEPHONE CODE NUMBERS ARE FORMED IN SIX STEPS AS FOLLOWS:									
(1) Type Of Instrument (See Part 1)	2843	15	O	BA	42	M			
(2) Color (See Part 2)									
(3) Version (See Part 3)									
(4) Ringer (See Part 4)									
(5) Special Feature (See Part 5)									
(6) Dial (See Part 6)									
PART 1 TYPE OF INSTRUMENT									
CODE	DESCRIPTION	COLOR OFFERED	VERSION OFFERED	RINGER OFFERED	FEATURE OFFERED	DIAL OFFERED			
2843	17-Line, Handsfree, Push-button Dial, Desk Telephone	00, 05, 13, 15, 44, And 45 (Available On All Models)	O	BA	42, 76	M, R			
2843	17-Line, Handsfree, Push-button Dial, Desk Telephone		M	BA	42, 76	M			
REFER TO INDIVIDUAL UNIT DESCRIPTION FOR COMPLETE DESCRIPTION OF FEATURE COMBINATIONS									
PART 2 COLORS		PART 3 VERSIONS		PART 4 RINGERS		PART 5 SPECIAL FEATURES		PART 6 DIALS	
CODE	COLORS	CODE	VERSIONS	CODE	RINGERS	CODE	SPECIAL FEATURES	CODE	DIALS
00	Black	O	Nonmodular	BA	Straight-Line	42	Equipped For Handsfree Operation	M	Metropolitan (Letters & Numerals)
05	Moss Green								
13	Beige	M	Full-Modular (With Handset Cord)			76	42 Combined With Automatic Exclusion And Release button	R	Regular (Numerals Only)
15	White								
44	Light Ash								
45	Cocoa Brown								

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to the right of the hold key are used for CO/PBX lines or intercom lines. The two keys to the right of these seven line keys are used for ON and OFF control of the handsfree equipment. The remaining ten keys are used for CO/PBX lines or intercom lines.

**Warning:** On the Model 2843 telephones equipped with the 76 exclusion feature, the last three pickup keys on the key strip are reserved for intercom lines. Since damage to the exclusion circuit may result if a pickup key with the A lead connected is used for intercom, the A leads are taped and stored inside the telephone. By connecting the A lead, modifications may be made to these pickup keys to enable their use for different applications such as CO/PBX lines or intercom lines in a system where the A lead may be connected.

**1.08** A lamp beneath each of the seventeen pickup keys indicates the status of the associated line. (See Table B.)

**1.09** The Model 2843 telephones are available as nonmodular or full-modular versions. These versions are designated by a code letter that is placed in front of the ringer code letters in the order number of the telephone. (Refer to Table A.)

**1.10** Nonmodular version desk telephones include a hard-wired handset cord. This version is designated by the code letter O.

**1.11** Full-modular version desk telephones are available with a modular handset cord. The full-modular desk telephones are equipped with jacks to accept the plugs of a modular handset cord. The full-modular version of the telephone with a modular handset cord, terminated on each end with modular plugs, is designated by the code letter M.

**1.12** The Model 2843 telephones are described in the following paragraphs. The circuit labels for these telephones are contained in Section 50-843-105.

TABLE B  
LINE KEY SIGNALS

CONDITION	LAMP INDICATION
Idle	Lamp Dark
Busy	Lamp Lit
Hold	Lamp Winking
Call Incoming	Lamp Flashing

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### MODEL 2843\*\* ( ) 42

1.13 The Model 2843\*\* ( ) 42 is a standard 17-line, pushbutton dial, handsfree telephone. The microphone and loudspeaker, which are mounted inside the telephone, combine with the telephone circuitry to provide for handsfree application. This telephone is equipped with a 100-conductor mounting cord fitted with two 50-pin male connectors.

### MODEL 2843\*\* ( ) 76

1.14 The Model 2843\*\* ( ) 76 is the same as the Model 2843\*\* ( ) 42 except it is equipped with an automatic exclusion (privacy) circuit and a release button. Where this feature is used, all telephones in the key system must provide the exclusion circuit and release button.

## 2. INSTALLATION

2.01 Since these telephones are equipped with a connector-terminated mounting cord, installation consists of inserting the connectors into the jacks at the station connecting block and pressing to engage them. For specific wiring information, refer to the appropriate circuit label in Section 50-843-105. Cable connections for 17-line, handsfree telephones with feature code 42 are listed in Table C. Cable connections for 17-line, handsfree telephones with feature code 76 that differ from those listed in Table C are listed in Table D.

2.02 The power transformer provided with the telephone must be connected to the four-conductor power cord of the telephone and plugged into a standard 110 VAC service outlet. Terminals are provided inside the telephone for connecting wiring if additional cord length is required. The four-

conductor power cord with leads colored WH, BK, RD, and GN must be connected to the transformer terminals designated WH, BK, RD, and GN. The WH lead of the power cord connects to terminal WH of the transformer, the BK lead connects to terminal BK, the RD lead connects to terminal RD, and the GN lead connects to terminal GN.

*Note:* The transformer supplies power to the handsfree circuitry. Normal telephone operation using the handset is possible without the transformer.

## 3. MAINTENANCE

3.01 For replacement parts information and for an exploded-view drawing of major assembly groups, refer to Section 50-843-104.

## 4. OPERATION

4.01 To place or answer a call in the handsfree mode, press the ON key. The ON key lamp is lit while the handsfree circuit is enabled. The ON key may be released only by pressing the OFF key.

4.02 When the telephone is in the handsfree mode, going off-hook inhibits the handsfree circuit and permits conversation using the handset. The ON key lamp will stay lit. Replacing the handset reactivates the handsfree circuit and returns the telephone to handsfree operation until the OFF key is pressed.

4.03 To prevent the distant party from hearing local conversation during handsfree operation, press the hold key. The hold key will release when the line pickup key is pressed again.

4.04 A lamp located in the OFF key acts as a visual transmit and receive indicator. The lamp is lit when the handsfree circuit is in the transmit mode and is dark when the circuit is in the receive mode. The lamp remains dark when the handsfree circuit is off.

4.05 The loudspeaker volume control is located underneath the right side of the telephone. Since the volume must be balanced to compensate for local noise level, this control also affects the performance of the telephone. Clipping or chopping of speech caused by excessive background noise may be controlled by increasing the volume. Volume is increased by rotating the volume control clockwise.

TABLE C  
CABLE CONNECTIONS FOR 17-LINE  
HANDSFREE TELEPHONES  
(FEATURE CODE 42)

LINES 1 THROUGH 6				LINES 7 THROUGH 13				LINES 14 THROUGH 19			
TELEPHONE TERMINAL	LEAD COLOR	LEAD DESIG	CONNECTOR TERMINAL	TELEPHONE TERMINAL	LEAD COLOR	LEAD DESIG	CONNECTOR TERMINAL	TELEPHONE TERMINAL	LEAD COLOR	LEAD DESIG	CONNECTOR TERMINAL
Line 1 (Blue Plug)	WH-BL	T	26	Line 7 (Red Plug)	YL-BN	T	44	Line 14 (Slate Plug)	BK-GN	T	38
	BL-WH	R	1		BN-YL	R	19		GN-BK	R	13
	WH-OR	A Or S	27		BL-BK	A Or S	11		BK-BN	A Or S	39
	WH-GN	LG	28		VI-BL	LG	46		BK-SL	LG	40
	GN-WH	L	3		BL-VI	L	21		SL-BK	L	15
Line 2 (Orange Plug)	WH-BN	T	29	10 G	OR-WH	A1	2	Line 15 (White Plug)	YL-BL	T	41
	BN-WH	R	4		YL-SL	B1	45		BL-YL	R	16
	WH-SL	A Or S	30		SL-YL	R1	20		BN-BK	A Or S	14
	RD-BL	LG	31		YL-OR	BL, AG, Or Spare	42		YL-GN	LG	43
	BL-RD	L	6		OR-YL	SG, LK, Or Spare	17		GN-YL	L	18
Line 3 (Green Plug)	RD-OR	T	32	Line 10 (Blue Plug)	WH-BL	T	26	Line 16 (Red Plug)	YL-BN	T	44
	OR-RD	R	7		BL-WH	R	1		BN-YL	R	19
	RD-GN	A Or S	33		WH-OR	A Or S	27		BL-BK	A Or S	11
	RD-BN	LG	34		WH-GN	LG	28		VI-BL	LG	46
	BN-RD	L	9		GN-WH	L	3		BL-VI	L	21
Line 4 (Ivory Plug)	RD-SL	T	35	Line 11 (Orange Plug)	WH-BN	T	29	Line 17 (Black Plug)	VI-OR	T	47
	SL-RD	R	10		BN-WH	R	4		OR-VI	R	22
	BK-BL	A Or S	36		WH-SL	A Or S	30		GN-RD	A Or S	8
	BK-OR	LG	37		RD-BL	LG	31		VI-BN	LG	49
	OR-BK	L	12		BL-RD	L	6		BN-VI	L	24
Line 5 (Slate Plug)	BK-GN	T	38	Line 12 (Green Plug)	RD-OR	T	32	Line 18 (Yellow Plug)	VI-SL	T	50
	GN-BK	R	13		OR-RD	R	7		SL-VI	R	25
	BK-BN	A Or S	39		RD-GN	A Or S	33		SL-WH	A Or S	5
	BK-SL	LG	40		RD-BN	LG	34		VI-GN	LG	48
	SL-BK	L	15		BN-RD	L	9		GN-VI	L	23
Line 6 (White Plug)	YL-BL	T	41	Line 13 (Ivory Plug)	RD-SL	T	35	Line 19 (Violet Plug)	YL-SL	T	45
	BL-YL	R	16		SL-RD	R	10		SL-YL	R	20
	BN-BK	A Or S	14		BK-BL	A Or S	36		OR-WH	A Or S	2
	YL-GN	LG	43		BK-OR	LG	37		YL-OR	LG	42
	GN-YL	L	18		OR-BK	L	12		OR-YL	L	17

## NOTES:

1. The YL-OR and OR-YL leads are spare leads and are taped and stored inside the telephone.
2. The designation S indicates that the lead provides an individual signal ground.

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If the voice being received is too loud, the volume should be decreased by rotating the volume control counterclockwise. If the called party is also using handsfree equipment, mutual adjustment of the volume controls may be necessary. Usually, a comfortable talk and listen level will ensure proper performance.

**4.06** It is important to note that a telephone equipped with the exclusion feature, which has been modified for trunk-to-trunk conferencing, can override its exclusion circuit and pick up a line with a call in progress.

*Note:* Handsfree telephones may be subject to some types of radio frequency interference.

## 5. BUTTON CONVERSIONS

**5.01** Any pickup key may be converted to signaling mode by removing the slotted head pin from the plunger shank. The slotted head pin is removed by being turned clockwise.

## 6. BUZZER INSTALLATION

**6.01** A buzzer may be installed as the signaling device of the telephone to be signaled. The buzzer may be installed on the dial mounting bracket or may be externally mounted. For telephones with feature code 42, the buzzer leads must be connected to the OR-YL and YL-OR leads inside the telephone. These leads are spare and can be found taped and stored inside the telephone. For

TABLE D  
SPECIAL CABLE CONNECTIONS FOR

17-LINE HANDSFREE TELEPHONES (FEATURE CODE 76)

TELEPHONE TERMINAL	LEAD COLOR	LEAD DESIG	CONNECTOR TERMINAL
6	OR-YL	-24 VDC	17
Line 16 (Red Plug)	WH-RD	A Or S	11
Line 17 (Black Plug)	RD-WH	A Or S	8
Line 18 (Yellow Plug)	BL-SL	A Or S	5
Line 19 (Violet Plug)	SL-BL	A Or S	2

**NOTE:**

This table lists those connections that differ from the connections for feature code 42 telephones shown in Table C.

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telephones with feature code 76, a spare lead (BN-VI) is used instead of the OR-YL lead (provided the proper station cross-connections are made). Low voltage buzzers (6 to 40 VAC) or high voltage buzzers (105 VAC) may be selected for this use. (See Figure 2.)

**6.02** A buzzer may also be used in place of the ringer. A 105 VAC buzzer must be provided. The ringer leads are removed and replaced by the buzzer leads.

## 7. DESIGNATION TABS

**7.01** Designation tabs are included with each telephone. These tabs are installed by removing the cap from the key, placing the tab in the cap, and reinstalling the cap. The caps are removed by squeezing the sides of the cap and lifting. Note that locking surfaces are located on the right and left sides of the caps and keys. These locking surfaces must align properly.

## 8. GROUNDING PUSHBUTTON

**8.01** Modifications are made to line 7 of the telephone if a grounding pushbutton is required. A grounding pushbutton is required in some PBX applications for transferring calls, originating calls

during a power failure, or other special functions. Modifications for converting line 7 to a grounding pushbutton are as follows:

- (a) Modify the button to nonlocking operation by removing the interlock pin from the line 7 plunger.
- (b) Cross-connect from the BL-BK lead to the PBX connection for the desired function.

*Note:* Ground is provided on the BK-BL (A1) lead by the key system. (No cross-connect is necessary for this lead.)

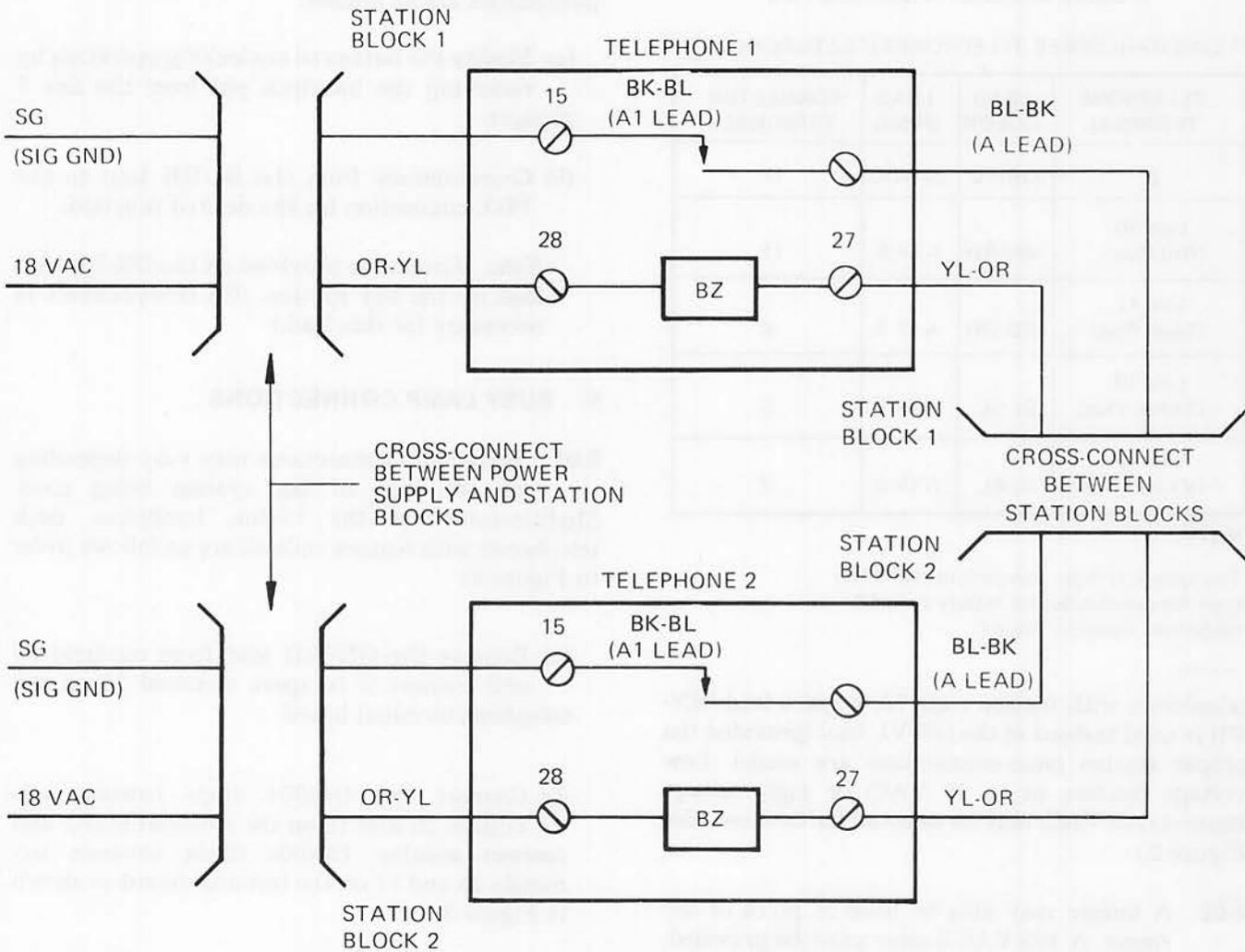
## 9. BUSY LAMP CONNECTIONS

**9.01** Busy lamp connections may vary depending on the type of key system being used. Modifications for the 17-line, handsfree, desk telephones with feature code 42 are as follows (refer to Figure 3):

- (a) Remove the GN-WH lead from terminal 25 and connect it to spare terminal 16 on the telephone terminal board.
- (b) Connect one 1N4004 diode between terminals 25 and 16 on the terminal board, and connect another 1N4004 diode between terminals 25 and 17 on the terminal board as shown in Figure 3.
- (c) Connect the OR-YL mounting cord lead to terminal 17 on the terminal board.

**9.02** Special busy lamp connections are required for telephones equipped with an exclusion circuit. Modifications for the 17-line, handsfree, desk telephones with feature code 76 are as follows (refer to Figure 4):

- (a) Connect one 1N4004 diode from terminal 25 to terminal 16 on the telephone terminal board as shown in Figure 4.
- (b) Connect any spare lead (BN-VI) to terminal 16 on the telephone terminal board. (Proper station cross-connections must be made to allow the use of a spare lead.)

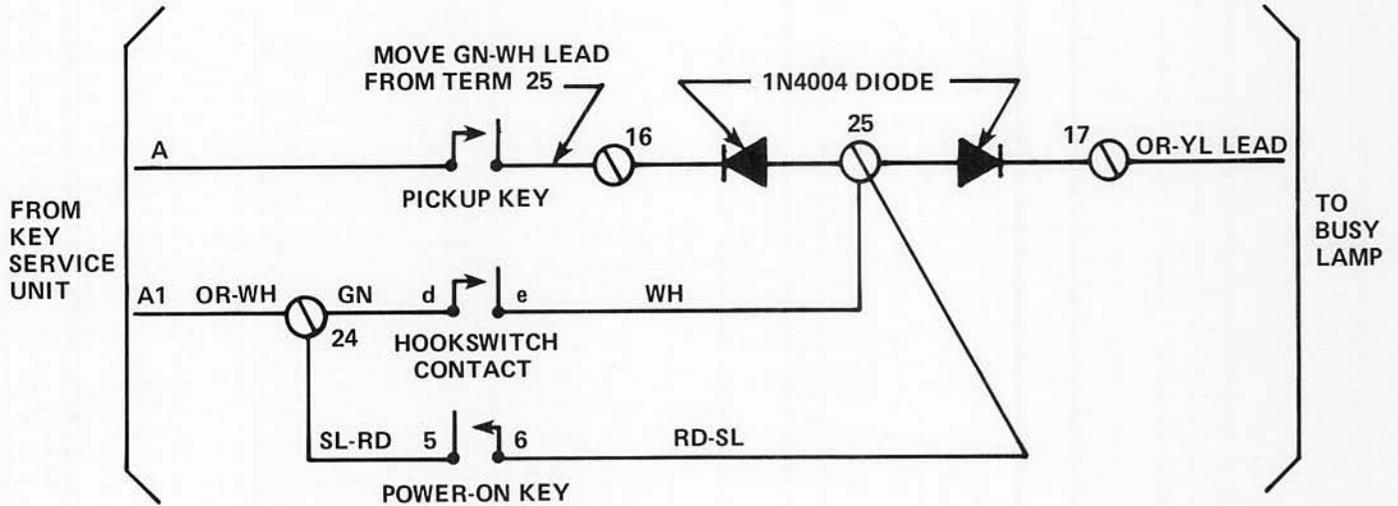


NOTES:

1. THE ARRANGEMENT SHOWN IS USING LINE 7 OF A TELEPHONE WITH FEATURE CODE 42 AS AN EXAMPLE. IF ANOTHER LINE IS USED, SUBSTITUTE THE APPROPRIATE A1 AND A LEADS FOR THAT LINE.
2. IN THE 17-LINE HANDSFREE TELEPHONE, GROUND IS CONNECTED TO TERMINAL 14 (BK-BL). NO CROSS-CONNECT IS NECESSARY FOR THIS LEAD.
3. FOR TELEPHONES WITH FEATURE CODE 76, A SPARE LEAD SUCH AS BN-VI IS USED INSTEAD OF THE OR-YL LEAD (PROVIDED THE PROPER STATION CROSS-CONNECTIONS ARE MADE).

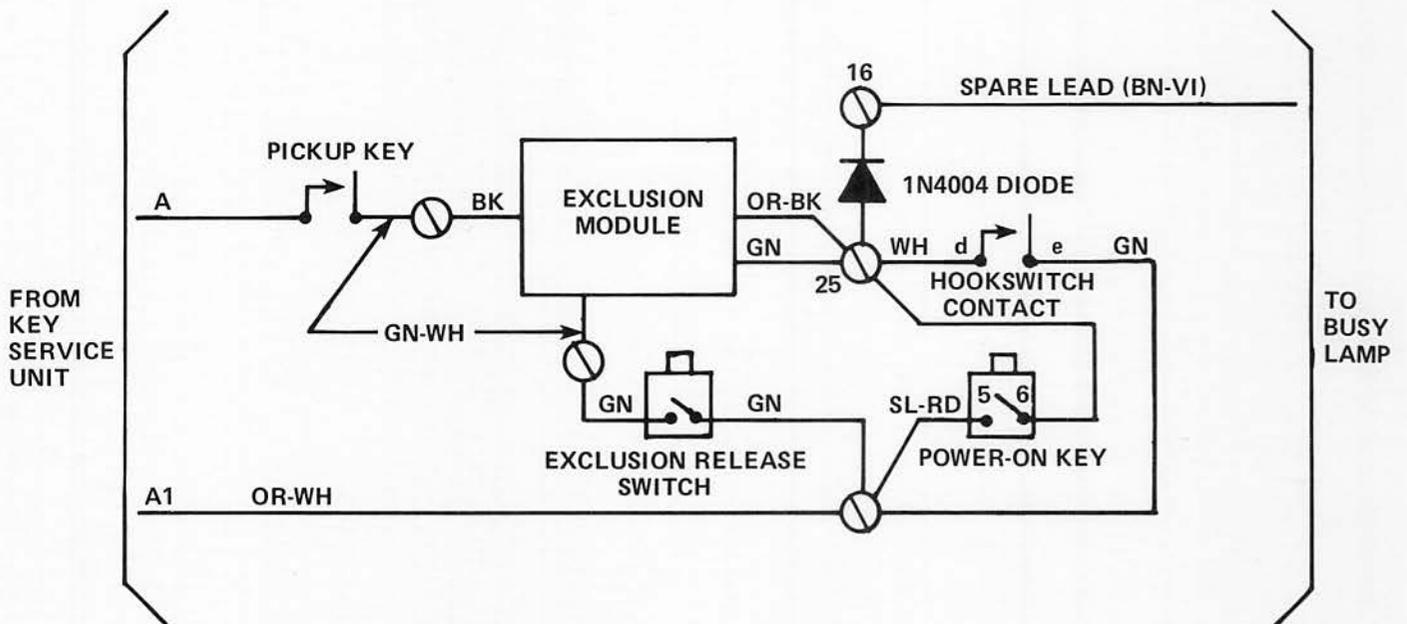
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Figure 2: Typical Circuit Diagram for Signal Buzzer



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Figure 3: Busy Lamp Connections for 17-Line Handsfree Telephones with Feature Code 42



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Figure 4: Busy Lamp Connections for 17-Line Handsfree Telephones with Feature Code 76