

20-BUTTON, ROTARY DIAL, DESK TELEPHONES GENERAL DESCRIPTION

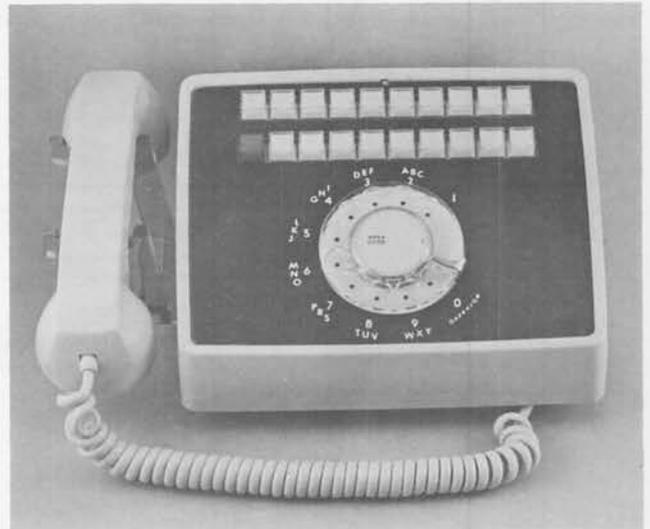
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1. GENERAL DESCRIPTION

1.01 This document covers the 20-button, rotary dial, desk telephone. (See Figure 1.) A general description plus information peculiar to 20-button, rotary dial, desk telephones is included.

1.02 Whenever this section is reissued, reason for reissue will be listed in this paragraph.

1.03 For additional information, refer to Section 50-831-101, Replacement Parts, and to Section 50-831-102, Circuit Labels. For information on installation, maintenance, and components or equip-



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Figure 1: 20-Button, Rotary Dial, Desk Telephone

ment, consult related documents of the ITT Telephone Apparatus Practices Manual.

1.04 The Model 831 desk telephones are 20-button, rotary dial, antisidetone type units that operate efficiently over a wide range of loop resistances and line impedances. These telephones are designed for use with key telephone systems, such as the ITT 1A2 System, where several telephones have access to the same lines, CO trunks, or intercom lines. All models are equipped with a mounting cord terminated in two Amphenol-type connectors.

1.05 The Model 831 desk 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 Nineteen pushbutton keys on the telephone are used for line, trunk, or intercom lines. 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. All remaining keys may be used as line keys or may be wired as either intercom lines or signal keys.

TABLE B
LINE KEY SIGNALS

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

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MODEL 831** () 46

1.11 The Model 831** () 46 is the same as the Model 831** () 42 with the addition of an operator recall button. This button, containing normally closed contacts, can be used to recall the operator if the hookswitch restoration feature is used.

MODEL 831** () 76

1.12 The Model 831** () 76 is the same as the Model 831** () 42 with the addition of an automatic exclusion (privacy) circuit with a release button. This release button contains normally open contacts. Where this feature is used, all telephones in the key system must contain the exclusion circuit and a 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. For specific wiring information, refer to the appropriate circuit label in Section 50-831-102. Cable connections for 20-button telephones with feature codes 42 and 46 are listed in Table C. Cable connections for 20-button telephones with feature code 76 that differ from those listed in Table C are listed in Table D. For general installation information and installation of repair parts, refer to the applicable section of the ITT Telephone Apparatus Practices Manual.

3. MAINTENANCE

3.01 For general maintenance information, refer to the maintenance section of the ITT Telephone Apparatus Practices Manual. For a pictorial view and parts list, refer to Section 50-831-101.

4. SPEAKERPHONE

4.01 An external speakerphone may be installed on 20-button telephones. Most speakerphones provide the following additional features:

- (a) Handsfree telephone operation. (Handsfree talking and dialing.)
- (b) On-hook dialing.
- (c) Automatic switching from speakerphone to handset operation.
- (d) Transmitter muting for private conversation.
- (e) Visual indication when system is in use.
- (f) Cutoff of common ringer or other signaling devices when desired.

5. BUTTON CONVERSIONS

5.01 Any line key may be converted to signaling mode by removing the slotted head pin from the plunger shank. The slotted head pin is removed by turning clockwise. (On earlier models of the 20-button telephone the pin is removed by turning counterclockwise.)

6. BUZZER INSTALLATION

6.01 A buzzer may be installed as the signaling device of a telephone receiving an intercom call. The buzzer may be either installed on the dial mounting bracket or mounted externally. For telephones with feature codes 42 and 46, buzzer leads must be connected to the OR-YL and YL-OR leads inside the telephone. The OR-YL and YL-OR leads are spare and can be found taped and stored inside the telephone. For telephones with feature code 76, a lamp ground lead is used instead of the OR-YL lead (provided the proper station cross-connections are made). Buzzers selected for this use must operate at 18 VAC, 60 Hz. (See Figure 2.)

TABLE C
CABLE CONNECTIONS FOR 20-BUTTON
TELEPHONES

(FEATURE CODES 42 AND 46)

LINES 1 THROUGH 7				LINES 8 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 8 (Black Plug)	VI-OR	T	47	Line 14 (Slate Plug)	BK-GN	T	38
	BL-WH	R	1		OR-VI	R	22		GN-BK	R	13
	WH-OR	A or S	27		GN-RD	A or S	8		BK-BN	A or S	39
	WH-GN	LG	28		VI-BN	LG, P3 or 1R	49		BK-SL	LG	40
	GN-WH	L	3		BN-VI	L, P4 or 1T	24	SL-BK	L	15	
Line 2 (Orange Plug)	WH-BN	T	29	Line 9 (Yellow Plug)	VI-SL	T	50	Line 15 (White Plug)	YL-BL	T	41
	BN-WH	R	4		SL-VI	R	25		BL-YL	R	16
	WH-SL	A or S	30		SL-WH	A or S	5		BN-BK	A or S	14
	RD-BL	LG	31		VI-GN	LG or T1	48		YL-GN	LG	43
	BL-RD	L	6		GN-VI	L or R1	23	GN-YL	L	18	
Line 3 (Green Plug)	RD-OR	T	32	Line 10 (Blue Plug)	OR-WH	A1	2	Line 16 (Red Plug)	YL-BN	T	44
	OR-RD	R	7		YL-SL	B1	45		BN-YL	R	19
	RD-GN	A or S	33		SL-YL	R1	20		BL-BK	A or S	11
	RD-BN	LG	34		YL-OR	BL, AG or Spare	42		VI-BL	LG	46
	BN-RD	L	9		OR-YL	SG, LK or Spare	17	BL-VI	L	21	
Line 4 (Ivory Plug)	RD-SL	T	35	Line 11 (Orange Plug)	WH-BL	T	26	Line 17 (Black Plug)	VI-OR	T	47
	SL-RD	R	10		BL-WH	R	1		OR-VI	R	22
	BK-BL	A or S	36		WH-OR	A or S	27		GN-RD	A or S	8
	BK-OR	LG	37		WH-GN	LG	28		VI-BN	LG	49
	OR-BK	L	12		GN-WH	L	3	BN-VI	L	24	
Line 5 (Slate Plug)	BK-GN	T	38	Line 12 (Green Plug)	WH-BN	T	29	Line 18 (Yellow Plug)	VI-SL	T	50
	GN-BK	R	13		BN-WH	R	4		SL-VI	R	25
	BK-BN	A or S	39		WH-SL	A or S	30		SL-WH	A or S	5
	BK-SL	LG	40		RD-BL	LG	31		VI-GN	LG	48
	SL-BK	L	15		BL-RD	L	6	GN-VI	L	23	
Line 6 (White Plug)	YL-BL	T	41	Line 13 (Ivory Plug)	RD-OR	T	32	Line 19 (Violet Plug)	YL-SL	T	45
	BL-YL	R	16		OR-RD	R	7		SL-YL	R	20
	BN-BK	A or S	14		RD-GN	A or S	33		OR-WH	A or S	2
	YL-GN	LG	43		RD-BN	LG	34		YL-OR	LG	42
	GN-YL	L	18		BN-RD	L	9	OR-YL	L	17	
Line 7 (Red Plug)	YL-BN	T	44	Line 14 (Slate Plug)	RD-SL	T	35	Line 15 (White Plug)	YL-BL	T	41
	BN-YL	R	19		SL-RD	R	10		BL-YL	R	16
	BL-BK	A or S	11		BK-BL	A or S	36		BN-BK	A or S	14
	VI-BL	LG	46		BK-OR	LG	37		YL-GN	LG	43
	BL-VI	L	21		OR-BK	L	12	GN-YL	L	18	

NOTES:

1. All lamp ground leads are common.
2. Lead designations P3, P4, LK T1, R1, AG and A1 are for speakerphone connections.
3. The YL-OR and OR-YL leads are spare leads and are taped and stored inside the telephone.
4. The designation S indicates that the lead provides an individual signal ground.

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TABLE D
SPECIAL CABLE CONNECTIONS FOR
20-BUTTON TELEPHONES (FEATURE CODE 76)

TELEPHONE TERMINAL	LEAD COLOR	LEAD DESIG.	CONNECTOR TERMINAL
17	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:

1. This table lists those connections that differ from the connections for feature codes 42 and 46 telephones shown in Table C.

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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 each key, placing the tab in the cap, and reinstalling the cap. The caps are removed by squeezing the sides and lifting. Note that locking surfaces are located on each of the caps and keys. These locking surfaces must properly align when reinstalling.

8. GROUNDING PUSHBUTTON

8.01 Modifications are made to line 9 of the telephone if a grounding pushbutton is required. A grounding pushbutton is required in some PABX applications for transferring calls, originating calls during a power failure, or other special functions. To convert line 9 to a grounding pushbutton, the following modifications should be made:

- (a) Modify button to non-locking operation by removing the interlock pin from line 9 plunger.
- (b) Ground is provided on the WH-SL (A1) lead by the key system. (No cross-connect is necessary for this lead.)
- (c) Cross-connect from the SL-WH lead to the PABX connection for the desired function.

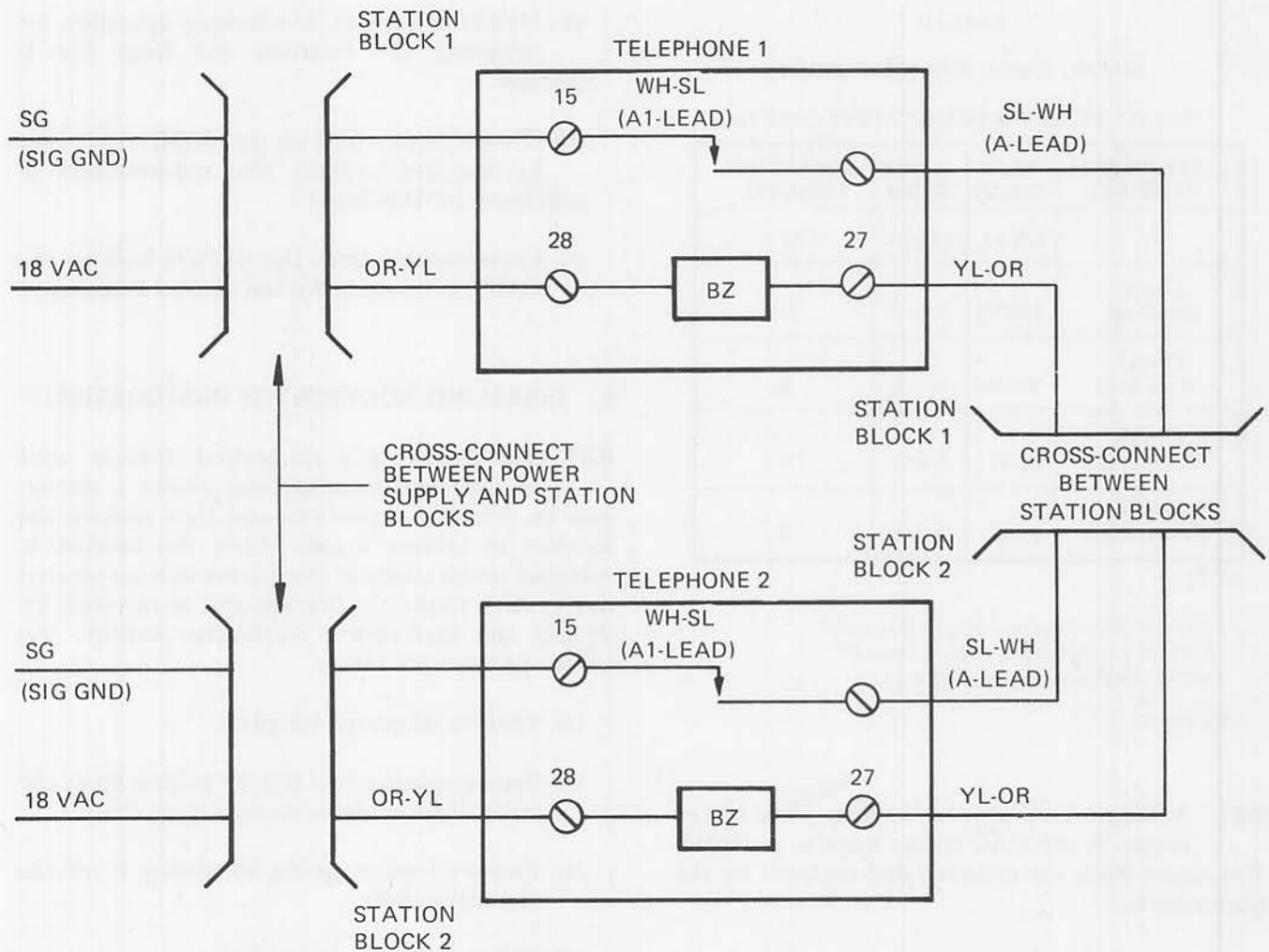
9. DISABLING HOOKSWITCH RESTORATION

9.01 The hookswitch restoration feature used in multibutton telephones allows a station user to preselect a line key and then remove the handset to initiate a call. When the handset is returned to the cradle or the hookswitch is operated (hookswitch flash), the line key will be restored. To disable the hookswitch restoration feature, the following steps are taken:

- (a) Remove telephone faceplate.
- (b) Remove plastic trip arm by pulling up at the point directly above its mounting shaft.
- (c) Remove torsion spring by sliding it off the mounting shaft.
- (d) Reinstall telephone faceplate.

9.02 To enable the hookswitch restoration feature, the following steps are taken: (See Figure 3.)

- (a) Remove telephone faceplate.
- (b) Install torsion spring by sliding it onto the mounting shaft and hooking one end between the mounting shaft and the hookswitch operating arm.
- (c) Install plastic trip arm by placing the notch in the trip arm on the end of the torsion spring (opposite the end hooked behind the operating arm) and pressing the trip arm onto the mounting shaft.
- (d) When the hookswitch is operated, the plastic trip arm should engage with the latch arm.
- (e) Reinstall telephone faceplate.



NOTES:

1. THE ARRANGEMENT SHOWN IS USING LINE 9 OF A TELEPHONE WITH FEATURE CODES 42 AND 46 AS AN EXAMPLE. IF ANOTHER LINE IS USED, SUBSTITUTE THE APPROPRIATE A1 AND A-LEADS FOR THAT LINE.
2. IN THE 20-BUTTON TELEPHONE, GROUND IS CONNECTED TO TERMINAL 15 (WH-SL LEAD). NO CROSS-CONNECT IS NECESSARY FOR THIS LEAD.
3. FOR TELEPHONES WITH FEATURE CODE 76, A LAMP GROUND LEAD IS USED INSTEAD OF THE OR-YL LEAD (PROVIDED THE PROPER STATION CROSS-CONNECTIONS ARE MADE).

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Figure 2: Circuit Diagram For Signal Buzzer

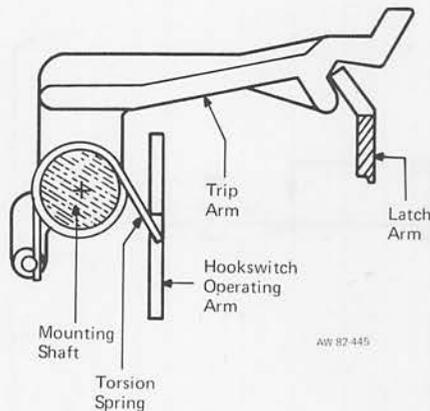


Figure 3: Installation of Trip Arm and Torsion Spring

9.03 Whenever the hookswitch restoration feature is disabled, it may become necessary to shorten or lengthen the spring connected to the operating arm to insure proper hookswitch operation. Proper operation requires the cradle to be fully depressed by the weight of the handset and return to the full up position when the handset is off-hook.

9.04 Earlier models of multibutton telephones may not provide the preselect function with the hookswitch restoration feature. These models include an adjustment screw on the latch arm rather than the plastic trip arm or torsion spring. To disable hookswitch restoration in these telephones, the following steps are taken:

- (a) Remove telephone faceplate and housing.
- (b) Turn the screw in the latch arm approximately five turns counterclockwise.
- (c) Reinstall telephone faceplate and housing.

10. CONNECTING 174B CALL ANNOUNCER

10.01 A 174B call announcer is used to provide tone and voice signaling to, and handsfree answerback from, an intercom station. The 174B call announcer connects to 20-button telephones as follows:

- (a) Connect BK (-24 VDC) lead of call announcer together with VI-BL lead of telephone to terminal 17 of terminal board.
- (b) Connect YL (GND) lead of call announcer together with YL-OR lead of telephone to terminal 27 of terminal board.
- (c) Connect RD (CA RST) lead of call announcer together with VI-BN lead of telephone to terminal 21 of terminal board.
- (d) Connect GN (CA RT) lead of call announcer together with VI-GN lead of telephone to terminal 13 of terminal board. (The VI-GN lead must be moved from RR on network.)

11. BUSY LAMP CONNECTIONS

11.01 Busy lamp connections may vary depending on the type of key system being used. Modifications for the 20-button desk telephones with feature codes 42 and 46 should be as follows: (Refer to Figure 4.)

- (a) Remove GN-WH lead from terminal 22 and connect to terminal 16 on the telephone terminal board.
- (b) Connect one 1N4004 diode between terminals 22 and 16 on the terminal board, and connect another 1N4004 diode between terminals 22 and 28 on the terminal board as shown in Figure 4.
- (c) Connect OR-YL mounting cord lead to terminal 28 of terminal board.

11.02 Modifications for the 20-button desk telephones with feature code 76 should be as follows: (Refer to Figure 5.)

- (a) Connect one 1N4004 diode from terminal 22 to terminal 28 on telephone terminal board as shown in Figure 5.
- (b) Connect any "LG" lamp ground lead to terminal 28 on the telephone terminal board. (Proper station cross-connections must be made to allow the use of an LG lead.)

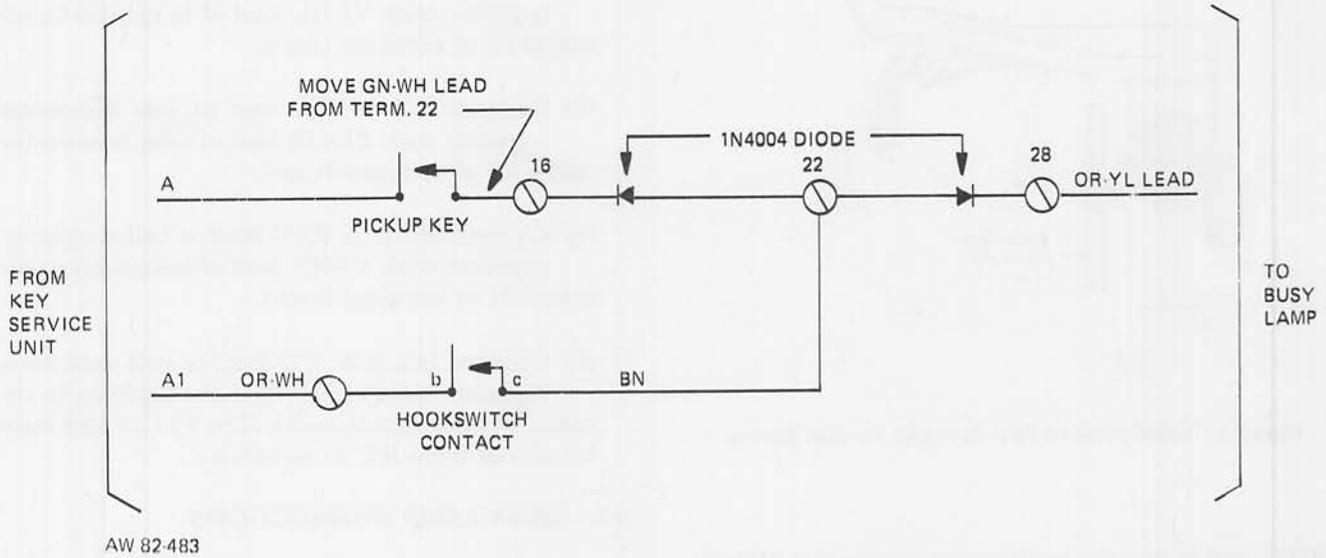


Figure 4: Busy Lamp Connections For 20-Button Telephones with Feature Codes 42 and 46

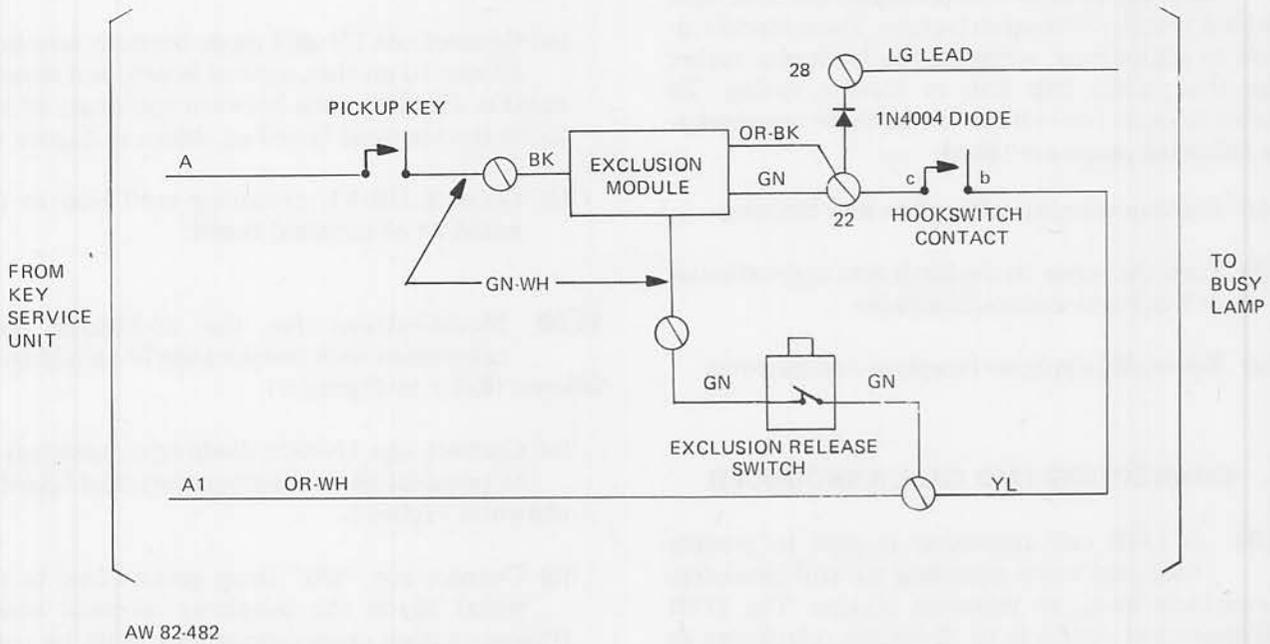


Figure 5: Busy Lamp Connections For 20-Button Telephones with Feature Code 76

TABLE A
REPLACEMENT PARTS LIST (Cont)

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED		
			831/42	831/46	831/76
		20-Button, Rotary Dial, Desk Telephone			
28	181254-102	Bracket, Dial	2	2	2
29	182337-101	Foot	4	4	4
30	082486-102	Rivet, Foot	4	4	4
31	181260-101	Cradle Switch Assembly ¹	1	1	1
32	181150-102	Left Bracket Assembly	1	1	1
	185619-101	Left Trip Bracket Assembly	1	1	1
	181252-101	Bracket, Key Left	1	1	1
	185618-101	Bracket, Trip	1	1	1
33	181298-102	Terminal Board	1	1	1
34	182386-101	PC Board (Exclusion)	—	—	1
35	000148-DBA	Ringer ¹	1	1	1
36	183105-102	Switch Hook Assembly	1	1	1
	182900-101	Cradle Switch Hook	1	1	1
	181145-101	Screw, Switch Hook Cradle	3	3	3
	185494-101	Operating Arm Assembly	1	1	1
	185487-101	Arm, Operating	1	1	1
	075307-104	Spring, Cradle Return	1	1	1
	181282-101	Shaft, Pivot	1	1	1
	073538-110	Ring, Retainer	1	1	1
37	185488-101	Arm, Latch	1	1	1
38	181151-101	Spring, Latch Arm	1	1	1
39	073538-110	Ring, Retainer	2	2	2
40	181152-101	Pin, Pivot	1	1	1
41	185486-101	Arm, Trip	1	1	1
42	185485-101	Spring, Torsion	1	1	1
43	075415-101	Card, Number	1	1	1
44	003800-00H	Dial Assembly, Metropolitan (Letters And Numerals) ¹	1	1	1
45	181146-101	Bracket, Dial Adapter	2	2	2
46	0065**-0C2	Handset Assembly, Nonmodular ¹	1	1	1
46	0065**-0M2	Handset Assembly, Modular ¹	1	1	1