

MODELS 32 AND 36 PUSHBUTTON DIALS

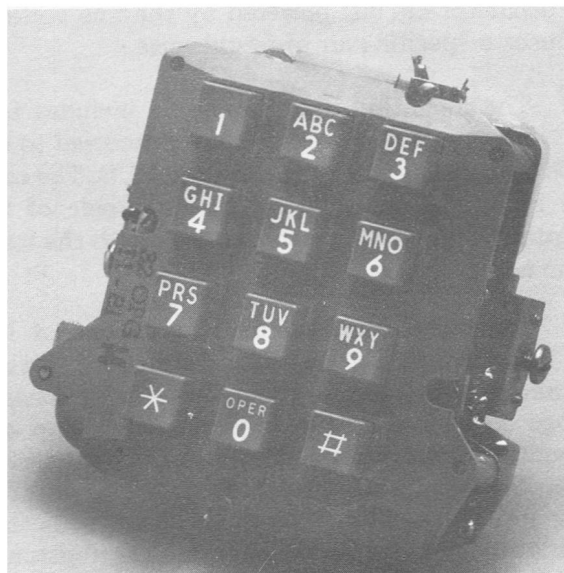
| CONTENTS | PAGE |
|------------------------------|------|
| 1. INTRODUCTION | 1 |
| 2. GENERAL DESCRIPTION | 1 |
| MODEL 003200-OOG | 4 |
| MODEL 003200-ODD | 4 |
| MODEL 003200-OPG | 5 |
| MODEL 003200-OPD | 5 |
| MODEL 003600-OOG | 5 |
| MODEL 003600-ODD | 5 |
| MODEL 003600-OPG | 5 |
| MODEL 003600-OPD | 5 |
| 3. REMOVAL | 5 |
| 4. DISASSEMBLY | 5 |
| 5. REPLACEMENT PARTS | 6 |
| 6. ASSEMBLY | 6 |
| 7. INSTALLATION | 8 |
| 8. ADJUSTMENTS | 8 |

1. INTRODUCTION

1.01 This document covers the Models 32 and 36 pushbutton dials. (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, assembly, installation, and adjustments is included.

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

1.03 For information concerning telephones that this dial is used in, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.



AW 85-183

Figure 1: Models 32 and 36 Pushbutton Dials**2. GENERAL DESCRIPTION**

2.01 The Models 32 and 36 dials are 12-pushbutton Tel-Touch dials available with either metropolitan-style pushbuttons (letters and numerals) coded G or regular-style pushbuttons (numerals only) coded D. Either dial may be equipped with polarity guard coded OPG or OPD. The Models 32 and 36 pushbutton dials are similar except for an additional set of contacts appearing in the Model 36 pushbutton dial to allow its use with handsfree equipment. Both dials are referred to as Tel-Touch dials because they produce dual tone multifrequency (DTMF) signals.

Note: These dials can only be used when the associated central office equipment is arranged for DTMF signaling.

2.02 The Models 32 and 36 pushbutton dials (see Figure 2) consist of a pushbutton assembly and a tone-generating printed circuit board (PCB). An insulator separates the two assemblies.

2.03 The pushbutton assembly consists of a cover plate, 12 pushbuttons, four horizontal cranks, three vertical cranks, 12 pushbutton return springs, a frame, an actuator slide, a mounting plate assembly, and a common switch.

2.04 The tone-generating PCB consists of a transistor oscillator with two tuned circuits, and may include an optional polarity guard circuit. The oscillator circuit, powered by the line voltage, produces a specific pair of frequencies.

2.05 The mounting plate assembly includes four groups of contacts that are connected to the tuned circuits of the tone-generating PCB. The common switch is mounted on the rear side of the mounting plate and its springs mesh with the teeth of the actuator slide.

2.06 Pressing a pushbutton rotates one of the horizontal (row) cranks and one of the vertical (column) cranks. The vertical cranks operate contact springs connected to the high-band coil, and the horizontal cranks operate contact springs connected to the low-band coil. (See Figures 3 and 4.) The horizontal cranks also move the actuator slide that operates the common switch. When a pushbutton is pressed, a single high-band tone and a single low-band tone are simultaneously transmitted through the common switch and polarity guard circuit (Models OPG and OPD).

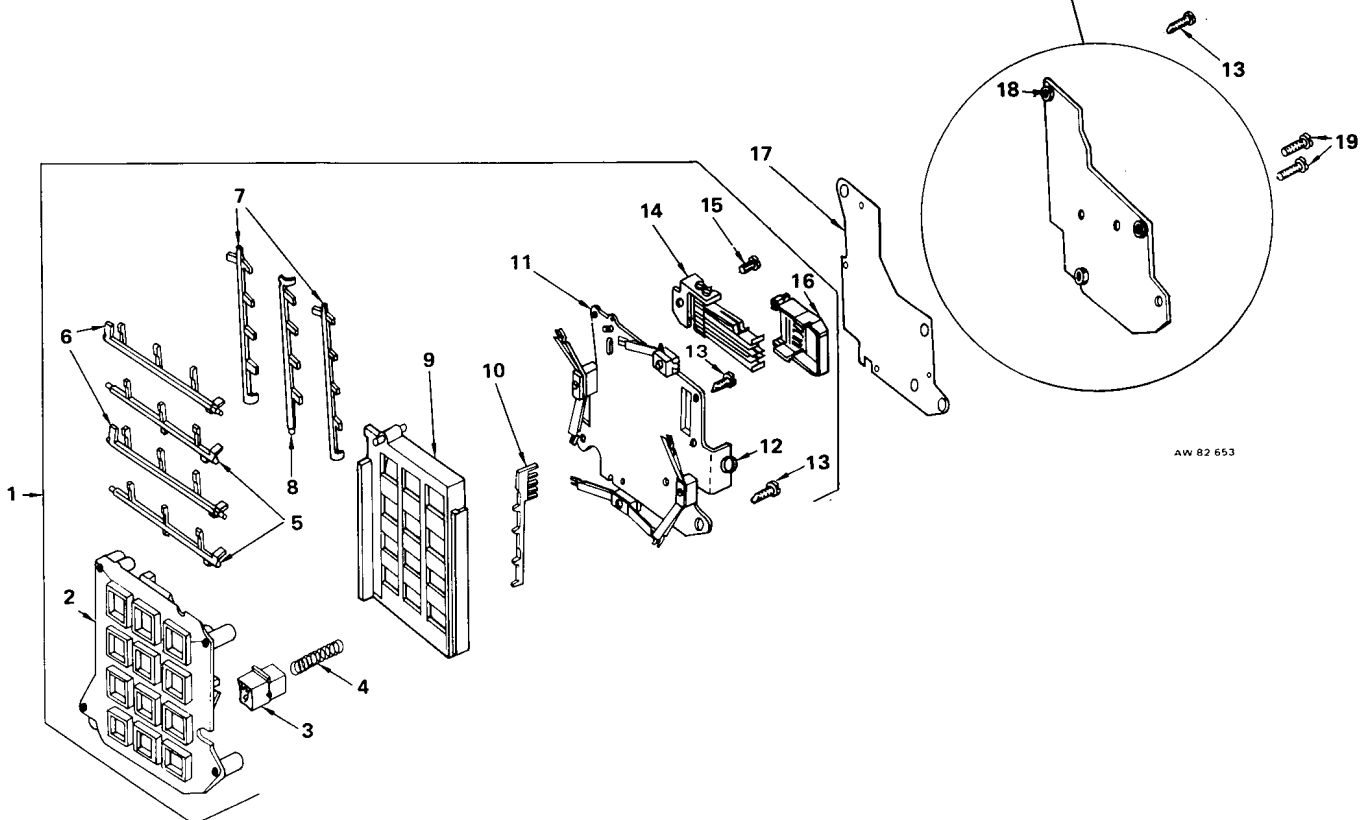
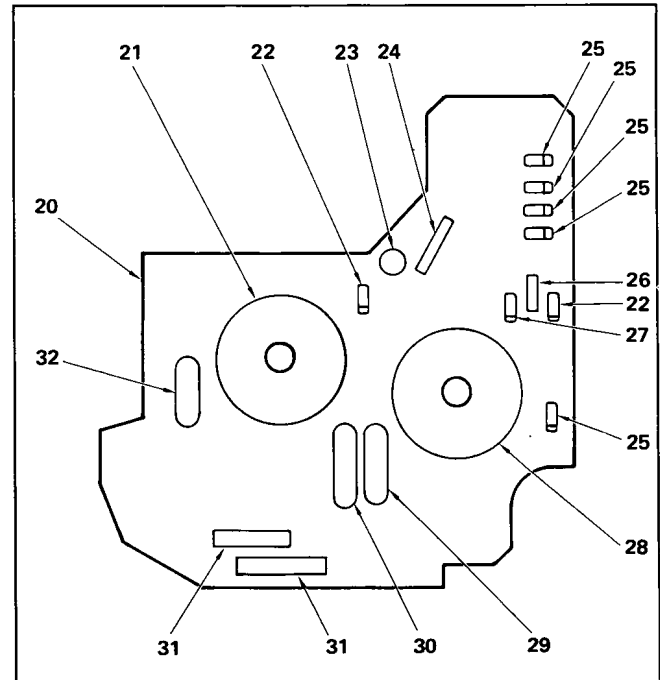


Figure 2: Models 32 and 36 Pushbutton Dials, Exploded View



11. $2x^2 + 3x - 2 = 0$



11. $2x^2 + 3x - 2 = 0$

Note: Pushbuttons numbered 0 through 9 are used to dial a desired directory number. The two pushbuttons designated * and # are for special functions.

- 2.07** The optional polarity guard circuit, available on Models OPG and OPD, provides protection against improper connection of the Tip and Ring leads to the telephone. The transistor on the tone-generating PCB must have a specific supply voltage polarity to transmit tones. In instances where the Tip and Ring leads may be reversed or unidentifiable at the station, the polarity guard circuit ensures tone transmission regardless of line polarity.
- 2.08** The Models 32 and 36 pushbutton dials are identified by a code number stamped in ink on the front of the cover plate. Refer to Table A for

ordering information and for an explanation of each code. Variations of the Models 32 and 36 pushbutton dials are briefly described in the following paragraphs.

MODEL 003200-OOG

2.09 The Model 003200-OOG pushbutton dial is a standard Tel-Touch dial designed for use in various telephones where DTMF signaling is desired. This dial is equipped with metropolitan-style pushbuttons displaying both letters and numerals.

MODEL 003200-OOD

2.10 The Model 003200-OOD pushbutton dial is the same as the Model 003200-OOG pushbutton dial except it is equipped with regular-style pushbuttons displaying numerals only.

TABLE A

ORDERING INFORMATION

| CODE NUMBERS | | |
|---|---|--------------------|
| DIAL CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS: | | |
| <div><div>(1) Dial Model Number (See Part 1)</div><div>(2) Dial Style (See Part 2)</div><div>003200</div><div>OOG</div></div> | | |
| PART 1 DIAL MODEL NUMBER | | |
| CODE | DESCRIPTION | DIAL STYLE |
| 003200 | Model 32 Pushbutton Dial | OOG, OOD, OPG, OPD |
| 003600 | Model 36 Pushbutton Dial (For Handsfree Operation) | OOG, OOD, OPG, OPD |
| PART 2 DIAL STYLE | | |
| CODE | DESCRIPTION | |
| OOG | Metropolitan (Letters And Numerals) | |
| OOD | Regular (Numerals Only) | |
| OPG | Metropolitan (Letters And Numerals) With Polarity Guard | |
| OPD | Regular (Numerals Only) With Polarity Guard | |

AW 84-917

MODEL 003200-OPG

2.11 The Model 003200-OPG pushbutton dial is the same as the Model 003200-OOG pushbutton dial except it is equipped with polarity guard that allows the dial to operate regardless of line polarity.

MODEL 003200-OPD

2.12 The Model 003200-OPD pushbutton dial is the same as the Model 003200-OOD pushbutton dial except it is equipped with polarity guard that allows the dial to operate regardless of line polarity.

MODEL 003600-OOG

2.13 The Model 003600-OOG pushbutton dial is a Tel-Touch dial designed for use in handsfree telephones or in telephones used in connection with handsfree equipment where DTMF signaling is desired. This dial is equipped with metropolitan-style pushbuttons displaying both letters and numerals.

MODEL 003600-OOD

2.14 The Model 003600-OOD pushbutton dial is the same as the Model 003600-OOG pushbutton dial except it is equipped with regular-style pushbuttons displaying numerals only.

MODEL 003600-OPG

2.15 The Model 003600-OPG pushbutton dial is the same as the Model 003600-OOG pushbutton dial except it is equipped with polarity guard that allows the dial to operate regardless of line polarity.

MODEL 003600-OPD

2.16 The Model 003600-OPD pushbutton dial is the same as the Model 003600-OOD pushbutton dial except it is equipped with polarity guard that allows the dial to operate regardless of line polarity.

2.17 The Models 32 and 36 pushbutton dials are no longer manufactured. The Model 32 pushbutton dial has been replaced by the Model 42 pushbutton dial. The Model 36 pushbutton dial has been replaced by the Model 46 pushbutton dial.

3. REMOVAL

3.01 To remove the dial from the telephone, proceed as follows:

- (a) Remove the telephone faceplate.
- (b) Remove the telephone housing.
- (c) Loosen the two dial mounting screws; lift the dial from the dial mounting brackets.
- (d) Disconnect the dial leads.

4. DISASSEMBLY

4.01 To disassemble the dial, proceed as follows:

- (a) Rotate the common switch cover clockwise until it clears the printed circuit board. Lift upward to remove the spring cover from the screw threads, if desired. (See Figure 5.)

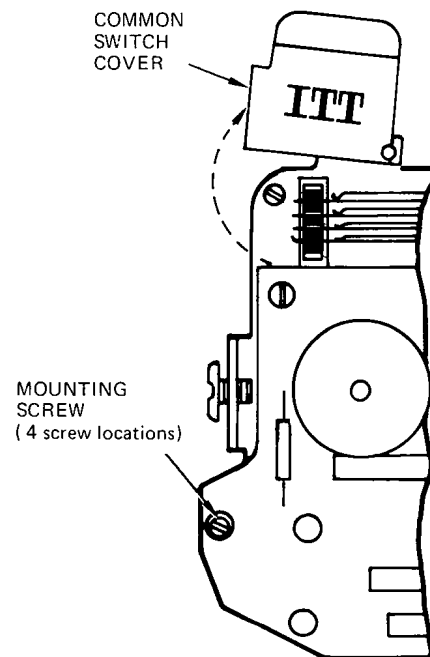


Figure 5: Rear View of Dial

- (b) Loosen the four screws that hold the mounting plate assembly to the cover plate. Note that one of the screws is located under the printed circuit board. A small screwdriver can be inserted through the hole in the printed circuit board and the screw can be loosened as the mounting plate is lifted from the cover plate. (See Figure 5.)

- (c) Place the dial face down in a holding fixture. (See Figure 6.)

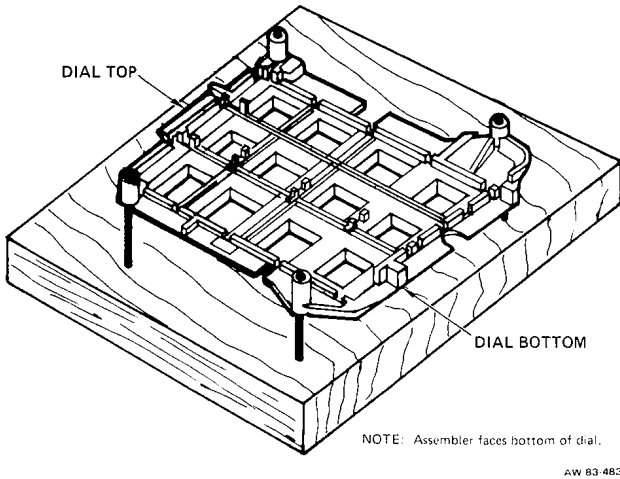


Figure 6: Holding Fixture

- (d) Loosen and remove the four screws that hold the mounting plate assembly to the cover plate.

- (e) Lift the mounting plate (with the printed circuit board) from the cover plate.

Note: Wires connecting the contact springs to the printed circuit board must be disconnected to remove the printed circuit board. (Refer to Figures 7 and 8.)

- (f) Lift the actuator slide and the pushbutton frame from the mounting plate.

- (g) Remove the cranks, springs, and pushbuttons from the cover plate as required.

5. REPLACEMENT PARTS

- 5.01 Replacement parts for the Models 32 and 36 pushbutton dials are listed in Table B.

6. ASSEMBLY

- 6.01 To assemble the dial, proceed as follows:

- (a) Place the cover plate face down on a holding fixture. (See Figure 6.)

- (b) Place the pushbuttons in the proper holes of the cover plate. Position the holding fixture so that the opening at the bottom of the dial cover

is toward the assembler. Starting with the pushbutton for the numeral 1 in the upper right-hand corner, progress from right to left and from top to bottom: 1, 2, 3, 4, 5, 6, 7, 8, 9, *, 0, and #.

- (c) Place the horizontal (row) cranks in position in the cover plate. The arms that contact the actuator slide must be to the assembler's left and must point upward. The round section of each crank must ride in the appropriate slots. (See Figure 9.)

- (d) Place the vertical (column) cranks in position. The arms of the cranks ride on the flanges of the pushbuttons. (See Figure 9.)

Note: One vertical (column) crank differs in design from the other two. This crank must be placed in the center slot position with the stop pointing toward the top of the dial. The two outside vertical (column) cranks must be placed with the stops pointing toward the bottom of the dial.

- (e) Place the pushbutton frame over the assembled parts so that the dowel pin of the frame inserts into the dowel hole of the cover plate.

- (f) Place one spring into position on each pushbutton.

- (g) Place the actuator slide in the frame so that the arms on the front side mesh below the arms of the four vertical (column) cranks.

- (h) Position the mounting plate and printed circuit board group over the assembled parts. Ensure that the teeth of the actuator slide mesh properly with the springs of the contact spring assembly. The top tooth goes above the top long flat spring. Each successive tooth goes above the subsequent long flat springs. The fourth tooth engages the stiffener spring of the contact spring assembly.

- (j) Secure the mounting plate to the cover plate using four screws.

- (k) Install the spring cover by pressing it down on the threads of the screw and rotating it counterclockwise until it engages the printed circuit board.

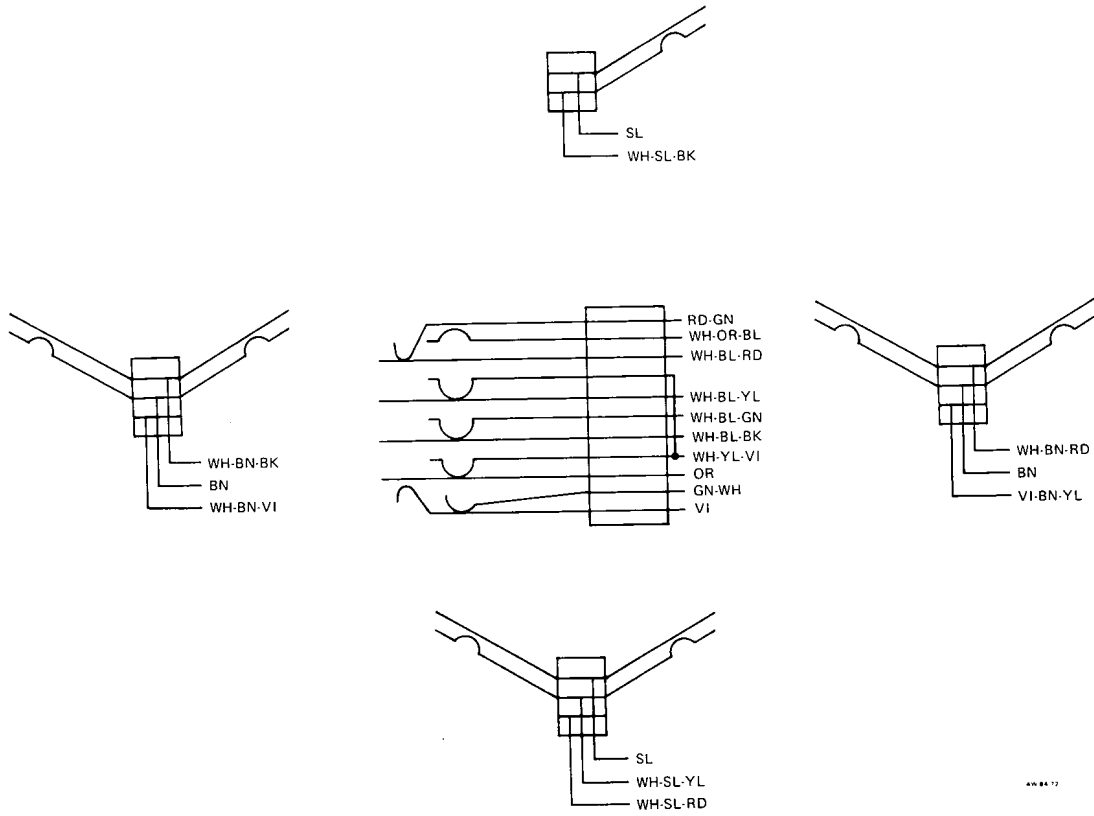


Figure 7: Model 36 Pushbutton Dial, Wiring Diagram

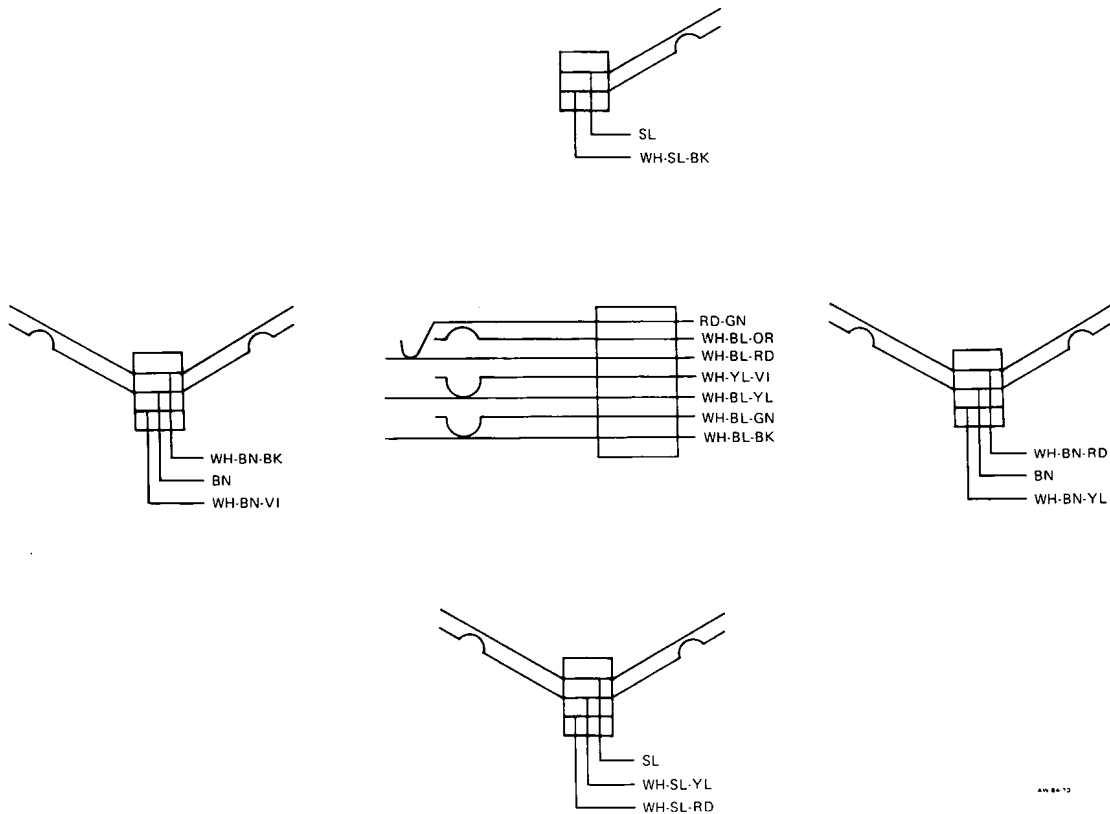


Figure 8: Model 32 Pushbutton Dial, Wiring Diagram

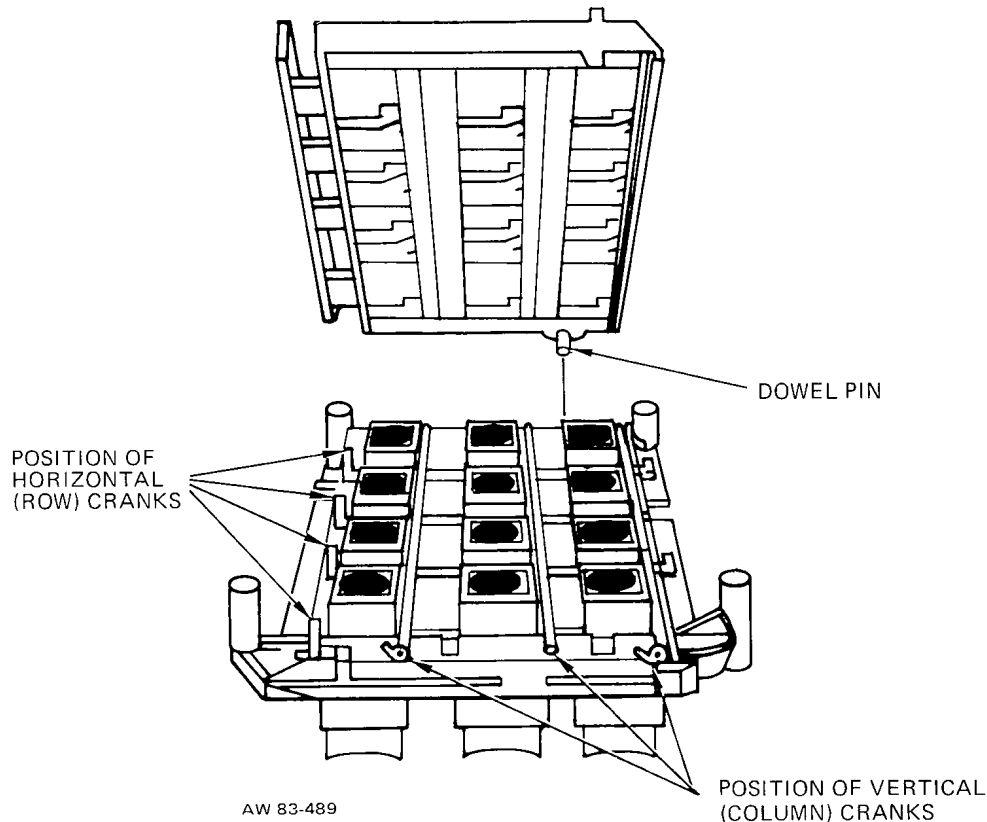


Figure 9: Relative Position of Cranks

7. INSTALLATION

7.01 To install the dial inside a telephone, proceed as follows:

- (a) Remove the telephone faceplate and housing.
- (b) Connect the dial leads to the telephone. Refer to the telephone circuit label for the appropriate connections.
- (c) Place the dial into the dial mounting brackets and tighten the mounting screws.
- (d) Install the telephone housing and faceplate.

8. ADJUSTMENTS

8.01 For dials that are equipped with polarity guard, the polarity guard can be disabled by proceeding as follows:

- (a) Disconnect the GN dial lead from the telephone and replace it with the BN-BK dial lead. Tape and store the GN dial lead.
- (b) Disconnect the WH-RD dial lead from the telephone and replace it with the lead(s) from the two-position terminal on the dial. Tape and store the WH-RD dial lead.
- (c) Connect the SL-BL dial lead to network terminal RR.

TABLE B
REPLACEMENT PARTS LIST

| INDEX NO | PART NUMBER | DESCRIPTION | QUANTITY USED | | | | | | | |
|----------|-------------|--|---------------|--------|--------|--------|--------|--------|--------|--------|
| | | | 32/00G | 32/00D | 32/0PG | 32/0PD | 36/00G | 36/00D | 36/0PG | 36/0PD |
| 1 | 086134-103 | Pushbutton Assembly | 1 | - | 1 | - | - | - | - | - |
| 1 | 086134-104 | Pushbutton Assembly | - | 1 | - | 1 | - | - | - | - |
| 1 | 086134-105 | Pushbutton Assembly | - | - | - | - | 1 | - | 1 | - |
| 1 | 086134-106 | Pushbutton Assembly | - | - | - | - | - | 1 | - | 1 |
| 2 | 086101-104 | Plate, Cover | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 181452-101 | Pushbutton, 1, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-111 | Pushbutton, 1, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-102 | Pushbutton, 2, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-112 | Pushbutton, 2, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-103 | Pushbutton, 3, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-113 | Pushbutton, 3, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-104 | Pushbutton, 4, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-114 | Pushbutton, 4, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-105 | Pushbutton, 5, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-115 | Pushbutton, 5, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-106 | Pushbutton, 6, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-116 | Pushbutton, 6, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-107 | Pushbutton, 7, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-117 | Pushbutton, 7, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-108 | Pushbutton, 8, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-118 | Pushbutton, 8, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-109 | Pushbutton, 9, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-119 | Pushbutton, 9, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-110 | Pushbutton, 0, Metropolitan | 1 | - | 1 | - | 1 | - | 1 | - |
| | 181452-120 | Pushbutton, 0, Regular | - | 1 | - | 1 | - | 1 | - | 1 |
| | 181452-131 | Pushbutton, * | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 181452-132 | Pushbutton, # | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 086112-101 | Spring | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| 5 | 086109-101 | Crank, Horizontal (2nd And 4th From Top) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 6 | 086108-101 | Crank, Horizontal (1st And 3rd From Top) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 7 | 086111-101 | Crank, Vertical (Outer Positions) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 8 | 086110-101 | Crank, Vertical (Center Position) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 086102-101 | Frame | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | 086113-101 | Slide, Actuator | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 086107-101 | Mounting Plate Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 182607-101 | Screw, Dial Mounting | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 13 | 076787-102 | Screw, Self-Tapping | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 14 | 086133-101 | Common Spring Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | 088891-101 | Common Spring Assembly | - | - | - | - | - | - | - | - |
| 16 | 071660-101 | Screw, Mounting | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | 184068-101 | Cover | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

TABLE A
REPLACEMENT PARTS LIST (Cont)

| INDEX NO | PART NUMBER | DESCRIPTION | QUANTITY USED | | | | | | | | | |
|----------|-------------|--|---------------|--------|--------|--------|--------|--------|--------|--------|---|---|
| | | | 32/00G | 32/00D | 32/0PG | 32/0PD | 36/00G | 36/00D | 36/0PG | 36/0PD | | |
| 17 | 086106-101 | Insulator | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 182831-101 | PC Board Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 182831-102 | PC Board Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 182831-103 | PC Board Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 182831-104 | PC Board Assembly | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 079485-102 | Screw, Mounting | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 20 | 182830-101 | Board, Printed Circuit | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 21 | 086125-102 | Transformer, T2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | 180656-103 | Diode, 1N4448, CR3, CR4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 23 | 095830-101 | Transistor, PNP, Germanium, Q1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | 182135-104 | Capacitor, 0.0068 MFD, 300 V, C3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 180658-101 | Diode, 1N4004, CR1, CR5 - CR8 | 1 | 1 | 5 | 5 | 1 | 1 | 5 | 5 | 5 | 5 |
| 26 | 181789-102 | Resistor, 33 K, 1/4 W, $\pm 5\%$, R4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 095853-101 | Varistor, V1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 180658-101 | Diode, 1N4004, CR9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 28 | 086125-101 | Transformer, T1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 29 | 181789-180 | Resistor, 5.1 K, 1/4 W, $\pm 5\%$, R3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 30 | 181789-243 | Resistor, 820 Ohm, 1/2 W, $\pm 5\%$, R1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 31 | 181608-101 | Capacitor, 0.043 MFD, 100 V, C1, C2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 32 | 095535-118 | Resistor, 45.3 Ohm, 1 W, $\pm 1\%$, R2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

NOTE: All capacitor values are in microfarads (MFD).

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