

# **PUBLIC SERVICES STATION MANUAL**

**VOLUME I**



## **PUBLIC SERVICES STATION MANUAL VOLUME I**

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# PUBLIC SERVICES STATION MANUAL VOLUME I

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## Introduction

This manual is a selected compilation of sections concerning installation and maintenance of coin stations.

Information not included in this manual may be found in standard BSP files.

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**KS-21250, L2**  
**COIN CRAFTS' TEST SET**

**1. GENERAL**

**1.01** This section provides identification, operation, and maintenance for the KS-21250, L2 Coin Crafts' Test Set (Fig. 1).

**1.02** Whenever this section is reissued, the reason(s) for reissue will be listed in this paragraph.

**1.03** The KS-21250, L2 test set is a portable, self-contained test set for use in testing coin telephone components and the interaction between the coin telephone set and the central office (CO).

**2. IDENTIFICATION**

**2.01** The KS-21250, L2 test set is housed in a metal case approximately 8-1/4 inches wide, 6-1/2 inches high, 7 inches deep, and weighs about 5 pounds. It has a hinged cover and a carrying strap. The test set is powered by twelve 1-1/2 volt AA batteries (not furnished with set).

**2.02** The features of the test set are as follows:

- (a) Hinged cover with spot-welded brackets for coiling test cord, fastening test clips, storing instruction booklet, and restoring power switch to OFF position when cover is closed. The hinged cover may also be removed for easy positioning of test set while working.
- (b) W4CN four-conductor test cord to connect test set to coin telephone set with color coded insulators on test clips.
- (c) Three square headed terminals marked RING, TIP, and GND for bridging of craft hand test set.
- (d) Power off/on switch.

(e) Battery check switch and associated light emitting diode (LED) for visual test of batteries.

(f) Coin relay operate switch and associated neon indicator lamp for field testing of coin relay.

(g) Coin relay battery off/on switch to provide battery for the coin relay operate and timing circuit.

(h) Coin return-coin relay timing/coin collect (CR-TIME/CC) switch for testing the operation and timing of the coin relay.

(i) Fast and slow LEDs as visual indicators of coin relay timing test.

(j) Loop battery off/on switch for providing local battery to test coin telephone set independent of CO.

(k) -48/+48 switch for reversing local loop battery to simulate normal CO or positive CO battery condition.

(l) Normal/sample hold switch provides opportunity to display sequence signals from CO in normal sequence timing (approximately 1/2 second) or sample and hold display of signals for approximately 4-1/2 seconds.

(m) Seven LEDs for visual indication of (CO generated) sequence tests, loop battery, polarity tests, and loop current and foreign EMF tests.

(n) 23MA detector switch for making loop current test.

(o) Loop margin off/on switch for introducing 10-percent loop loss when testing marginal loop battery conditions.

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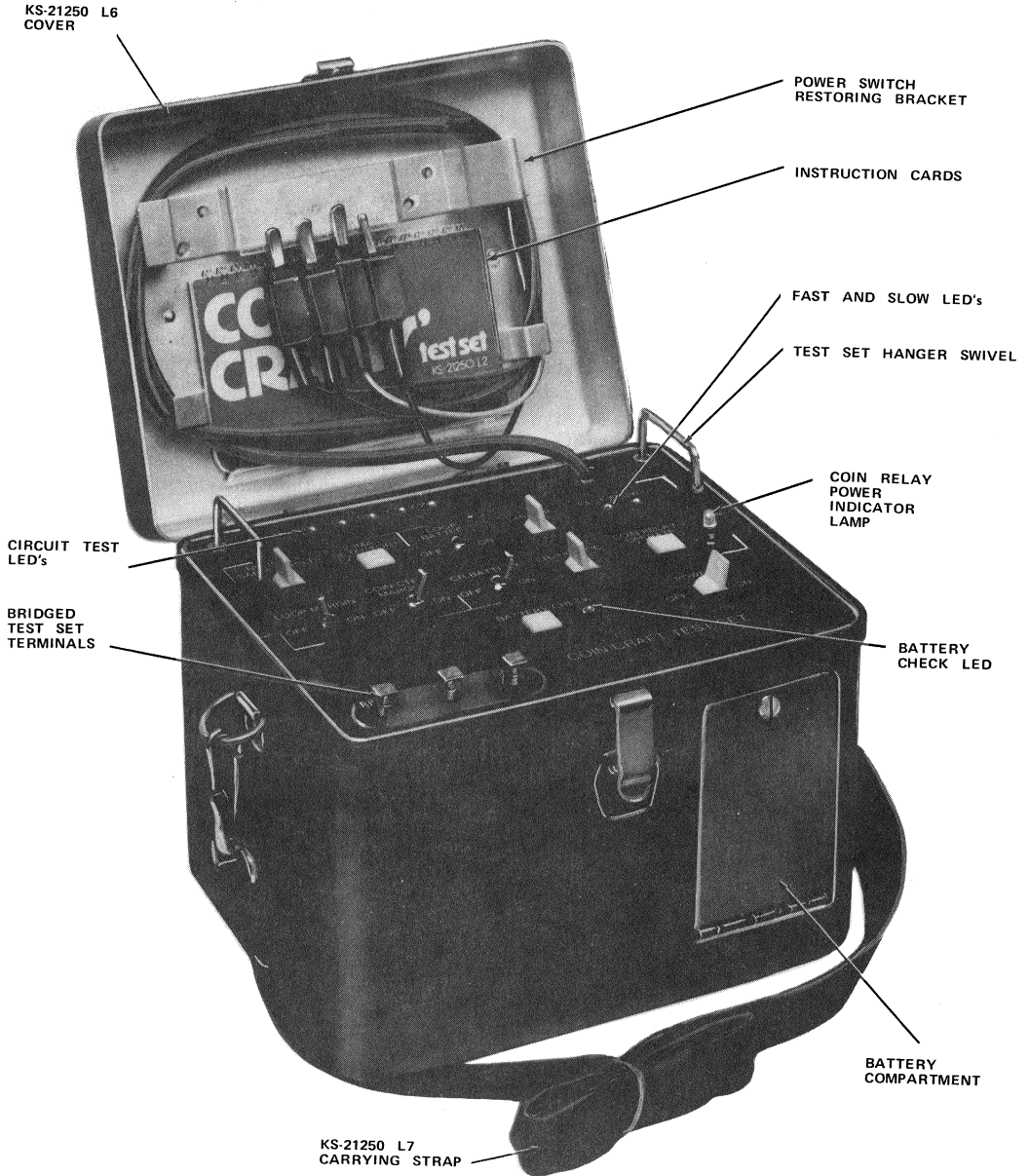


Fig. 1—KS-21250, L2 Coin Crafts' Test Set



(p) Coin control margin off/on switch for introducing 10-percent loss in coin control loop when testing marginal coin loop conditions.

(q) HT1 receiver unit controlled by loop battery key, used for monitoring coin tones, TOUCH-TONE® dial signals, and transmission from coin telephone handset.

(r) An easy access battery compartment with captive single-turn screw lock and latching battery holder that slides in and out of battery compartment on a track for ease of battery replacement.

(s) Single battery pack power source.

(t) Automatic shut-off when batteries are too low.

(u) Convenient easy to use controls.

(v) Adjustable carrying strap of webbed material with snap-on clasps for carrying test set.

(w) Two test set hangar swivels to suspend test set on the front of 1- and 2-type telephone sets.

**2.03** The KS-21250, L2 coin test set does not come equipped with batteries. The batteries must be provided by the craft. The test set uses twelve 1-1/2 volt AA batteries.

**2.04** The set of instruction cards supplied with the test set are intended as a guide only. If more detailed instructions are needed, refer to this section or Section 506-900-503.

### 3. OPERATION

**3.01** The KS-21250, L2 test set has three general classes of test procedures:

- (a) CO source, loop and external wiring of coin telephone set.
- (b) Interaction between coin telephone and CO line.
- (c) Coin telephone testing and timing independent of CO line.



*If the fast or slow LEDs come on when test set power is turned on, they will reset when the Coin Return Battery switch is turned ON and OFF.*

**3.02** To perform CO source, loop and external wiring tests, remove cover of coin telephone set, install P11C patch cord, or hang cover on KS-20950, L2 cover parking tool, swivel hangars around to suspend test set from telephone set and proceed as follows:

- (1) **23MA Test**—The 23MA current detector circuit simulates a 350-ohm load to the CO and will light a LED indicating when a current of 23MA or greater is flowing in the loop. This represents a worst case telephone set resistance which could be encountered in the field.



*Bullet (e) at beginning of line indicates normal response or test OK to preceding step.*

- (a) All **off/on** switches in **off** position.
- (b) Connect test set leads to TB-1 of coin telephone set per Fig. 2:
  - -48V LED lights.
- (c) With coin telephone handset on-hook, depress and hold 23MA DETECTOR switch:
  - 23MA LED lights.

(2) **Loop Margin Test**—The loop margin test checks the ring and tip loop from the CO by shunting 10 percent of the available current away from the coin telephone set. This in effect extends the loop by 10 percent. If the circuit fails the loop margin test, it indicates a borderline loop resistance condition and the telephone set may experience erratic troubles or failures.

- (a) All OFF/ON switches in OFF position except POWER switch.
- (b) Connect test set leads per Fig. 2 and take coin telephone handset off-hook:
  - -48V LED lights.

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- (c) Connect 1013-type hand test set (with switch in monitor position) to ring and tip test terminals (square headed terminals in lower left corner of test set).
  - (d) Set LOOP MARGIN switch to ON.
  - (e) Deposit 35 cents in coin chute and observe tones on 1013 hand test set.
  - (f) If no tones are heard, turn LOOP MARGIN switch OFF, deposit 35 cents, and observe tones.
  - (g) If tones still are not heard, consult test desk for loop and ground measurements.
  - (h) If tones are heard and coin control problems are known to exist, the test desk should be consulted for loop and ground measurements.
  - (i) Hang up coin telephone handset:
    - Coins should return.
  - (j) Set LOOP MARGIN switch to OFF.
- (3) **Coin Control Margin Test**—The coin control margin test checks for marginal conditions on the tip to ground coin control path. A failure on this test indicates a borderline circuit resistance and the telephone set may experience erratic trouble or failures.
- (a) All OFF/ON switches in OFF position except POWER switch.
  - (b) Connect test set leads per Fig. 2 and take telephone handset off-hook:
    - -48V LED lights.
  - (c) Set NORMAL/SAMPLE HOLD switch to SAMPLE HOLD.
  - (d) Set COIN CONTROL MARGIN switch to ON.
  - (e) Trip hopper trigger by hand.
  - (f) Place telephone handset on-hook:
    - Coin relay should operate and CR LED should be ON.
  - (g) Set COIN CONTROL MARGIN switch to OFF.
  - (h) If test (f) fails, repeat test with switch in OFF position.
  - (i) If test still fails, consult test desk for loop and ground measurements.
- (4) **Foreign EMF Test**—This is a special use test where the test desk may not be available but you do have access to service on the CO main distributing frame. It will show if there is induced or crossed battery and ground on the pair but will not indicate trouble on individual conductors.
- (a) All OFF/ON switches in OFF position except POWER switch.
  - (b) Connect test set leads per Fig. 2:
    - -48V LED should light.
  - (c) Have tip and ring opened at CO main frame:
    - LED should go off.
  - (d) If any LED lights, call test desk for circuit test.

**3.03 LED SIGNAL DETECTION EXPLANATIONS:**

The sequence charts in Section 506-100-120 specifies when the following signals may be applied to the coin telephone for both Coin First Operation and Dial Tone First Operation. These signal indicators are not designed to work with range extenders (DLL, SRE, etc):

- -48: This LED indicates -48 volts ring to tip at the coin set. (This is the normal polarity applied to the set during call initiation.)
- +48: This LED indicates +48 volts ring to tip at the coin set. (This is the normal polarity applied to the set when an operator is on line during DTF calls.)
- -CP: The "minus coin presence" test is used to determine if initial rate requirements have been met in the DTF coin telephone

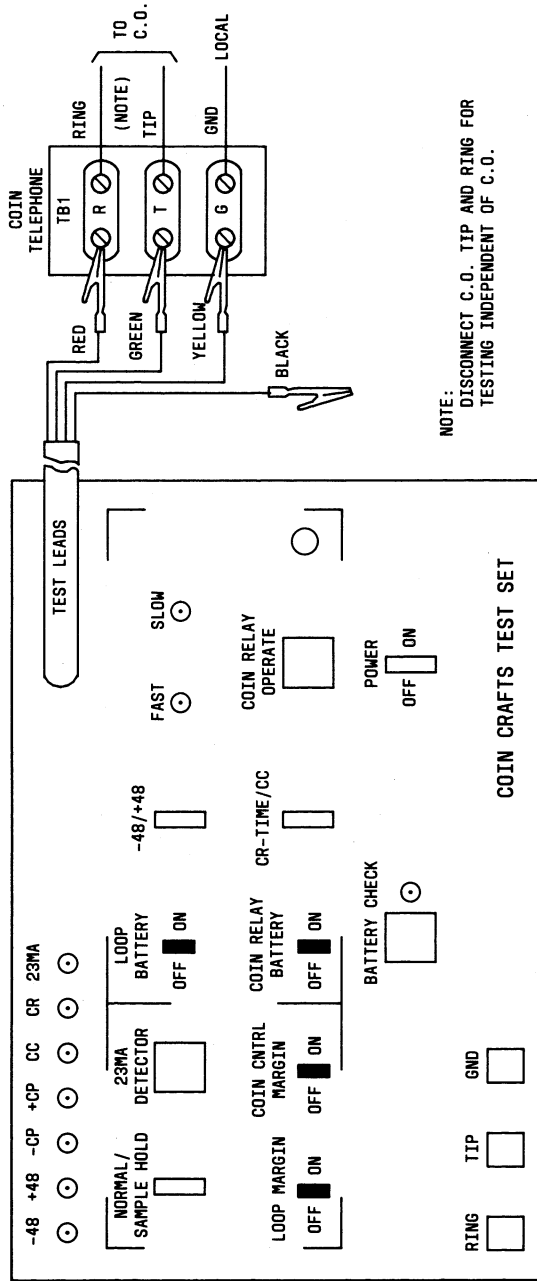


Fig. 2—Test Lead Set-up for All Tests Except Coin Relay Timing

set. This test is made with -48 volts tip to ground.

- +CP: The “positive coin presence” test is used to determine if the hopper has been cleared of coins. It is also used for the five cent local overtime charge. This test is made with +48 volts tip to ground (Note).
- CC: The “coin collect” LED is on whenever a coin collect signal is applied to the coin set (+130 volts tip to ground).
- CR: The “coin return” LED is on whenever a coin return signal is applied to the coin set (-130 volts tip to ground).
- 23MA: This LED is used with the test set 23MA test.

**Note:** In a CF office, -48 volts is applied; in a DTF or CF/DTF office, +48 volts is applied; however, in some offices, coin return voltage may be used for this test.

**3.04 The CO Sequence Test:** Tests the interaction between the coin telephone set and the CO equipment. During these tests, LEDs other than those shown may light. These others may be ignored. Prepare coin telephone set as follows and proceed as in (1) or (2).

- Install P11C patch cord or hang cover of coin telephone set on KS-20950, L2 cover parking tool.
- Connect test set leads to TB-1 of coin telephone set per Fig. 2.
- Set test set POWER switch to ON.
- Depress **Battery Check** switch—**Battery Check LED** should light.
- For extended **LED** viewing time set **Normal/Sample Hold**, switch to **Sample Hold**.



**The -48, +48 LEDs are not controlled by Sample Hold switch.** These LEDs will only light when the respective voltages are present in circuit.

(1) **Coin First Mode Operational Test:**  
 Bullet (●) indicates Test OK action or normal response. If failure refer to table and step in Section 506-900-503 or follow instruction.

ACTION	FAILURE TABLE	STEP
(a) Remove coin relay dust cover—lift handset off-hook—operate hopper trigger by hand:		
Dial tone is heard.	A	14
● -48 LED lights.		
(If both fail—CO or outside plant trouble is indicated—consult test desk)		
(b) Dial any digit except <b>0</b> or <b>1</b> :		
● Dial tone remains after dialing.	A	15
(c) Set <b>Loop Margin</b> switch to <b>On</b> —deposit nickel:		
● Dial tone remains [if this test is <b>OK</b> , skip Step (d)].		
(d) Repeat test (c) with <b>Loop Margin</b> switch in <b>Off</b> position:		
● Dial tone remains—[If telephone set passes this test and failed test (c), refer to test desk for loop and ground resistance measurements].	A	16
<b>The CO may time out to permanent signal if dial tone is requested past time out period.</b>		
(e) Set <b>Loop Margin</b> switch to <b>Off</b> —set <b>Coin Control Margin</b> switch to <b>ON</b> —hang up handset:		
● <b>CR LED</b> lights while coin relay operates and nickel returns [if this test is <b>OK</b> , skip test (f)].		

ACTION	FAILURE TABLE STEP
(f) Repeat test (e) with <b>Coin Control Margin</b> switch in <b>Off</b> position:	
<ul style="list-style-type: none"> <li>• <b>CR LED</b> lights while coin relay operates and nickel returns [if telephone set passes this test and failed test (e), refer to test desk for loop and ground resistance measurements].</li> </ul>	A 17
(g) Set <b>Coin Control Margin</b> switch to <b>off</b> . Lift handset off-hook and deposit initial rate. Dial a busy number. When busy signal is heard, hang up handset:	
<ul style="list-style-type: none"> <li>• <b>+CP LED</b> lights. (If the <b>+CP LED</b> does not light and the coin relay operates or if the <b>-CP LED</b> lights and the coin relay operates, a CO trouble is indicated. Refer to test desk.)</li> </ul>	
<b>Other LEDs will light during this test but may be ignored.</b>	
(h) With handset on-hook—trip hopper trigger by hand and depress and hold the <b>23MA Detector</b> switch:	
<ul style="list-style-type: none"> <li>• <b>23MA LED</b> should light. (If <b>23MA LED</b> does not light, refer to test desk for loop and ground resistance measurements.)</li> </ul>	
(i) To ensure a completely operational coin telephone set, proceed with Steps 4, 5, 6, 7, and 8 of the <b>Eight Step Coin Station Routine</b> . Use the coin crafts' test set for coin relay timing as discussed in paragraph 3.06.	

(2) **Dial Tone First Operational Test:**  
 Bullet (•) indicates **Test OK** action or normal response. If failure, refer to table and step in Section 506-900-503 or follow instruction. After initial set up -48 **LED** should be lighted, then proceed as follows:

ACTION	FAILURE TABLE STEP
(a) Connect craft hand test set to ring and tip terminals of coin crafts' test set with hand test set in monitor position.	
(b) With the handset on-hook, depress <b>23MA Detector Switch:</b>	
<ul style="list-style-type: none"> <li>• <b>23MA LED</b> lights (if test fails, refer to test desk for loop and ground resistance test). Release <b>23MA Detector Switch</b>.</li> </ul>	
(c) Lift handset off-hook:	
<ul style="list-style-type: none"> <li>• Dial tone should be heard.</li> </ul>	B 4
(d) Dial any digit <b>except</b> 0 or 1:	
<ul style="list-style-type: none"> <li>• Dial tone should be broken.</li> </ul>	B 9
(e) Set <b>Loop Margin</b> switch to <b>On</b> —deposit 35 cents:	
<ul style="list-style-type: none"> <li>• Totalizer should restore. Coin tones should be heard in craft hand test set (if initial rate is less than or equal to 35 cents).</li> </ul>	
If Step (e) test is OK—skip test (f).	
(f) Set <b>Loop Margin</b> switch to <b>Off</b> —Deposit 35 cents:	
<ul style="list-style-type: none"> <li>• Totalizer should restore—coin tones should be heard in craft hand test set. [If this test passes and test (d) failed, refer to test desk for loop and ground resistance measurements.]</li> </ul>	B 5

ACTION	FAILURE TABLE STEP
(g) Set <i>Coin Control Margin</i> switch to <b>On</b> . Hang-up handset:  <i>CR LED</i> lights while coin relay operates [if test OK—skip test (h)].	Proceed to Step (h)
(h) Set <i>Coin Control Margin</i> switch to <b>off</b> and retest:  <i>CR LED</i> lights while coin relay operates. [If this test passes and test (g) failed, refer to test desk for loop and ground resistance measurements.] Set <i>Coin Control Margin</i> to <b>off</b> .	B 6
(i) Lift handset off-hook, dial a busy or charged number and hang up before answer:	
• - <i>CP LED</i> lights (failure indicates CO failure—refer to test desk).	
(j) Lift handset off-hook, dial a busy number. After busy signal is heard, hang up handset:	
• + <i>CP LED</i> lights—failure indicates CO failure—refer to test desk.	
(k) To ensure a completely operational coin telephone set, proceed with Steps 4, 5, 6, 7, and 8 of the <i>Eight Step Coin Station Routine</i> . Use the coin crafts' test set for coin relay timing as discussed in paragraph 3.06.	

**3.05 Coin Telephone Testing and Timing Independent of CO**—For this test,

craftsperson will have to know coin telephone type and type operation (coin first or dial tone first) it is wired for. Telephone tests include test of dial, sidetone, totalizer, T1 rate contact, SCR and zener diode, and oscillator. Table and Step No. refer to corresponding entries in Section 506-900-503 and only coin telephone set related "Possible Cause" and "Remedial Action" entries apply. These instructions apply when there is **no** interaction

with the central office, ie, the coin station is being driven by the test set.

**DANGER: There are high voltages on test leads when COIN RELAY OPERATE switch is depressed. KEEP HANDS CLEAR.**

- (1) Set coin telephone and coin crafts' test set up as follows:
  - (a) Remove coin telephone front cover and install P11C patch cord or hang cover on KS-20950, L2 cover parking tool.
  - (b) Disconnect tip and ring of line at TB-1 of coin telephone set.
  - (c) Connect test set leads per Fig. 2.
  - (d) All OFF/ON SWITCHES in OFF position except POWER switch.
  - (e) Depress BATTERY CHECK switch:
    - BATTERY CHECK LED should light.
  - (f) Set COIN RELAY BATTERY switch to ON:
    - NEON lamp next to COIN RELAY OPERATE switch should light after approximately 12 seconds.
  - (g) Set CR (coin return)—TIME/CC (coin collect) switch to CR-TIME.
  - (h) -48/+48 battery switch to -48.
  - (i) Set LOOP BATTERY switch to ON.
  - (j) Proceed as in (2), (3), (4), or (5).
- (2) COIN FIRST OPERATION WITH 1A, 2A, 1C OR 2C COIN TELEPHONES

**Note:** Bullet (•) indicates **Test OK** action, if failure refer to table and step in Section 506-900-503.

ACTION	TABLE STEP
(a) Handset on-hook—deposit 35 cents:	
• Totalizer steps back—beep tones are heard from test set.	A 5

ACTION	TABLE	STEP	(3) DIAL TONE FIRST OPERATION WITH 1C OR 2C SETS
(b) Return money by depressing <b>Coin Relay Operate</b> switch:			
• Coin relay operates—money returned.	A	5	<b>ACTION</b>
(c) Handset off-hook—set <b>Loop Battery</b> switch to <b>Off</b> —deposit nickel less than initial rate. Set <b>Loop Battery</b> switch to <b>On</b> :			<b>TABLE STEP</b>
• Totalizer does <b>not</b> step back—no beep tones heard.	A	7	(a) Handset off-hook—deposit 35 cents:
(d) Hang up handset:			• Totalizer steps back—beep tones are heard. B 5
• Totalizer steps back—beep tones are heard.	A	6	(b) Handset on-hook—return money by depressing <b>Coin Relay Operate</b> switch:
(e) Handset off-hook—operate dial:			• Money returns. B 6
• Clicks/T-T signals are not heard—sidetone is present in handset.	A	6	(c) Handset off-hook—deposit nickel less than initial rate:
(f) Return money with <b>Coin Relay Operate</b> switch. Set <b>Loop Battery</b> switch to <b>Off</b> —Deposit initial rate—set <b>Loop Battery</b> switch <b>On</b> :			• Totalizer does not step back—no beep tones are heard. B 7
• Totalizer steps back—beep tones are heard.	A	8,9	(d) Operate Dial:
(g) Operate dial:			• Clicks/T-T signals are heard in test set. B 7
• Clicks/T-T signals are heard in test set.	A	8,9	(e) Handset on-hook:
(h) Set -48/+48 switch to +48—operate T-T dial (this test does not apply to 1A coin sets):			• Totalizer steps back—beep tones are heard. B 8
• T-T signals not generated—sidetone is present in handset.	A	8,9	(f) Return money by depressing <b>Coin Relay Operate</b> switch†take headset off-hook—set -48/+48 switch to +48—deposit nickel:
(i) Depress <b>Coin Relay Operate</b> switch to return money.			• Totalizer steps back—beep tones are heard. B 12
(j) All <b>Off/On</b> switches to <b>Off</b> . -48/+48 switch to -48.			(g) With -48/+48 switch still in +48 position—operate T-T dial:
(k) Disconnect test set and restore CO connections to coin set.			• C-type sets equipped with polarity guard—TT signals are heard.
			• C-type sets not equipped with polarity guard—TT signals are not heard.
			(h) All <b>off/on</b> switches to <b>off</b> —-48/+48 switch to -48.

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ACTION	TABLE	STEP	ACTION	TABLE	STEP
(i) Disconnect test set and restore CO connections to coin set.			(c) Set -48/+48 switch to +48 and deposit initial rate:		
(4) DIAL TONE FIRST OPERATION WITH 1D OR 2D SETS			• Totalizer does not step back—in a 1E1 set equipped with a 51A hopper, a click is heard in test set speaker. If set is equipped with a 50A hopper, operate coin trap by hand and a click is heard in test set speaker.	E	14,15,17
ACTION	TABLE	STEP			
(a) Handset off-hook—deposit 35 cents:			(d) Handset on-hook:		
• Series of rapid beeps from test set.	B	12	• Totalizer steps back—beep tones are heard.	E	14,17
(b) Depress and <b>hold</b> T-T dial button or hold rotary dial at off-normal position (during wind-up portion of dial cycle)—deposit dime:			(e) Set -48/+48 switch to -48 and deposit initial rate:		
• Coin signal beep tones are <b>not</b> heard.	B	12	• Totalizer steps back—beep tones are heard.	E	14,17
(c) Release dial:			(f) Retrieve coins.	E	16
• Two beep tones are generated when dial returns to normal.	B	12	(g) All OFF/ON switches to OFF.		
(d) -48/+48 switch to +48—deposit nickel:			(h) Disconnect test set and restore CO connections to coin set.		
• Beep tone is heard.	B	12	<b>3.06 Coin Relay Timing Test:</b> For this test, CO may be disconnected by removing front cover plug P1:		
(e) All <b>off/on</b> switches to <b>off</b> : -48/+48 switch to -48.			(a) Connect test set leads—green to No. 3 terminal of coin relay, yellow to ground terminal of coin relay, black to the top of coin relay resistor (Fig. 3).		
(f) Disconnect test set and restore CO connections to coin set.			(b) Set test set <b>Power</b> switch to <b>On</b> .		
(5) DIAL POST PAY OPERATION WITH 1E1 OR 1E3 SETS			(c) Depress <b>Battery Check</b> switch:		
<b>Note:</b> Insert KS-14995, L3 tool between coin chute and hopper to prevent loss of coins.			• <b>Battery Check</b> LED should light.		
ACTION	TABLE	STEP	(d) Set <b>Coin Relay Battery</b> switch to <b>On</b> :		
(a) Handset off-hook:			• Neon lamp should light after approximately 12 seconds.		
• Sidetone present in handset.	E	4	(e) Set <b>CR-Time/CC</b> switch to the <b>CR-Time</b> position.		
(b) Rotate and release dial:					
• Clicks heard in test set.	E	5	(f) Trip coin relay hopper trigger.		



- (g) Press and hold **Coin Relay Operate switch**—[after neon lamp Step (d) is lighted];
- Observe **Fast** and **Slow** LEDs and refer to Table A of this section for action required.
- (h) Unfasten and lift out P-15E730 coin return chute assembly if not already done (single-slot chute).
- (i) Set **CR-TIME/CC** switch to CC.
- (j) Depress **Coin Relay Operate** switch:
- Observe if coin vane in hopper moves to the **collect** position.
- (k) Reassemble disconnected components.
- (l) All **OFF/ON** switches to **OFF** position **CR-TIME/CC** switch to **CR-TIME**.
- (m) Disconnect test set and restore **P1** plug.

#### 4. MAINTENANCE AND ORDERING

**4.01** Under normal use, the KS-21250, L2 test set should not require repair or maintenance except battery replacement.

**4.02 Battery Replacement:** Turn captive locking screw counterclockwise and lower hinged battery compartment door. Pull plastic latch forward and down and slide battery cartridge

completely out. Replace batteries taking care to observe polarity as marked on battery cartridge. Restore cartridge to compartment taking care to observe guide tracks on top and bottom of battery compartment. Engage plastic latch and seat firmly. Close door and lock with captive screw. Replacement batteries for the KS-21250, L2 test set are:

- KS-14368 1.5V AA-type

or

- For operation below 0°F—Eveready No. E91, or Ray-O-Vac No. 815 batteries.

**4.03** The KS-21250, L2 Coin Crafts' Test Set comes complete with carrying strap, cover, and instruction cards. Only the batteries must be ordered separately.

**4.04** If necessary, new replacement carrying strap, test set cover, and instruction cards may be ordered by KS list number.

#### (a) ORDER AS FOLLOWS

- KS-21250, L2—Coin Crafts' Test Set
- KS-21250, L5—Instruction Cards
- KS-21250, L6—Test Set Cover
- KS-21250, L7—Carrying Strap.

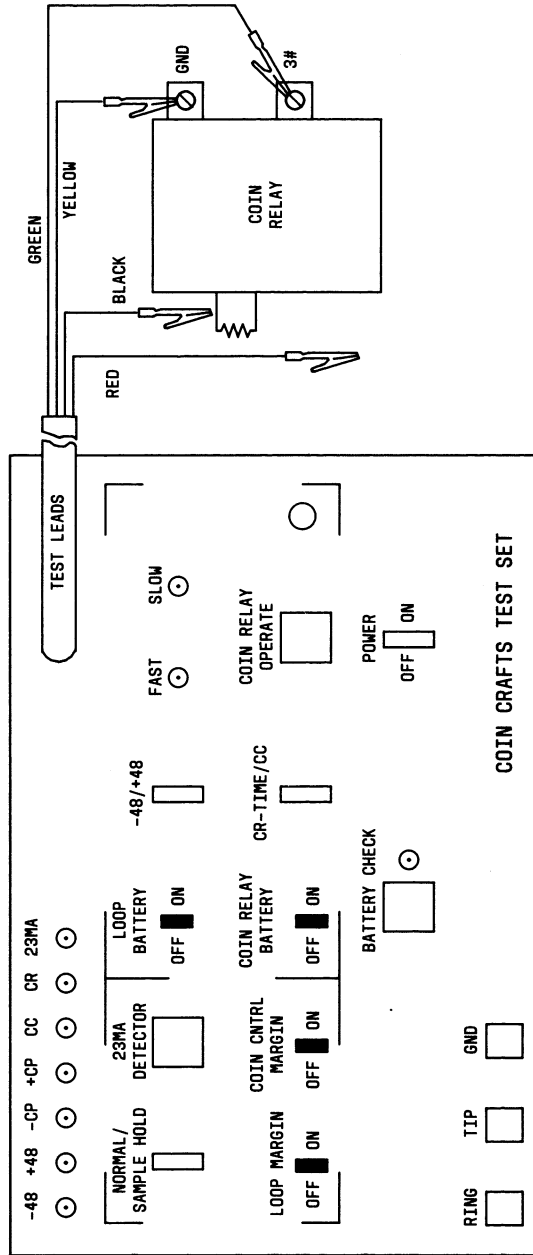


Fig. 3—Test Lead Set-up for Coin Relay Timing

TABLE A

BELOW -20°F	-20°F TO 20°F	20°F TO 60°F	60°F TO 100°F	ABOVE 100°F
Test set indicator lights will indicate SLOW after adjustment.				-FAST- then 1/4-turn CCW
		-SLOW- then 1/4-turn CW		-FAST- then 1/2-turn CCW
-SLOW- then 1/2-turn CCW	-SLOW- then 1/4-turn CCW			

*Note:* Adjust coin relay timing screw in 1/4-turn increments until the KS-21250, L2 test set indicates only FAST or SLOW as specified for the temperature range at time of adjustment. Then turn the relay timing screw clockwise (CW) or counterclockwise (CCW) the specified amount as indicated on the chart.

## PUBLIC SERVICES STATION BONDING AND GROUNDING

### 1. GENERAL

**1.01** This section is intended to provide general background knowledge on protection, grounding and bonding applicable to Public Services Station installations. More detailed coverage of related equipment and procedure can be found in Sections 876-300-100—Electrical Protection-Stations and Customer Premises Equipment, 460-100-400—Station Protection and Grounds, and 508-100-100—Grounding and Wiring Requirements Public Telephone Enclosures.

**1.02** Whenever this section is reissued, the reasons for reissue will be listed in this paragraph.

**1.03** The National Electrical Code (NEC) requirements for protecting communication circuits is defined in Article 800 of the NEC. The NEC requirements are primarily based on power exposure and only incidently on lightning exposure. Bell System requirements, however, must consider all sources of electrical disturbances or exposure, including lightning, power contact, power induction and ground potential rise, and must assure that adequate protection is provided. Therefore, all Public Services Station installations shall be grounded and protected in accordance with this practice unless otherwise specified by local instructions.

**1.04 Definitions:** The terms listed below are defined here with respect to their specific usage in this section.

- (a) **Ground**—The arbitrary zero reference point for an electrical potential. A large conducting body, such as the earth, used as a common return for an electrical circuit.
- (b) **Building Ground**—An acceptable ground connection provided by building construction steel in contact with earth ground or a bare copper wire encased in concrete building footing.

(c) **Ring Ground**—A ground ring encircling a building or structure in direct contact with the earth at a depth below earth surface not less than 2-1/2 feet, consisting of at least 20 feet of bare copper conductor not smaller than No. 2 AWG.

(d) **Water Pipe Ground**—An acceptable ground connection provided by a continuous buried **metal** pipe with at least 10 feet of length in moist earth and carrying water into the building where the station is installed.

(e) **Multigrounded Neutral (MGN) System**  
—A grounded commercial power distribution system in which the neutral wire is grounded at frequent intervals along the distribution system.

(f) **Entrance Conduit**—The conduit which carries the power service cable from the point of building attachment to the service entrance equipment.

(g) **Branch Conduit**—A conduit which carries branch power circuit wiring from the service entrance box to outlet points or secondary service boxes within the building (**DO NOT USE FOR PROTECTOR OR SIGNAL GROUND**).

(h) **Potential Equalization**—A means for maintaining two or more circuit points at approximately the same potential: usually achieved by bonding points or by providing a single connection point for all circuits involved.

### 2. GROUND SELECTION FOR STATION PROTECTORS

**2.01** Selection of an acceptable point for connecting the protector ground wire is of the utmost importance in providing an acceptable station installation. The protector ground serves as the primary Public Services Station signal ground reference point, which should be 50 ohms or less. The flow chart in Fig. 1 is designed to help the installer identify the

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HOW TO SELECT AN APPROVED GROUND FOR PUBLIC SERVICE STATION PROTECTORS

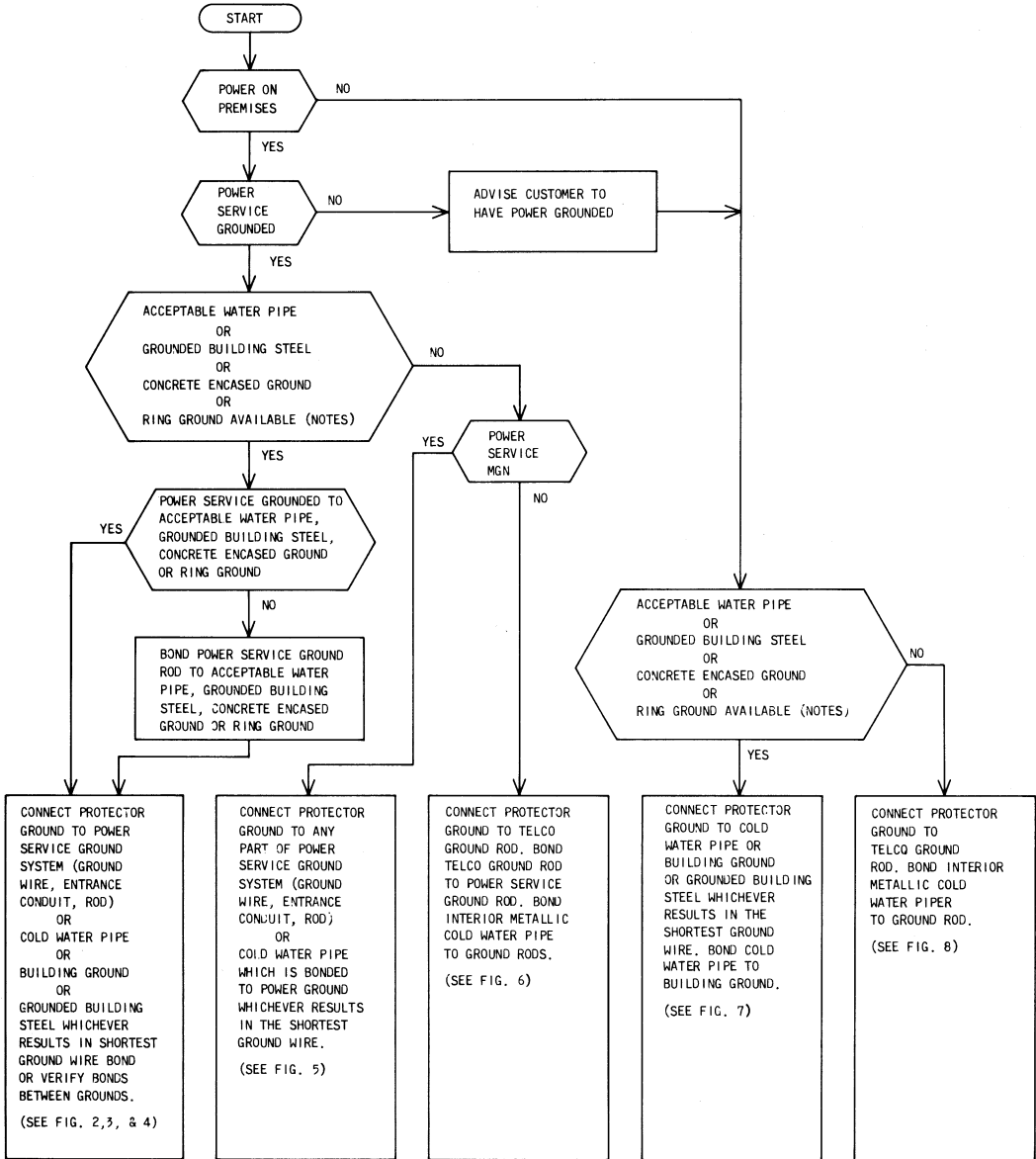


Fig. 1—Selecting An Approved Ground (Sheet 1 of 2)

NOTES:

1. ACCEPTABLE WATER PIPE - A METAL UNDERGROUND WATER PIPE IN DIRECT CONTACT WITH THE EARTH FOR 10 FEET OR MORE AND ELECTRICALLY CONTINUOUS (OR MADE ELECTRICALLY CONTINUOUS BY BONDING AROUND INSULATING JOINTS, PLASTIC PIPE OR PLASTIC WATER METERS) TO THE POINT WHERE THE PROTECTOR GROUND WIRE IS CONNECTED.
2. CONCRETE ENCASED GROUND - AN ELECTRODE ENCASED BY AT LEAST 2 INCHES OF CONCRETE, LOCATED WITHIN AND NEAR THE BOTTOM OF A CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH THE EARTH, CONSISTING OF AT LEAST 20 FEET OF ONE OR MORE STEEL REINFORCING BARS OR RODS OF NOT LESS THAN 1/2-INCH DIAMETER, OR CONSISTING OF AT LEAST 20 FEET OF BARE SOLID COPPER CONDUCTOR NOT SMALLER THAN NO. 4 AWG.
3. RING GROUND - A GROUND RING ENCIRCLING A BUILDING OR STRUCTURE IN DIRECT CONTACT WITH THE EARTH AT A DEPTH BELOW EARTH SURFACE NOT LESS THAN 2 1/2 FEET, CONSISTING OF AT LEAST 20 FEET OF BARE COPPER CONDUCTOR NOT SMALLER THAN NO. 2 AWG.

**Fig. 1—Selecting An Approved Ground (Sheet 2 of 2)**

best choice of a ground available in most situations. The decision blocks contain questions regarding the installation conditions, the responses to which will lead to selection of an acceptable ground. The flow chart should be followed until the last block in the path is reached. The reference notes and figures provide additional information and illustrations of actual installation procedures. All protector ground clamps should be tagged with Form E3013B, also the ground location shall be noted and placed in the station. For clarification, form E3013B has been left out of Fig. 2 through 8.

**2.02** The protector shall be located in, on, or immediately adjacent to the structure or building served and as close as practicable to the point at which the exposed conductors enter or attach: all Public Services Station Protectors shall be securely covered if within 6 feet from Public Services Station, extension, or extension bell.

**2.03** Public Services Enclosures: when the station protector is located inside of or in the immediate vicinity of the enclosure, the station protector ground terminal must be bonded to the telephone enclosure metal structure through the bonding lug provided. The ground lead must be no smaller than No. 12 AWG wire.

**Note:** The grounding conductor (third-wire of an electrical circuit) must never be used as the protector or signal ground. Refer to Section 508-100-100 covering Enclosure Bonding and Grounding in detail.

**2.04** Ground wire capacity for protectors is as shown in Table A.

**2.05** Summary of requirements for adequate Public Services Station protection and signal grounding is as follows:

- Use gas tube protection on all Public Service lines
- Select best available system ground for protector ground connection (use flow chart Fig. 1)
- Bond power ground and protector ground
- Route ground wire over shortest possible path

**TABLE A**

**GROUND WIRE CAPACITY (SEE NOTES)**

WIRE SIZE NUMBER	NUMBER OF PROTECTED CIRCUITS FUSELESS
12	2
10	6
6	7 or More

**Note 1:** Wire between protectors shall be same size as wire between protector and grounding electrode.

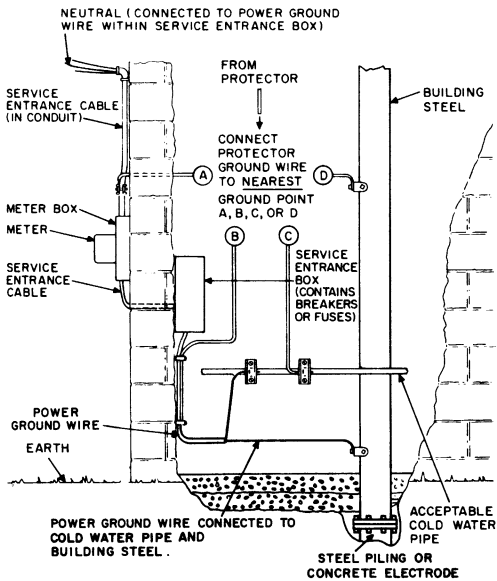
**Note 2:** All fuseless protectors used for Public Service shall be equipped with UL Listed gas tube protectors, equipped with fusible disc (11A1A, 11B1A or approved equivalent).

**Note 3:** All separate protector and power grounds must be bonded.

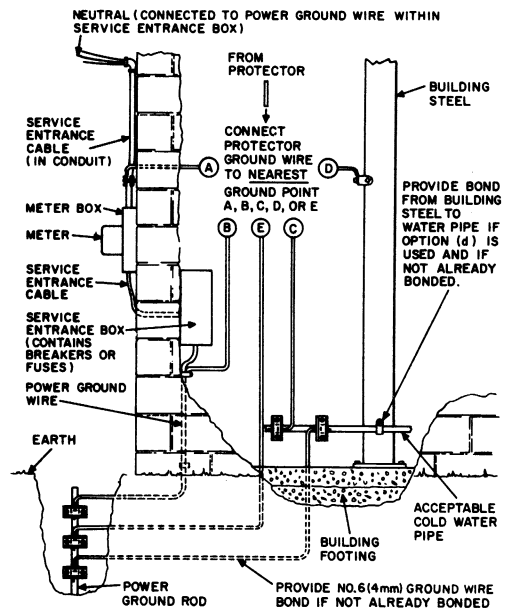
- Do not splice ground wire
- Do not use third-wire of an electrical circuit for protector ground
- All protectors located within 6 feet of station must be enclosed
- Do not use sprinkler system, gas, or hot water pipes for ground
- Use UL listed gas tube protectors equipped with a fusible disc (no applique units)
- Tag all protector grounds with Form E3013B

**Note:** For clarification Form E3013B has been left out of Fig. 2 through 8.

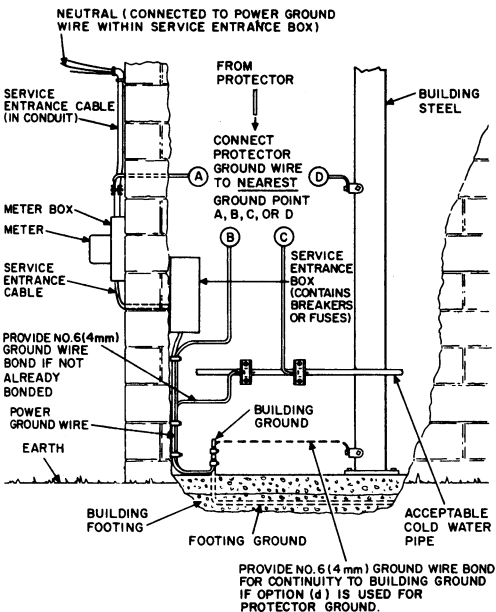
- Place a tag in station set showing location of protector and ground
- All metal enclosures equipped with commercial power must be connected to power ground
- All metal enclosures without commercial power must be grounded with a No. 12 AWG or larger ground wire.



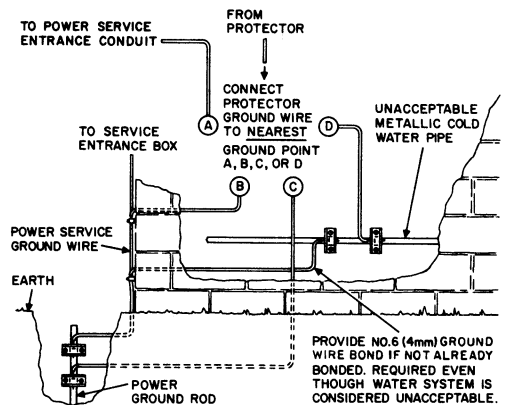
**Fig. 2—Acceptable Water System or Building Ground—Power Service Grounded to Cold Water Pipe and Grounded Building Steel**



**Fig. 4—Acceptable Water System—MGN Power Service Grounded to Ground Rod**

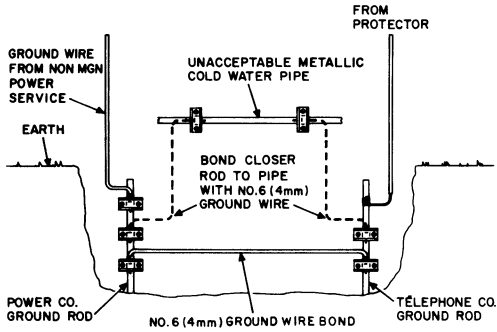


**Fig. 3—Acceptable Water System or Building Ground—Power Service Grounded to Building Footing Ground**

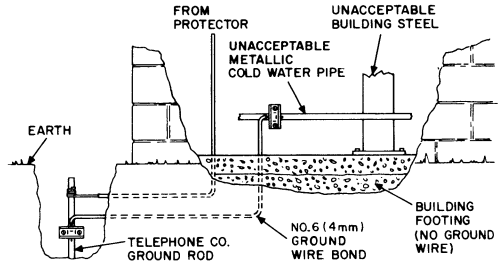


**Fig. 5—Acceptable Water System or Building Ground Not Available—MGN Power Service Grounded to Ground Rod**

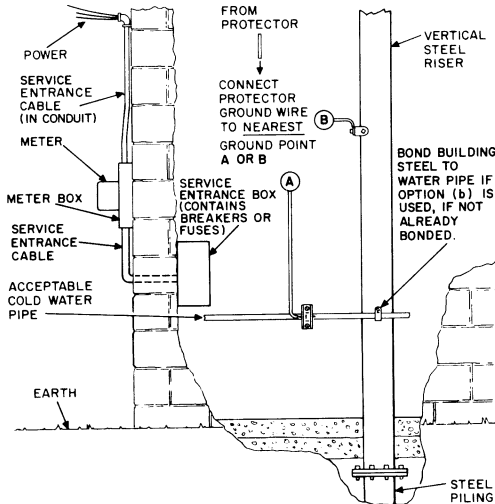




**Fig. 6—Acceptable Water System or Building Ground Not Available—Non-MGN Power Service Grounded to Ground Rod**



**Fig. 8—Acceptable Water System or Building Ground Not Available—Power Service Not Grounded or No Power on Premises**



**Fig. 7—Acceptable Water System or Building Ground—Power Service Not Grounded or No Power on Premises**

## COIN TELEPHONE STATIONS BACKBOARDS

### 1. GENERAL

1.01 This section provides identification and installation information for coin telephone set backboards and through-wall fasteners.

1.02 This section is reissued to:

- Delete information on all special purpose backboards
- Add information on KS-21676, List 2 backboard and KS-21676, List 3 security plate
- Show 178A backboard as being available in Moss Green (-51)
- Include information on through wall fasteners and universal mounting plate
- Add 269A adapter
- Add Table to provide proper mounting height specifications

1.03 Information on special purpose backboards, previously contained in this section, can be found in the respective booth or shelf sections in Division 508.

### 2. MULTIUSE BACKBOARDS

- 2.01 For design features, refer to (Fig. 1 through 7).
- 2.02 For mounting height specifications refer to Table A.
- 2.03 Refer to Table B for proper fastening device and quantity to be used for each backboard dependent upon:

- Type of surface

- Strength and rigidity of base material



♦ **Backboards must be mounted securely using the number and type of fasteners specified. Avoid mounting backboards on uneven surface to prevent distortion or fracture when fasteners are securely tightened. Distribute fasteners as evenly as possible to ensure the most secure mounting.** ♦

2.04 Refer to Division 080 for method of installing fasteners.

2.05 Backboards located outdoors should be secured with rustproof fasteners, such as galvanized screws or bolts.

2.06 Consult supervisor and obtain instructions before proceeding to mount a backboard on a finely finished surface, such as glazed tile or marble, that would be expensive to repair.

### 3. THROUGH WALL FASTENERS

3.01 Through wall fasteners are intended to be used for additional security when securing a backboard to a wall in "High-Risk" locations such as laundromats, garages, rooming house hallways, construction shanties, amusement parks, and other places where the phone is not under the scrutiny of the proprietor or cannot be seen easily by the general public.



**Before installing a through-wall fastener, inform the subscriber of the requirement to drill through the wall. If the subscriber objects, and the set requires the security, refer the matter to your supervisor. DO NOT INSTALL A SET WHERE SECURITY IS IN QUESTION.** ♦

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**3.02** †Two types of through wall fasteners are available and either type may be used depending on local requirements.

(1) **Twin-Bolt Fastener (Fig. 8):**

(a) This fastener will accommodate a mounting surface which can vary in thickness from 4 inches to 7-5/8 inches. Due to the design of the bolt and threaded shaft, it is not necessary to cut the bolts to different lengths for varying thicknesses of walls. Where thicker walls are encountered, longer bolts should be obtained.

(b) EL No. 4325, dated December 8, 1975, provided a representative listing of commercial vendors who produce these materials.

(c) Install twin-bolt fastener as follows:

(1) Install the backboard in the normal manner except reserve the two center mounting holes (Fig. 9).

**Note:** Where possible, straddle a stud or other wall supporting structure with the fasteners so that maximum strength is obtained (Fig. 10).

(2) Drill two 3/8-inch diameter holes through the wall or other supporting surface using the backboard as a template.

**Note:** Extreme care must be exercised to drill the holes perpendicular to the wall, otherwise, it may not be possible to insert the fastener into the holes from other side of wall.

(3) From back side of wall, enlarge the holes to 3/4-inch diameter to a depth of 4-1/2 inches.

(4) Install the shaft nut assembly by placing it into wall from back side. A small hole is provided in center of plate so it can be secured with a nail until bolts are installed.

(5) Install the two slotted hex-head bolts through backboard into the shaft nuts

and tighten securely. Use a large screwdriver or an appropriate size wrench.

(2) **Long-Bolt Fastener (Fig. 11) and Universal Mounting Plate (Fig. 12):**

(a) The long bolt will accommodate a wall surface up to 17 inches thick.

(b) This bolt can be used with or without the universal mounting plate (Fig. 12). When the universal mounting plate is used with two long bolts the same effect is obtained as using the twin-bolt fastener (Fig. 8).

(c) For ordering information on the long-bolt type fastener, refer to EL No. 4325. The universal mounting plate may have to be fabricated locally while a source of supply is established.

(d) Install long-bolt fastener as follows:

(1) Install the 174A backboard in the normal manner except reserve the mounting holes (Fig. 9) which are to be used for the long-bolt fasteners.

**Note:** Where possible, install bolts on each side of a stud or other wall supporting structure, making use of universal mounting plate, so that maximum security is obtained.

(2) For each long bolt, drill a 3/8-inch diameter hole through the wall or other supporting surface using the backboard as a template.

**Note:** The drill should be lined up carefully while drilling to avoid uneven pressure on the cup head of the bolts when they are installed.

(3) Install the bolts from back side of wall, through the universal mounting plate, if applicable, and secure backboard on front side with the hex nuts provided.

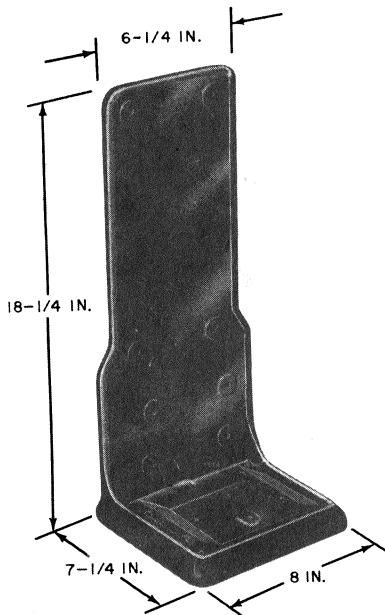
**Note:** If a universal mounting plate is used, it can be secured with a nail until bolts are secured.

(4) When an outside wall is involved, apply a plastic duct seal to the cup portion

of bolt heads. After backboard is secure, remove excess duct seal from around bolt heads.

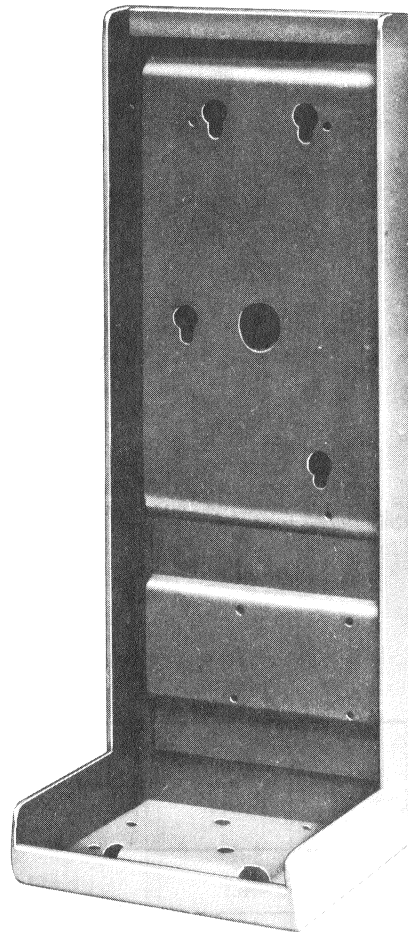
(5) Cut off excess length of bolt flush with hex nut using a hacksaw with the blade turned 90 degrees.

(6) Using a cold chisel or center punch, score the bolt threads at hex nut to prevent nut from backing loose. ♦

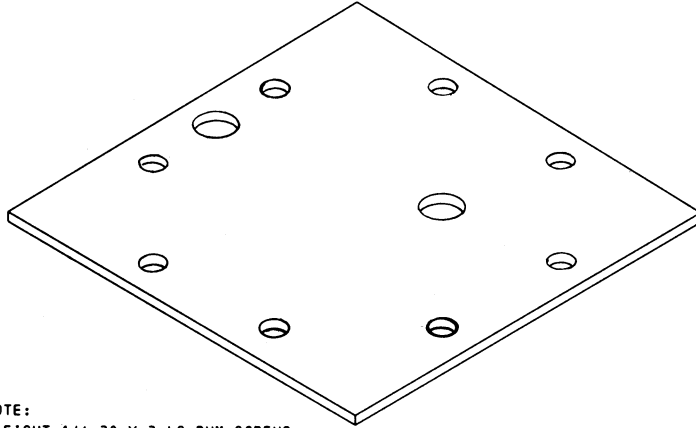


- METAL BLACK
- FOR MOUNTING ALL 200-TYPE COIN COLLECTORS (EXCEPT PANEL TYPE) ON HORIZONTAL SURFACES
- SCREWS PROVIDED FOR MOUNTING COIN COLLECTOR

**Fig. 1 — 139A-03 (MD) Backboard**



**Fig. 2 — KS-21676, List 2 Backboard ♦**



NOTE:  
 EIGHT 1/4-20 X 2 LG RHM SCREWS  
 AND EIGHT 1/4-IN LOCK WASHERS  
 FURNISHED WITH PLATE.

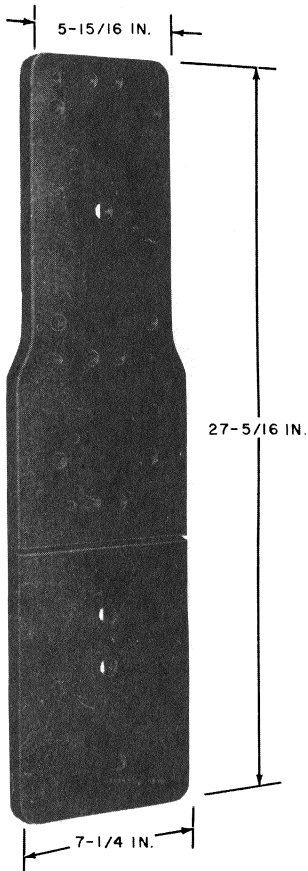
Fig. 3—KS-21676, List 3 Security Plate

TABLE A

HEIGHT REQUIREMENTS

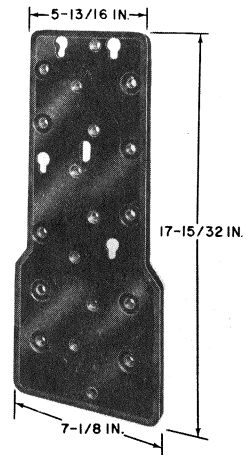
BACK-BOARD	COIN TEL SET	DISTANCE FROM TOP OF BACKBOARD TO FLOOR TO FLOOR	
		COIN SLOT HEIGHT AT 66 INCHES (STANDARD HEIGHT)	COIN SLOT HEIGHT AT 54 INCHES (UNIVERSAL HEIGHT)
178A	Single Slot	67-1/4 inches	55-1/4 inches
174A (MD)	Single* Slot	65 inches	53 inches
	Multi-Slot	65-1/2 inches	53-1/2 inches
144D	Multi-Slot	65-1/2 inches	53-1/2 inches

\* It is not recommended that a 174A backboard be used for a new single slot set installation. When installing a single slot set on an existing 174A backboard, use a 269A adapter (Fig. 7) plus short thread security studs with 3/8-inch long shoulders 834080616 (P-40Y061).



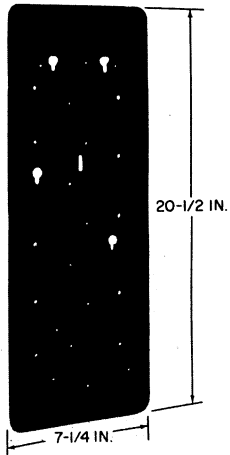
- WOOD, BLACK
- FOR MOUNTING ALL 200-TYPE COIN COLLECTORS (EXCEPT PANEL TYPE) AND A SUBSCRIBER SET ON A WALL AS ONE UNIT
- PROVIDED WITH A SAW SLOT SO BOTTOM PORTION CAN BE CUT OFF WHEN SUBSCRIBER SET IS NOT REQUIRED
- HOLES FOR MOUNTING COIN COLLECTORS ARE PROVIDED WITH 1/4-20 THREADED INSERTS
- REPLACES 144C BACKBOARD

Fig. 4—144D Backboard



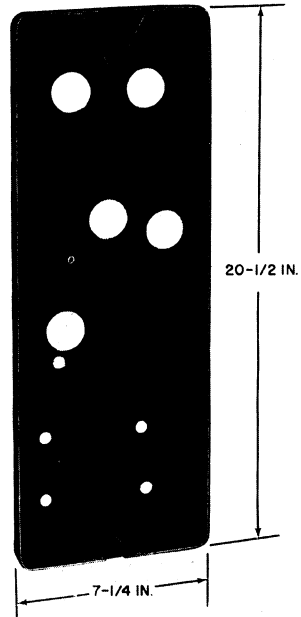
- ALUMINUM ALLOY, BLACK
- FOR MOUNTING ALL 200-TYPE COIN COLLECTORS (EXCEPT PANEL TYPE) ON A WALL
- WILL MOUNT A 1-TYPE SET WHEN 269A BEZEL ADAPTER IS USED

Fig. 5—174A (MD) Backboard



- ALUMINUM ALLOY
- FOR MOUNTING 1-TYPE COIN TELEPHONE SET ON A WALL
- AVAILABLE IN BLACK (-03) AND MOSS GREEN (-51)

Fig. 6—178A Backboard



- STEEL
- FOR MOUNTING OVER A 174A BACKBOARD WHEN 1-TYPE SET IS USED TO REPLACE A MULTISLOT SET
- SECURITY STUDS WITH 3/8-IN LONG SHOULDER AND SHORT THREADS ARE REQUIRED
- AVAILABLE IN BLACK (-03) AND MOSS GREEN (-51)

Fig. 7—269A Bezel Adapter

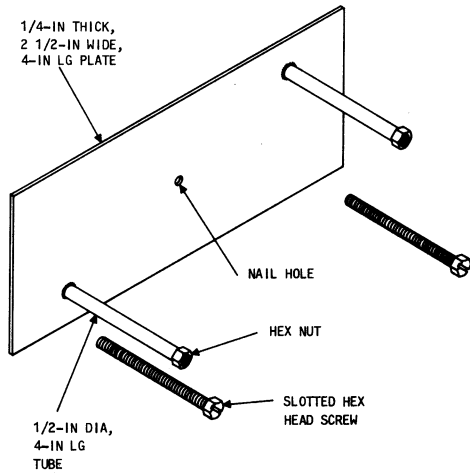
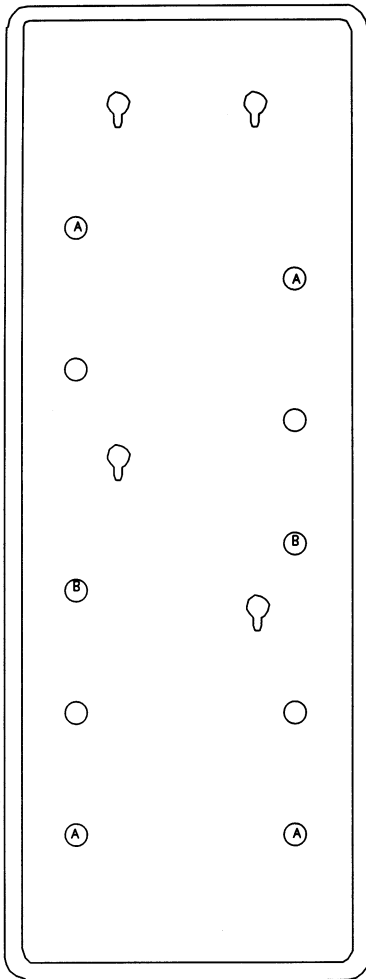


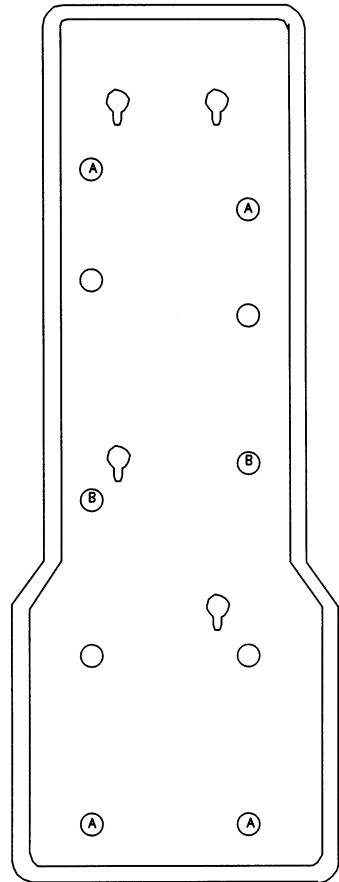
Fig. 8—Twin-Bolt Fastener





NO. 178A BACKBOARD

NOTE:  
USE HOLES "A" WHEN  
4 THROUGH BOLT  
FASTENERS ARE  
REQUIRED. USE HOLES  
"B" WHEN TWIN BOLT  
FASTENER OR 2 LONG  
BOLT FASTENERS ARE  
REQUIRED



NO. 174A BACKBOARD

Fig. 9—Backboards Showing Mounting Holes

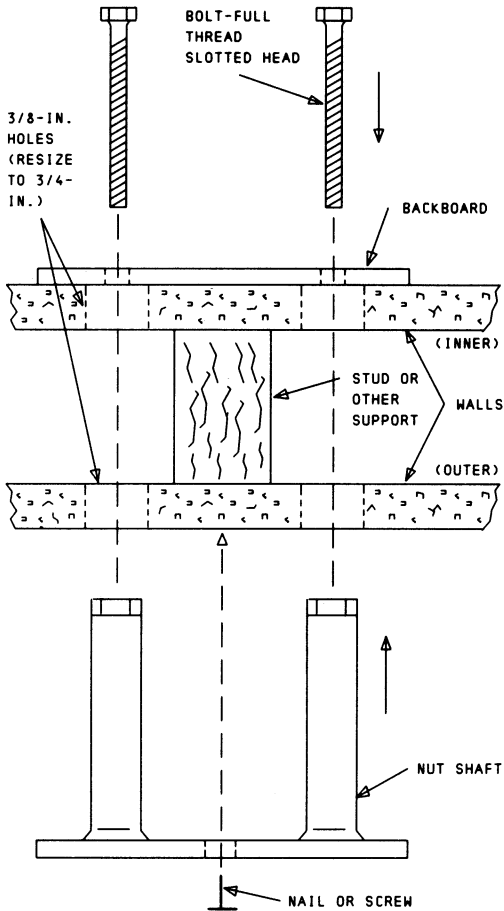


Fig. 10—Twin Bolt Fastener Installation

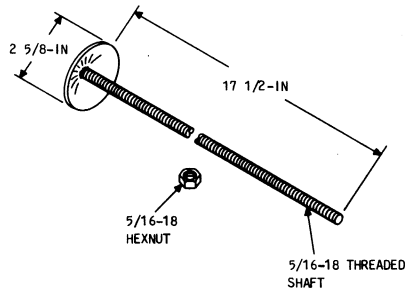


Fig. 11—Long-Bolt Fastener

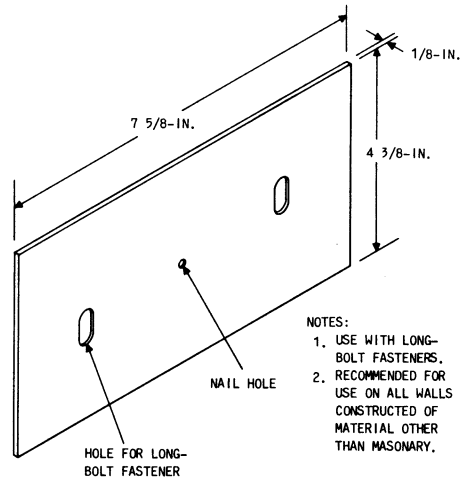


Fig. 12—Universal Mounting Plate

TABLE B-4  
FASTENERS USED IN MOUNTING BACKBOARDS

BACKBOARD TYPE	MOUNTING SURFACES					HOLE SIZE REQUIRED	FASTENERS	
	SOFT-WOOD	HARD-WOOD	MASONRY (CONCRETE, BRICK) (NOTE 1)	PLASTER BOARD AND PLASTER ON LATH (NOTE 2)	PLASTER ON CINDER BLOCK, HOLLOW TILE, METAL LATH		SIZE AND TYPE	QUANTITY (NOTE 3)
139A and KS-21676, List 2 (Note 4)	•					1/8 or No. 30	1-3/4 inch No. 14 FH tapping screw	139A uses 4.
		•				1/2	1-1/4 inch No. 14 FH tapping screw	KS-21676, L1 can use up to 8.
			•				1/4-20 by 1-1/2-inch FH machine screw in 1/4 by 1-1/4-inch expansion shield	
	•					1/8 or No. 30	1-3/4 inch No. 14 FH tapping screw	
144D, 174A, and 178A		•				1/2	1-1/4 inch No. 14 FH tapping screw	7
			•				1/4-20 by 1-1/2-inch FH machine screw in 1/4 by 1-1/4-inch expansion shield	
				•		1/8 or No. 30	1-3/4 inch No. 14 FH tapping screw, secure in stud a minimum of 1 inch	
					•	3/4	1/4- by 4-inch RH toggle bolt (Note 5)	6

Notes:

- When mounting on plastered masonry, install expansion shield below plastered surface by amount equal to thickness of plaster and use 1/2-inch longer machine screw than specified in table.
- When mounting on plasterboard, plaster on lath, etc, fasteners must be embedded in stud at least 1 inch.
- When additional security is required for wall backboards, use through wall fasteners.
- When additional security is required for the KS-21676, List 2, use a KS-21676, List 3 security plate and the hardware furnished with the plate.
- When using toggle bolts, cut off excess length.

COIN TELEPHONE STATIONS  
TOOLS, GAUGES, AND MATERIALS

1. GENERAL

1.01 This section covers the identification and use of those tools, gauges, and materials which may be required, in addition to those normally carried, to properly install, modify, or maintain coin collectors and coin telephone sets.

1.02 This section is reissued to add:

- 216B tool
- 787A tool
- Modified P-248585 release tool

1.03 The items listed in this section must be ordered separately as required.

2. TOOLS

<u>NAME</u>	<u>NO.</u>	<u>FIG.</u>	<u>USE</u>	<u>REMARKS</u>
Tool	139B	1	Leveling coins	Read calibrated scale at top of slider
◆Tool	216B	2	Replace information plate assembly, TOUCH-TONE® dial number card, or terminate conductors on 123A1A protector or similar binding post terminals	Dual purpose wrench: 3/8-inch hexagon socket on one end; 7/16 inch-hexagon socket on other end◆
Tool	265C	3	Burnishing contacts	Consists of a chuck having a rubber handle and a magazine. Chuck will hold any No. 266-type tool. Furnished with three No. 266C and six No. 266E tools
Tool	376A	4	Viewing contacts	A magnifying mirror
Tool	466A	5	Adjusting contact springs	
Tool	528A	6	Cleaning out key slots of locks	Consists of two implements in a leather holder. Each implement consists of a piece of music wire with handle
Tool (2 req'd)	641A	7	To facilitate mounting No. 5 dials	An aligning guide
Tool	710A	8	Removing damaged switch-hooks from corner-mounted coin collectors	A hardened steel bar
Tool	719A	9	Opening of door and face-plate assembly (panel phones); removing cover unit assembly (1A-, 1C-type)	
◆Tool	787A	10	To release dimes jammed in coin chute of single slot sets◆	

## SECTION 506-100-103

<u>NAME</u>	<u>NO.</u>	<u>FIG.</u>	<u>USE</u>	<u>REMARKS</u>
Orange Stick	KS-6320	—	Removing stuck coins; tripping hopper trigger	
Nylon Brush	KS-13786	—	Cleaning coin return	
Brush	KS-14164	—	Cleaning washer reject mechanism	
Tool	KS-14995, List 3	11	Trap and vane release test	
Releaser	KS-16750, L4	12	Removing dial finger wheel; resetting totalizer	
Spring Hook	TP-75503	13	Assembling spring on pull bucket	
Release Tool	P-248585	14	Releasing 27A "key snatcher" lock	
	◆ Modified P-248585	15	Releasing 32A "key snatcher" lock◆	
Sash Brush	No. 6	—	General cleaning	
Allen Wrenches	Assorted	—	Adjusting switchhook travel	
Center Punch	—	—	Removing and replacing pull bucket shaft	
Cold Chisel	1/2-in.	—	Removing plastic pull buckets	
Phillips Screw- driver	—	—	Adjusting coin relay	
Spirit Level	—	—	Vertical alignment of coin telephone set	
Spacer	P-12A745	16	Reducing upper housing vertical play	
Spacing Washer	P-297872	—	Reducing switchhook end play	Brass, .438 OD, .297 ID, .010 thk.
Cover Parking Tool	KS-20950, L1	17	To mount cover unit assembly of 1A/1C/1E-type coin telephone set to corner of housing and mounting plate assembly	Permits trouble shooting without use of P11C cord

<u>NAME</u>	<u>NO.</u>	<u>FIG.</u>	<u>USE</u>	<u>REMARKS</u>
<b>3. GAUGES</b>				
Feeler Gauges	131A	18	Adjusting armature travel	
Bias Margin Gauge	146A	19	Coin relay bias margin test	<b>For use on 2-coil coin relay</b>
Bias Margin Gauge	146B	20	Coin relay bias margin test	For use on single-coil relay
Gauge	147A	21	Checking the restoring capability and contact pressure of the coin relay in prepay multislot coin collectors	When mounted on the horizontal portion of the operating arm in front of the stop lugs by the full depth of the slot in the long end, the gauge will exert a torque of $70 \pm 2$ gram-inches on the operating arm in a coin relay.  When mounted on the switch lever by the three slots in the side, the gauge will exert torques on the switch lever corresponding to pressures of min. 3, min. 5, and max. 7 grams, respectively, on the spring contacts
Gauge	178A	22	Setting the position of the operating arm on coin collectors	Use with coin collectors having shaft-type switchhooks
Gauge	178B	22	Same as 178A	Use with coin collectors having pin-type switchhooks
<b>4. CORDS</b>				
Cord	P10B	23	Maintenance or testing of 236G and 1234G coin collectors with upper housing removed	
Cord	P11C	24	Maintenance or testing of single slot coin-telephone sets with cover unit assembly removed or door and faceplate assembly opened (Also use with 235G and 1235G coin collectors)	

## SECTION 506-100-103

<u>NAME</u>	<u>NO.</u>	<u>FIG.</u>	<u>USE</u>	<u>REMARKS</u>
Cord	P5M	25	Maintenance or testing of 200-type coin collectors with upper housing removed	
<b>5. MATERIALS</b>				
Aluminum Oxide Cloth	No. 320	—	Smoothing rough spots on fork slot on 2-coil relay	
Antiseize Compound	KS-19094, L1 or L2	—	Lock and screw threads	L1 is pre-mixed; L2 must be mixed on site.
Cotton Twill Cloth	KS-2423	—	General cleaning	
Form	E-4914	26	Out-of-service label	Packaged in books of 5
Form	KS-7991	27	Out-of-service sign	
Grease	KS-14774, L1	—	General lubrication	
Lead Pencil	2B or Softer	—	Lubricating switchhook and coin release mechanism	
Paper	KS-16601, L1	—	Cleaning	
Paper Clip	—	—	Dial shorting	
Petroleum Spirits	KS-7860	—	Cleaning	<i>Warning: Highly flammable. Use safety precautions while using.</i>
Pipe Cleaners	—	—	Cleaning coin gauges	
Sealing Compound	6824	—	Sealing bias adjustment screw on coin relay	
Tinnerman Clips	C-29313-012-445 or C-3412-020-38	—	Upper and lower housing ground clips	

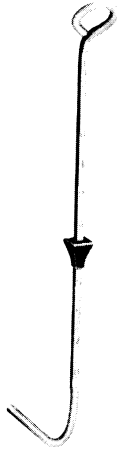


Fig. 1 - 139B Tool

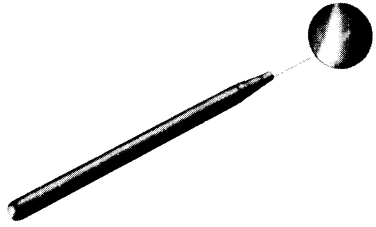


Fig. 4 - 376A Tool

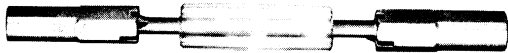


Fig. 2 - 216B Tool

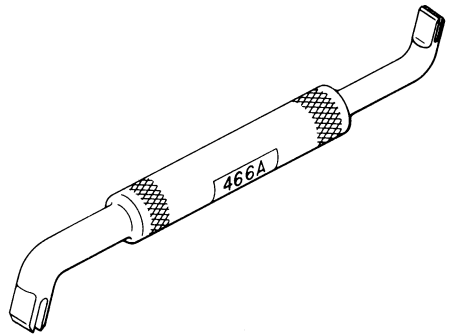


Fig. 5 - 466A Tool

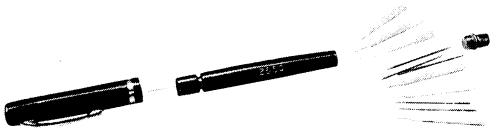


Fig. 3 - 265C Tool

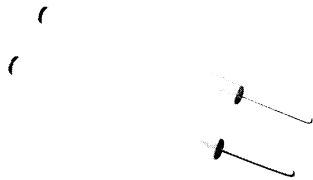


Fig. 6 - 528A Tool



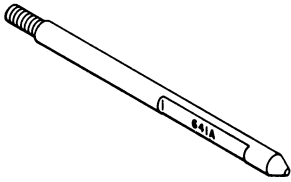


Fig. 7 - 641A Tool

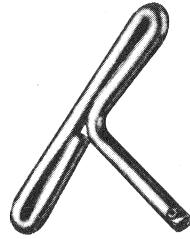


Fig. 9 - 719A Tool

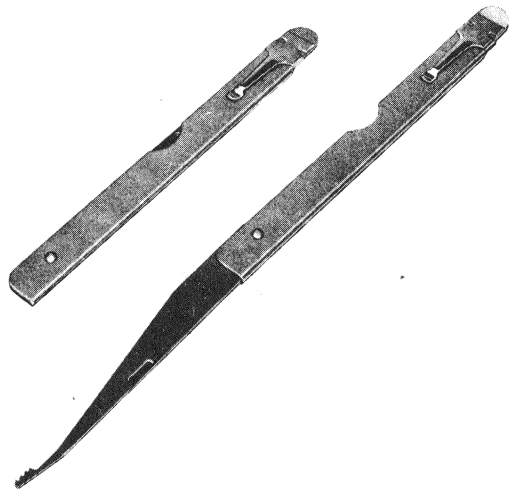
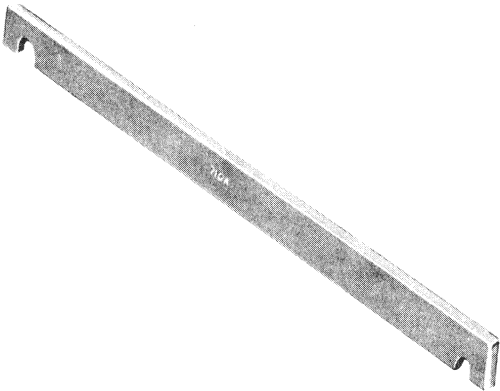


Fig. 10 - 787A Tool

MULTISLOT COIN COLLECTOR MAINTENANCE	SINGLE SLOT COIN TELEPHONE SET MAINTENANCE
INSPECT EXTERIOR Handset, Coins, Dial Cards: Instruction & No Coin Release, Return Bucket	INSPECT EXTERIOR Handset, Coins, Dial Cards: Instruction & No Coin Release, Return Bucket
COIN TESTS 5c, 10c, 25c Dial Tone, Coin Return Trouble Analysis	COIN TESTS 5c, 10c, 25c Dial Tone Coin Return On Hook Coin Return Trouble Analysis
INSPECT INTERIOR Gauge, Connections Security Fasteners Housing Contacts	INSPECT INTERIOR Chute Assembly Connections, Plugs Switchhook
COIN CHUTE Dirt, Corrosion	COIN RELAY Bias Margin, Trap, Vane
SWITCHHOOK Spring Pileups	RESISTANCE TESTS Loop, Ground
COIN RELAY Bias Margin, Trap, Vane	STATION WIRING Ground Connections Protector Booth Ground
RESISTANCE TESTS Loop, Ground	OPERATIONAL TESTS Coins Operator, Ring Back
STATION WIRING Ground Connections Protector Booth Ground	INSPECT BOOTH Glass, Door, Lights Blower, Directories
OPERATIONAL TESTS Coins Operator, Ring Back	KS 14995 L3 TOOL
INSPECT BOOTH Glass, Door, Lights Blower, Directories	

Fig. 11 – KS-14995, List 3 Tool



Fig. 12 – KS-16750, List 4 Releaser

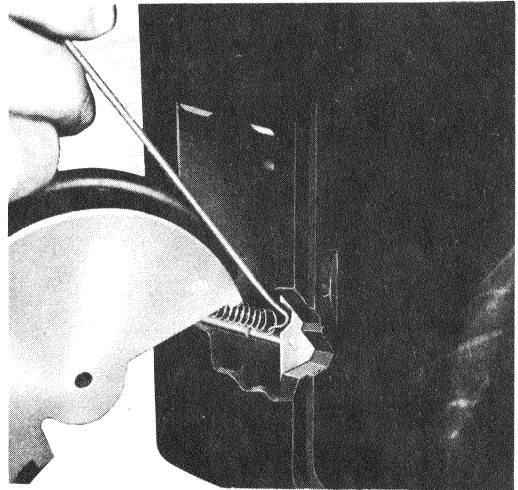


Fig. 13 – TP-75503 Spring Hook

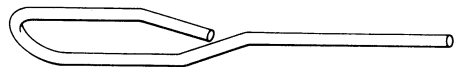


Fig. 14 – P-248585 Release Tool

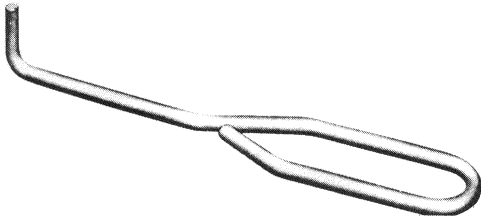


Fig. 15 – Modified P-248585 Release Tool

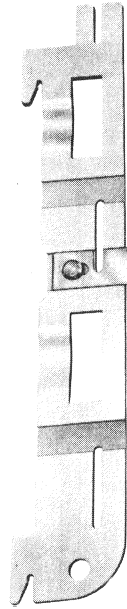


Fig. 17 – KS-20950, List 1 Cover Parking Tool

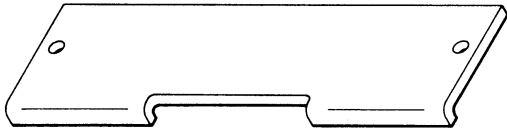


Fig. 16 – P-12A745 Spacer

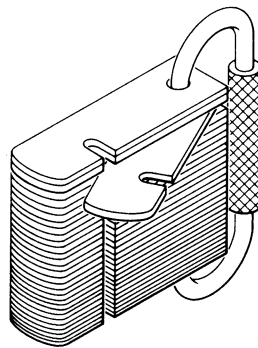


Fig. 18 – 131A Feeler Gauges

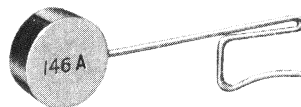


Fig. 19 – 146A Bias Margin Gauge

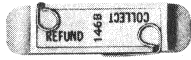


Fig. 20 - 146B Bias Margin Gauge

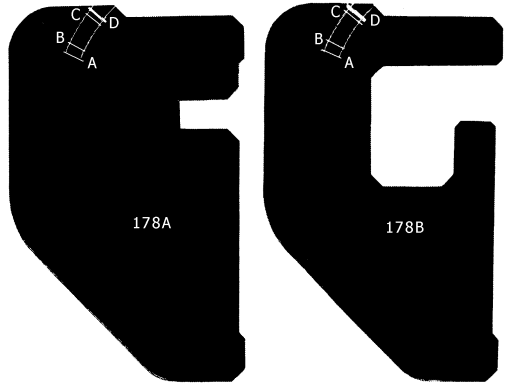


Fig. 22 - 178A and 178B Gauges

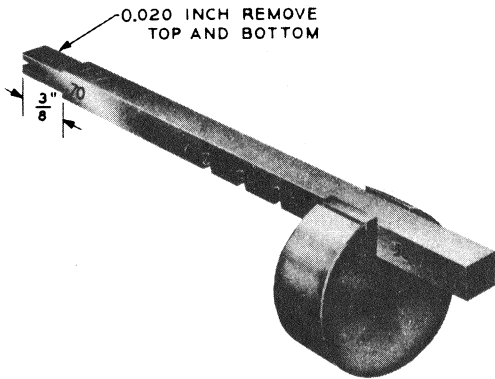


Fig. 21 - 147A Gauge

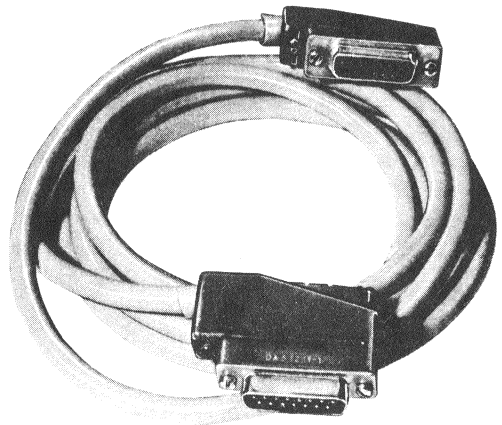


Fig. 23 - P10B Cord

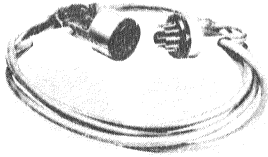


Fig. 24 – P11C Cord



Fig. 26 – E-4914 Form

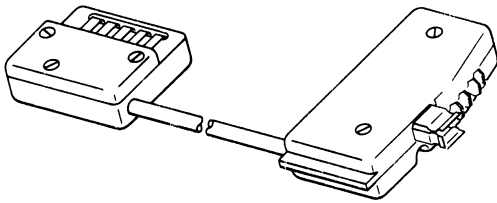


Fig. 25 – P5M Cord

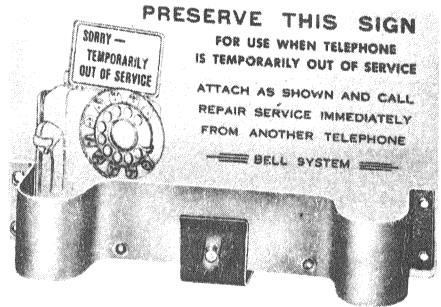


Fig. 27 – KS-7991 Form, Rear View

## COIN LEVEL DETECTOR

### IDENTIFICATION, INSTALLATION, CONNECTIONS, OPERATION, AND MAINTENANCE

### COIN TELEPHONE STATIONS

#### 1. GENERAL

- 1.01 This section contains information on the coin level detector (CLD).
- 1.02 This section is reissued to:
- Revise Fig. 1
  - Revise paragraphs 3.04(10) and 3.05(8)
  - Add Note to Part 4
  - Add information on 1D- and 2D-type coin telephone sets.

#### 2. IDENTIFICATION

- 2.01 The coin level detector is a device which provides a means for local or remote monitoring of the level of coins in the coin box of coin telephone sets.
- 2.02 The components necessary to incorporate the CLD are furnished as follows.
- (a) One D-180042 Kit of Parts (Fig. 1) is required to modify each telephone set housing. The kit consists of a terminal board assembly, contact spring assembly with hex nut and a lockwasher, an insulation strip, and a terminal board cover.
- (b) One D-180110 Kit of Parts (Fig. 2) is required to modify each coin box. The kit consists of a dual element sensor which clamps to the rear of the coin box.
- (c) A 1E coin receptacle cover (Fig. 3) is also required for each coin box. The 1E cover is similar to the 1D (MD) cover except it is equipped with a contact stud.



*The 1E cover can be used with or without the CLD modification.*

#### 3. INSTALLATION

- 3.01 The following tools are necessary to perform the modification:
- 743A drilling template (Fig. 4)
  - 1/4-inch drill (Note)
  - Small C-clamp (2- to 3-inch)
  - Flat file.

**Note:** Telephone housings equipped with KS-19277 locks pose an interference problem with the 1/4-inch drill. The shank of the drill can be no greater than 0.175-inch diameter to permit drilling adjacent to the bolt fastener.

##### A. Modification of Coin Box

- 3.02 Replace the 1D coin box cover with the 1E cover (Fig. 5).
- 3.03 Clip the dual element sensor on the rear of the coin box (Fig. 5).

##### B. Modification of Coin Telephone Sets

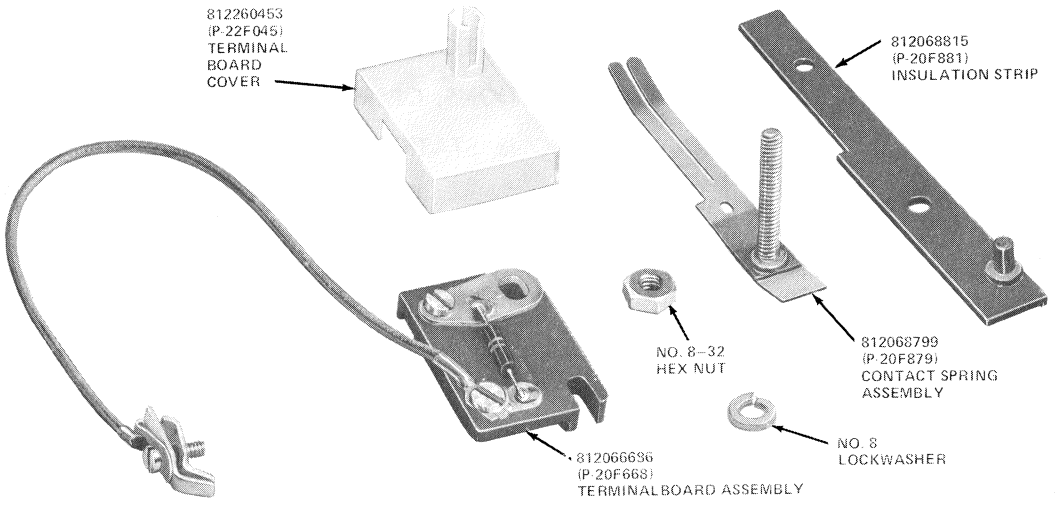
- 3.04 Install D-180042 Kit of Parts in the 1A, 1C, or 1D coin telephone set as follows.

**Note:** Coin chute and coin chassis must be removed from 1A, 1C, or 1D coin telephone set. Refer to paragraph 3.05(1) for removal.♦

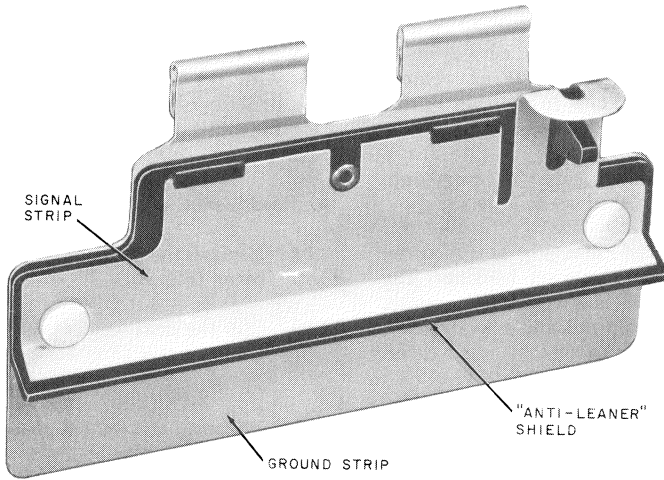
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**SECTION 506-100-105**



**Fig. 1—D-180042 Kit of Parts**



**Fig. 2—D-180110 Kit of Parts**

- (1) Remove the RH screw which secures the right front of the 1B rail to the lower housing.
- (2) Install the 743A template against the right side of the base as shown in Fig. 6 and secure it with the screw removed in (1).

**Note:** The positioning tab of the template must be inserted in the coin leveling hole.

- (3) Clamp the 1B rail to the housing during the drilling operation using the C-clamp described in paragraph 3.01.



**Cover the coin relay, hopper, and return chute with a piece of plastic, cloth, or other suitable material to prevent metal drill shavings from falling into these mechanisms.**

- (4) Using the 1/4-inch drill described in paragraph 3.01, drill the hole through the housing.
- (5) Remove the screw and drilling template.
- (6) Using the 1/4-inch drill, enlarge the hole where the screw was removed.
- (7) Using a suitable file, remove all burrs from the 1B rail.
- (8) Remove the C-clamp.
- (9) Remove all drill chips from the telephone set.
- (10) Position the insulation strip against the 1B rail with the boss on the strip in the 1/4-inch mounting screw hole (Fig. 7). Hold the contact springs in place with the stud extending through the hole drilled in the base, and fasten the terminal board in place on the housing base with the nut and lockwasher provided (Fig. 8).



**◆ Tighten the 8-32 nut firmly (finger tight). Then using a suitable tool (wrench) tighten the nut an additional 90 degrees (quarter turn), NO MORE!**

- (11) Reinstall coin chute and coin chassis [see paragraph 3.05(7)].

### 3.05 Install D-180042 Kit of Parts in 2A, 2C, or 2D coin telephone sets as follows.

- (1) Remove coin chute and coin chassis as follows.
  - (a) Disconnect P2 from J2 and remove coin chute.
  - (b) Disconnect (BK) and (Y) leads from coin relay and carefully pull leads through guide hole in hopper.
  - (c) Loosen chassis captive mounting screw.
  - (d) Pull chassis out at bottom, slide down, and remove.
- (2) Using the contact spring mounting hole as a guide (Fig. 9) drill through coin rail with 1/4-inch drill.
- (3) Remove the RH screw which secures the right front of the 1B rail to the housing assembly.



**Cover the coin relay, hopper, and return chute with a piece of plastic, cloth, or other suitable material to prevent metal drill shavings from falling into these mechanisms.**

- (4) Using the 1/4-inch drill, enlarge the hole where the screw was removed.
- (5) Using a suitable file, remove all burrs from the 1B rail.
- (6) Remove all drill chips from the telephone set.
- (7) Install coin chute and coin chassis as follows.
  - (a) Install coin chassis by reversing procedure in Step (1).
  - (b) Thread (BK) and (Y) leads of chassis through hole on coin hopper. Connect (BK) lead to terminal 3 and (Y) lead to terminal G of coin relay.
  - (c) Install coin chute and connect P2 to J2.



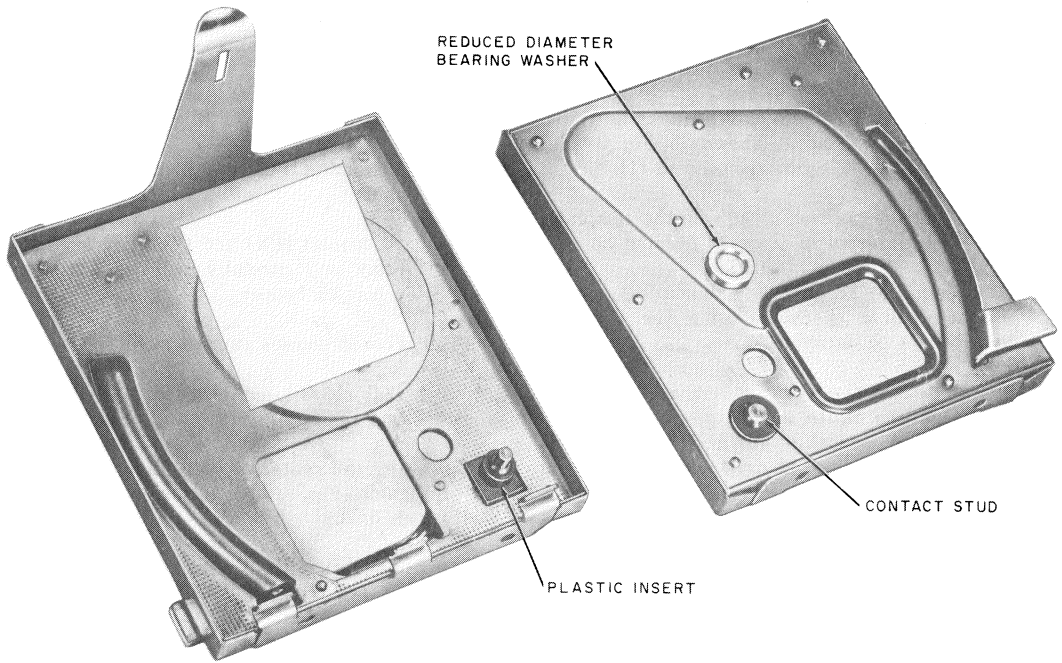


Fig. 3—1E Cover

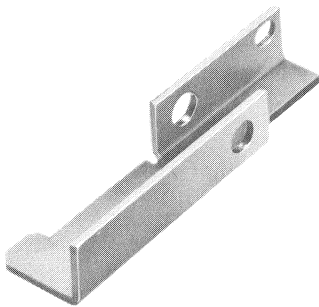


Fig. 4—743A Drilling Template

(8) Position the insulation strip against the 1B rail with the boss on the strip in the 1/4-inch mounting screw hole (Fig. 7). Hold the contact springs in place with the stud extending through

the hole drilled in the base, and fasten the terminal board in place on the housing base with the nut and blockwasher provided (Fig. 8).

#### C. Replacing Coin Box

3.06 Replace existing coin box with a modified coin box (Fig. 5).

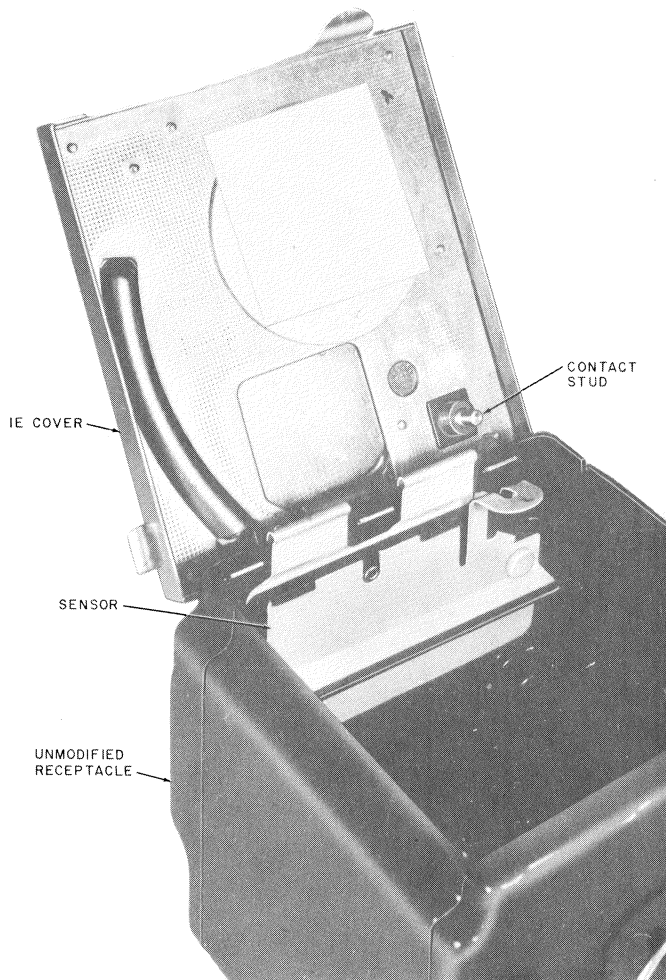
### 4. CONNECTIONS

#### A. Remote Monitoring (Central Office Line Insulation Test)

**Note:** Remote monitoring will not work in dial-tone-first mode.

4.01 Remove coin relay cover.

4.02 The lead provided with the D-180042 Kit of Parts is equipped with a screw clamp to facilitate fastening to the ground tab on the coin



**Fig. 5—Modified Coin Box**

relay (Fig. 8). Care must be taken not to alter the adjustment of the coin relay by bending the spring member. Connect the spade tip of the lead to the front terminal on the terminal board.

#### **B. Local Monitoring**

**4.03** Connect a lead from the rear terminal of the terminal board to the indicating device

through existing cable entries in the rear of the telephone housing.

**4.04** Refer to Fig. 10 for connection diagram.

**4.05** Install coin relay cover and terminal board cover (Fig. 11).

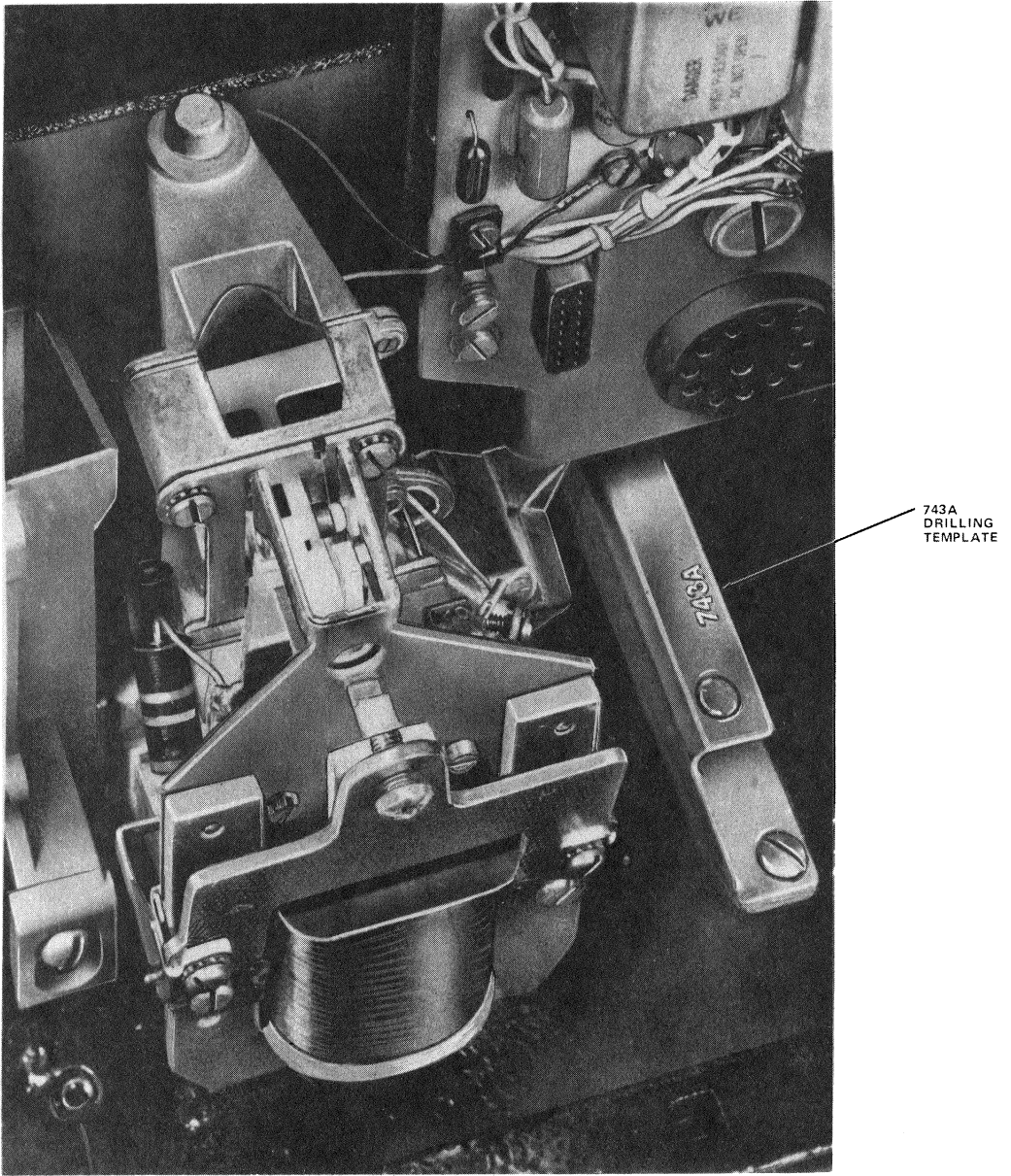
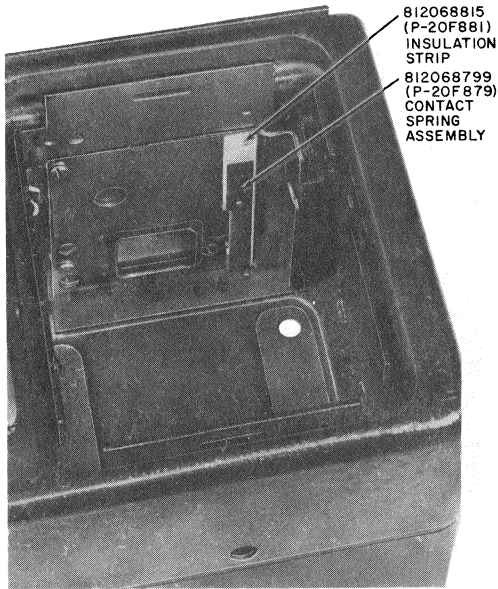


Fig. 6—Installation of Drilling Template



**Fig. 7—Installation of Insulation Strip and Contact Spring Assembly**

## 5. OPERATION

**5.01** The dual element sensor is constructed of an insulated mounting plate with two conducting surfaces. One surface is grounded through the coin receptacle cover by spring clip contacts. The other conducting surface presses

against the insulated stud on the cover and carries a coin level signal through the spring contacts (mounted on the receptacle rail) to the terminal board on the base of the set housing.

**5.02** Coins accumulating in the cash box will complete a circuit between the conducting surfaces of the sensor. A ledge between the conducting surfaces protrudes into the coin box and prevents coins from leaning against the sensor and prematurely indicating the coin level accumulation. The sensor is designed and physically mounted to provide an indication to local or remote monitors when the coin level reaches approximately 70 percent of the coin box capacity.

**5.03** For local monitoring, a locally supplied lead is connected to the terminal board to complete the circuit to a visual indicator. Alternately, a supplied lead and clamp assembly complete the circuit, through a 51K resistor to the coin relay, to permit central office monitoring of the coin level circuit with line insulation test equipment. To prevent degradation of service, the 51K resistor is shorted by the hopper trigger contacts when the telephone is in use.

## 6. MAINTENANCE

**6.01** Inspect for dirty spring contacts and positive ground contact between the sensor and the coin box cover. The insulated stud on the cover should be free of dirt and make a wiping contact with the upper plate of the sensor in the coin box. The top of the stud should make a wiping contact with the spring contact on the 1B rail when the coin box is installed in the vault.

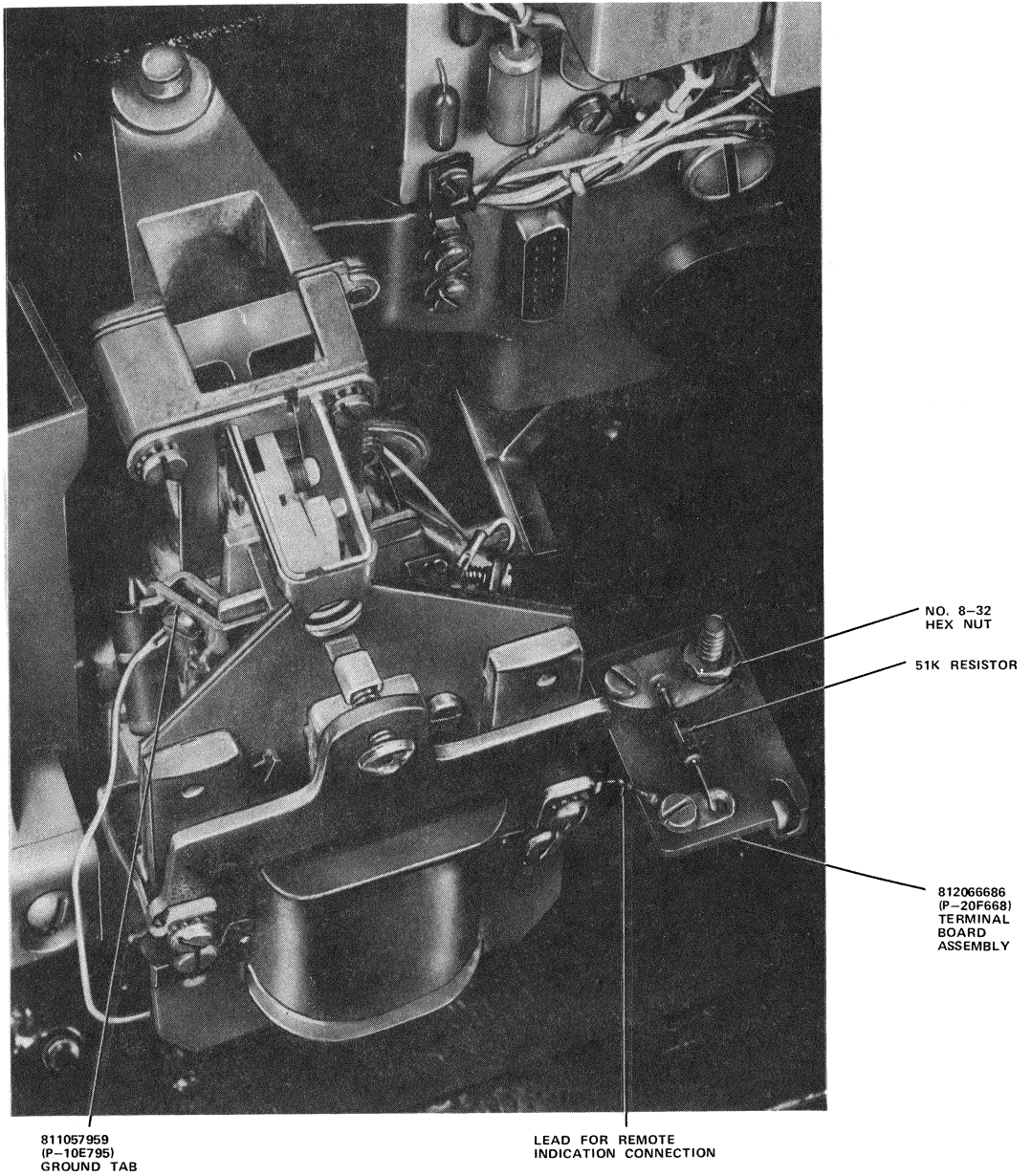


Fig. 8—Installation of Terminal Board Assembly



Fig. 9—Location of Contact Spring Mounting Hole in 2A, 2C, or 2D Telephone Sets

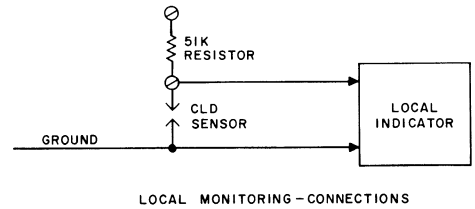
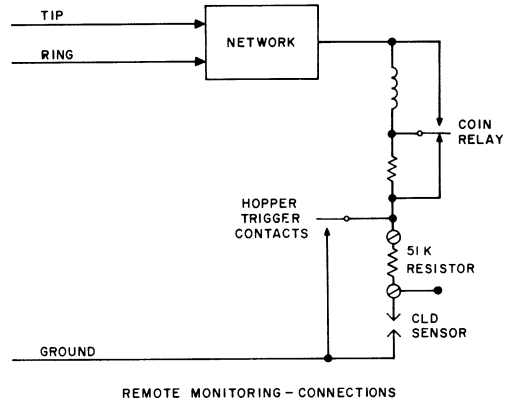


Fig. 10—Coin Level Detector—Connections

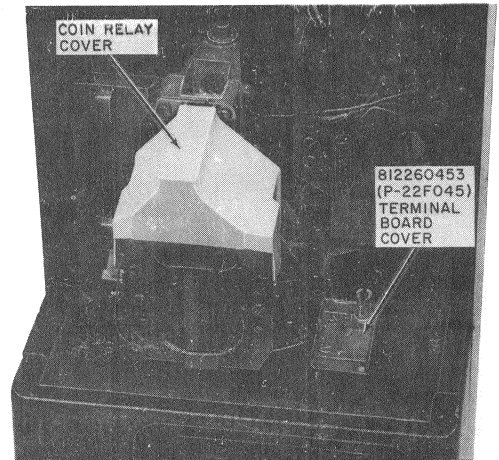


Fig. 11—Installation of Coin Relay Cover and Terminal Board Cover

## MANUAL EXTENSION STATION SERVICE ON SEMI-PUBLIC COIN LINES CONNECTED TO COIN TELEPHONE SETS

### 1. GENERAL

**1.01** This section provides installation, connections, and testing information for associating a nondial extension telephone on a semi-public coin line which terminates in a 1C/2C/1D/2D/1E-type coin telephone set.

**1.02** This section is reissued to add information on the 1D/2D- and 1E-type coin telephone sets.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

**1.03** A single manual extension station can be used with a 1C/2C-, 1D/2D-, or 1E-type coin telephone set. ***Do not use a manual extension with a 1A/2A-type coin telephone set.***

**1.04** Either a wall or desk-type telephone specially modified by the Service Center must be used as the extension station instrument. A desk-type set can be ordered as a "Set, Telephone, 500C-(plus suffix color code), modified per D-180405". A wall-type set can be ordered as a "Set, Telephone, 554A-(plus suffix color code), modified per D-180406".

**1.05** Only one extension station plus one external ringer can be used with a coin telephone set.

### 2. INSTALLATION

**2.01** Since the special D-kit applique circuit installed in and operated by the extension station is associated with the ring side of the line, it is necessary to bridge the ring lead of the incoming CO line on the L1 terminal of the coin phone and extend it from there to the extension station and back before connecting it on the R terminal of

the coin chassis (Fig. 1). A loose 814313920 screw is furnished with the D-kit equipped extension station for the L1 network terminal. This screw is not required for a 1D/2D set.

**2.02** The tip side of the coin line is extended from the T terminal in the coin set to the extension set location over one of two paired wires. The other half pair lead is deadended at both ends to provide capacitance balance.

**2.03** The coin signaling ground should not be extended beyond its normal G termination in the coin telephone set.

**2.04** When using the extension set with a 1D/2D- or 1E-type coin telephone set, move the (G) lead from terminal 2 on the printed circuit board to terminal 5 (Fig. 2).

**2.05** In the coin telephone set, transfer the (R) ringer lead from TB1-R to L1.

**2.06** An 11A card holder is available for adding an additional instruction card to the top of a 1-type coin telephone set. Installation instructions are provided with each card holder. Install as necessary.

### 3. CONNECTIONS

**3.01** Fig. 1 illustrates connections to the coin telephone set, manual extension station and, when provided, an optional station busy visual signal which will indicate when the extension station is off-hook.

**3.02** Fig. 2 shows internal connections of the D-kit equipped manual extension sets.

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4. STATION TESTS

4.01 After extension station is installed and before instructing customer in its use, verify with the test desk (or operator) that the extension station can not talk or monitor on any call originated or answered at the coin telephone station **before** the extension station goes off-hook.

4.02 Verify with the testdesk (or operator) and the customer that the coin telephone user can participate on an incoming call **after** it has been answered at the extension station.

4.03 With both coin telephone and extension station off-hook and conversing on an incoming call (as per 4.02), momentarily operate line switch at extension station. Verify that cutoff takes place and no further conversation is possible on that call from the extension station location.

4.04 When an extension set is connected to a 1C/2C-type coin telephone set, have testdesk (or operator) initiate incoming call to station line under test. Answer call at extension station. Leave handset off-hook.

- (1) Go off-hook at coin telephone set. Deposit initial rate. Totalizer steps off-normal.
- (2) Transmission may be cut off or impaired. Coin(s) fall into hopper, onto coin trap.
- (3) Momentarily depress pushbutton on extension station set.
  - Totalizer steps back. Transmission returns to normal.
- (4) Hang up handset at extension station. Request refund of initial rate deposit. Hang up coin station handset.
  - Coin(s) returned.

4.05 When provided, verify that station busy visual signal indicator operates whenever the extension station goes off-hook.

5. CUSTOMER INSTRUCTIONS

5.01 Install appropriate customer instruction tag or sign at coin telephone location signifying that: nearby extension station can answer incoming calls on this line, and that if conversation is heard on the line when attempting to initiate call COIN DEPOSITS SHOULD NOT BE MADE. Instead, carefully hang up handset. Wait several minutes before trying again.

**Note:** Use an 11A card holder, if required, to support the customer instruction tag at the coin set (2.06).

5.02 A 7/8 by 3-1/4 inch customer instruction label (840390876) is furnished with each D-kit of parts (extras can be ordered separately) and should be installed approximately 1/8-inch below dial apparatus blank on a desk set or approximately 1/2-inch below dial apparatus blank on a wall set. The label reads as follows:

**NOTICE:** If someone tries to use coin phone or deposit coins while you are talking, ask that person hang up until your call is ended. PUSH BUTTON on this phone momentarily to prevent cutoff.



***It is recommended that the customer or extension station user participate with the craftsperson in running through operational verification (4.02, 4.03, and 4.04) so that the customer-user can become familiar with both the coin station and extension station operating features involved.***



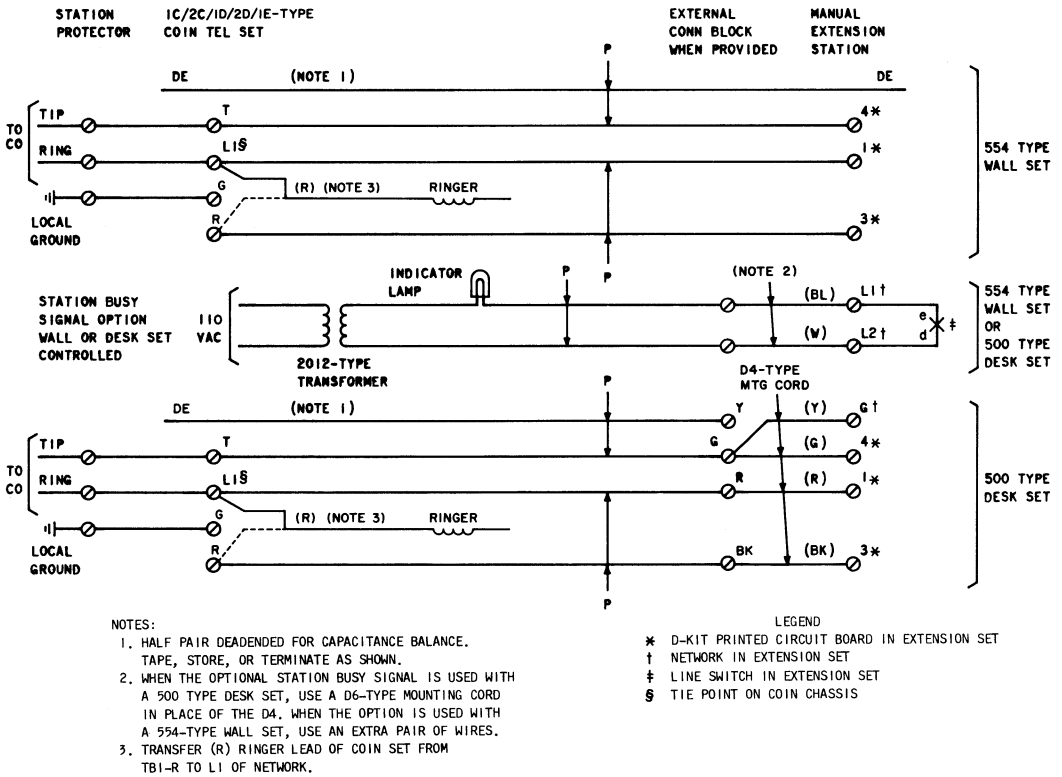
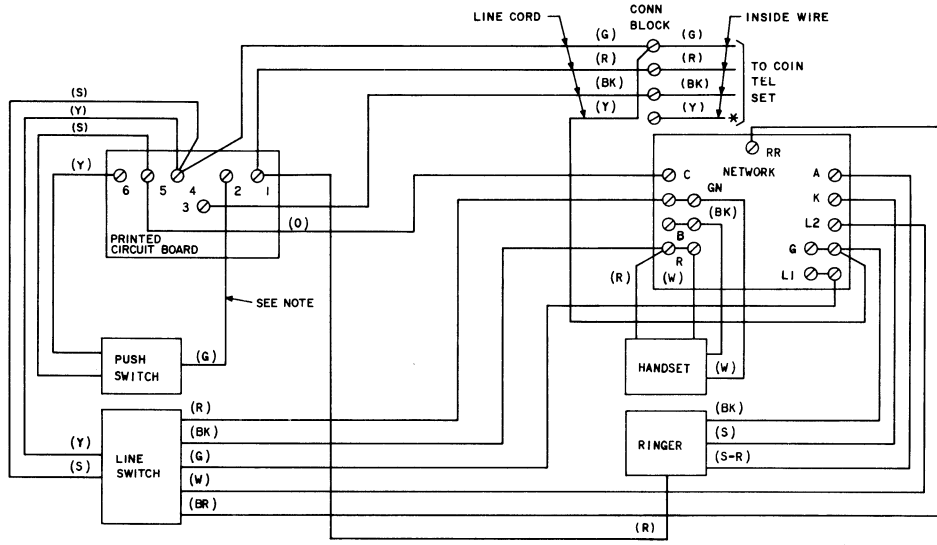
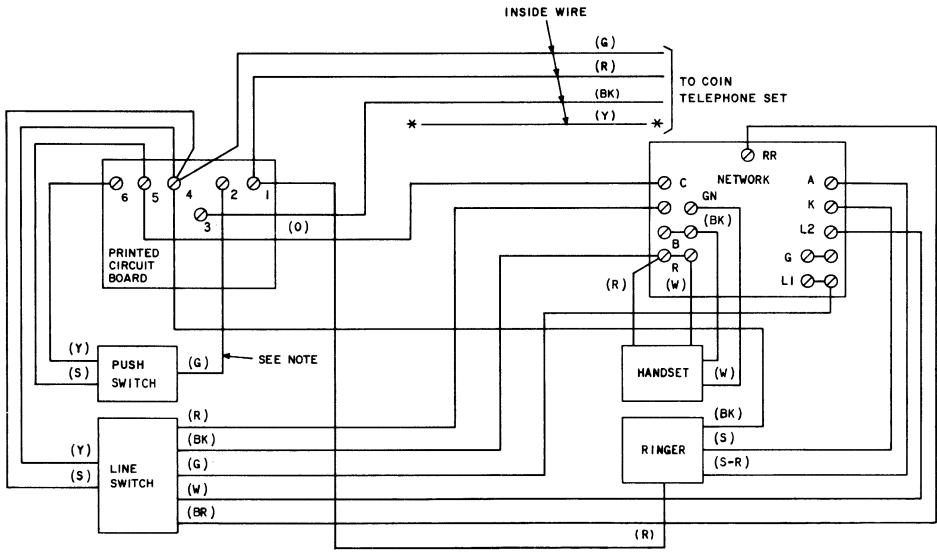


Fig. 1—Connections for Manual Extension Station Service With Station Busy Signal Option in Association With Semi-Public Coin Telephone Set



VIEW A-MODIFIED 500C TELEPHONE SET



VIEW B-MODIFIED 554-TYPE WALL TELEPHONE SET

\* INSULATE AND STORE

NOTE:  
 WHEN USING THE EXTENSION SET WITH A ID/2D-OR IE-TYPE COIN TELEPHONE SET, MOVE THE (G) LEAD FROM TERM. 2 OF THE PRINTED CIRCUIT BOARD TO TERM. 5.

Fig. 2—Manual Extension Stations for Use With Coin Telephone Set

## COIN TELEPHONE STATIONS

### COIN HOPPER VANE REPLACEMENT

#### 1. GENERAL

1.01 This section provides identification and installation information for field replacement of the coin vane.

1.02 This section is reissued to add information on the 840157333 trap lever spring.

#### 2. IDENTIFICATION

2.01 The 840360572 replaceable coin vane (Fig. 1) is a part of D-180410 Kit of Parts.

2.02 This replaceable vane can be installed in all coin collectors and coin telephone sets having single-coil coin relays.

#### 3. INSTALLATION

3.01 Remove upper housing, cover unit assembly, or open door and faceplate assembly to obtain access to coin relay.

3.02 With single slot coin telephone sets, remove chute-totalizer and return chute assembly.

3.03 To remove coin relay:

- (1) Remove dust cover.
- (2) Tag for later reference; then, disconnect leads from terminals G and 3 of coin relay.
- (3) Remove four mounting screws (one on each side and two at top-front).
- (4) Slide relay forward to clear trap and vane and lift upward. Exercise care when extracting trigger from hopper.

3.04 To remove coin trap:

- (1) Move vane to right (Fig. 2).

(2) Remove trap pin by sliding vertical portion over boss on front of hopper and sliding to the right.

(3) Turn coin trap sideways and remove through opening. ♦If P-10E702 trap lever spring (Fig. 2) exists, it can be removed from trap lever and discarded or left in place if desired.♦

3.05 To remove old coin vane:



***Do not drop particles into coin box or coin return. Stuff a cloth or equivalent in the return chute during modification.***

(1) With long nose pliers and screwdriver, break out old damaged vane ***using caution to avoid injury.***

3.06 To install new vane in hopper:

(1) Refer to Fig. 1 and carefully break handle off new 840360572 vane. This handle serves as the new hinge pin.

(2) Position vane in hopper (Fig. 3) through left side opening and grasp with long nose pliers (Fig. 4).

(3) Insert pin (Fig. 4) through hopper housing and vane until indentations on pin snap in place in vane (Fig. 5). Ensure that vane moves freely.

3.07 To install coin trap and associated parts:

***Note:*** ♦Always use an 840157333, wire type, trap lever spring when installing a coin trap.

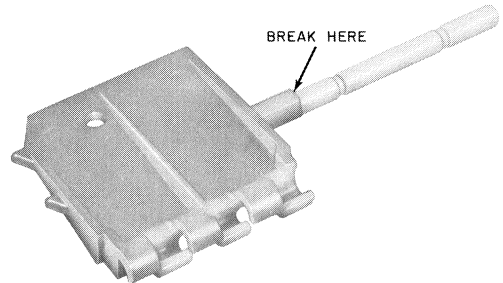
(1) Partially insert trap pin.

(2) Place trap lever on trap pin (Fig. 6).

(3) Insert coin trap in hopper and engage pin in trap (step 1, Fig. 7).♦

## SECTION 506-100-110

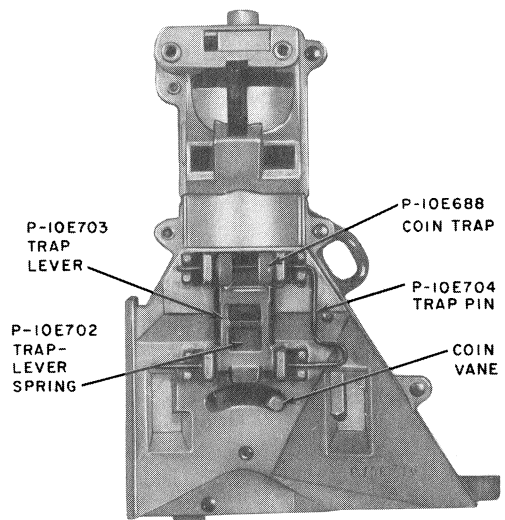
- (4) Holding notched left leg of 840157333 spring at an angle away from hopper, slide the right notched leg of the spring under trap pin (step 2, Fig. 7).
- (5) Swing loose end of spring across face of trap lever and position notch of left leg in alignment with end of trap pin (step 3, Fig. 7).
- (6) Push trap pin to the left, over and through the left leg notch of the new spring, until the trap pin detents (step 4, Fig. 7).



**Fig. 1—840360572 Replaceable Coin Vane**

### 3.08 To install coin relay:

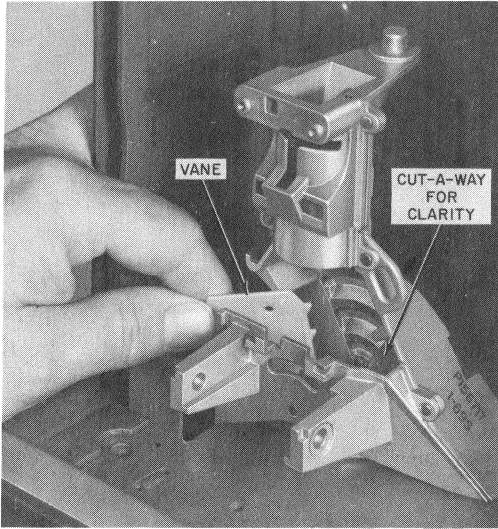
- (1) Move vane to right.
- (2) With trigger tripped, place relay on hopper.
- (3) Slide relay back until trigger enters opening in hopper and trap-lever tab enters slot in selector card (Fig. 8).
- (4) Close armature manually by pressing downward on ear on left side of selector card.
- (5) Slide relay back, vane stem should enter hole in cam and mounting screw holes should line up.
- (6) Replace mounting screws.
- (7) Trigger should have some end play; and armature, trap, and vane should operate and release without binding.
- (8) If trigger binds, loosen upper mounting screws.
- (9) If trigger is free with upper mounting screws loose, retighten screws evenly.
- (10) Replace relay if trigger still binds.
- (11) Connect the two leads to terminals G and 3 on coin relay.
- (12) Replace dust cover.



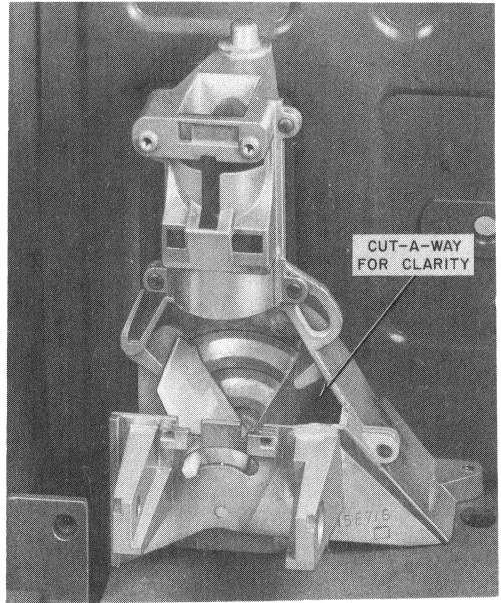
**Fig. 2—Coin Trap and Trap-Lever Assembly**

**3.09** With single slot coin telephone sets, install return chute assembly and chute-totalizer.

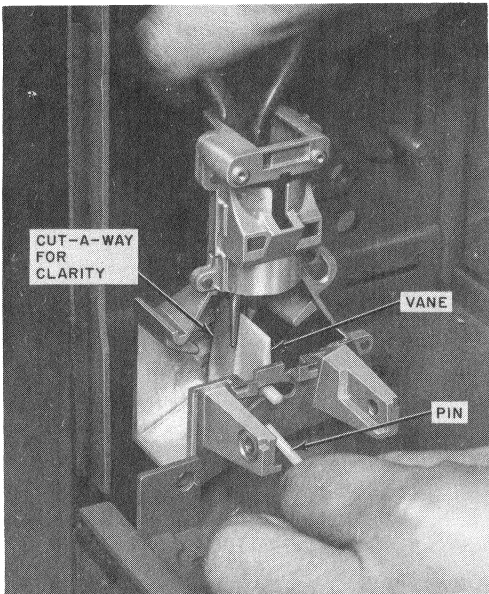
**3.10** Close door and faceplate assembly, install cover unit assembly, or install upper housing.



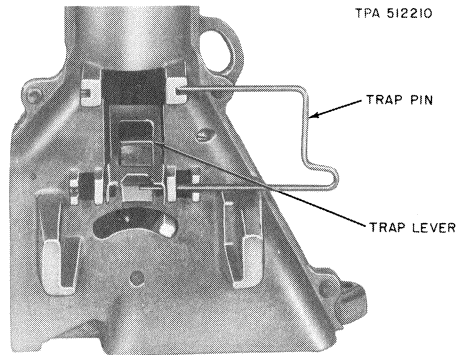
**Fig. 3—Inserting Vane**



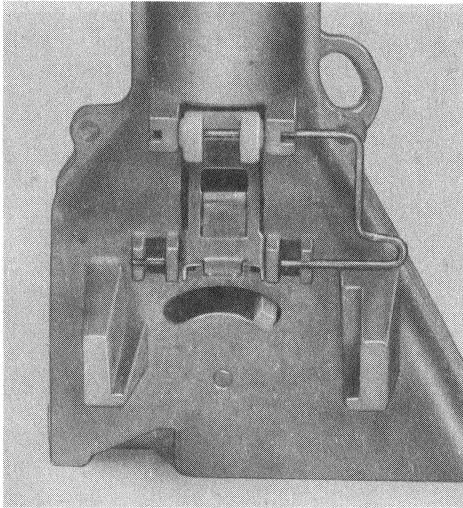
**Fig. 5—Vane Installed**



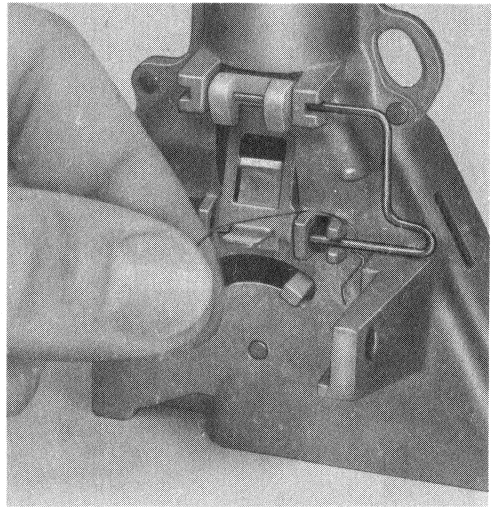
**Fig. 4—Installing Pin in Vane**



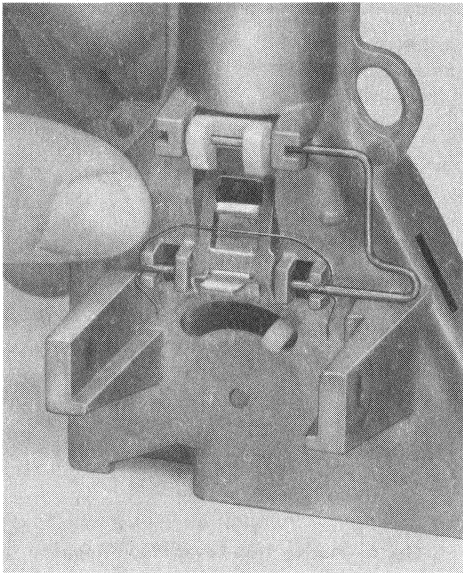
**Fig. 6—Placing Trap-Lever Pin in Hopper**



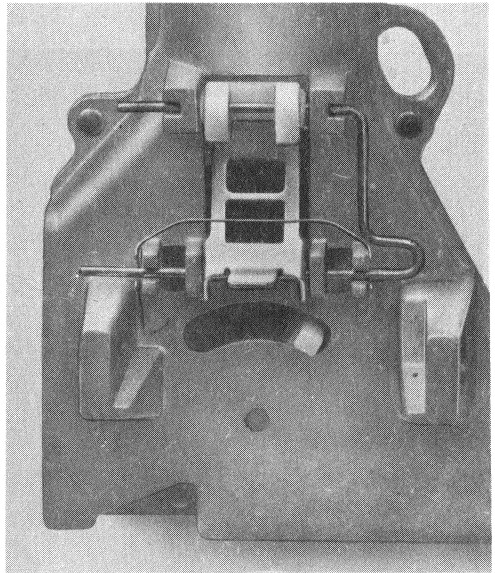
STEP 1



STEP 2

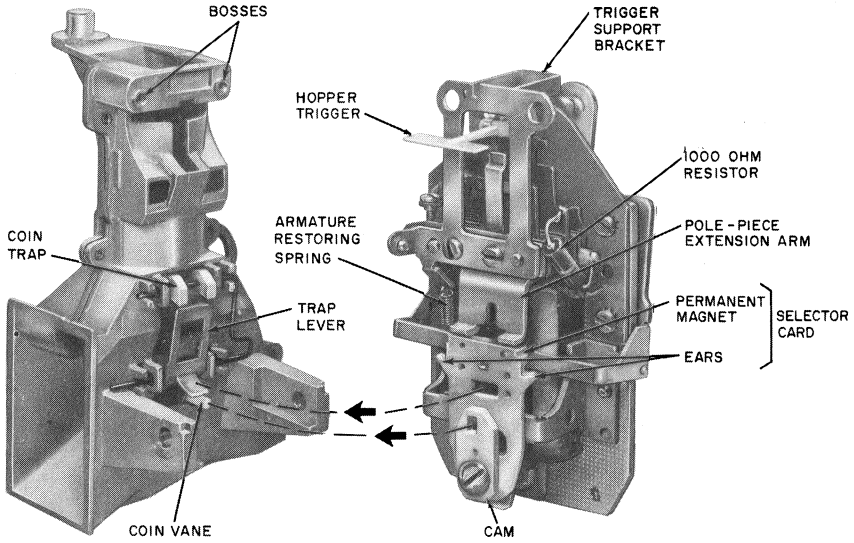


STEP 3



STEP 4

Fig. 7—▶Installing 840157333 Trap Lever Spring◀



**Fig. 8—Coin Hopper and Rear View of Coin Relay (Typical)**

## COIN TEST LINE CIRCUIT

### 1. GENERAL

1.01 The Coin Station Test line is usable on coin lines *not* equipped with dial long line units or subscriber loop carrier systems. Lines equipped with 8A range extenders can be tested

1.02 This section is reissued to add:

- Dial digit 8 and 9 tests
- KS-20950, List 2 cover parking tool.

1.03 The coin test line allows the installation or repair forces to make the following operational tests without tying up local test desk facilities or requiring services of an operator:

- Coin Detection and Ground Removal
- Ground Circuit Foreign EMF (ZK Option)
- Loop Foreign EMF (ZK Option)
- Ground Circuit Check
- Loop Resistance
- Marginal Loop Resistance (ZX Option)
- Loop Leakage
- Coin Collect
- Coin Return
- Coin Collect and Return Marginal Tests (ZO Option)
- Coin Relay Operating Time
- Resistance Test Self Diagnostics (ZO Option).

**Note:** All test lines are not equipped with ZO option at this time.

1.04 While performing the preceding tests, proper functioning of the following can be determined:

- Coin Chute
- Dial
- Totalizer
- Ringer
- Transmitter and Receiver
- Automatic Coin Local Overtime (DTF).

1.05 the referenced tables are found in the Public Services Maintenance Check Booklet or Section 506-900-503. Example: (B-4) indicates Step 4 in the Trouble Analysis, Table B.

1.06 Initial rate must be deposited to access the test line. After the test line has been seized CF stations require a single coin deposit equal to or greater than initial rate to dial additional tests; example: initial rate is 15 cents, a quarter must be deposited. For DTF stations nickel, dime, or quarter can be deposited for additional tests except when Automatic Coin Overtime Test is made.

1.07 Tests should be made in a sequential manner as shown in the Test Line Procedure. Tests may be repeated by dialing the assigned digit when the test line is in the "Test Selection Mode" (interrupted dial tone). Once the Relay Time test has been dialed (digit 5), the test can be recycled as often as necessary by tripping hopper trigger or redepositing a coin. The switchhook must be momentarily operated before disconnect can occur or new test can be dialed. The Coin Detection and Ground Removal tests require disconnect and reseizure of the test line if retest is desired.

1.08 If no action is taken for approximately 60 seconds after the reception of the "Test Selection Tone" (interrupted dial tone) during any

### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement



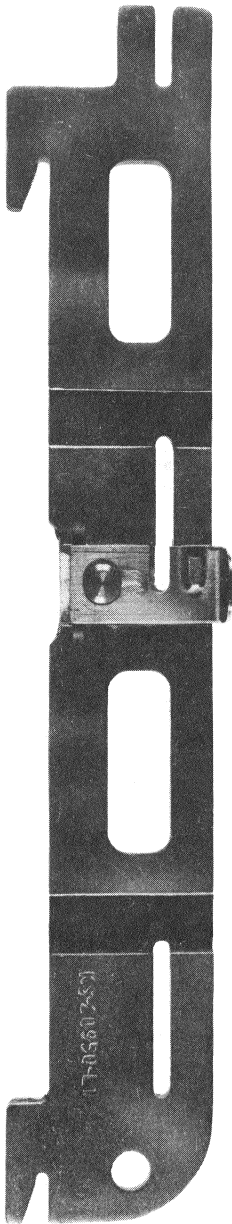


Fig. 1—KS-20950, List 2 Cover Parking Tool

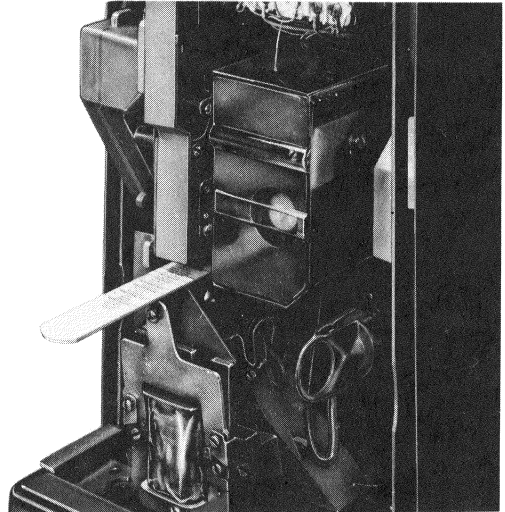


Fig. 2—KS-14995, List 3 Tool—In Position for Collect Test

phase of the sequence, the test line will automatically disconnect and restore the circuit to normal.

1.09 Tones are used to indicate a required action by the craftsperson as follows:

- Alternating high and low tone (Tone C)—requires deposit of coin or operation of hopper trigger.
- Steady high tone (hang-up tone)—request to restore handset to on-hook condition. Steady high tone is also used as a test answer in coin relay timing test.
- Interrupted dial tone (test selection tone)—proper digit should be dialed depending on test desired.

**Note:** In some ESS offices the high tone may be too low to hear clearly in noisy background locations. In this case the BT lead should be removed from the HT terminal on the ring and tone bay and connected to the MT2 terminal (busy verification tone), if available. For additional information, refer to SD-1C297-01, Issue 16B.

1.10 Test results are returned to the craftsperson in the form of coded beeps or rings which are repeated three times. When rings are called

for the handset should be taken off-hook before the 3rd group of rings to prevent test line disconnect.

1.11 The Coin Test Line is capable of testing rotary or TOUCH-TONE® dial stations.

1.12 Recommended procedure is outlined in Part 3. However, individual tests can be made for each of the dialed tests.

## 2. PREPARATION

2.01 The following apparatus is required:

- P11C cord—Used to connect cover unit assembly or door and faceplate assembly to coin chassis
- KS-20950, L2 cover parking tool (Fig. 1)—Used to hang cover unit assembly of 1-type set on side of housing, eliminating the need for a P11C cord
- 146B bias margin gauge—Collect and Return Test
- 1013-type hand test set—Connect to receiver circuit when upper housing or cover unit assembly is on floor or to verify coin signals

- KS-14995, L3 tool—Placed between coin chute and hopper in single slot sets during Collect test to prevent collection of coins (Fig. 2)

- Two dimes, one nickel, one quarter.

2.02 Prepare coin station as follows.

- (1) Remove cover unit assembly 1-type sets or open door and faceplate assembly of 2-type sets.
- (2) If P11C cord is used, invert handset on switchhook of 1-type sets to prevent armored cord pushing handset off-hook when cover unit assembly is set aside.
- (3) Where possible, install coin cover unit on a KS-20950, L2 cover parking tool (Fig. 1).
- (4) When testing 1C- or 2C-type sets, ensure that totalizer CF-DTF mode switch, is in the proper position.

## 3. COIN TEST LINE PROCEDURE

3.01 Perform test per following flow charts:

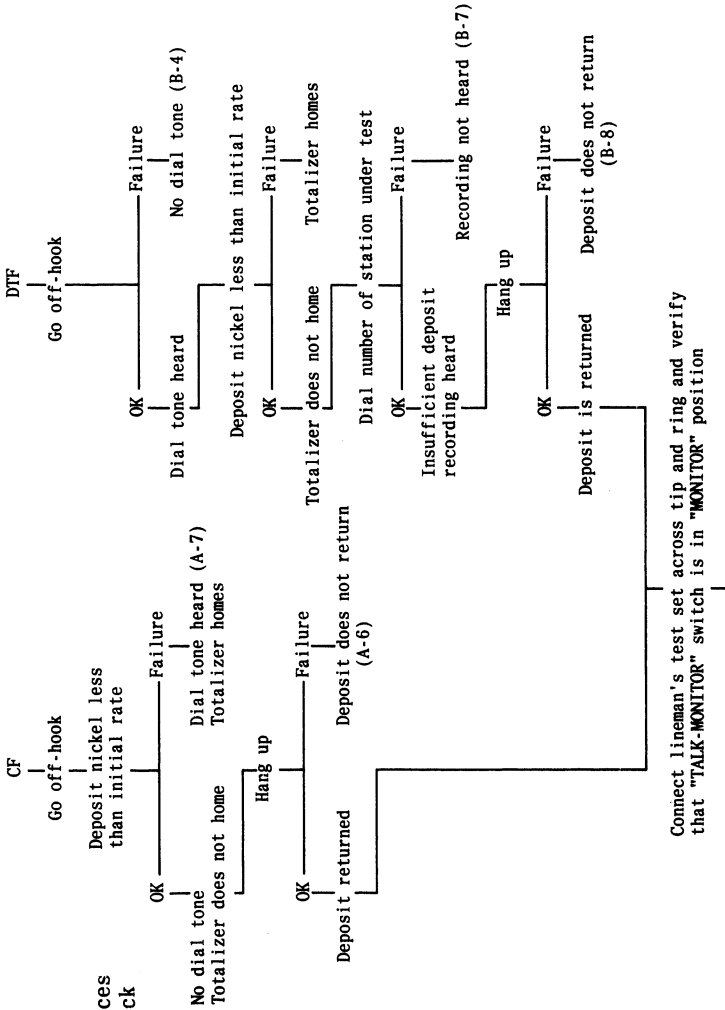
**LEGEND**

CF—Coin First  
DTF—Dial Tone First  
(A-7)—Table A

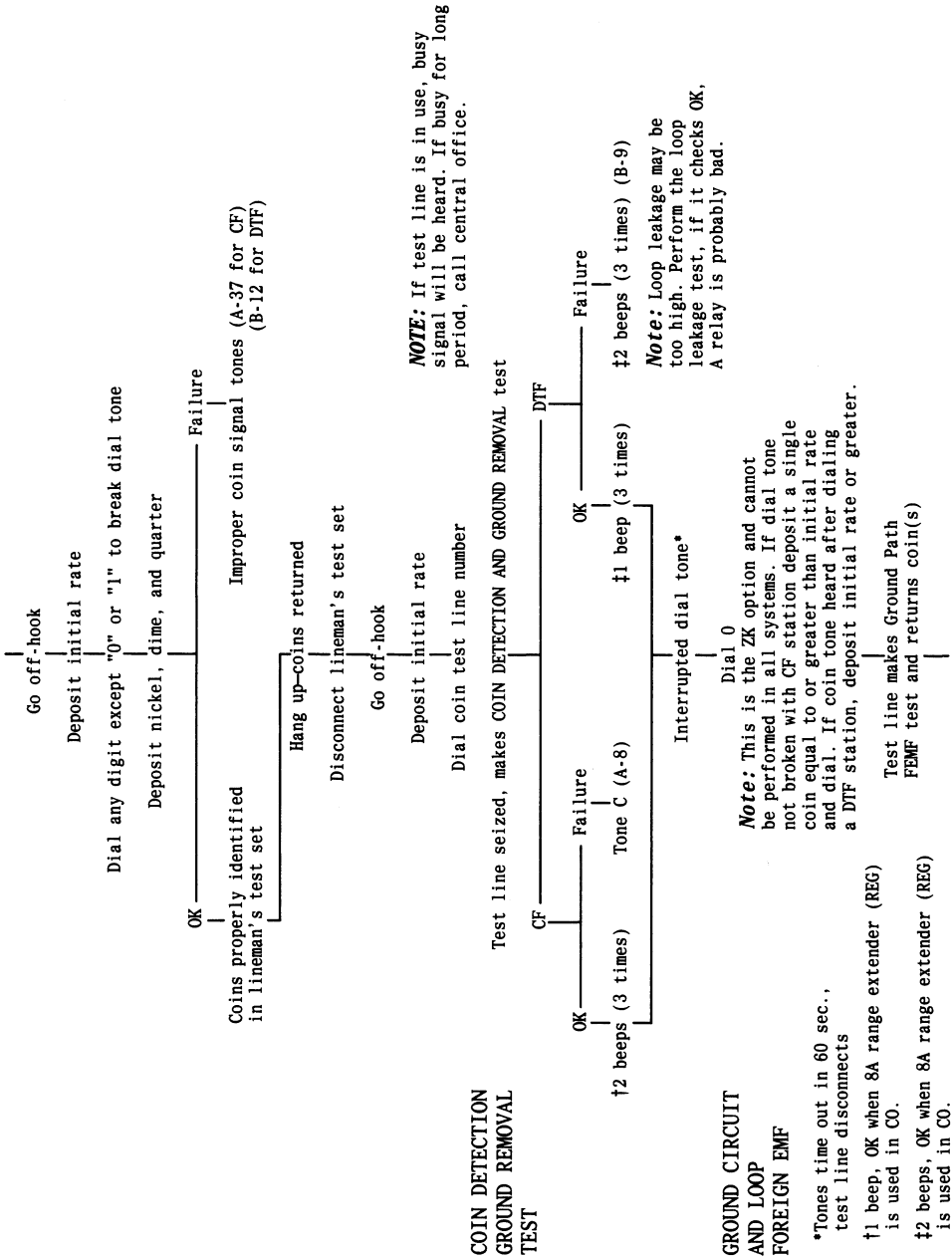
Step No. 7  
In Public Services  
Maintenance Check  
Booklet,

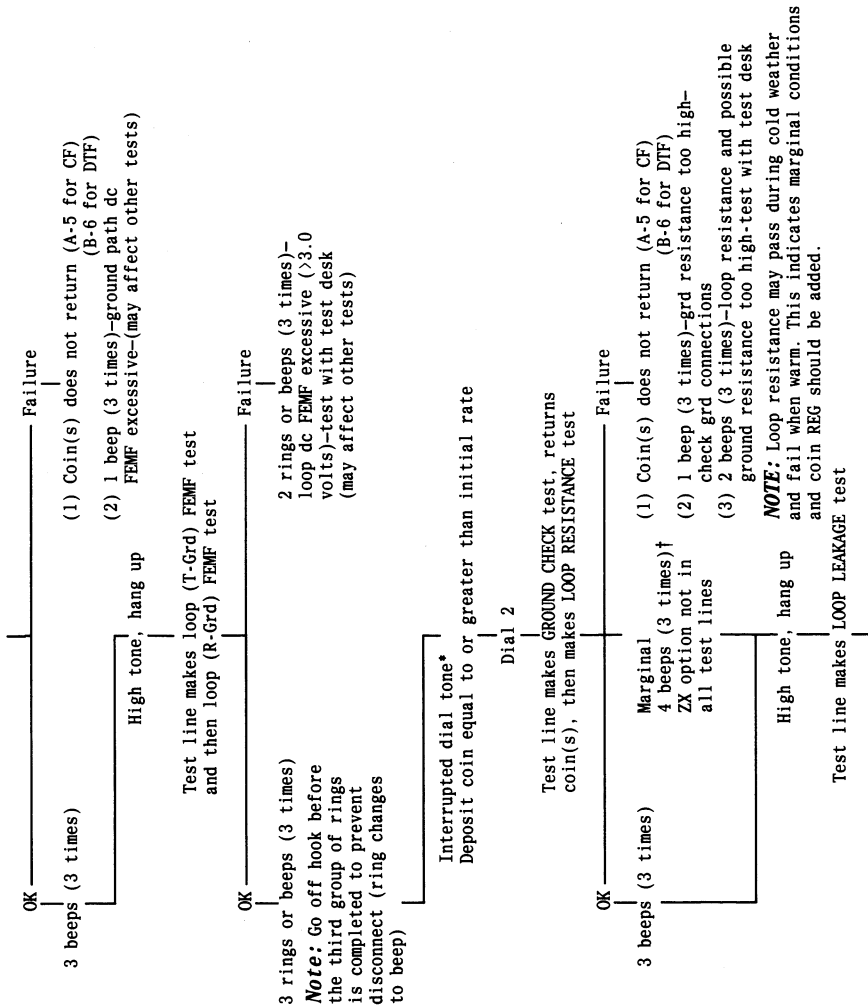
(Typical)

**COIN TEST LINE TESTS**



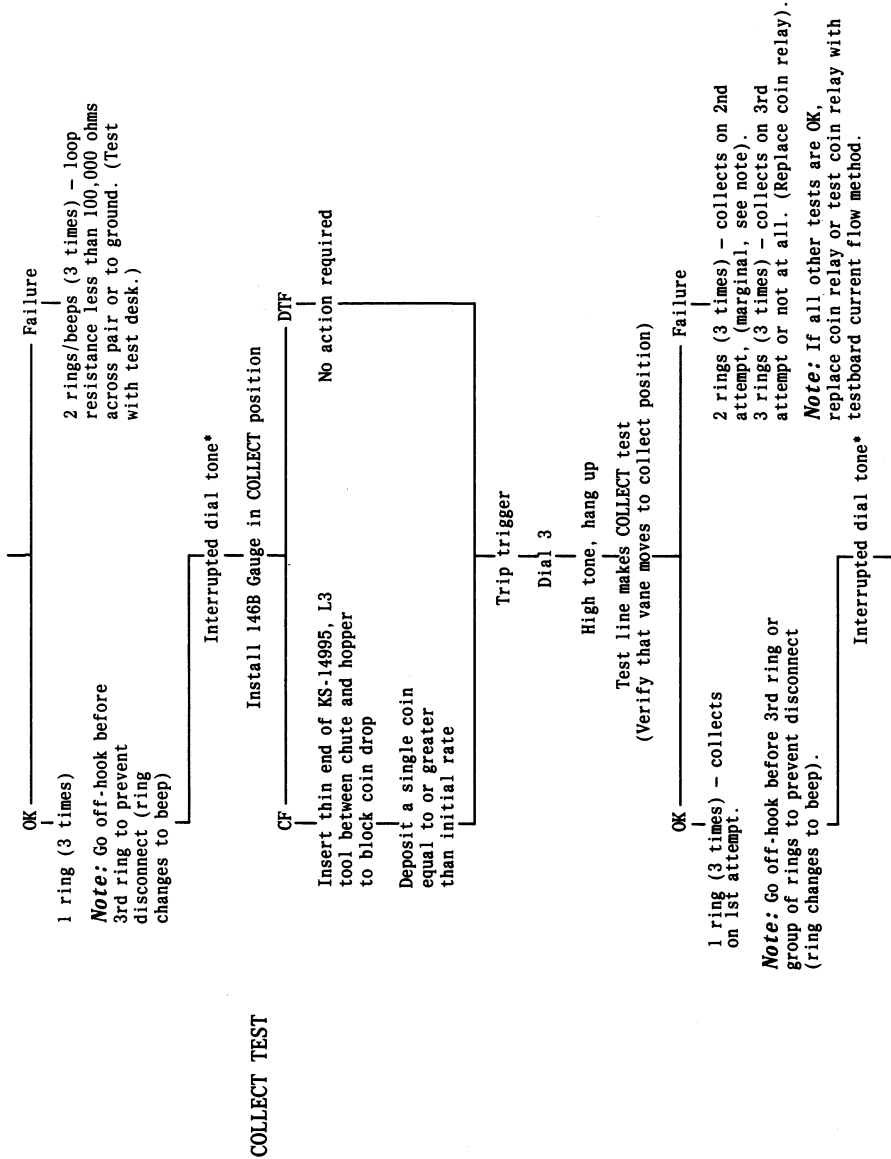
Connect lineman's test set across tip and ring and verify that "TALK-MONITOR" switch is in "MONITOR" position





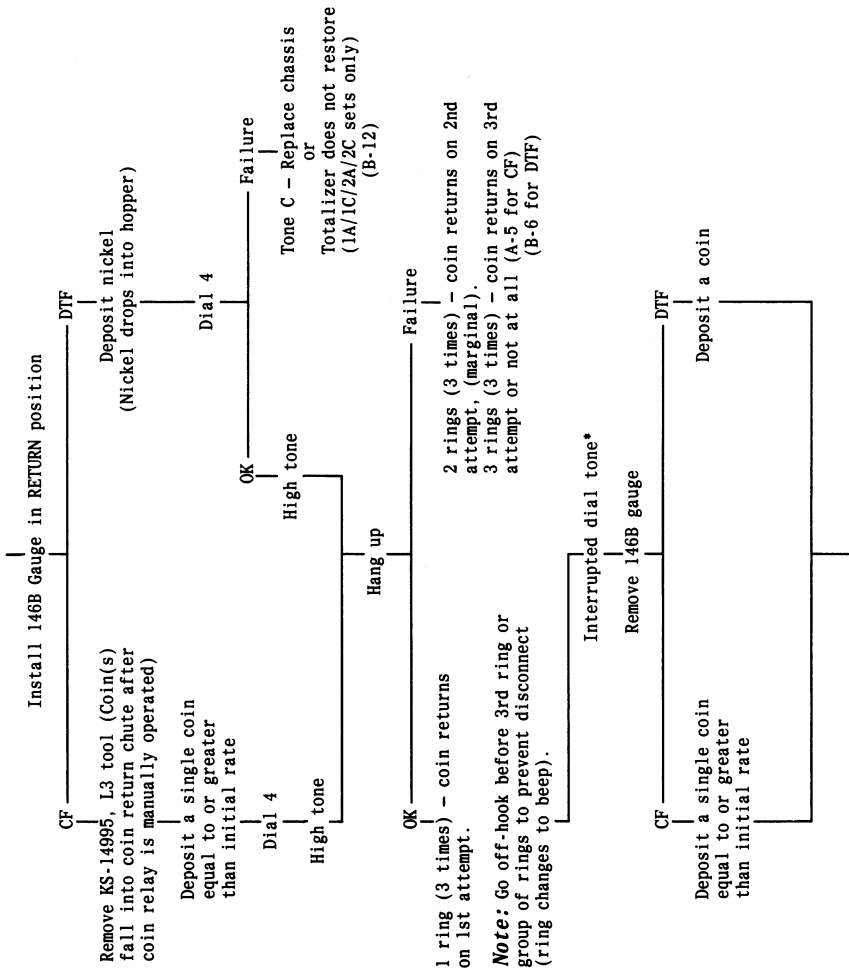
**GROUND CHECK, LOOP RESISTANCE, AND LOOP LEAKAGE TESTS**

\*Tones time out in 60 sec., test line disconnects  
 †Loop is within 8 percent of maximum requirement.  
 If cable makeup is all underground, loop is OK.  
 However if any aerial cable is used and outside temperature at time of test is less than 80°F, range extension may be required.



\*Tones time out in 60 sec., test line disconnects

RETURN TEST  
(AND AUTOMATIC  
NICKEL LOCAL  
OVERTIME TEST  
DTF only)



\*Tones time out in 60 sec., test line disconnects

**COIN RELAY  
TIMING TEST**

Dial 5

Redeposit a single coin equal to or greater than initial rate to recycle test

Test line makes COIN RELAY TIME test

SIGNAL (Coin relay operate time)	TEMPERATURE of Coin Relay		
	Below 20°	20-60°	60-100° Above 100°
4 Beeps (Above 500 milliseconds)	Refer to Adjust Chart	100 Slow Refer to Adjust Chart	100 Slow Refer to Adjust Chart
3 Beeps (475-500 milliseconds)			
STEADY TONE (425-475 milliseconds)		OK	
2 Beeps (400-425 milliseconds)			
1 Beep (Below 400 milliseconds)		100 Fast Refer to Adjust Chart	

Adjust Chart

Temperature	Adjusting Procedure
Above 100°	Adjust to steady tone and turn armature screw clockwise until first indication of 2 beeps is acquired
60 to 100°	Adjust to 3 beeps and turn armature screw clockwise until first indication of steady tone is acquired
20 to 60°	Adjust to 4 beeps and turn armature screw clockwise until first indication of 3 beeps is acquired
Below 20°	Adjust to 3 beeps and turn armature screw counterclockwise until first indication of 4 beeps is acquired - then turn screw counterclockwise an additional 1/4 turn

Go on hook momentarily (flash switchhook), see note.

Interrupted dial tone heard\*

Hang up, test line disconnects

Go off-hook to assure test line is disconnected

\*Tones time out in 60 sec., test line disconnects

CF  
No tone heard

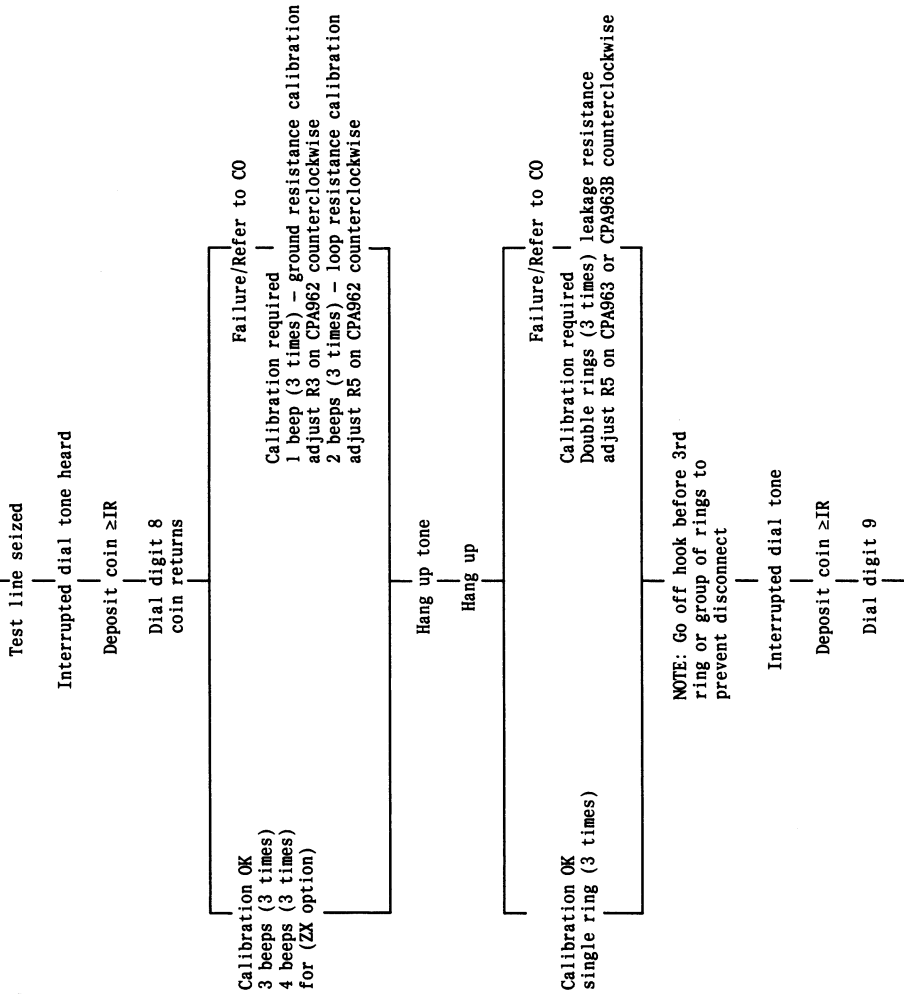
DTF  
Steady dial tone heard

**NOTE:** If switchhook flash is not executed the test line will not disconnect for 60 seconds and no new test can be dialed.



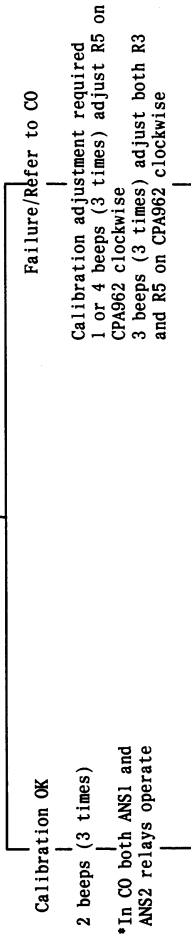
TO CHECK THE TEST LINE CALIBRATION  
FOR DIAL 2 RESISTANCE TESTS - PROCEED AS FOLLOWS

IR - INITIAL RATE



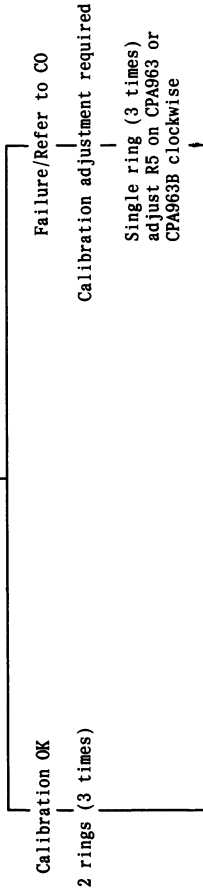
(Dial digit 9, cont)

Coin returns



Hang up tone

Hang up



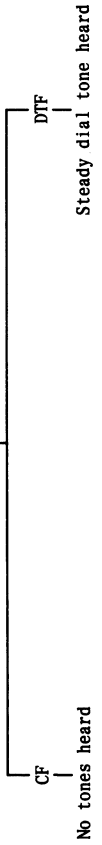
NOTE: Go off-hook before 3rd ring or group of rings to prevent disconnect

Interrupted dial tone

Deposit coin  $\geq$ IR

Dial new test or hang up if no further tests are to be made

After several seconds check for disconnect



## **SERVICE**

### **SECURITY DEVICES**

#### **1. GENERAL**

**1.01** This section contains identification and installation information on security devices for coin collectors and coin telephone sets.

**1.02** This section is reissued to:

- Revise information on coin relay antidrill guard assembly and dust cover
- Add information on 840360184 knob and shaft assembly

**1.03** Security devices are added to standard equipment to discourage thievery, vandalism, and strong arm attack.

#### **2. SECURITY DEVICES**

**2.01** Security devices include locks, studs, special backplates, covers, ring seals, armored cords, a switchhook kit, and special tools needed to handle them.



***Locks and keys will be shipped only on orders that specify authorized recipients.***

##### **Upper Housing and Cover Assembly Locks**

**2.02** Two models of locks may be used for upper housings and cover assemblies: the 10-type and 29-type (Fig. 1). Both are lever tumbler-type locks requiring a corrugated key.

**2.03** The 10-type lock has been used in upper housing assemblies of 190 and 200 series coin collectors.

**2.04** The 29-type lock is used in cover assemblies of 1- and 2-type coin telephone sets and in 235- and 1235-type coin collectors.

##### **KS-19277 Lock and Associated Parts**

**2.05** The KS-19277 lock and associated parts (Fig. 2) give additional security to the upper housing. They consist of a screw type lock and appropriate fasteners which secure an upper housing to either backplate or mounting surface.

**2.06** The lock mounts in a specially provided hole in the lower right side of the upper housing (Fig. 3) and is held in place by a spring steel washer and heavy steel nut (Fig. 4). Use of a tubular key permits the back of the lock to rotate and screw onto the end of a security bolt or stud fastener.

**2.07** The lock cannot be used on coin collectors equipped with 2-coil relays, those not having a lower right security stud hole, or panel coin phones.

**2.08** The P-13A091 (BXX) terminal assembly (Fig. 5) must be replaced with a P-25E300 terminal assembly to provide clearance of fasteners (Fig. 6 and 7).

**2.09** One of three different fasteners may be used with the KS-19277 lock (Fig. 2).

- (a) P-25E301 bolt fastener—short shoulder; for use with 3/16-inch thick backboards.
- (b) P-25E302 bolt fastener—long shoulder; for use with 5/16-inch thick backboards.
- (c) P-25E303 stud fastener—for use where security studs are not required.

**2.10** Two methods can be used to determine if existing coin collector backboards are equipped with keyhole slots without removing the coin collector from its mounting:

- If a security stud is present in the lower right security stud hole of the backplate (Fig. 5), the appropriate bolt fastener (2.09)

may be installed in place of the security stud.

- If there is no security stud in the lower right security stud hole of the backplate, place a small-bladed screwdriver in the hole (Fig. 8). If blade enters to a depth of at least 3/4-inch, a keyhole slot is present in the backboard (Fig. 9) and the appropriate bolt fastener can be used.

**2.11** Use of bolt fasteners is limited by the surface (backboards, shelf, or booth) upon which the coin collector is mounted.



*In vulnerable locations where prying of upper housing is likely, always use bolt fastener where possible.*

**2.12** The P-25E301 and P-25E302 bolt fasteners screw from the rear into the lower right security stud hole of the coin collector backplate (Fig. 7). The coin collector is installed in the same manner as any other coin collector equipped with security studs.

**2.13** To install a bolt fastener at existing installations, disconnect and remove the coin collector from its mounting.

**2.14** Use the P-25E303 stud fastener (Fig. 6) where a bolt fastener is not required, but where protection is desired against unauthorized use of the 10-type upper housing key.

**2.15** The stud fastener can be installed without removing the backplate assembly from its mounting surface.

**2.16** Use a P-25E351 insulator on either the bolt or stud fastener (Fig. 6 and 7) to prevent it from grounding against the lower lug of the housing contacts. To install, start at the BKX terminal and wind in "barber pole fashion" around the stud or bolt. Do not cover the threads on the exposed end of the stud or bolt. Redress wiring to upper housing contacts (Fig. 10).

**2.17** After the bolt or stud fastener is properly installed, fasten upper housing as follows:

- (a) Insert the tubular key into the KS-19277 lock.

(b) Apply and maintain a slight forward pressure on the key while rotating it in a clockwise direction **until the key is hand tight**. Do not force the key beyond this point. To remove the key, maintain a forward pressure, turn counterclockwise to the first release position and pull the key away from the lock.



*Do not use pliers or other unauthorized tools on the handle of the key. Do not file tab off end of key. Once the upper cover assembly has been drawn to the backplate assembly so that the upper cover assembly lock can be engaged, there is no need to further tighten the KS-19277 lock.*

**2.18** When an upper housing is equipped with a KS-19277 lock and is removed for maintenance, apply a coating of KS-19094 antiseize compound to the threaded area of the bolt or stud fastener which engages the security lock to prevent binding or "freezing" of parts.

#### Security Studs

**2.19** Security studs provide added strength to the mounting of a coin collector or coin telephone set on a backboard. Four versions are available as shown in Fig. 11.



*Security studs can be used only if the backboard has key-hole slots which align with the coin collector security stud mounting holes.*

**2.20** The P-10E070 and P-12E798 studs are used with the 190, 200, and 1200 series coin collectors and panel coin phones. The P-40Y060 and P-40Y061 studs are used with the 1A- and 1C-type coin telephone sets.

**2.21** Security studs with long shoulders are used with 5/16-inch thick backboards. Those with short shoulders are used with 3/16-inch thick backboards.

#### 719A Tool

**2.22** A 719A tool (Fig. 12) is required to release or engage the locking mechanism on both of the 1- and 2-type coin telephone sets and 235/1235-type coin collectors.

**1A Backplate**

**2.23** The 1A backplate made of sheet steel (Fig. 13), is intended for use on coin collectors equipped with aluminum backplates to reduce the possibility of breaking away the lower housing by means of a pry bar.

**2.24** The 1A backplate is provided with clearance holes for security studs and mounting screws. It is fastened to the coin collector backplate by replacing the four lower housing assembly screws with one P-12E799 and three P-13E656 high-strength flathead steel screws (Fig. 14). Replacement screws must be ordered separately.

**Note:** The 1A backplate cannot be used with 139A backboards or 19-type shelves.

**Armored Cords**

**2.25** All current coin collectors and coin telephone sets are equipped with armored handset cords (Fig. 15). Transmitter and receiver caps are cemented to the handset handle. Refer to Section 501-210-102 for complete information on handsets.♣

**2.26** Use the following procedures to equip existing coin collectors in the field with G3-type, G13-type, or FIL handset.

- (1) Remove the upper housing from the coin collector.
- (2) Disconnect the handset cord conductors and cord fasteners. Before removing old cord from the cord entrance hole, attach a pull wire to the old cord. This will aid in pulling in the new cord.



**Cover the coin relay, hopper, and return chute with a piece of plastic, cloth, or other suitable material to prevent metal drill shavings from falling into them.**

- (3) Using a small center punch and hammer, mark hole to be drilled and tapped in the coin collector backplate. This hole is to be located in the cord entrance tube halfway between the outer beveled edge of the coin collector and the left edge of the cord chamber (Fig. 16).

- (4) Drill hole with a No. 7 drill (.201 inch).



**When drilling aluminum backplates do not exert too much pressure on drill. This may cause drill to cut too fast, thus making hole oversized.**

- (5) Tap the hole using a 1/4-20 tap with a Greenfield T-Handle tap wrench or equivalent.

**Caution: The tap wrench should be long enough to permit the wrench handle to be turned without injury to the installer or possible damage to the coin relay.**

- (6) Clean metal shavings from the cord entrance hole.
- (7) Using the pull-in wire placed in step 2, pull in the new cord.
- (8) Remove the pull wire from new cord and fasten a P-12A096 clamp over the cord (Fig. 17).
- (9) A P-26E084 1/4-20 by 5/16-inch self-locking setscrew is used to secure the cord to the coin collector backplate (Fig. 17). A flat surface is located approximately 1/4-inch from the set end of the stainless steel flexible hose. Using a 1/8-inch Allen wrench, screw the socket setscrew into the hole drilled in step 4 until it just makes contact with the flat surface of the metal hose. Give the setscrew a minimum of 1/4 turn and a maximum of 1/2 turn. This should hold the cord firmly in the coin collector.

**Caution: Screwing the socket setscrew down more than one turn against the steel flexible hose may damage the cord conductors.**

- (10) Remove the protective covering placed during drilling and replace the upper housing.

**Caution: Carefully brush out all metal shavings from the coin collector, and dispose of them so that they will not cause injury or damage equipment.**

- 2.27** Refer to Fig. 18 for routing and securing handset cord in 1-type coin telephone sets.

## SECTION 506-101-400

**2.28** Refer to Fig. 19 for routing and securing handset cord in 2-type coin telephone sets.

**2.29** Refer to Fig. 20 for routing and securing handset cord to 235/1235-type coin collectors.

### D-180009 Switchhook Conversion Kit

**2.30** The D-180009 switchhook conversion kit (Fig. 21) is designed to reduce switchhook blocking and permit a simple adjustment of switchhook travel. The conversion kit can be used for field conversion of 200-type and 1234-type coin collectors.

**2.31** Two types of switchhooks *may be found* in the field: A one-piece switchhook with a long shaft and a two-piece switchhook with a short shaft and an adapter.

**2.32** To remove a one-piece switchhook:

- (1) Remove and retain hex head machine screw, lockwashers, tension spring, switchhook arm assembly, and any spacing washer that may be present, from right end of shaft (Fig. 22).
- (2) Slide switchhook to the left and out of bearings.

**2.33** If coin collector is mounted in a corner, a one-piece switchhook may be removed without removing the coin collector from backboard as follows:

- (1) Perform operations outlined in 2.32 (1).
- (2) Place the larger notch of a 710A bending tool on the switchhook hub as shown in Fig. 23, View A. Apply force on the tool as shown and move the switchhook out, bending it slightly.
- (3) Having partially bent the shaft, move the switchhook to the left. Place the smaller notch of the bending tool over the shaft as shown in Fig. 23, View B. Apply force on the tool as shown.
- (4) Continue moving the switchhook to the left and applying additional bends as needed to remove the switchhook.

**2.34** To remove a two-piece switchhook:

- (1) Perform operations outlined in 2.32 (1).

(2) Loosen the flathead screw which secures P-12E828 adapter (Fig. 24) to the switchhook shaft.

(3) Slide switchhooks to left and out of bearing.

(4) Slide adapter to left and out of bearing.

**2.35** Remove wire guide clamp (Fig. 22).

**2.36** To install new switchhook kit:

(1) Install P-20F161 wire guide clamp (Fig. 25) on backplate. Ensure that wiring is routed as shown.

(2) Select correct bushing (Fig. 21) and slide over shaft of switchhook.

(3) Secure bushing on shaft with a cotter pin (Fig. 26).

(4) Slide the P-20F155 adapter assembly into right bearing (Fig. 26).

(5) Slide switchhook assembly with bushing installed through left bearing to mate with adapter assembly.

(6) Secure adapter to shaft with hex socket head cap screw (Fig. 27) which is furnished with kit.

(7) Install P-297872 spring washers as required to reduce excessive end play. End play of switchhook shaft shall not exceed 1/32-inch.

(8) Place switchhook arm assembly (Fig. 28) retained in 2.32 over switchhook shaft and secure to end of adapter shaft with lockwasher and hex head machine screw. Install tension spring.

**2.37** Adjust switchhook travel with the two adjusting screws (Fig. 28) to meet contact spring pile up requirements and check switchhook operation per Section 506-310-100.

**2.38** Ensure that all wires are clear of adapter travel and adjusting screws.

### Coin Relay Guard Assembly

**2.39** A special case-hardened steel antidrill guard assembly (KS-20892) is available to prevent fraudulent operation of coin relay in single slot coin telephone sets (Fig. 29). The guard assembly must be ordered separately.

**2.40** When the antidrill guard assembly is used, the existing coin relay plastic dust cover must be trimmed to fit around the guard assembly. Trim the dust cover per Fig. 30 using electrician scissors or side cutters.

**Note:** Currently manufactured dust covers are provided with guide lines to follow when cutting. When these lines are provided, disregard Fig. 30.

**2.41** Secure the antidrill guard assembly to the set using the existing return chute assembly mounting screw (Fig. 29).

### 840360184 Knob and Shaft Assembly

**2.42** The 840360184 knob and shaft assembly (Fig. 31) is designed as a replacement for the lever-type coin release handle and shaft assembly on single slot coin telephone sets in areas where a high rate of vandalism has resulted in serious damage to internal linkage and other chute actuating components.

**2.43** A built-in clutch arrangement ensures that the chute actuating components are neither damaged nor destroyed if the knob is forcibly turned beyond its normal rotational limit.

**2.44** Notches and indentations on the sloped turning surface minimize slippage of the fingers.

**2.45** To replace the lever-type coin release with the knob-type (Fig. 32):

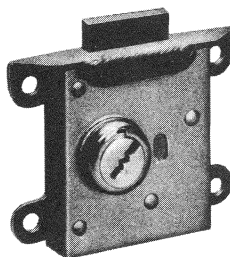
- (1) Remove cover unit assembly (1-type set) or open door and faceplate assembly (2-type set).
- (2) Remove and retain RM-651418 screw which secures link and lever assembly to coin release lever shaft. Remove lever and shaft assembly.

- (3) Insert knob and shaft assembly and ensure that arrow on knob is oriented as shown.

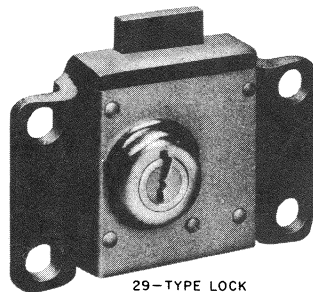
- (4) On a panel coin telephone set, the steel spacer must be used.

**Note:** Do not use spacer on a 1-type set.

- (5) Place link and lever assembly over rear of shaft and secure with the RM-651418 screw retained in (2).



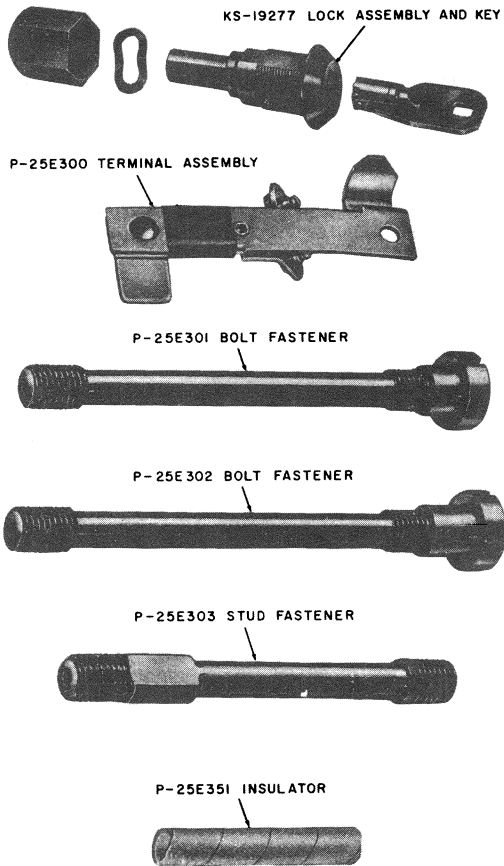
10-TYPE LOCK



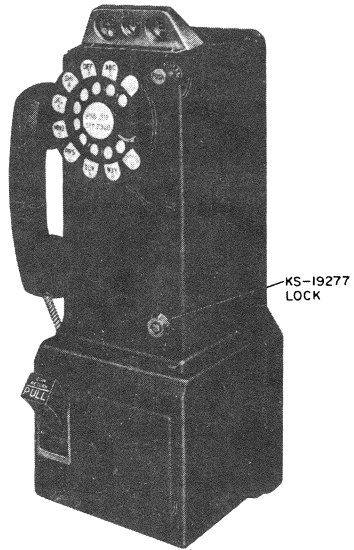
29-TYPE LOCK

**Fig. 1—Upper Housing and Cover Assembly Locks**

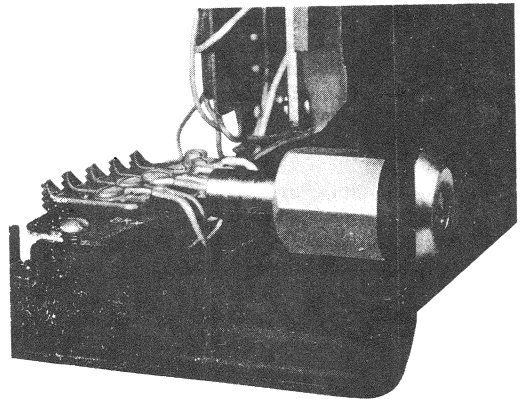
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**Fig. 2—KS-19277 Lock and Associated Parts**

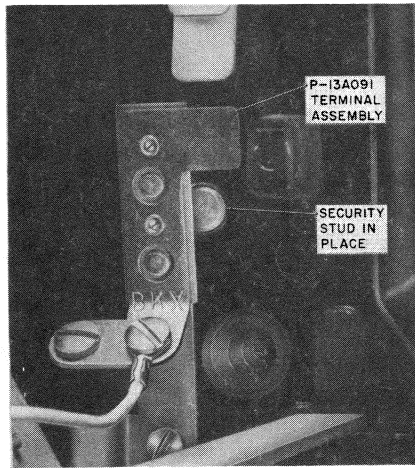


**Fig. 3—Coin Collector Equipped With KS-19277 Lock**

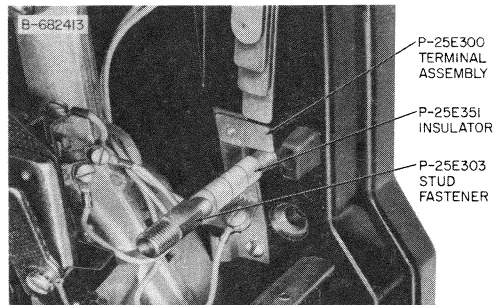


**Fig. 4—KS-19277 Lock Installed in Upper Housing**

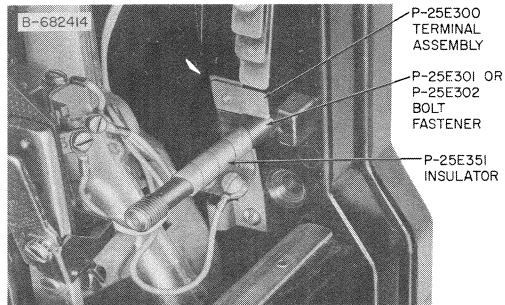




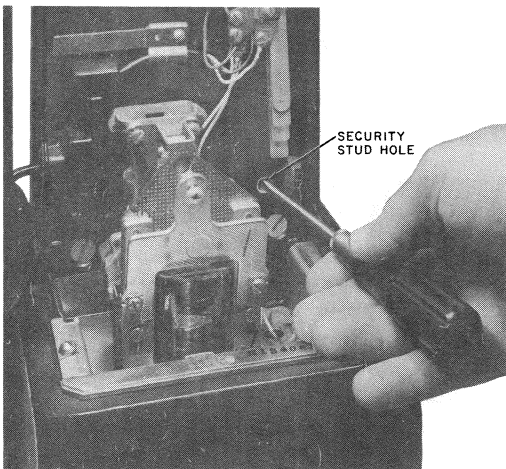
**Fig. 5—P-13A091 Terminal Assembly with Security Stud Installed**



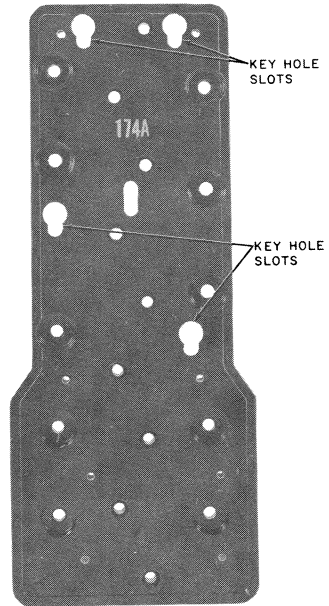
**Fig. 6—Terminal Assembly, Insulator, and Stud Fastener**



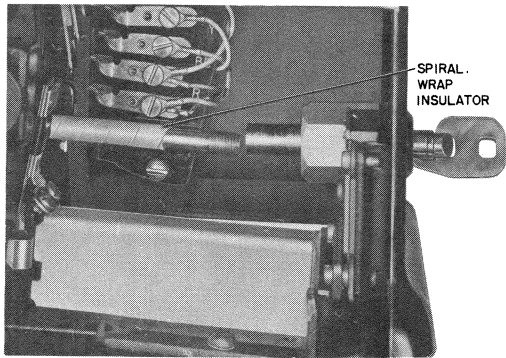
**Fig. 7—Terminal Assembly, Insulator, and Bolt Fastener**



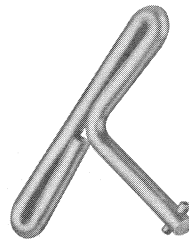
**Fig. 8—Determining Presence of Keyhole Slots**



**Fig. 9—174A Backboard with Keyhole Slots for Security Studs and Bolt Fastener**

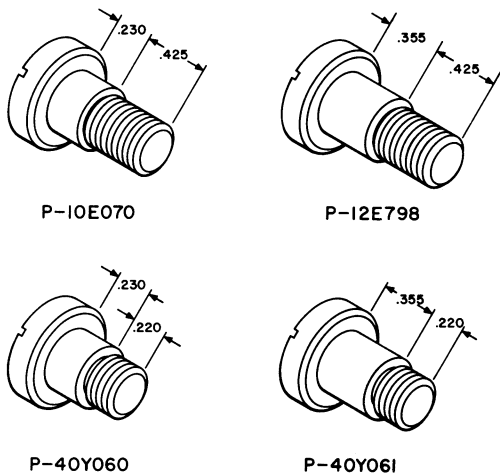


**Fig. 10—Cutaway Section of Upper Housing Showing Mating of Bolt Fastener and KS-19277 Lock**

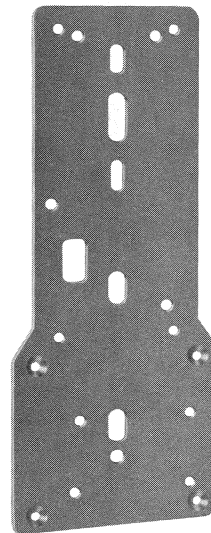


**Fig. 12—719A Tool**

NOTE:  
ALL DIMENSIONS SHOWN ARE IN INCHES.

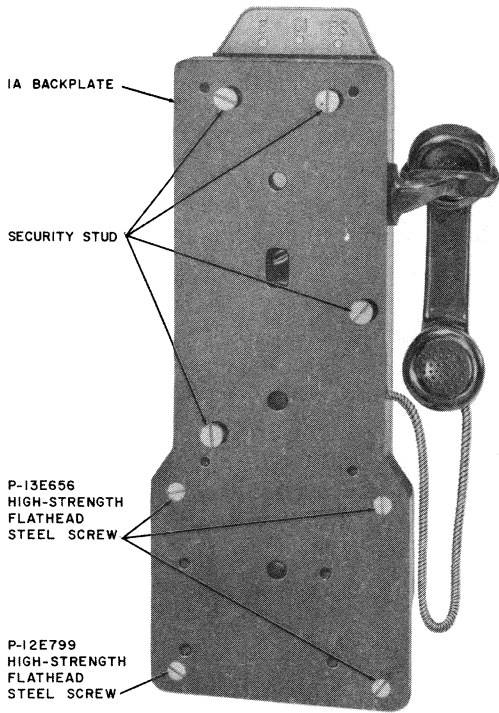


**Fig. 11—Security Studs**

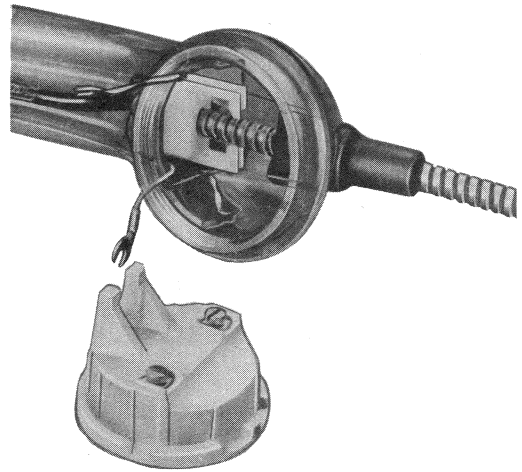


**Fig. 13—1A Backplate**

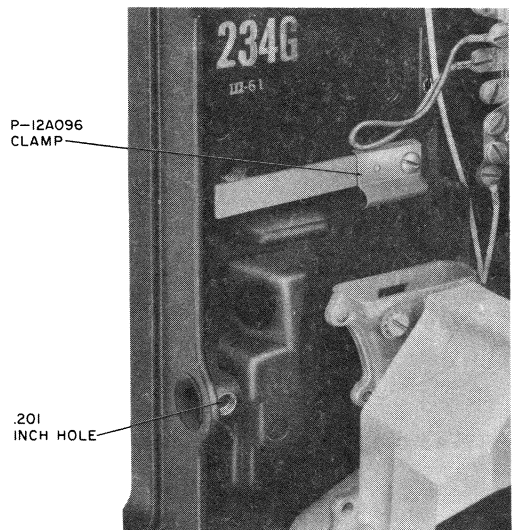
**SECTION 506-101-400**



**Fig. 14—Rear View of Coin Collector with 1A Backplate Attached**



**Fig. 15—Handset with Armored Cable**



**Fig. 16—Location of .201 Inch Hole**

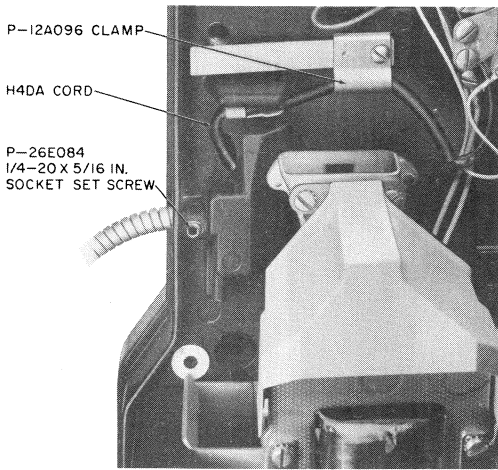


Fig. 17—Installation of Armored Cord

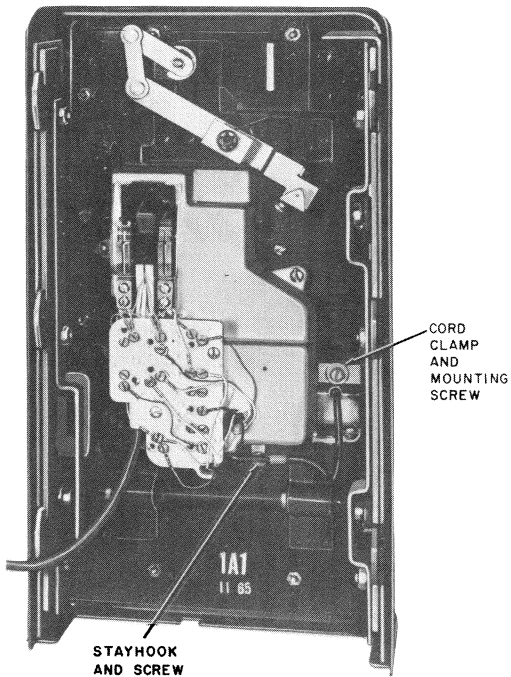


Fig. 18—Location of Armored Cord Mounting Hardware in 1A/1C-Type Coin Telephone Set

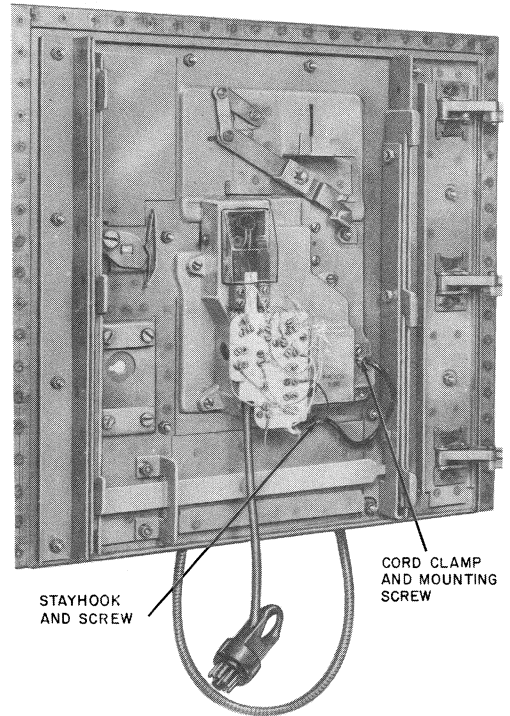
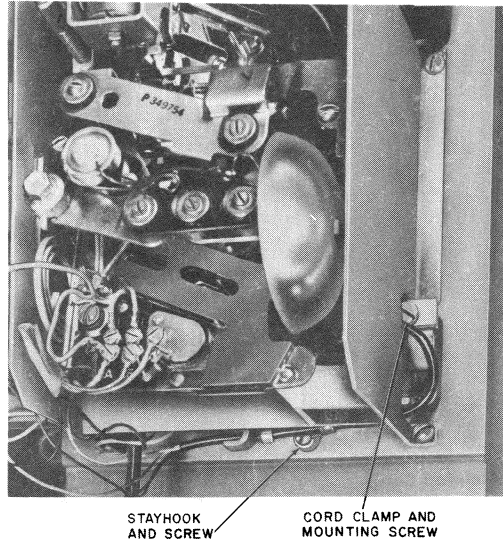
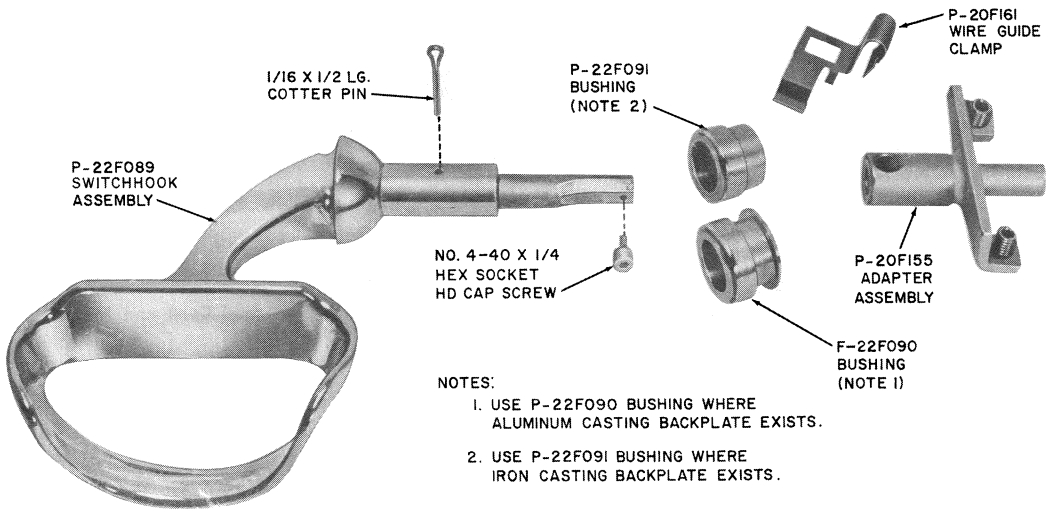


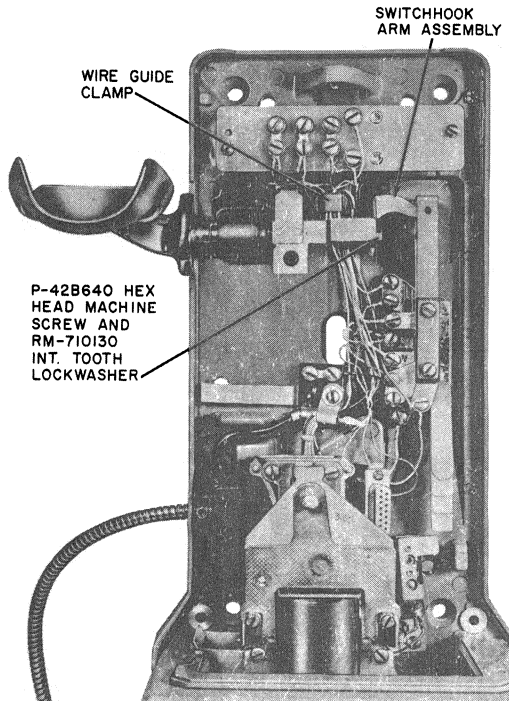
Fig. 19—Location of Armored Cord and Mounting Hardware in 2A/2C-Type Coin Telephone Set



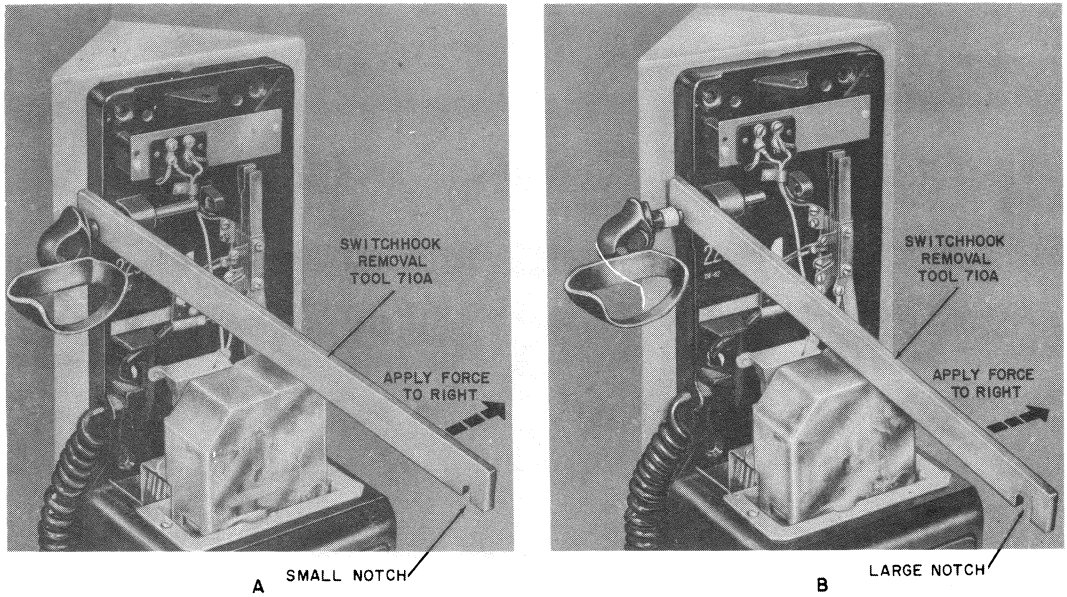
**Fig. 20—Location of Armored Cord and Mounting Hardware in 235/1235-Type Coin Collector**



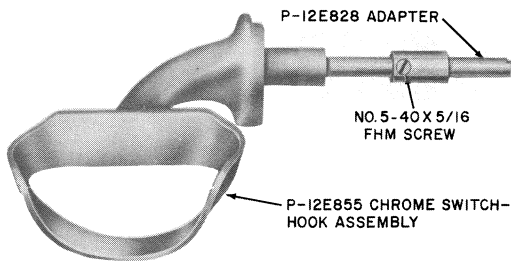
**Fig. 21—D-180009 Switchhook Kit**



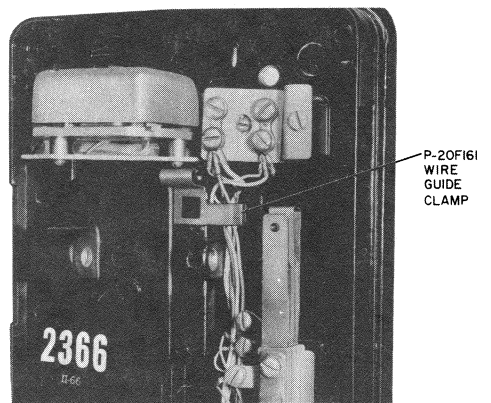
**Fig. 22—Switchhook Installed**



**Fig. 23—Removal of One-Piece Switchhook Located in Corner**

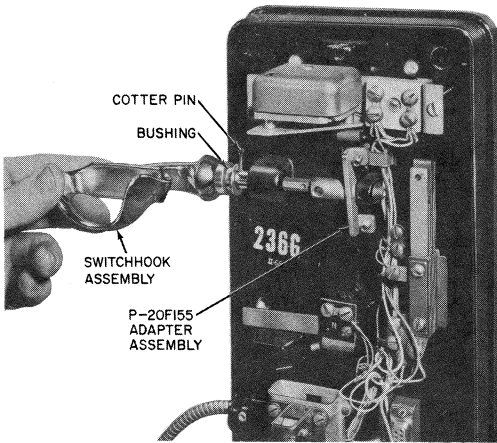


**Fig. 24—Two-Piece Switchhook**

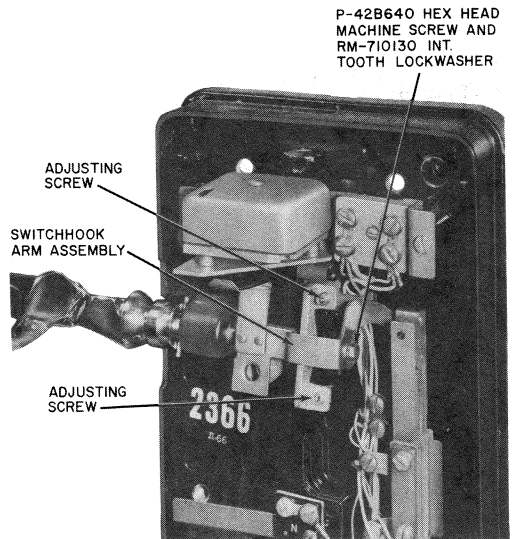


**Fig. 25—Installation of Wire Guide Clamp**

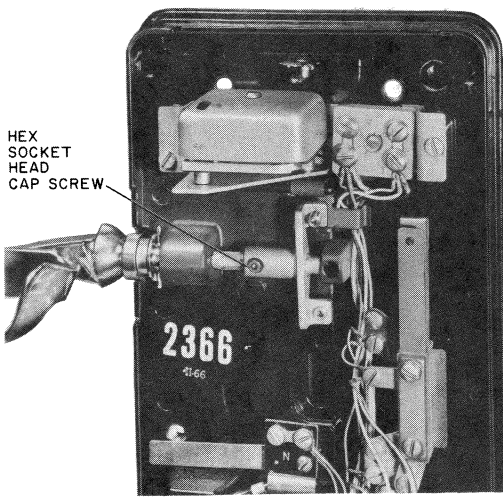




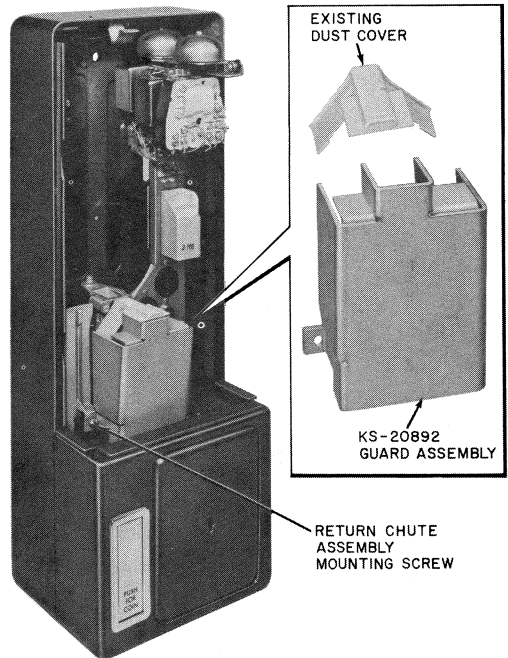
**Fig. 26—Installation of Adapter Assembly and Switchhook Assembly**



**Fig. 28—Installation of Switchhook Arm Assembly**



**Fig. 27—Method of Securing Adapter to Switchhook Assembly**



**Fig. 29—Relay Antidrill Guard Arrangement**

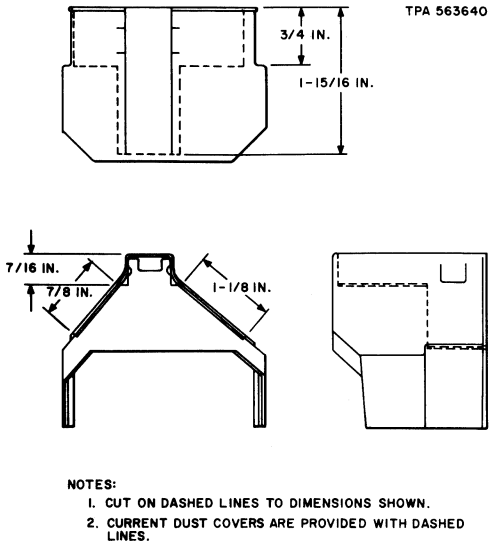


Fig. 30—Outline for Cutting Dust Cover

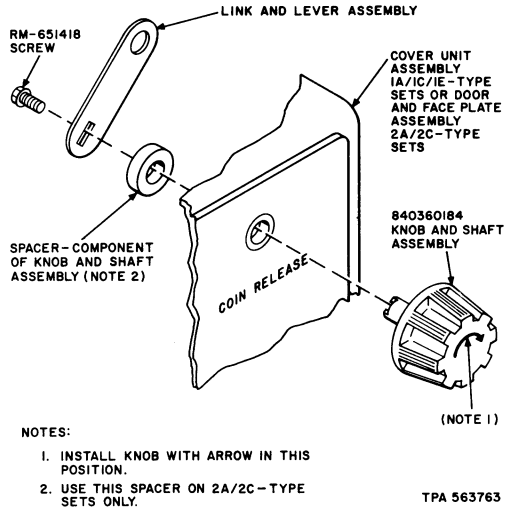


Fig. 32—Installation of 840360184 Knob and Shaft Assembly

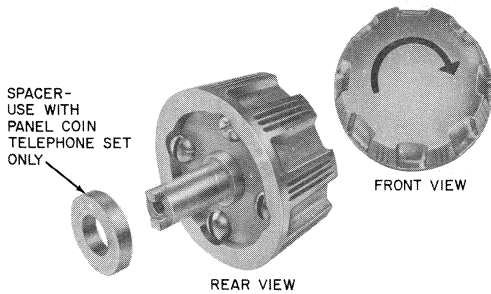


Fig. 31—840360184 Knob and Shaft Assembly

1A/2A, 1C/2C, AND 1E TYPES  
COIN TELEPHONE SETS

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**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

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**1. GENERAL**

1.01 This section contains identification, installation, maintenance, and connection information on the 1A/2A-, 1C/2C-, and 1E-type coin telephone sets (Fig. 1 and 2).

1.02 This section is reissued to add:

- KS-20950, List 2 cover panking tool
- KS-22473 leveling device
- KS-22551 Gauge
- 70B Dial

- G13D handset
- RFI information
- 20A coin chute—shimmed dime slot
- New Table F.

Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 Coin telephone set codes are described in Table A.

1.04 A detailed description of these sets can be found in Public Services Crafts' Manual.

1.05 The 1A/1C rotary dial sets can be converted to 1A/1C TOUCH-TONE sets by replacing the coin cover unit. Verify correct wiring. No provisions are made for modifying the 2A/2C rotary dial sets to 2A/2C TOUCH-TONE sets.

1.06 Coin telephone sets in dial tone first can be used only with those central office switching systems that have been converted to dial tone first.

1.07 The 1E-type postpay coin telephone sets have no provision for coin refund; however, slugs or bent coins trapped in the chute can be cleared and will fall into the coin return when the coin release lever has been operated.

1.08 Overall dimensions of the 1A/1C/1E-type coin telephone sets are:

- Height—21 inches
- Width—7-3/4 inches
- Depth—6-1/4 inches

1.09 Overall dimensions of the 2A/2C-type coin telephone sets are shown in Fig. 3.

1.10 1A/2A-type sets are MD.

TABLE A  
CODE SIGNIFICANCE

CODE	FIG.	HOUSING	MODE OF OPERATION	DIAL	
1A1	1	Box Type	Coin First Only	Rotary	
1A2				TOUCH-TONE	
2A1	2	Panel Type		Rotary	
2A2				TOUCH-TONE	
1C1	3	Box Type		Rotary	
1C2				TOUCH-TONE	
2C1	4	Panel Type		Coin First or Dial Tone First	Rotary
2C2					TOUCH-TONE
1E1	5	Box Type	Post Pay		Rotary
1E3					None (Manual)

## 2. IDENTIFICATION

### A. Ordering Guide

#### 2.01 Basic Telephone Set:

- Set, Coin Telephone, 1C1, 1C2, 2C1, 2C2, 1E1, or 1E3

**Note 1:** See Tables B and C for color selection.

**Note 2:** All 1C/2C-type sets are shipped from the factory wired for coin-first service. Following is an example of how a typical set is equipped (see Table C):

1—Example—1C1-51 will be a green, box type set equipped with:

- 70A1-50 coin cover unit which includes a 60A1-44 coin dial unit which contains an 8WA dial with an 818418527 number plate
- G3AH-52 handset
- 20A1A chute-totalizer

- 31A coin chassis

- 1AA coin relay

- 2A-51 cash compartment door.

**2.02 Components:** See Tables B, C and Fig. 1, 2.

**Note:** Coin cover unit and coin dial units can be ordered from the factory-wired for coin-first or dial-tone-first service.

**2.03 Associated Apparatus (Order Separately):** See Table D.

**2.04 Optional Equipment (Order Separately):** See Table E.

### B. Design Features

**2.05** All parts are contained in a high-security steel housing. The coin cover unit/door and faceplate assembly has six locking points actuated by a 719A tool (Fig. 4) and secured by a 29A lock. A 32A special purpose lock may be used in 1-type sets.

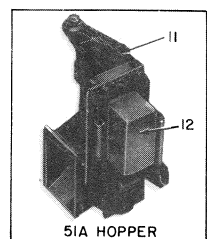
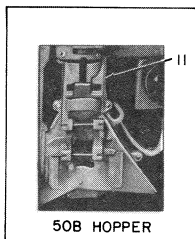
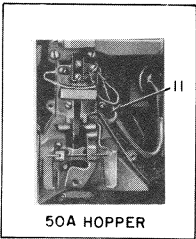
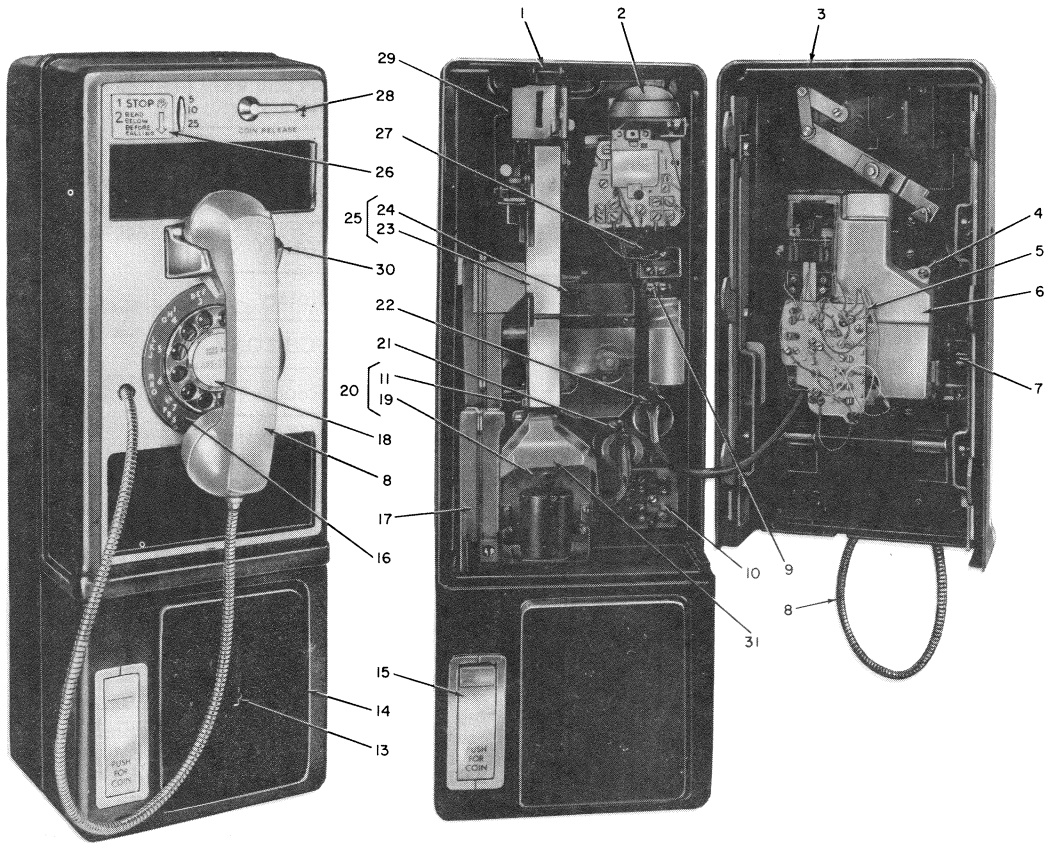


Fig. 1—1-Type Coin Telephone Set

**LEGEND (FIG. 1)**

- 1 — 812755429 (P-27E542) Chute Locking Lever and 812754976 (P-27E497) Spring
- 2 — C4-Type Ringer
- 3 — Coin Cover Unit\*
- 4 — 840157390 Self-locking Screw
- 5 — TB2
- 6 — Coin Dial Unit\*
- 7 — 811554443 (P-15E444) Coverplate and 801816786 (P-181678) BHM Screw
- 8 — Handset\*
- 9 — Coin Chassis\*
- 10 — TB3 (1C Set Only)
- 11 — Hopper Assembly\*
- 12 — Delay Circuit Assembly
- 13 — Slot For 719A Tool
- 14 — 2-Type Door
- 15 — 812165462 (P-21F546) Coin Return Assembly
- 16 — Number Plate or Apparatus Blank\*
- 17 — 811557304 (P-15E730) Return Chute Assembly
- 18 — Dial\*
- 19 — Coin Relay (1A/1C-Type Sets Only)\*
- 20 — Coin Relay and Hopper Assembly (1A/1C-Type Sets Only)\*
- 21 — P2
- 22 — P1
- 23 — Chute\*
- 24 — Totalizer\*
- 25 — Chute-Totalizer\*
- 26 — Information Plate\*
- 27 — TB1
- 28 — 840358725 Shaft and Handle Assembly
- 29 — 812363612 (P-23F361) Entrance Stop
- 30 — 840358303 Hook
- 31 — 811057835 Cover

\* Refer to Tables B and C.

**Fig. 1—Legend**

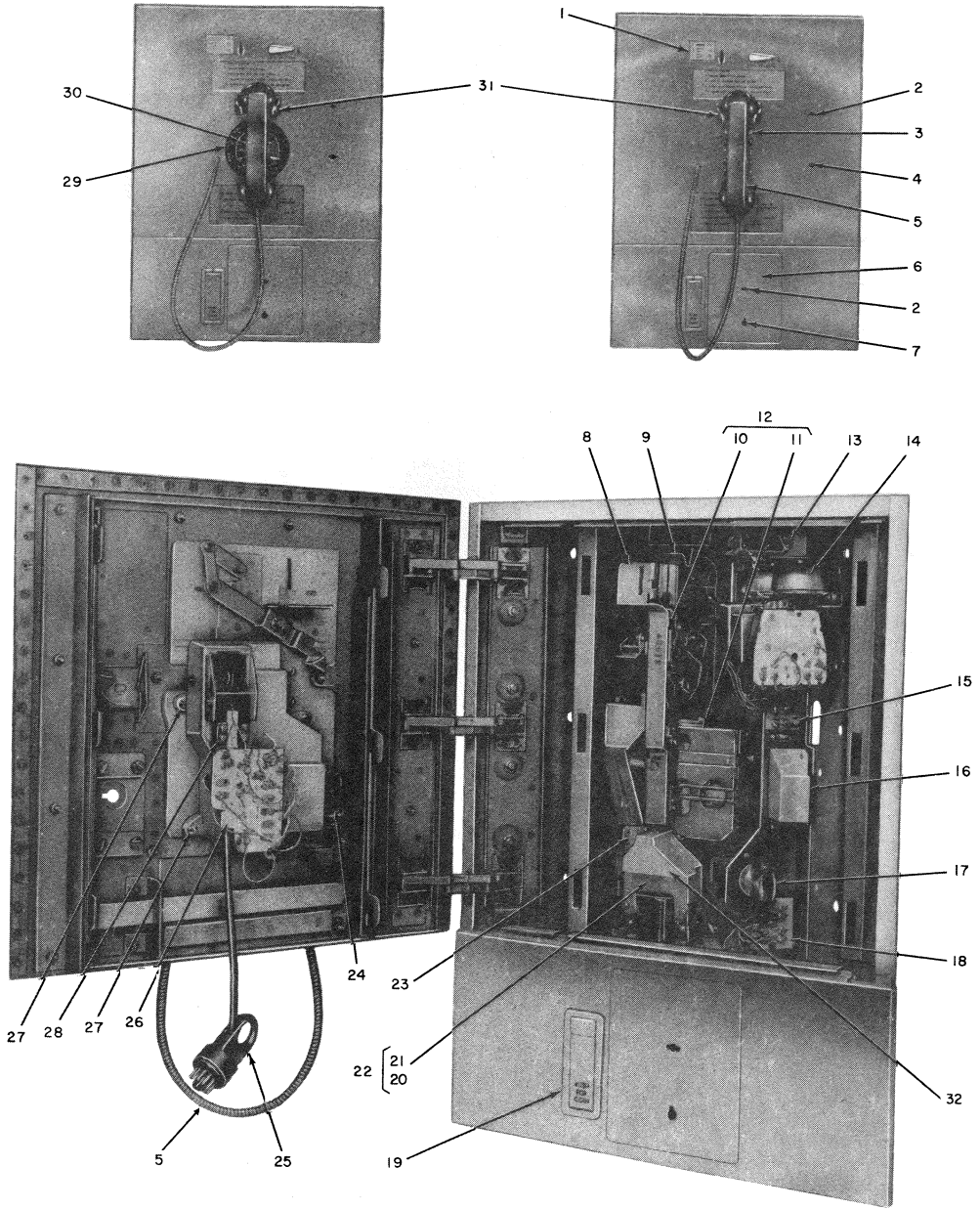


Fig. 2—2-Type Coin Telephone Set

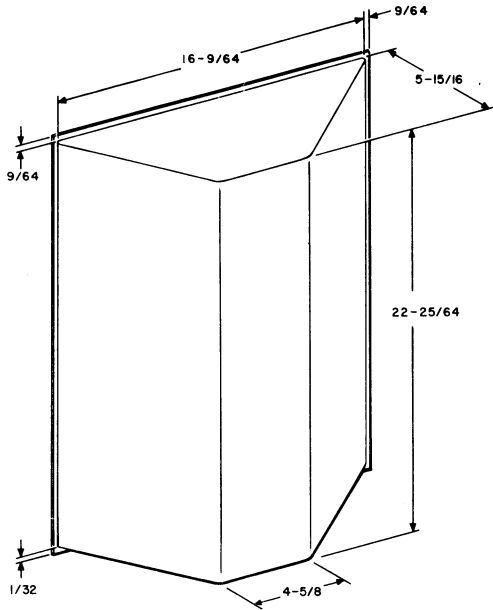


**LEGEND (FIG. 2)**

- 1 – Information Plate\*
- 2 – Slot for 719A Tool
- 3 – Number Card
- 4 – Slot for 29A Lock
- 5 – Handset\*
- 6 – 5A Door
- 7 – Slot for 30-Type Lock
- 8 – 812363612 (P-23F361) Entrance Stop
- 9 – 812755429 (P-27E542) Chute Locking Lever and 812754976 (P-27E497) Spring
- 10 – Chute\*
- 11 – Totalizer\*
- 12 – Chute-Totalizer\*
- 13 – 7A Clip
- 14 – C4-Type Ringer
- 15 – TB1
- 16 – Coin Chassis\*
- 17 – P2
- 18 – TB3 (2C Set Only)
- 19 – Coin Return Assembly
- 20 – Coin Relay\*
- 21 – Hopper Assembly\*
- 22 – Coin Relay and Hopper Assembly\*
- 23 – Return Chute Assembly\*
- 24 – 811554443 (P-15E444) Coverplate and 801816786 (P-181678) BHM Screw
- 25 – P1
- 26 – TB2
- 27 – 840157390 Self-locking Screw
- 28 – Coin Dial Unit\*
- 29 – Number Plate Assembly\*
- 30 – Dial\*
- 31 – 840358303 Hook
- 32 – 811057835 Cover

\* Refer to Tables B and C.

**Fig. 2—Legend**



- NOTES:  
 1. ALL DIMENSIONS SHOWN ARE IN INCHES.  
 2. THE SWITCHHOOK AND HANDSET EXTEND 2-3/4 INCHES IN FRONT OF THE FACEPLATE.

**Fig. 3—Rear View of Panel Set Showing Dimensions**

- 2.06** The 1-type set cash compartment door has four locking points actuated by a 719A tool. The 2-type set cash compartment door has five locking points; three are actuated by a 719A tool; two are stationary. All cash compartment doors are secured by a 30-type lock.
- 2.07** Provision is made for use of four security studs.
- 2.08** The set is designed to accept U.S. nickels, dimes, and quarters only.
- 2.09** All sorting of coins is done internally by the coin chute.
- 2.10** Sets have transmission characteristics of 500-type telephone sets.
- 2.11** Electrical connections of field replaceable coin cover unit and chute-totalizer are made by plug and jack arrangement.

**2.12** Each set is equipped with a totalizer mounted on the side of the coin chute. The totalizer cam shaft is rotated 10 degrees by each nickel deposited, 20 degrees by each dime, and 50 degrees by each quarter. Each cog (10 degrees) on the gear wheel represents a 5-cent increment. The totalizer can be set for an initial rate of any amount from 5 cents to 45 cents in 5-cent increments. A call cannot be made, except as described in paragraph 2.17 until the correct initial rate has been deposited. All totalizers are preset at the factory for a 10-cent initial rate.

**2.13** Operator identification of coin deposits is by oscillator generated beep tones. A nickel is identified as one beep, a dime as two beeps, and a quarter as five rapid beeps. These tones may be audible in the handset. In switching systems designed for machine detection of customer coin deposits, sets equipped with dual frequency (DF) type chassis must be used.

**2.14** Several versions of totalizers may be found in the field as shown in Fig. 5. The CF-DTF mode switch on current models or PP-DTF connector on older models can be moved manually from one position to another.

**2.15** The black reference mark appearing on the ratchet wheel indicates whether the totalizer shaft is off-normal or in its "home" position. As viewed from the front of the coin telephone set, a totalizer is in its home position when the mark is at a point 1 tooth to the left of the 6 o'clock position.

### C. Basic Operating Features

#### **2.16 Coin First Service (Prepay System):**

For coin first operation, the coin station line circuit at the central office responds to ground start control. A start circuit must be completed between ring lead and the ground lead at the coin telephone set before the dialing and talking circuit is connected and energized.

#### **2.17 Dial Tone First Service (Prepay System):**

System operation for dial tone first is on a loop start basis with ground present test for initial rate, and polarity reversal for subsequent deposits. This system provides dial tone before coin deposit and allows call completion to certain numbers without a coin deposit. Loop start circuit control is completed between the ring

**TABLE B**  
**COMPONENT AND COLOR SECTION**  
**(1A/2A-TYPE SETS)**

COIN TEL SET	FRONT COVER		DIAL AND HOUSING		DIAL	NUMBER PLATE ASSY	INFORMATION PLATE	HANDSET
	COVER UNIT ASSY (MD)	COIN COVER UNIT *	DIAL AND HOUSING ASSY (MD)	COIN DIAL UNIT *				
1A1-03 (Black)	819054032 (P-90E403)	70A1-03	841317241 or 819042748 (P-90D274)	60A1-44	8WA or 8W (MD)	818418527		
1A1-44 (Chrome)	819054446 (P-90E444)	70A1-44		60A2-44				
1A1-51 (Moss Green)	819054511 (P-90E451)	70A1-51		60A2-44				
1A2-03 (Black)	819055039 (P-90E503)	71A1-03	840346977	61A1-44	70A (MD) or 70B	840156319		G3AH-52† G3AK-52† G3AHF-52† G3AKF-52† G13-Type‡
			819042755 (P-90D275)		35T3A			
1A2-44 (Chrome)	819055443 (P-90E544)	71A1-44	840346977	61A1-44	70A (MD) or 70B			
			819042755 (P-90D275)		35T3A			
1A2-51 (Moss Green)	819055518 (P-90E551)	71A1-51	840346977	61A1-44	70A (MD) or 70B			
			819042755 (P-90D275)		35T3A			
2A1-67 (Brushed Stainless)				61A1-44	8WA or 8W (MD)	818720526		
2A2-67 (Brushed Stainless)				61A1-44	70A (MD) or 70B			
					35T3A			

\* These coin cover unit and coin dial unit codes are for ordering information to obtain the unit, wired, tested, and equipped for the correct mode of operation. Since the units may be field converted from one type to another, maintenance, and installation should be based on the first three (3) characters of the code only. It is important therefore to ensure that the unit being used is wired properly and that the coin cover unit has the proper information plate and instruction cards for the type of service with which it is being used. All rotary coin cover units are equipped with 8WA dials and all TOUCH-TONE coin covers units are equipped with 70A (MD) or 70B dials.

† G3AHF-52 and G3AKF-52 are optional flame retardant handsets and cords that can replace the G3AH-52 and G3AK-52 respectively. The G3AK and G3AKF are equipped with a moisture resistant transmitter barrier and special transmitter cap.

‡ A G13D amplified handset can be used. Refer to Section 501-211-102 for complete information.

**TABLE B (Contd)**  
**COMPONENT AND COLOR SECTION**  
**(1A/2A-TYPE SETS)**

HOUSING AND MTG PLATE ASSY	CHUTE-TOTALIZER	COIN CHASSIS	COIN RELAY AND HOPPER ASSY	RETURN CHUTE ASSY	COIN RETURN ASSY	COIN RECP RAIL	CASH COMPT. DOOR
818512036 (P-85A203)	811554286 (P-15E428) Consist of 20A Chute 811555796 (P-15E579) Totalizer	840693634 with DF Oscillator	1AA Coin Relay Consist of 1A Coin Relay and 811557172 Coin Hopper Assembly	811557305 (Current return chute assemblies are made of plastic instead of diecasting)	812165462	1B	2A-03 or 2B-03 (Optional)
818512444 (P-85A244)							2A-44 or 2B-44 (Optional)
818512519 (P-85A251)							2A-51 or 2B-51 (Optional)
818512036 (P-85A203)							2A-03 or 2B-03 (Optional)
818512444 (P-85A244)							2A-44 or 2B-44 (Optional)
818512519 (P-85A251)	2A-51 or 2B-51 (Optional)						
						1D	5A-67

**TABLE C  
COMPONENT AND COLOR SECTION  
(1C/2C/1E-TYPE SETS)**

COIN TEL SET	MODE OF OPERATION	FRONT COVER		DIAL AND HOUSING		DIAL	NUMBER PLATE ASSY	INFORMATION PLATE	HANDSET
		COVER UNIT ASSY (MD)	COIN COVER UNIT *	DIAL AND HOUSING ASSY (MD)	COIN DIAL UNIT				
1C1-03 (Black)	CF	819054032	70A1-03	841317241 or 819042748 (P-90D274)	60A1-44	8WA or 8W (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E403)	70A2-03		60A2-44				
1C1-44 (Chrome)	CF	819054446	70A1-44	819042748 (P-90D274)	60A1-44	8WA or 8W (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E444)	70A2-44		60A2-44				
1C1-51 (Moss Green)	CF	819054511	70A1-51	840346977 (70A Dial) or 819042755 (P-90D275)	60A1-44	70A (MD), or 70B, 35T3A (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E451)	70A2-51		60A2-44				
1C2-03 (Black)	CF	819055039	71A1-03	840346977 (70A Dial) or 819042755 (P-90D275)	61A1-44	70A (MD), or 70B, 35T3A (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E503)	71A2-03		61A2-44				
1C2-44 (Chrome)	CF	819055443	71A1-44	840346977 (70A Dial) or 819042755 (P-90D275)	61A1-44	70A (MD), or 70B, 35T3A (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E544)	71A2-44		61A2-44				
1C2-51 (Moss Green)	CF	819055518	71A1-51	840346977 (70A Dial) or 819042755 (P-90D275)	61A1-44	70A (MD), or 70B, 35T3A (MD)	818418527	840156319 for Coin First	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF	(P-90E551)	71A2-51		61A2-44				
2C1-67 (Brushed Stainless)	CF			841317241 or 819042748 (P-90D274)	60A1-44	8WA or 8W (MD)	818720526	(Used on 1C-and 2C-Type sets only)	G3AH-03, G3AK-03, G13-Type‡
	DTF				60A2-44				
2C1-84 (Bronze)	CF			841317258 or 840152227	60A1-84	8WA or 8W (MD)	818720039	(Used on 1C-and 2C-Type sets only)	G3AH-03, G3AK-03, G13-Type‡
	DTF				60A2-84				
2C2-67 (Brushed Stainless)	CF			840346977 or 819042755	61A1-44	70A (MD), 70B, 35T3A (MD)	818720039	(Used on 1C-and 2C-Type sets only)	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
	DTF				61A2-44				
	CF				61A1-44				
	DTF				61A2-44				
2C2-84 (Bronze)	CF			840347173 or 840157580	61A1-84	70A (MD), 70B, 35T3A (MD)	818720039	(Used on 1C-and 2C-Type sets only)	G3AH-03, G3AK-03, G13-Type‡
	DTF				61A2-84				
	CF				61A1-84				
	DTF				61A2-84				
1E1-03 (Black)	Dial Post Pay	840658033	70A5-03	841317241 or 819042748 (P-90D274)	60A2-44	8WA or 8W (MD)	818418527	840156087	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
1E1-44 (Chrome)		840658447	70A5-44						
1E1-51 (Moss Green)		840658512	70A5-51						
1E3-03 (Black)	Manual Post Pay	840659031	70A4-03	841317266 or 812366516 (P-23F651) Housing Assembly	60A4-44	840994727 Apparatus Blank Assembly	818418527	840156087	G3AH-52† G3AK-52† G3AHF-52† G3AKF-52 † G13-Type‡
1E3-44 (Chrome)		840659445	70A4-44						
1E3-51 (Moss Green)		840659510	70A4-51						

\* These coin cover unit and coin dial unit codes are for ordering information to obtain the unit, wired, tested, and equipped for the correct mode of operation. Since the units may be field converted from one type to another, maintenance, and installation should be based on the first three (3) characters of the code only. It is important therefore to ensure that the unit being used is wired properly and that the coin cover unit has the proper information plate and instruction cards for the type of service with which it is being used. All rotary coin cover units are equipped with 8WA dials and all TOUCH-TONE coin cover units are equipped with 70A (MD) or 70B dials.

† G3AHF-52 and G3AKF-52 are optional flame retardant handsets and cords that can replace the G3AH-52 and G3AK-52 respectively. The G3AK and G3AKF are equipped with a moisture resistant transmitter barrier and special transmitter cap.

**TABLE C (Contd)**  
**COMPONENT AND COLOR SECTION**  
**(1C/2C/1E-TYPE SETS)**

HOUSING AND MTG PLATE ASSY	CHUTE-TOTALIZER	COIN CHASSIS	COIN RELAY AND HOPPER ASSY	RETURN CHUTE ASSY	COIN RETURN ASSY	COIN RECP RAIL	CASH COMPT. DOOR
818512036 (P-85A203)	20A1A Consist of 20A Chute and 1A Totalizer	31A with DF Oscillator (31A2 Coin Chassis is available wired and tested for DTF service)	1AA Coin Relay Consist of 1A Coin Relay and 811557172 Coin Hopper Assembly	811557305 (Current return chute assemblies are made of plastic instead of diecasting)	812165462	1B	2A-03 or 2B-03 (Optional)
818512444 (P-85A244)							2A-44 or 2B-44 (Optional)
818512519 (P-85A251)							2A-51 or 2B-51 (Optional)
818512036 (P-85A203)							2A-03 or 2B-03 (Optional)
818512444 (P-85A244)							2A-44 or 2B-44 (Optional)
818512519 (P-85A251)							2A-51 or 2B-51 (Optional)
840656037	20A10A Consist of 20A Chute and 10A Totalizer	30B with DF Oscillator	51A or 50A (MD) Hopper Assembly	811557305 (Current return chute assemblies are made of plastic instead of diecasting)	812165462	1B	2A-03 or 2B-03 (Optional)
840656441							2A-44 or 2B-44 (Optional)
840656516			50B Hopper Assembly				2A-51 or 2B-51 (Optional)
840657035							2A-03 or 2B-03 (Optional)
840657449							2A-44 or 2B-44 (Optional)
840657514							2A-51 or 2B-51 (Optional)
					840152219	1D	5A-67
					840152219		5A-84
					812165462		5A-67
					840152219		5A-84

‡ A G13D amplified handset can be used. Refer to Section 501-211-102 for complete information.

**TABLE D**  
**ASSOCIATED APPARATUS**  
(Order Separately)

COIN TEL SET	CASH COMPT DOOR	COIN RECEP- TACLE	COIN RECEP- TACLE COVER	CASH COMP LOCK	COVER UNIT ASSY OR DOOR AND FACEPLATE ASSY LOCK	ALARM SWITCH
1A/1C/1E- Type	2A-3* (Black) 2A-44* (Chrome) 2A-51* (Moss Green)	1C-Type ‡	1E	30-Type	29A	1A Switch Kit & 257A Switch
2A-Type	5A-67† (Stainless)					257A Switch
2C-Type	5A-67† (Stainless) or 5A-84† (Bronze)					

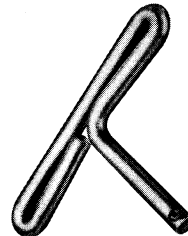
\* 2B door is optional.

† The cash compartment door is furnished with all panel phones.

‡ Sets equipped with false floor in coin vault will require a 1B receptacle.

**TABLE E**  
**OPTIONAL EQUIPMENT**

ITEM	USED ON	REMARKS
1A Switch Kit	1-type Set	Refer to BSP 506-101-100
257A Alarm Switch	30-type Lock	BSP 506-101-100
Magnetic Coin Stop (D-180848 Kit of Parts)	1-type Set	Paragraphs 5.37 through 5.43
11A Card Holder	1-Type Set Mounted on a 178A backboard	Paragraph 3.28 through 3.30
D-180893 Kit of Parts (Polarity Guard)	1C2/2C2 Tel Set DTF Mode Only	Table R and Fig. 63



**Fig. 4—719A Tool**

lead and the tip lead at the coin telephone set when the handset is lifted and the switchhook is operated.

**2.18 Dial Postpay Service:** The system provides negative battery to the ring side of the line with tip grounded. Dial tone is received

TABLE F

## TOOLS

ITEM	USE	REMARKS
719A Tool	To open coin cover unit (1-type set) or door and faceplate assembly (2-type set)	Fig. 4
KS-20950, List 2 Cover Parking Tool	To hold coin cover unit open (1-type set) during maintenance	See Note and Fig. 33
P11C Test Cord	Connects coin cover unit to chassis with door and faceplate assembly opened (2-type set)	Fig. 34
KS-22473 Leveling Device	To determine a vertical surface	Fig. 7
KS-14995, List 3 Tool	For trap and vane release test	Fig. 35
146B Bias Margin Gauge	To test bias margin on coin relay	Fig. 36

*Note:* KS-20950, List 1 tools that show excessive movement (looseness) or loose rivets should be replaced with a new tool, (preferably the List 2 if available), to avoid dropping the front cover.

and the party is dialed before coin deposit. Upon called party answer and following coin deposit, the CO switches the circuit for conversation.

**2.19 Manual Postpay Service:** The system provides negative battery to the ring side of the line with tip grounded. The operator is alerted when handset is lifted. Coin deposits are requested by the operator after connection to called party has been made.

**2.20 Automatic Coin Toll Service (ACTS):**

(a) ACTS is a feature, developed to further mechanize the handling of coin sent-paid toll calls at a No. 1 Traffic Service Position System (TSPS). This is accomplished by —

- (1) Providing automatic voice announcement to the customer.
- (2) Providing machine recognition of coin deposit signals.
- (3) Providing capability of checking for acceptability of the timing, frequency, and amplitude of coin signals generated by the coin telephone set.

(b) In order for a coin telephone set to be compatible with ACTS, it must be equipped

with a dual frequency (DF) oscillator mounted on the following chassis:

- 1A/2A-type sets—840693634 coin chassis
- 1C/2C-type sets—31A coin chassis
- 1E1 set—30B coin chassis

(c) The ACTS is compatible with coin telephone sets in the Coin-First (CF), Dial-Tone-First (DTF), and Dial Postpay (PP) mode of operation.

### 3. INSTALLATION

#### LOCATION

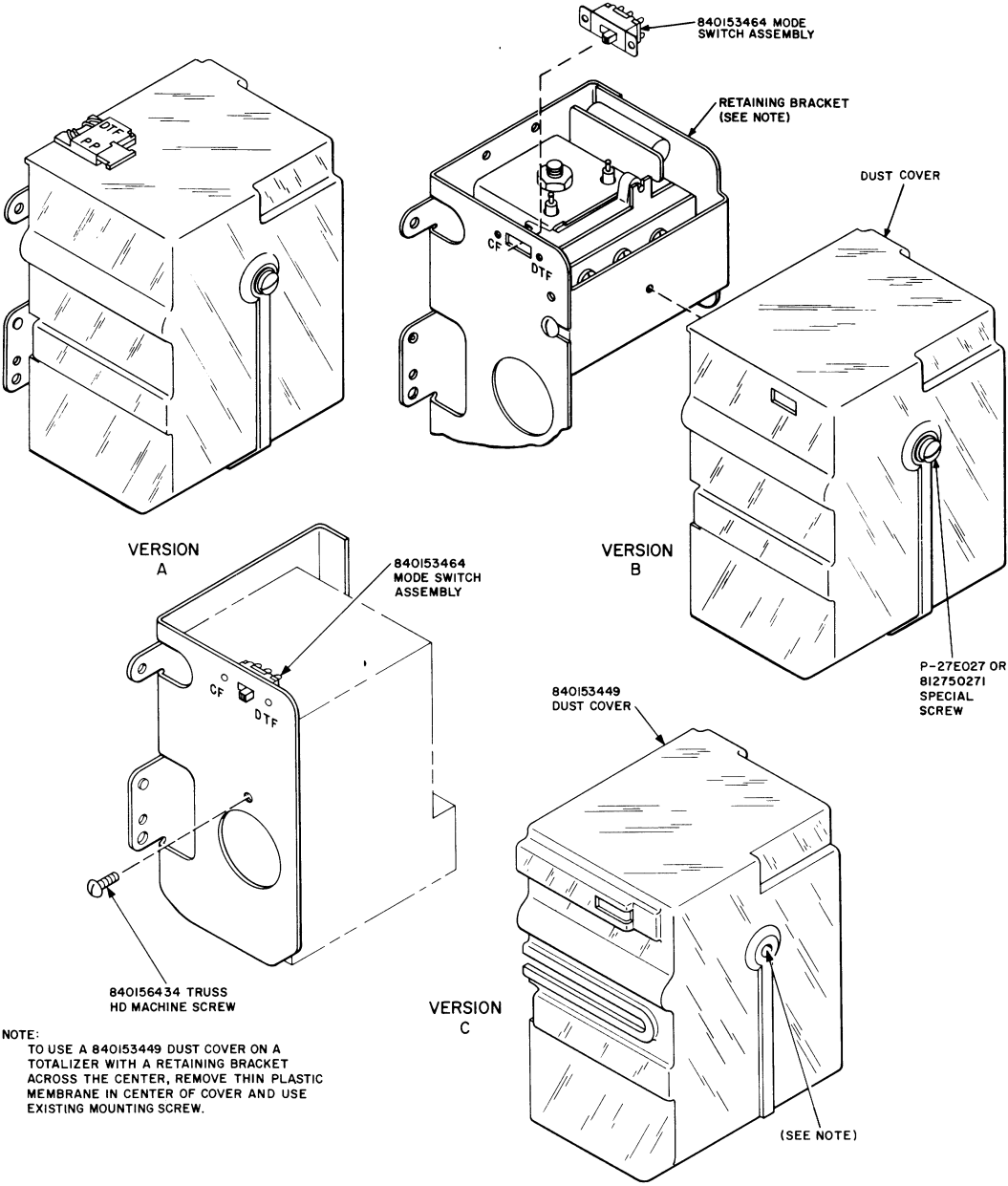
**3.01** The 1-type coin telephone set can be installed in facilities described in Table G.

**3.02** The 2-type coin telephone set can be installed in facilities described in Table H.

**3.03** The following should be adhered to.

- Ensure that Drop and Inside Wires are protected. IW wires should be protected at least 6 feet from set.
- Check visibility, accessibility, and possible accident hazards in selecting locations.





NOTE:  
 TO USE A 840153449 DUST COVER ON A TOTALIZER WITH A RETAINING BRACKET ACROSS THE CENTER, REMOVE THIN PLASTIC MEMBRANE IN CENTER OF COVER AND USE EXISTING MOUNTING SCREW.

Fig. 5—Partial View of Totalizer

- Check mounting surfaces—Consult a supervisor before locating coin telephone set on finishes that would be expensive to repair if the set is removed.
- Check inductive effects—Locate set and associated wiring away from neon fixtures, transformers, or other interference-causing equipment.
- For outdoor installations, be sure that telephone set will not be subject to driving rain, salt spray, or splashed salt water from snow melt-off on sidewalks or roadside mountings.
- Ensure that security studs and thru-wall fasteners are used where possible. Always install all (7) 1/4-20 hardened screws when mounting a 1-type set. A single 1/4 I.D. flat washer may be used under each screw head for added security.

**BACKBOARDS AND SECURITY STUDS**

**3.04** Refer to Section 506-100-101 and observe the following.



*When mounting the coin telephone set, a vertical surface must be provided. A tilt greater than 1-1/2 degrees in any direction can cause chute malfunction. A vertical surface may be determined in A or B.*

**A. KS-22473 Leveling Device (Fig. 7)**



*The leveling device must be vertical and the pendulum must be able to move freely.*

- (1) If a 178A backboard is used, position the leveling device so that the (2) studs insert into (2) of the center holes on the backboard and check that the black centerline on the pendulum is within the two 1.5 degree marks on the frame of the leveling device.
- (2) Align either long edge of the leveling device along the surface of the telephone enclosure (Fig. 8) on which the telephone set mounts and check that the black centerline on the pendulum

**TABLE G**  
**MOUNTING OF 1-TYPE SET (NOTE 3)**

BACKBOARD, BOOTH, SHELF, MOUNTING, OR KIOSK	BACKBOARD REQUIRED	SECURITY STUDS (4 REQUIRED)	
		834080608 (P-40Y060) (SHORT SHOULDER-SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER-SHORT THREAD)
178A-3 or -51 Backboard (Note 1)	Use on a vertical surface	•	
10- and 11-Type Booths	D-179939 or D-179940 Kit of Parts	•	
KS-14611 Booth	Furnished	•	
KS-16797 Booth	B-190387		•
KS-19206 Booth	KS-19206 List 6 Installation Kit	•	
KS-19267 Shelf	Furnished	•	
KS-19340 Booth	KS-19340 List 53	•	
KS-19425 Booth	Furnished		•
KS-19426 Mounting	KS-19426 List 7 Installation Kit		•
KS-19580 Booth	Furnished	•	
KS-19945 Shelf	Existing or 178A		•
KS-20194, L5 Shelf	178A-3 (Note 2)	•	
KS-20255 Kiosk	Furnished		•
KS-20842 Mounting	Furnished	•	
KS-21716 Booth	Furnished	•	
KS-21428 Phonecart	Furnished	•	
KS-21676, L2 Backboard		•	
KS-21571, L1, L2, L5, L6 Shelf	Furnished		•

**TABLE G (Contd)**

**MOUNTING OF 1-TYPE SET (NOTE 3)**

BACKBOARD, BOOTH, SHELF, MOUNTING, OR KIOSK	BACKBOARD REQUIRED	SECURITY STUDS (4 REQUIRED)	
		834080608 (P-40Y060) (SHORT SHOULDER-SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER-SHORT THREAD)
KS-21977 Mounting	Furnished	•	

*Note 1:* Top edge of 178A backboard should be approximately 55-1/4 inches from floor for a universal coin slot height of 54 inches.

*Note 2:* A 178A backboard is furnished with each KS-20194 shelf unless otherwise specified.

*Note 3:* Seven 1/4-20 by 5/8-inch hardened RHM screws 812367902 (P-23F790) are furnished with each coin telephone set for mounting to backboard.

is within the two 1.5 degree marks on the frame of the leveling device.

- (3) Align either long edge of the leveling device on a side surface of the enclosure which is known to be a true, vertical surface and again check that the black centerline on the pendulum is within the two 1.5 degree marks on the frame of the leveling device.
- (4) When installing enclosure posts, it may be more convenient to use the front and side surfaces of the post, which is valid if these surfaces are true vertical surfaces.
- (5) To check installed 1-type coin stations, align either long edge of the leveling device along the front chrome faceplate (Fig. 9) and again along the side of the station (Fig. 10) being sure to avoid the embosses and surface irregularities in these areas. Verify that the pendulum centerline is in both instances within the 1.5 degree limits marked on the frame.
- (6) To check installed 2-type (panel) coin stations, open the front door and align the long edge of the leveling device on the front face of the

housing frame that is flush with the wall surface on the right side and read the level measurement as before. Then align the tool on the left side of this same frame and again read the level measurement.

**Note:** If the KS-22473 leveling device is not available use B.

**B. Spirit Level**

- (1) Place a spirit level vertically against the mounting surface on which the set is to be installed.
- (2) When a vertical reading is obtained, the end of the level opposite the point of contact shall be no farther from the mounting surface than shown in Table I.
- (3) The left to right mounting axis shall also be within 1-1/2 degrees of true vertical.

**3.05** Refer to Fig. 11, 12 and Tables G, H for security stud requirements.

**MOUNTING ARRANGEMENTS**

**3.06** To gain access to the coin telephone set mounting holes.

- (1) Remove coin cover unit (1-type) per 3.10 or open door and faceplate assembly (2-type) per paragraph 3.11.
- (2) Remove chute-totalizer per paragraph 3.12.
- (3) Remove coin chassis per paragraph 3.22.

**1-Type**

**3.07** Refer to Table G for mounting applications.

**2-Type**

**3.08** To fully recess a 2-type set in a wall.

- (1) Ensure that wall thickness will accept the depth of set.
- (2) Refer to Fig. 3 for dimensions of the set.

TABLE H

## MOUNTING OF 2-TYPE SET (NOTE 2)

BOOTH, SHELF, OR MOUNTING	BACKBOARD REQUIRED	SECURITY STUDS (4 REQUIRED)		COVER REQUIRED (NOTE 1)
		834080608 (P-40Y060) (SHORT SHOULDER SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER SHORT THREAD)	
KS-19206 Booth	KS-19206, List 7 Installation Kit	•		127B Fig. 6
KS-19340 Booth	KS-19340 List 54 Backboard	•		127B Fig. 6
KS-19426 Mounting	Furnished		•	KS-19426, List 34 Top Assembly
KS-19442 Booth	KS-19340 List 54 Backboard	•		127A Fig. 6
KS-20194 Shelf	Furnished	•		None
KS-20630 Booth	Furnished	None Required (Note 3)		
KS-21571 L3, L4, L7, L8 Shelf	Furnished		•	None

*Note 1:* Three No. 8-32 by 3/16 RHM screws are furnished with cover for installation.

*Note 2:* Thirteen 1/4-20 by 5/8-inch hardened RHM screws 812367902 (P-23F790) are furnished with each coin telephone set for mounting to backboard.

*Note 3:* Use thirteen 1/4-20 by 3/8 RHM screws in a KS-20630 booth in place of the 1/4-20 by 5/8 lg. furnished screws.

(3) Cut a hole in the wall:

- Height—22-25/64 inches
- Width—16-9/64 inches
- Depth—6 inches
- Bottom edge of cutout should be approximately 34 inches from floor for a universal coin slot height of 54 inches.



*Ensure that the lip of the faceplate overlaps the wall around the hole.*

**3.09** Refer to Table H for all other mounting applications of the 2-type coin telephone set.

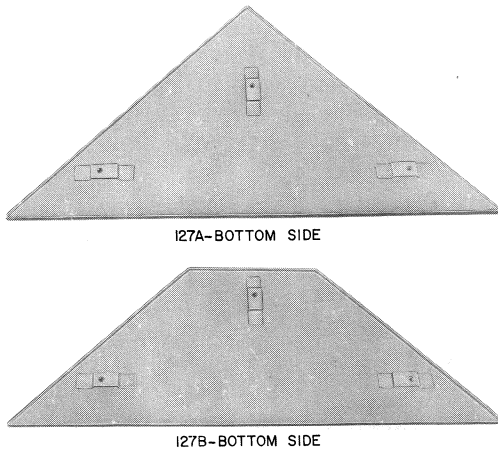


Fig. 6—127A and 127B Covers for Panel Sets

#### COMPONENTS

##### A. Coin Cover Unit (1-Type Set)

##### 3.10 To remove coin cover unit.

- (1) Unlock coin cover unit lock.
- (2) Release locking mechanism with 719A tool by turning tool 1/8-turn counterclockwise.
- (3) Pull cover off about 3 inches to gain access to P1.
- (4) Disconnect P1 by carefully pulling straight out as cover is removed.

##### B. Door and Faceplate Assembly (2-Type Set)



*Exercise care to keep the set from tipping over when door is opened.*

##### 3.11 To open door and faceplate assembly.

- (1) Unlock door and faceplate lock.
- (2) Release locking mechanism with 719A tool by turning 1/8-turn counterclockwise.
- (3) Open door approximately 3 inches to gain access to P1.

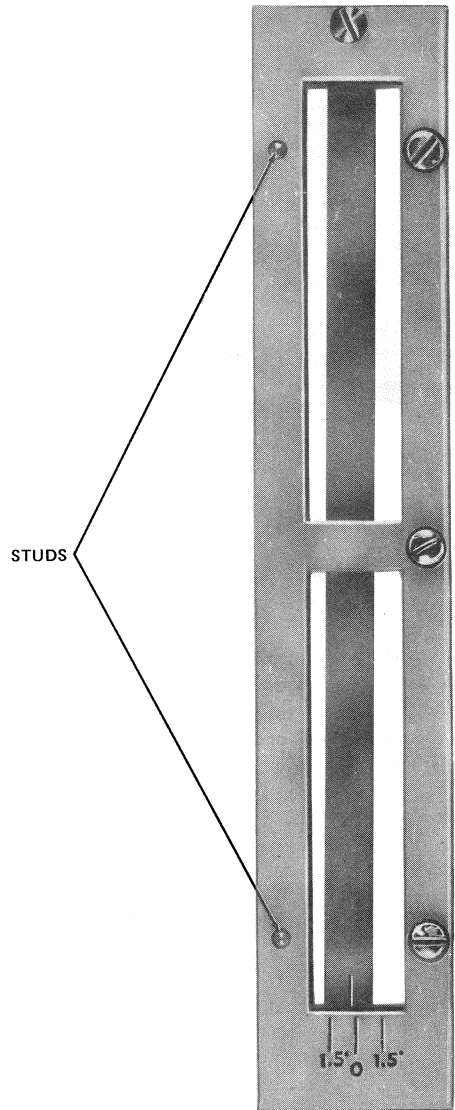


Fig. 7—KS-22473 Leveling Device

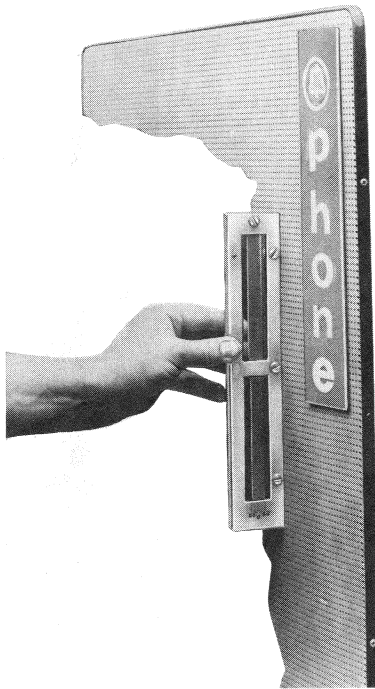


Fig. 8—KS-22473 Leveling Device Being Used to Check Wall and Backboard Alignment



Fig. 10—KS-22473 Leveling Device Being Used to Check Side Alignment

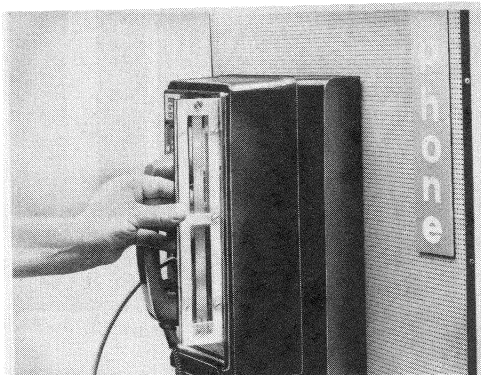


Fig. 9—KS-22473 Leveling Device Being Used to Check Front to Back Alignment

- (4) Disconnect P1 by carefully pulling straight out as door is opened.

### C. Chute-Totalizer

3.12 To remove chute-totalizer.

- (1) Disconnect P2.
- (2) Release chute locking lever.
- (3) Lift spring out of groove in chute.
- (4) Tilt top of chute forward and lift out.

3.13 To install chute-totalizer in set.

**Caution:** Before installing a chute in set, swing upper plate assembly open and clean off any foreign material adhering to chute magnets. Use a typewriter brush or equivalent.

TABLE I

METHOD OF DETERMINING  
A VERTICAL SURFACE

SPIRIT LEVEL LENGTH	MAXIMUM ALLOWABLE DISTANCE OUT OF PLUMB
18 inches	15/32 inch
24 inches	5/8 inch
30 inches	25/32 inch
36 inches	15/16 inch

- (1) Place chute on locating pins at rear of hopper assembly, and back of housing (Fig. 13).

**Note 1:** Ensure that reject chute, return chute, and coin return assemblies line up properly.

**Note 2:** Ensure that IW wires are properly dressed behind totalizer cutout.

- (2) Place spring in groove on chute.
- (3) Lock spring in place by pushing chute locking lever down.
- (4) Connect totalizer plug P2 to J2.

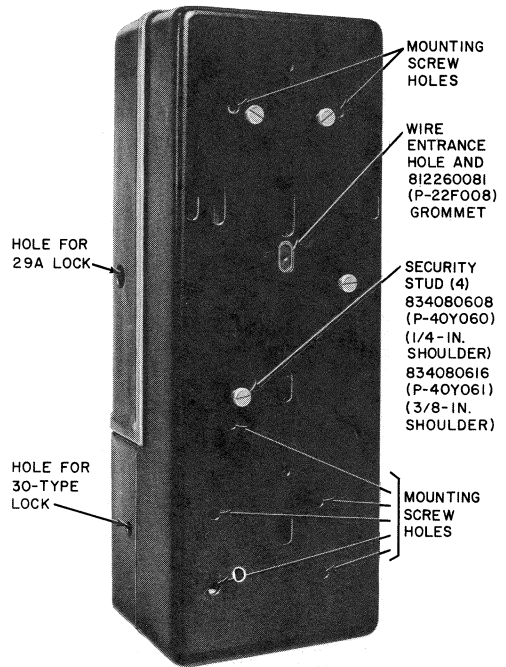


Fig. 11—Location of Mounting Screw Holes and Security Studs in 1-Type Set

- 3.14 To determine totalizer initial rate setting.



**Use extreme care when checking initial rate or resetting totalizer. Avoid damaging pawl and spring pile-ups. Do not attempt to turn totalizer cam shaft in direction opposite to that shown in Fig. 14.**

- (1) Remove chute-totalizer per paragraph 3.12.

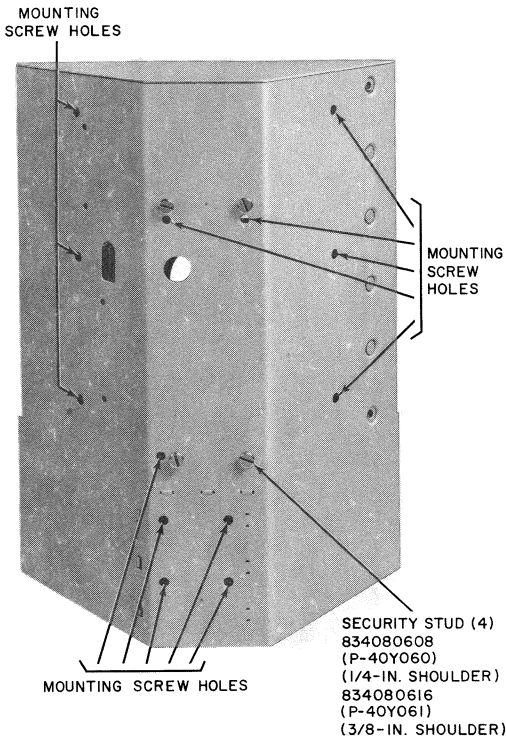


Fig. 12—Location of Mounting Screw Holes and Security Studs in 2-Type Set

- (2) Loosen retaining screw and remove transparent dust cover.
- (3) Rotate shaft in the proper direction (Fig. 14) until detent roller on detent wheel is positioned between the two black marks. This occurs at the same time T2 rests in depression in shaft. This position is called **home** position.
- (4) Release the reset latch by momentarily pressing downward on the armature of the RE relay (Fig. 14).
- (5) Slowly rotate shaft in proper direction, and count the steps until T1 springs operate (indicated by forward movement of reset latch).

- (6) Each step rotated from home position represents a 5-cent rate as shown in Table J.

3.15 To reset totalizer rate.

**Note:** Use two paper clips to reset the rate.

**Increasing Rate (Fig. 15).**

- (1) Rotate shaft in proper direction (Fig. 14) until it is in home position as described in paragraph 3.14(3).
- (2) Further rotate shaft approximately 10 steps until a tab on the T1 cam is accessible as shown in Fig. 15 and 16.
- (3) Insert a paper clip into one of the four holes indicated as hole 2 in center of shaft. Hold paper clip firmly so that shaft cannot move.

**Caution:** Do not push end of paper clip too far through shaft hole or it will damage insulation of coil located beneath shaft.

- (4) Position a second paper clip into the hole on T1 cam indicated as hole 1 and rotate cam in direction of the curved arrow as shown.



**If hole 1 in T1 cam has been mutilated or clogged preventing use, place paper clip against tab as shown in Fig. 15 and push tab in direction of the straight arrow.**

- (5) One step of rotation of the T1 cam in this direction increases the rate by 5 cents.
- (6) Check new initial rate setting per paragraph 3.14.

**Decreasing Rate (Fig. 16)**

- (7) Repeat steps (1) through (3).
- (8) Position a second paper clip into the hole on T1 cam indicated as hole 1 (Fig. 16) and rotate cam in direction of the curved arrow as shown.



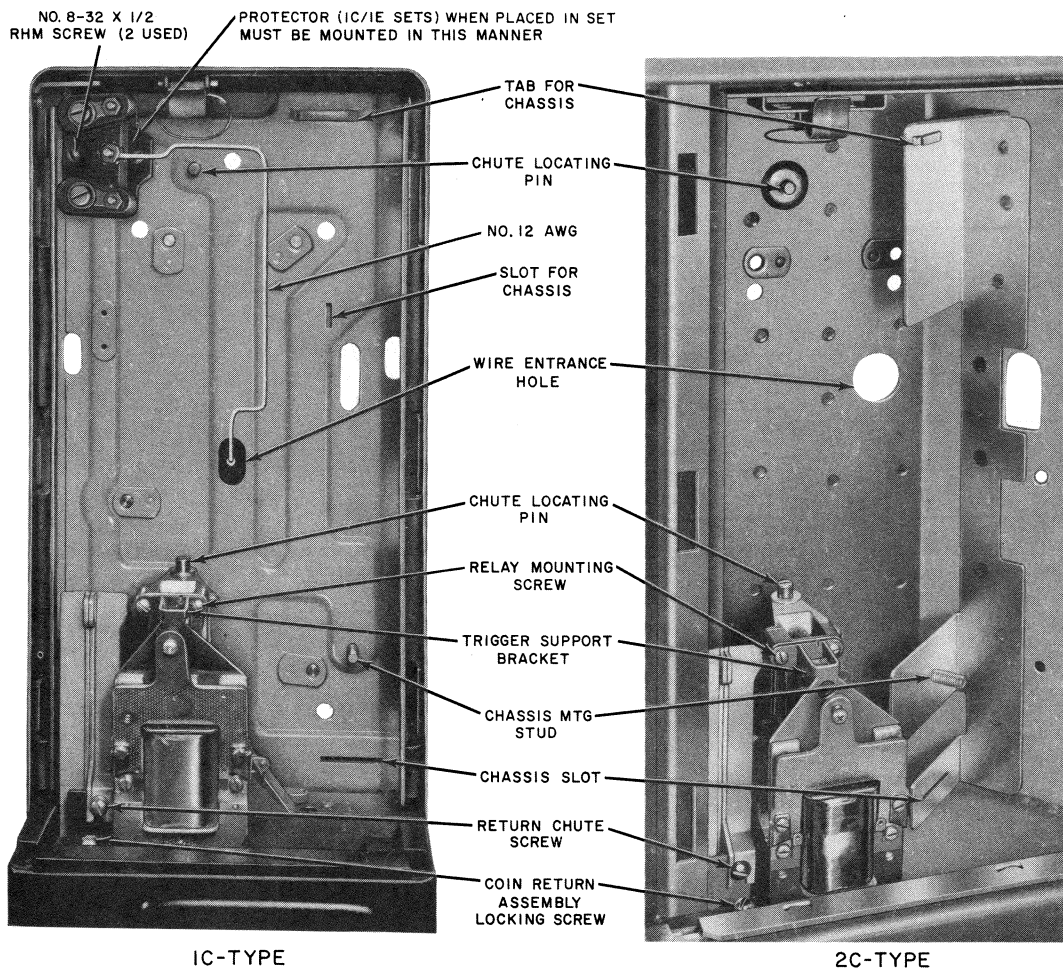


Fig. 13—Housing and Mounting Plate Assembly



*If hole 1 in T1 cam has been mutilated or clogged preventing use, place paper clip against tab as shown in Fig. 16 and push tab in direction of the straight arrow.*

- (9) One step of rotation of the T1 cam in this direction decreases the rate by 5 cents.
- (10) Check new initial rate setting as described in paragraph 3.14.

3.16 To remove totalizer from chute.



*Do not damage totalizer arms when removing or replacing totalizer on chute or when returning damaged totalizers to service center. Do not turn screws that are sealed with glyptal. When returning totalizers or chutes to service center, reuse packing material from which the new item was removed.*

TABLE J

METHOD FOR DETERMINING INITIAL RATE \*

NO. OF STEPS SHAFT IS ROTATED FROM HOME POSITION UNTIL T1 OPERATES	INDICATES FOLLOWING INITIAL RATE SETTING
1	5 cents
2	10 cents
3	15 cents
4	20 cents
5	25 cents
6	30 cents

\*30 cents is not the maximum setting that can be obtained.

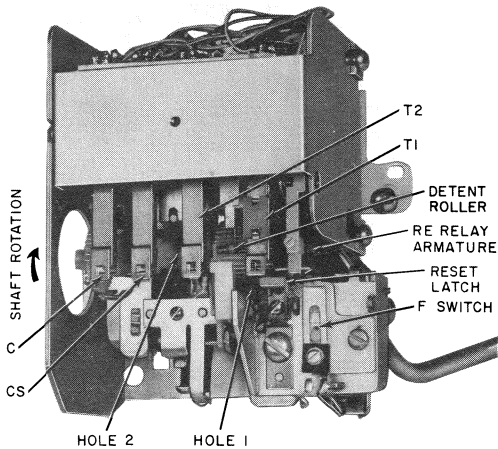


Fig. 14—Checking Totalizer Rate (Typical)

- (1) Unscrew three captive-type mounting screws from chute.
- (2) Carefully remove totalizer from chute.

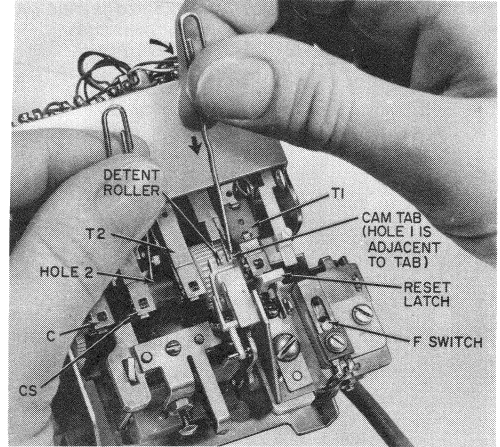


Fig. 15—Increasing Totalizer Rate (Typical)

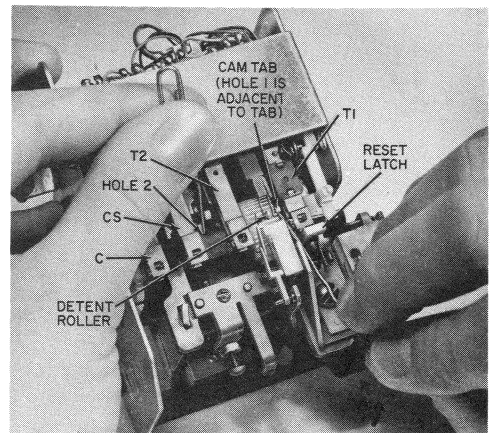


Fig. 16—Decreasing Totalizer Rate (Typical)

3.17 To install totalizer on chute.

- (1) Replace totalizer cover, if removed previously.
- (2) Line up the long guide pins on the totalizer with holes in the chute.

(3) Place totalizer on chute making sure that totalizer arms enter slots in chute. Be sure short guide pins on chute are in mating totalizer bracket holes.

(4) Tighten three captive-type mounting screws.

#### D. Coin Chassis

**3.18** The 811554377 (P-15E437) single frequency (SF) coin chassis used in 1A/2A-type sets, can be replaced with an 840693634 dual frequency (DF) coin chassis (Fig. 17).

**3.19** The 1A (SF) coin chassis used in 1C/2C-type sets can be replaced with a 31A (DF) coin chassis (Fig. 18).

**3.20** The 30A (SF) coin chassis used in 1E-type sets can be replaced with a 30B (DF) coin chassis (Fig. 19).

**3.21** DF oscillator-equipped coin chassis have the following features.

(a) Prior to August 1975, two screw terminals were furnished on the side of the oscillator. When these terminals are shorted, the oscillator is in the SF mode.

(b) All coin chassis and all sets containing them are shipped from the factory with a DF oscillator.

#### **3.22 To remove coin chassis.**

(1) Remove chute-totalizer per paragraph 3.12.

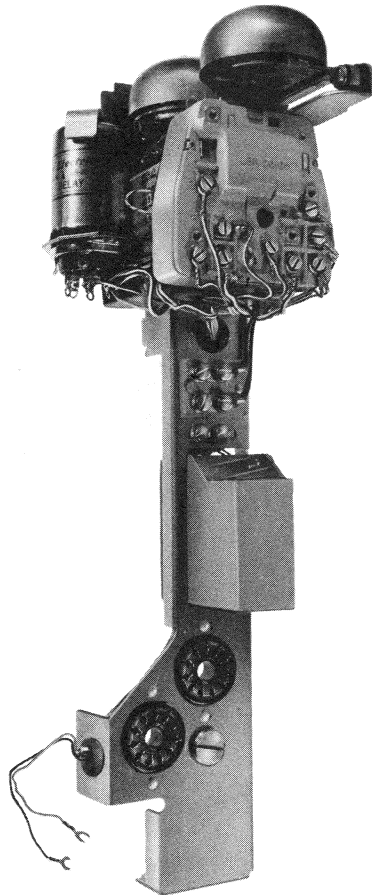
(2) Disconnect Tip, Ring, and Grd connections. Disconnect 12 AWG Grd strap if protector is mounted in set.

(3) On 1A/2A/1C/2C-type sets, disconnect (BK) and (Y) leads from coin relay and carefully pull leads through eyelet on side of hopper.

(4) On 1E1 set, disconnect (S-R) and (G) leads from coin hopper and carefully pull leads through eyelet on side of hopper.

(5) Loosen captive chassis mounting screw.

(6) Pull chassis assembly out at bottom and slide down to remove.



**Fig. 17—840693634 Coin Chassis—For Use in 1A/2A-Type Sets**

#### **3.23 To install coin chassis.**

(1) Slide chassis under tab (Fig. 13).

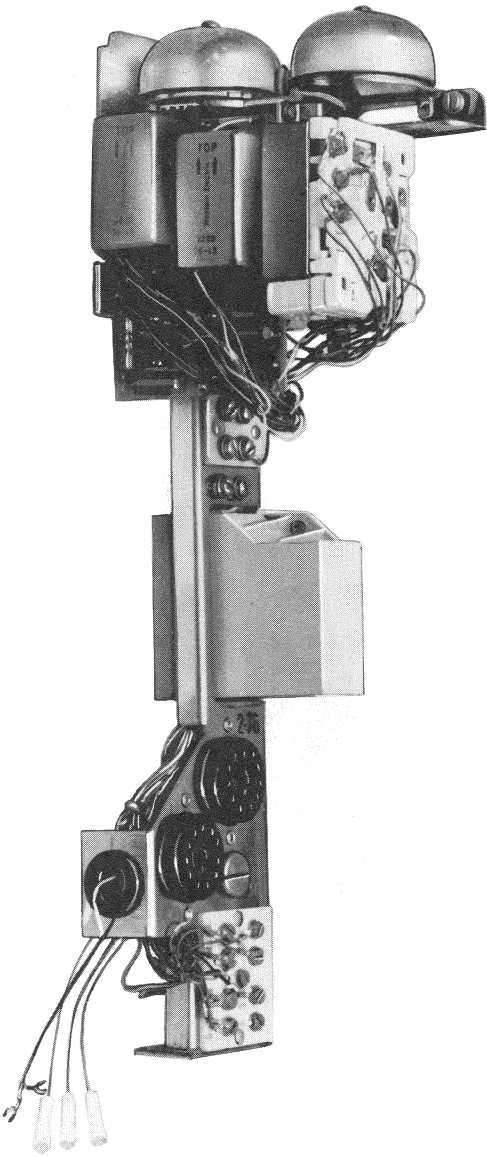
(2) Seat chassis tabs in slots.

(3) Tighten chassis mounting screw.

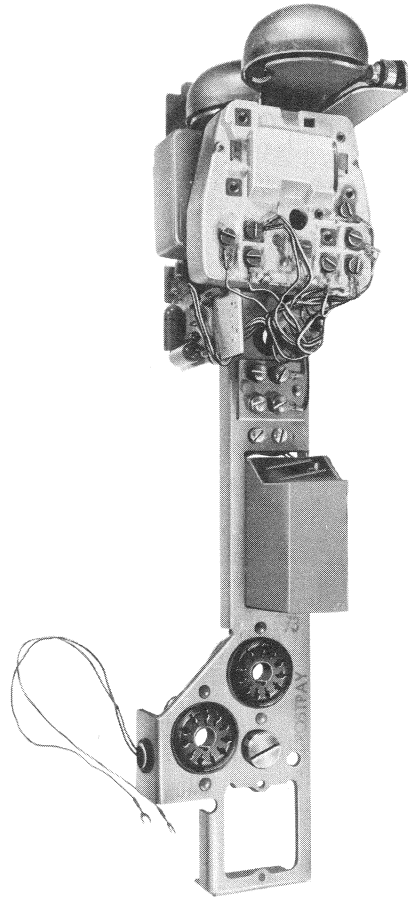
(4) On 1A/2A/1C/2C-type sets, thread (BK) and (Y) leads through eyelet on side of hopper.

● Connect (BK) lead to terminal 3 on coin relay

● Connect (Y) lead to terminal G on coin relay.



**Fig. 18—31A Coin Chassis—For Use in 1C/2C-Type Sets**



**Fig. 19—30B Coin Chassis—For Use in 1E-Type Sets**

- (5) On the 1E1 set, thread (S-R) and (G) leads through eyelet on side of hopper.
  - Connect (S-R) lead to left side of resistor on 50A hopper or terminal 15 on 51A hopper
  - Connect (G) lead to right side of resistor on 50A hopper or terminal 8 on 51A hopper.
  
- (6) On 1E3 set, tie the (S-R) and (G) leads together using a D-161488 connector. Ensure that connector is insulated.

- (7) Route IW wire up from grommet hole in backplate and to the right.
- (8) Connect Tip, Ring, and Grd leads, and if protector is mounted in set, 12 AWG Grd Strap.

### E. Coin Receptacle (Cash Box)

**3.24** Coin telephone sets manufactured prior to July 15, 1972 were equipped with a false floor to accommodate a 1B-type coin receptacle. They can be modified to accept a 1C-type receptacle as follows.

- (1) Remove cash compartment door.
- (2) Remove 1B-type coin receptacle.
  - Break spot welding at front tab
  - Pry out with large screwdriver or equivalent.
- (4) Install 1C-type coin receptacle.
- (5) Install cash compartment door.

### F. Instruction Cards (1-Type Set)

**3.25** Customer instruction cards are not furnished and must be procured locally.

**3.26** To install card.

- (1) Loosen card locking setscrew (if provided) in faceplate using a No. 4 (.050) Allen wrench. Turn counterclockwise to loosen.
- (2) Push up with fingers (Fig. 20).
- (3) Snap card in place.
- (4) Ensure that card is seated properly in slot.
- (5) Tighten the No. 4-40 by 3/16-inch hex socket setscrew (840153381), if applicable, in faceplate (Fig. 21). Turn clockwise to tighten.



*Do not over tighten setscrew after it becomes snug as this may bow the faceplate.*

**3.27** To remove card.

- (1) Loosen setscrew in faceplate, if provided, by turning it counterclockwise.
- (2) Push up with fingers.
- (3) Pry bottom out with small screwdriver or equivalent.



**Fig. 20—Installing Instruction Cards in 1-Type Set (Typical)**

### G. 11A Card Holder

**3.28** The 11A card holder (Fig. 22) is available as an auxiliary customer card frame which can be installed on 1-type coin telephone sets when they are mounted on 178A backboards.

**3.29** The card holder can be installed without drilling, tapping, or defacing the set in any way.

**3.30** Install as follows (Fig. 23).

- (1) Remove coin cover unit from set and set it aside.



Fig. 21—Securing Instruction Card (Typical)

- (2) Position small tab of rear bracket in wire cut-out of 178A backboard. Slide bracket to left as viewed from front.
- (3) Position gray plastic frame on front side of rear bracket and slide up.
- (4) Place instruction card (procured locally) and window in recessed area of plastic frame.
- (5) Mount front bracket over front edge of set housing and align screw holes of the two brackets.

**Note:** On older housings, an interference problem may be encountered with a flange on the front bracket. If this happens, cut the flange off the bracket.

- (6) Using a KS-19192, List 1 tool, secure with the two security screws furnished.

#### H. Instruction Cards (2-Type Set)

**3.31** Instruction cards are not furnished and must be procured locally.

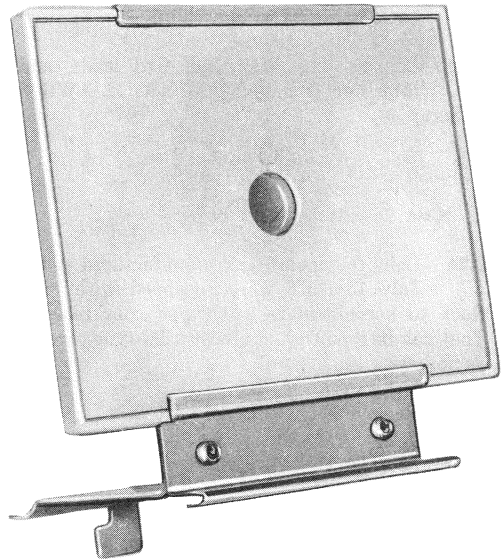


Fig. 22—11A Card Holder



*There are two different methods for securing instruction cards in the 2-type sets.*

*(1) An 812360410 (P-23E041) card spring (MD) is provided in the bottom of each card slot on early 2-type sets. This spring puts pressure on bottom of card to hold it in place.*

*(2) A cam located in the top of each card slot on later 2-type sets holds the card secure. The cam is operated with a No. 4 (.050) Allen wrench.*

**3.32** To install card in a set equipped with a spring.

- (1) Push down with fingers (Fig. 24).
- (2) Snap card in place.
- (3) Ensure that card is seated properly.

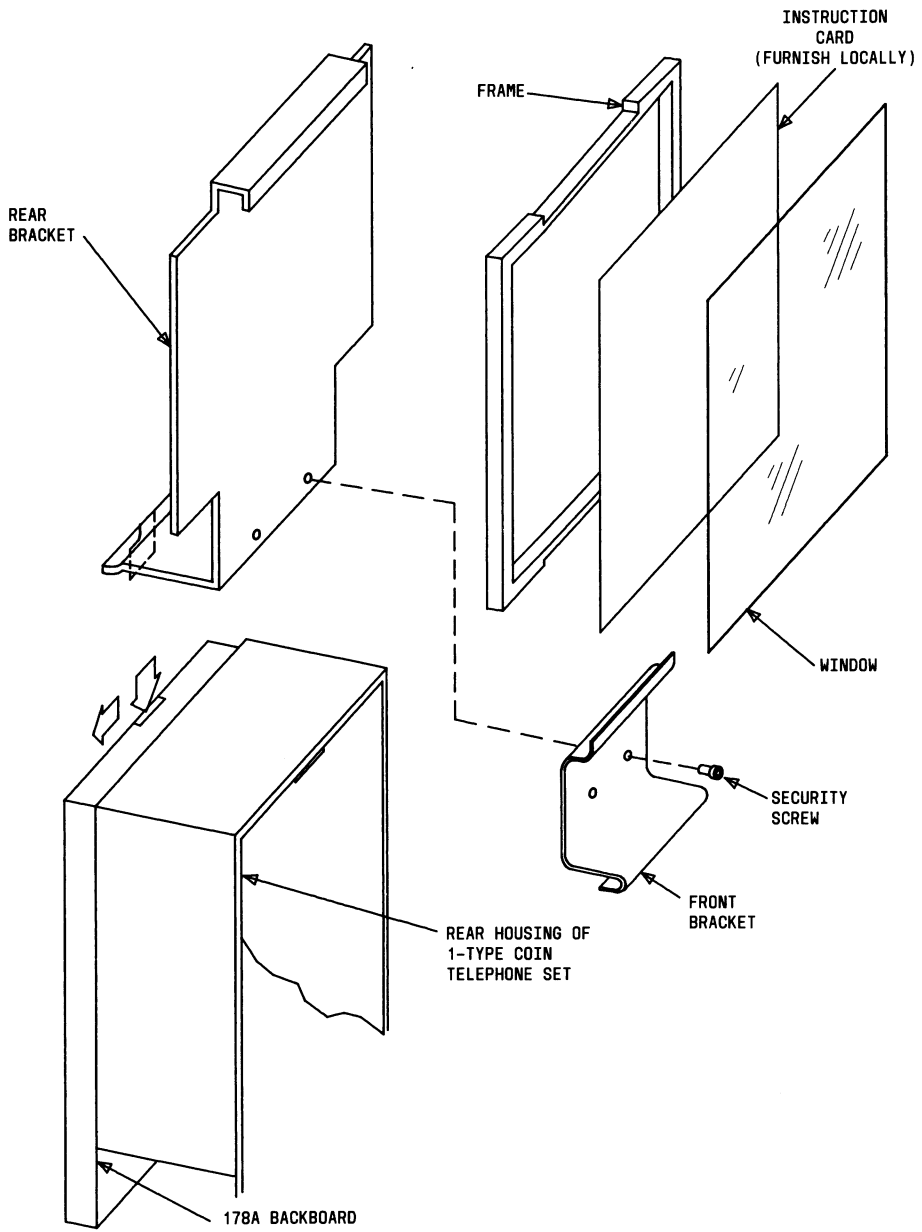


Fig. 23—Installation of 11A Card Holder

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**3.33** To remove card from a set equipped with a spring.

- (1) Push down with fingers.
- (2) Pry out from top with small screwdriver or equivalent.

**3.34** To install card in a set equipped with a cam.

- (1) Using a No. 4 (.050) Allen wrench, turn the cam until the low side is adjacent to card opening.
- (2) Push up with fingers (Fig. 25).
- (3) Snap card in place.
- (4) Ensure that card is seated properly in slot.
- (5) Secure card by turning cam 180 degrees, either clockwise or counterclockwise.

**3.35** To remove a card from a set equipped with cam.

- (1) Turn cam 1/2 turn away from card using a No. 4 (.050) Allen wrench.
- (2) Push up with fingers.
- (3) Pry out from bottom with a small screwdriver or equivalent.

### I. OUT-OF-SERVICE Sticker

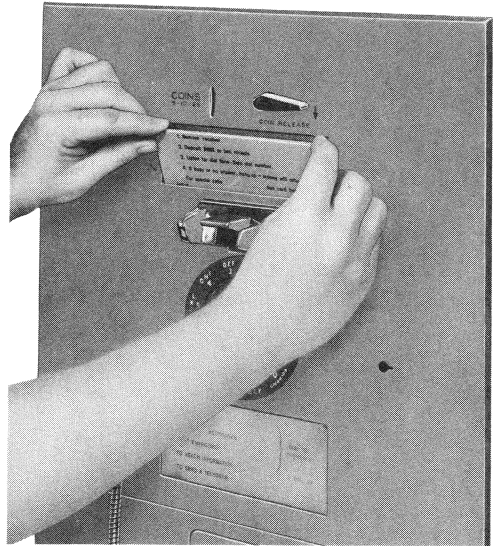
**3.36** A gummed OUT-OF-SERVICE sticker (Form E-4914) is available in books of five. Place over coin slot when required.

### J. Number Card [8U (MD), 8W (MD), or 8WA Dial]

**Note:** The fingerwheel (840151872) is shipped assembled to the dial and must be removed to install number card. It is secured with a No. 4-40 setscrew (840158331).

**3.37** To remove fingerwheel.

- (1) Refer to Fig. 26 use an Allen wrench and turn the setscrew in a clockwise direction until it clears fingerwheel.



**Fig. 24—Installing Instruction Card in 2-Type Set With 812360410 Card Spring**



**Fig. 25—Installing Instruction Card in 2-Type Set With Cam**



**Caution 1:** When turning setscrew on 8WA, dial must be in the fully rundown position to prevent loosening the setscrew.

**Caution 2:** Do not turn setscrew beyond stopping point as this may damage screw or wrench.

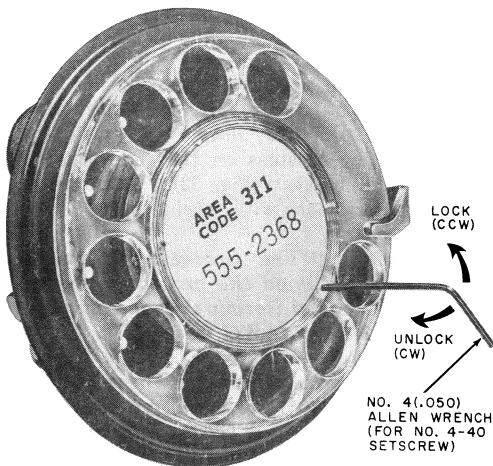
- (2) Turn fingerwheel in a clockwise direction until operator hole is in the 9 position and lift off.

### 3.38 Install number card.

### 3.39 To install fingerwheel.

- (1) Ensure that setscrew is all the way in (clockwise).
- (2) Place fingerwheel on dial with operator hole over the 9 position.
- (3) Rotate fingerwheel counterclockwise until it is in its normal position.
- (4) Using an Allen wrench, turn the setscrew in a counterclockwise direction until the stop is reached (Fig. 26).

**Caution: DO NOT OVERTIGHTEN SETSCREW**



**Fig. 26—Installing Fingerwheel on 8U (MD), 8W (MD), or 8WA Dial**

### K. Number Card (TOUCH-TONE Set)

**3.40** The number card shall be furnished locally.

**3.41** A card holder bracket, window, and two nuts (Fig. 27) are packaged separately and shipped from the factory in the cash compartment.

**3.42** Install number card as follows.

- (1) Remove dial housing.
- (2) Insert window in faceplate from rear (Fig. 28).
- (3) Insert number card in window (Fig. 28).
- (4) Secure window and number card using the card holder bracket and two nuts (Fig. 29).

**Note:** Thread-forming nuts are used on 1-type sets and hex nuts are used on 2-type sets.

- (5) Install dial housing.

**Note:** Ensure that the four dial housing mounting screws are tight to prevent dial housing from becoming loose due to vibration.



**The window, bracket, and nuts are available in a kit for maintenance purposes.**

- D-180567 kit for a 2-type set
- D-180655 kit for a 1-type set.

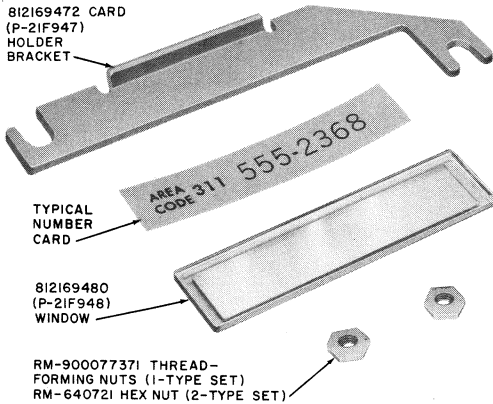
### WIRING AND GROUNDING

**3.43** Provide individual signaling ground for each station. Select and place wire in accordance with Section 461-200-100. Provide individual and multiple station grounding in accordance with Sections 460-100-400 and 506-100-100. Refer to Fig. 30 for special protection requirements and Section 508-100-100 to check for proper bonding and grounding of telephone enclosure commercial power.

**3.44** Feed inside wire straight up from entrance hole approximately 2 inches, then across to TB1 on the coin chassis.

**3.45** Dress inside wire to right side of coin chassis.

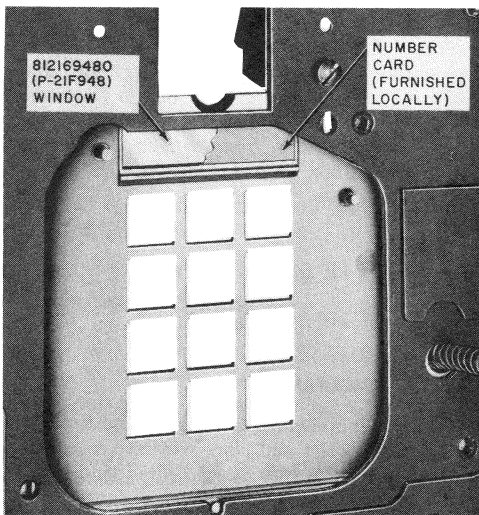
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**Fig. 27—Number Card and Associated Hardware for TOUCH-TONE Set**



**Fig. 29—Card Holder Bracket Installed in TOUCH-TONE Set**



**Fig. 28—Window and Number Card Installed in TOUCH-TONE Set**

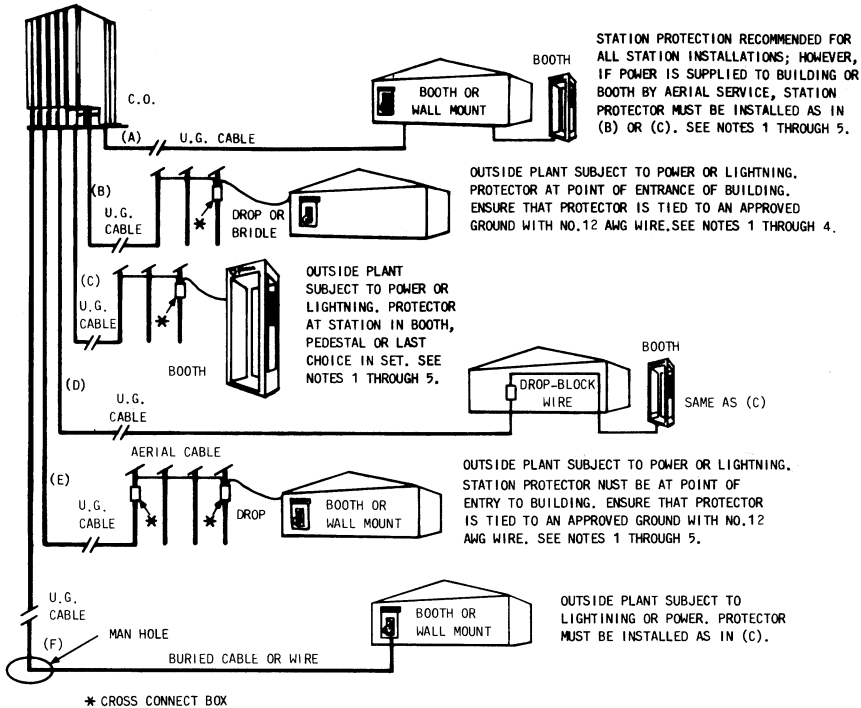
- 3.46 Conceal wiring near telephone. Use approved molding or tubing if necessary.
- 3.47 Locate protectors (123E1A gas tube, or 123A1A carbon-block), connecting blocks, etc, where they will be inaccessible to person using coin telephone set.
- 3.48 For outdoor installations where drop comes directly into set, a protector can be installed inside some sets as follows.

- (1) Install the protector inside a 1C- or 1E-type set as shown in Fig. 13 using two 802056077 (No. 8-32 by 1/2-inch) RHM screw provided locally.
- (2) Install the protector inside a 2A- or 2C-type set on a 7A clip (Fig. 31). Push the 7A clip, with protector, in the set so its spring loaded flange fastens on the right leg of the chute lock bracket (Fig. 32). Dress leads to avoid interference with moving parts.

**Caution:** When protector is mounted inside set, bond the protector ground to signal ground (terminal G on coin chassis) with No. 12 AWG wire (Fig. 30).



After installation has been completed, refer to Part 4 and verify that the coin telephone set is operating correctly and that information plate agrees with mode of service. Also verify that



NOTES:

1. FOR ADDITIONAL INFORMATION ON STATION PROTECTOR AND SIGNALING GROUNDS, REFER TO SECTION 460-100-400.
2. HOUSINGS OF ALL OUTSIDE STATIONS MUST BE GROUNDED, IF SET IS NOT MOUNTED IN A GROUNDED ENCLOSURE, RUN A NO. 12 AWG WIRE FROM STATION TO NEAREST APPROVED GROUND.
3. CARBON BLOCKS THAT BREAK DOWN PREMATURELY CAN CAUSE FAILURES OF COIN COLLECT OR REFUND. CARBON BLOCKS SHOULD BE REPLACED BY GAS TUBE PROTECTORS (123E1A) OR 1181A PROTECTOR UNITS IN 123-TYPE PROTECTOR BASE. SEE SECTION 506-100-100.
4. WHEN THE PROTECTOR IS MOUNTED IN AN ENCLOSURE SUCH AS A BOOTH OR SHELF, BOND THE ENCLOSURE AND PROTECTOR GROUND TOGETHER WITH NO LESS THAN NO. 12 AWG WIRE. SEE SECTION 508-100-100.
5. WHEN PROTECTOR IS MOUNTED INSIDE SET, CONNECT WIRING PER THIS SKETCH.

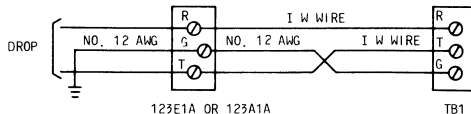
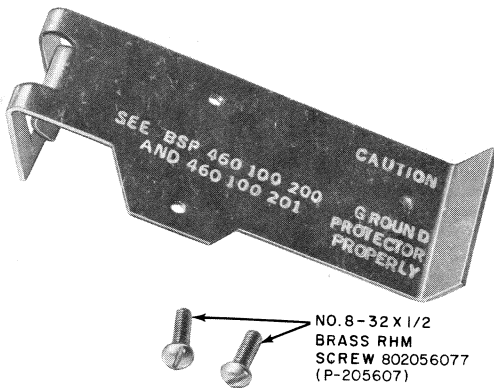
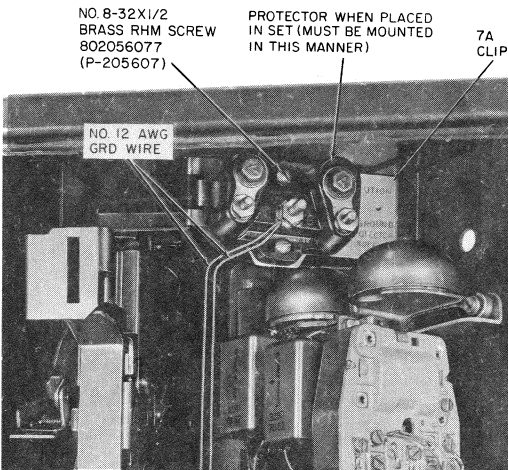


Fig. 30—Special Protection Requirements



**Fig. 31—7A Clip For Mounting 123A1A (MD) or 123E1A Protector and 840362024 Capacitor Board Assembly in Panel Set**



**Fig. 32—123A1A (MD) or 123E1A Protector Installed in Panel Set**

*entrance stop is adjusted properly to prevent rubbing of parts.*

**4. OPERATION TESTS AND TROUBLE ANALYSIS**



*On trouble reports of coins collected or returned in error, try to obtain area code and telephone number of called party to facilitate tracing trouble in central office. Tests specified in Tables K, L, M, N, or O shall be used to ensure proper set operation on installation and maintenance visits. For additional tests relating to general coin service, refer to Section 506-900-503 or the Public Services Maintenance Check Booklet.*

**4.01 Apparatus Required:**

- KS-20950, List 2 cover parking tool (Fig. 33)—1-type set only, refer to note under Table F.

*Note:* A P11C test cord (Fig. 34) may be used with 1-type sets in lieu of the cover parking tool, and on all 2-type sets.

- Coins: 1 penny, 2 nickels, 1 dime, 2 quarters
- KS-14995, List 3 Coin Trap and Vane Release Toll (Fig. 35)
- 146B Bias Margin Gauge (Fig. 36).

**4.02 Table K includes following trouble analysis tests for *Coin-First Service*.**

- Totalizer and Coin Relay Operation (On-Hook)
- Totalizer Operation (Off-Hook)
- Dial Shorting Test
- Trap and Vane Release Test
- Coin Relay Bias Margin Test
- Testing with ACTS.

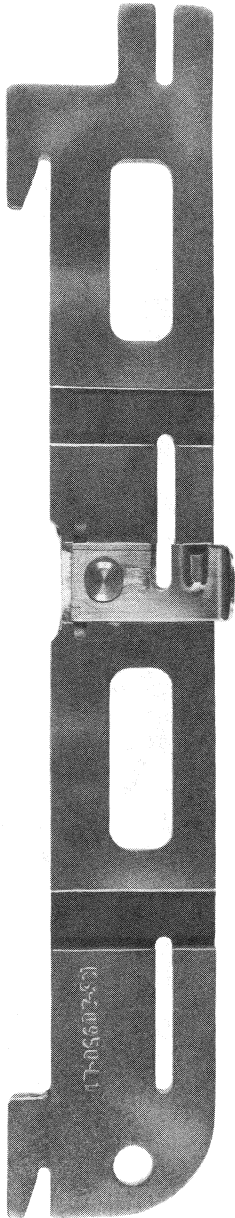


Fig. 33—KS-20950, List 2 Cover Parking Tool

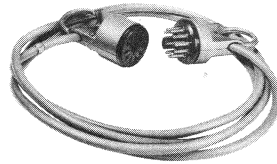


Fig. 34—P11C Test Cord

4.03 Table L includes the following trouble analysis test for *Dial-Tone-First Service*:

- Dial Tone Test
- Totalizer and Coin Relay Operation
- Trap and Vane Release Test
- Coin Relay Bias Margin Test
- Testing with ACTS.

4.04 Table M includes trouble analysis test for *Dial Postpay Service* where ACTS is not available.

4.05 Table N includes trouble analysis test for Dial Postpay Service where ACTS *is* available.

4.06 Table O includes trouble analysis test for *Manual Postpay Service*.

4.07 Refer to Table P for operate values of coin relay.

MULTISLOT COIN COLLECTOR MAINTENANCE	SINGLE SLOT COIN TELEPHONE SET MAINTENANCE
INSPECT EXTERIOR Handset, Cords, Dial Cards: Instruction & No. Coin Release, Return Bucket	INSPECT EXTERIOR Handset, Cords, Dial Cards: Instruction & No. Coin Release, Return Bucket
COIN TESTS 5c, 10c, 25c Dial Tone, Coin Return Trouble Analysis	COIN TESTS 5c, 10c, 25c Dial Tone Coin Return On-Hook Coin Return Trouble Analysis
INSPECT INTERIOR Gauge, Connections Security Fasteners Housing Contacts	INSPECT INTERIOR Chute Assembly Connections, Plugs Switchhook
COIN CHUTE Dirt, Corrosion	COIN RELAY Bias Margin, Trap, Vane
SWITCHHOOK Spring Pileups	RESISTANCE TESTS Loop, Ground
COIN RELAY Bias Margin, Trap, Vane	STATION WIRING Ground Connections Protector Booth Ground
RESISTANCE TESTS Loop, Ground	OPERATIONAL TESTS Coins Operator, Ring-Back
STATION WIRING Ground Connections Protector Booth Ground	INSPECT BOOTH Glass, Door, Lights Blower, Directories
OPERATIONAL TESTS Coins Operator, Ring-Back	KS-14995 L3 TOOL
INSPECT BOOTH Glass, Door, Lights Blower, Directories	

Fig. 35—KS-14995, List 3 Tool

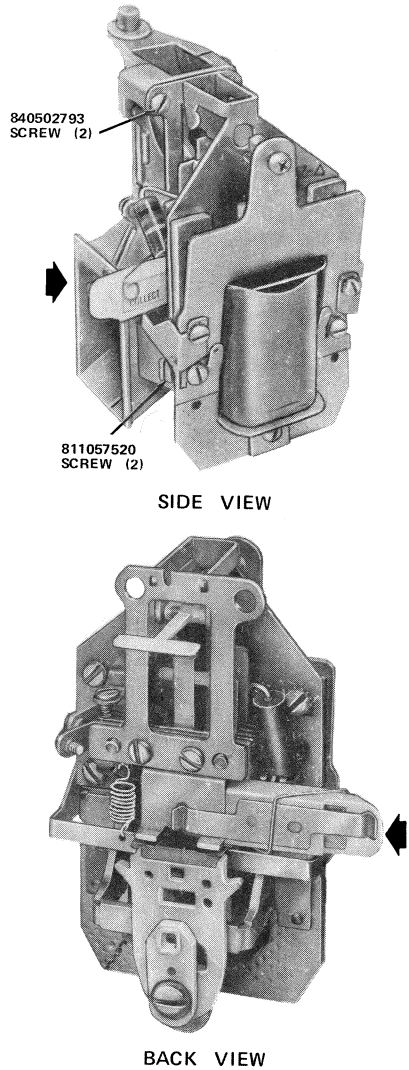


Fig. 36—Bias Margin Gauge in Position for Collect Test

TABLE K  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
Preparation For All Tests Except Trap and Vane Release					
1	Invert handset on switchhook (Fig. 37) (1-type only) to prevent cord from pushing handset off switchhook when cover is set down				
2	For a 1-type set: Remove coin cover unit and hang it on a KS-20950, List 2 cover parking tool (Fig. 33). If parking tool is not available, or cannot be used with the station, disconnect P1, place coin cover unit on a firm level surface, and connect a P11C cord between P1 and J1 of coin chassis.				
3	For a 2-type set: Open door and faceplate assembly and connect a P11C cord (Fig. 34) between P1 and J1.				
<b>Totalizer and Coin Relay Operation (On-Hook)</b>					
<i>Note:</i> On repeated "No Dial Tone" reports, a totalizer current flow test should be performed in addition to the following.					
4	Deposit penny and operate coin release mechanism	Coin is returned	Coin does not return	Blocked coin chute Defective coin release mechanism	Clear Replace defective linkage
5	Deposit quarter in chute	Coin relay refunds coin	Coin does not return or coin is collected	Blocked coin chute	Clear
				Tip and ring reversed or trunk trouble	Reconnect or refer to testdesk
				P1 and P2 reversed	Reconnect properly
				Totalizer in DTF mode (1C/2C set only)	Switch to CF mode
			TB3 not wired correctly (1C/2C set only)	Wire correctly	

TABLE K (Contd)  
TROUBLE ANALYSIS - 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
5 (Contd)				Traffic overload	Wait for refund pulse
				Coin jam in hopper	Clear jam
				Full coin receptacle	Level coins and notify coin collection department
				Coin relay HT contacts not making	Clean contacts or replace coin relay
				Switchhook transfer contacts SH1 (NC) or SH3 (NC) not making	Clean contacts or replaces coin dial unit
				Switchhook contacts SH2 and SH4 not breaking	Adjust contacts or replace coin dial unit
				Defective totalizer	
				Defective A relay	
				Defective handset	
				Defective dial TOUCH-TONE only	Replace defective apparatus
6	Deposit nickel	Nickel returned	Nickel does not return	Defective wiring in dial housing or chassis	
				Defective coin relay	
				Coin relay improperly wired	Wire properly
				Switchhook transfer contacts SH1 (NC) or SH3 (NC) not making	Clean contacts or replace coin dial unit
				TB2 and wired correctly	Wire correctly
7	Go off hook and deposit nickel in coin chute	No dial tone	Dial tone heard	Defective wiring in dial housing or chassis	Replace defective apparatus
				Traffic overload	Wait for refund pulse
<b>Totalizer Operation (Off-Hook)</b>					
7	Go off hook and deposit nickel in coin chute	No dial tone	Dial tone heard	T1 contacts remain latched after refund	Replace totalizer



TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
7 (Contd)				Switchhook transfer contacts SH3 (NC) not breaking (rotary dial sets only)	Replace coin dial unit
				Defective chassis or chassis wiring	Replace chassis or correct wiring
8	Deposit additional coins up to initial rate	Dial tone is heard	No dial tone, Reduced level or intermittent dial tone	Defective wiring in coin dial unit	Replace coin dial unit
				Traffic overload	Wait for dial tone
				Defective handset	Replace handset
				Switchhook contacts SH3 (NO) or SH2 and SH4 (NO) not making	Clean contacts or replace coin dial unit
				Switchhook transfer contacts SH1 (NO) not making	Clean contacts or replace coin dial unit
				Totalizer set for more than initial rate	Reset totalizer rate
				Conduct current flow test on totalizer and measure loop and ground resistance with test desk	Take action according to test board results
				T1 contacts (NO) not making	Replace totalizer
				F contacts (NC) not making	Replace totalizer
				Defective wiring in coin dial unit	Replace coin dial unit
9	Dial any digit but "0" or "1"	Dial tone breaks	Cannot break dial tone	Defective dial	Replace defective apparatus
				Defective chassis	Replace defective apparatus
				Defective totalizer	Replace defective apparatus
				Totalizer transfer contacts T2 (NC) not making (totalizer steps continuously)	Replace totalizer
				Totalizer contacts T1 not latching	Replace totalizer
				Defective dial	Replace totalizer
				Defective handset (TOUCH-TONE only)	Replace defective apparatus
Defective wiring in chassis, or coin dial unit	Replace defective apparatus				

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
9 (Contd)		Coins not returned	Coins returned	Defective dial	Replace dial
10	Go on hook	Coins returned	Coins not returned	Traffic overload	Wait for refund pulse
11	Go off hook and deposit initial rate	Dial tone heard	No dial tone	Coin trunk trouble	Refer to testdesk
12	Dial any digit but "0" or "1"	Dial tone breaks	Cannot break dial tone	Defective totalizer	Replace totalizer
13	Go on hook	Coins returned	Coins not returned	Traffic overload	Wait for refund pulse
	<b>Dial Shorting Test</b>			Coin trunk trouble	Refer to testdesk
14	Remove coin relay dust cover. Lift handset and operate hopper trigger by hand	Dial tone heard	No dial tone	Traffic overload	Wait for dial tone
15	Dial any digit but "0" or "1"	Dial tone remains after dialing	Dial tone breaks	Totalizer transfer contacts T1 (NC) not making	Replace totalizer
16	Deposit nickel	Dial tone remains after deposit	Line drops off. Coin returned	Defective chassis	Replace chassis
17	Hang up handset	Nickel returns	Nickel does not return	Defective chassis	Replace chassis
	<b>Trap and Vane Release Test</b>			Defective A relay (1A/2A only)	Replace A relay
18	Remove chute — totalizer from set			Traffic overload	Wait for coin return pulse
19	Remove coin relay dust cover			Defective coin trunk	Refer to testdesk

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
	<i>Caution: Tilt selector card by pressing down on one of the ears before manually operating the coin relay. This avoids jamming selector card and cam engaging surfaces.</i>				
20	Press down on left ear of selector card and manually operate coin relay armature to its full extent of travel	Coin vane moves to collect (left) position; coin trap moves downward			
21	With armature fully operated, insert KS-14995, L3 tool into hopper to operate trap to the limit of its travel (Fig. 38)				
22	Release armature and slowly withdraw tool	Armature, trap, and vane should return to nonoperated position and trap should lock	Armature, trap, or vane does not return to its normal position Vane does not restore properly	Relay could be binding  Vane binds Vane broken	Loosen mounting screws and re-align relay; tighten screws Replace relay  Remove coin relay from hopper and free vane Replace vane per Section 506-100-110
			Trap does not operate, restore or lock properly	Trap broken Trap spring bent or broken Trap lever broken Trap pin bent or broken	Replace defective apparatus
23	Press down on right ear of selector card and manually operate coin relay armature to its full extent of travel	Coin vane moves to refund (right) position. Coin trap moves downward			

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
24	With armature fully operated, insert KS-14995, L3 tool into hopper to operate trap to the limit of its travel (Fig. 38)				
25	Release armature and slowly withdraw tool	Same as 22	Same as 22	Same as 22	Same as 22
26	Install dust cover				
27	Install chute — totalizer				
<b>Coin Relay Bias Margin Test</b>					
Note: Make this test when coin relay fails to operate properly or on repeated reports of coins don't return.					
28	Remove coin relay dust cover				
29	Go off hook, obtain dial tone, call testdesk and request bias margin test. (Use central office test circuit where available)				
30	Slip 146B bias margin gauge over left polepiece extension arm from left side of coin relay (Fig. 36)				
31	Request testdesk to apply central office collect (or return) voltage as indicated in the lower left corner of gauge	Relay operates to collect (or return) coins as indicated in lower left corner of gauge	Relay does not operate properly	Defective coin relay	Replaces coin relay
32	Reverse the 146B bias margin gauge by turning it around on the same polepiece extension arm				

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
33	Request testdesk to collect (or refund) as indicated on the left corner of gauge	Relay operates to collect (or return) coins as indicated in lower corner of gauge	Relay does not operate properly	Defective coin relay	Replace coin relay
34	Remove 146B gauge and request testdesk to perform coin relay current flow test				
35	Go on-hook				
36	Install dust cover				
<b>Returning Set To Normal Operation where ACTS is not Available</b>					
37	Call operator. Deposit nickel, dime, and quarter	Coins identified by operator	Improper coin tones	Defective totalizer	Replace totalizer
38	Listen for coin tones in handset as coins are deposited	No coin tones or low level coin tones heard in handset	Loud coin tones heard in handset	Defective chassis	Replace chassis
39	Request operator to return coins	Coins returned	Coins not returned	Nonstation trouble	Repeat request, and if failure reoccurs refer to test desk
40	Request operator to call. Go on hook. Wait for incoming ring.	Ringer operates at maximum volume	No ringback or low volume	Defective ringer or leads	Replace ringer
				Ringer out of adjustment	Adjust
				Open ringer capacitor in network	Replace chassis
				Improper line assignment	Verify and correct
				Nonstation trouble	Refer to test desk
41	Call the dial test number and verify all TOUCH-TONE frequencies (if applicable)				

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
Returning Set to Normal Operation where ACTS is Available					
42	Dial the ACTS test line (Number supplied by local supervision) <i>Note:</i> Initial rate deposit is required in coin first service	Coin(s) returned (coin first only). Announcement "COIN TEST" is heard. After one second silence, announcement "PLEASE DEPOSIT NICKEL" is heard	Deposited coin(s) don't return. Announcement not heard. <i>Note:</i> If coin test line is busy, reorder tone will be heard.	Nonstation trouble	Refer to testdesk
43	Deposit a nickel <i>Note:</i> Dime and quarter are verified in the same manner.	Test line identifies coin by announcement "NICKEL" <i>Note:</i> Dime and quarter are verified in the same manner as a nickel.	Announcement "TIMING ERROR" is heard. <i>Note:</i> If retest is desired, do not hang up. After 1/2 second "PLEASE DEPOSIT NICKEL" announcement will be repeated.  No immediate announcement. <i>Note:</i> Coin signals of improper level and/or frequency are not recognized and are treated as if no coin was deposited. If no coin is detected within 6 seconds after original request for deposit, request will be repeated for retest. If no coin is detected after three additional requests, announcement "TEST HAS ENDED" will be made and test time will disconnect	Defective totalizer  Defective Chassis	Replace defective apparatus. (If trouble persists, refer to testdesk for loop analysis i.e. bridge tap or excessive loading.)

TABLE K (Contd)  
TROUBLE ANALYSIS – 1A/1C- AND 2A/2C-TYPE SETS  
COIN-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
43 (Contd)			Test line recognizes a coin other than that deposited. <i>Note:</i> This can occur during the basic sequence if improper coin is deposited or if totalizer generates an improper signal. Test line identifies coin as detected, returns coin, then repeats previous coin request announcement.	Defective totalizer	
44	Listen for coin tones in handset as coins are deposited	Low coin tones heard in handset	Loud coin tones heard in handset	Defective chassis	Replace chassis
45 (Optional)	Deposit additional coins in any sequence if desired; however, a two minute over-all time limit is placed on each test call. If this is exceeded, an announcement "TEST HAS ENDED" will be heard, a coin return signal will be generated, and the connection will be broken	Test line will identify coins as deposited	Same as Step 43	Same as Step 43	Same as Step 43
46	Hang up handset	Coins return	Coins do not return	Nonstation trouble	Refer to test desk
47	Dial the station under test from a nearby telephone or call operator and request operator to call back. Go on hook. Wait for incoming call.	Ringer operates at maximum volume	No ringback or low volume	Defective ringer or leads Ringer out of adjustment Open ringer capacitor in network Improper line assignment	Replace ringer Adjust Replace chassis Verify and correct Refer to test desk

TABLE L  
TROUBLE ANALYSIS - 1C- AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
Preparation For All Tests Except Trap and Vane Release					
1	Invert handset, on switchhook (Fig. 37) (1-type only) to prevent armored cord from pushing handset off hook when cover is set down.				
2	For 1-type set: Remove coin cover unit and hang it on a KS-20950, List 2 cover parking tool (Fig. 33). If parking tool is not available, or cannot be used at the station, disconnect P1, place coin cover unit on a firm level surface, and connect a P11C cord between plug P1 and jack J1 of the coin chassis.				
3	For 2-type set: Open door and faceplate assembly. Connect a P11C cord between P1 and J1.				
Dial Tone Test					
4	Go off hook	Dial tone received	No dial tone	Defective handset Traffic overload Switchhook contacts SH1 not making P1 and P2 reversed Totalizer in CF mode TB2 not wired correctly TB3 not wired correctly	Replace handset Wait Clean contacts or replace coin dial unit Reconnect properly Switch to DTF mode Wire correctly Wire correctly



TABLE L (Contd)  
TROUBLE ANALYSIS – 1C-AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
4 (Contd)				Defective totalizer Defective wiring in chassis, or coin dial unit Nonstation trouble	Replace totalizer Replace defective apparatus Refer to testdesk
Totalizer and Coin Relay Operation					
5	Deposit quarter	Quarter does not return	Quarter falls in return bucket	TB3 not wired correctly Chute path blocked Defective totalizer Defective chassis	Wire correctly Clear Replace defective apparatus
6	Depress switchhook	Quarter returned	Quarter does not return	Switchhook contacts not breaking Defective coin trunk Defective totalizer Defective chassis	Replace coin dial unit Refer to testdesk Replace defective apparatus
7	Deposit nickel less than initial rate. Dial a number that requires initial rate.	Dial tone breaks Recording states that insufficient deposit was made	Dial tone does not break Recording not heard	Defective dial Tip, ring, or grd reversed Defective chassis Initial rate set incorrectly TB3 not wired correctly Totalizer contacts TI making with less than initial rate deposited Traffic overload Nonstation trouble	Replace dial Wire correctly Replace chassis Reset the rate Wire correctly Reset totalizer rate or replace totalizer Wait and repeat test Refer to testdesk

TABLE L (Contd)  
TROUBLE ANALYSIS – 1C- AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
8	Depress switchhook	Coin returned <i>Note:</i> Coin may have already returned on announcement trunk seizure	Coin not returned	Switchhook contacts not breaking	Replace coin dial unit
				Defective coin trunk	Refer to testdesk
				Traffic overload	
				Nonstation trouble	
				Defective totalizer	
9	Go off-hook deposit initial rate, dial a number that requires a deposit <i>Note:</i> Ensure that called number will not be answered.	Ringing tone heard in handset	Insufficient deposit recording heard	Defective chassis	Replace defective apparatus
				Defective coin relay	
				Initial rate set for more than the deposit	Reset rate
				Defective T1 or F contacts in totalizer	Replace defective apparatus
				Defective chassis	
				Switchhook SH3 (NO) not making	Clean contact, replace coin dial unit
				TB3 not wired correctly	Wire correctly
10	Go on-hook	Coins returned	Coins not returned	Defective coin trunk	Refer to testdesk
11	Deposit penny and operate coin release lever	Penny returned	Coin does not return	Nonstation trouble	Clear
				Defective coin chute	Replace defective linkage mechanism

TABLE L (Contd)  
TROUBLE ANALYSIS – 1C- AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
Trap and Vane Release Test					
<i>Note:</i> Refer to Table K					
Coin Relay Bias Margin Test					
<i>Note:</i> Refer to Table K					
Returning Set To Normal Operation where ACTS is not Available					
12	Call operator. Deposit nickel, dime, and quarter	Coins identified by operator	Improper coin tone signals	Defective totalizer	Replace defective apparatus
13	Listen for coin tones in handset as coins are deposited	Low coin tones heard in handset	Loud coin tones heard in handset	Defective chassis	
14	Request operator to return coins	Coins returned	Coins not returned	Nonstation trouble	Repeat request, and if failure reoccurs refer to testdesk
15	Request operator to ring back (hang up)	Ringer operates at maximum volume	No ringback or low volume	Defective ringer or leads	Replace ringer
				Ringer out of adjustment	Adjust
				Open ringer capacitor in network	Replace chassis
16	Call the dial test number and verify all TOUCH-TONE frequencies (if applicable)			Improper line assignment	Refer to testdesk
Returning Set to Normal Operation where ACTS is Available					
17	Dial the ACTS test line (Number supplied by local supervision).	Announcement "COIN TEST" is heard. After one second silence, announcement "PLEASE DEPOSIT NICKEL" is heard.	Announcement not heard. <i>Note:</i> If coin test line is busy, reorder tone will be heard.	Nonstation trouble	Refer to testdesk

TABLE L (Contd)  
TROUBLE ANALYSIS – 1C- AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
18	Deposit a nickel <i>Note:</i> Dime and quarter are verified in the same manner.	Test line identifies coin by announcement "NICKEL". <i>Note:</i> Dime and quarter are verified in the same manner as a nickel.	Announcement "TIMING ERROR" is heard. <i>Note:</i> If retest is desired, do not hang up. After 1/2 second, "PLEASE DEPOSIT NICKEL" announcement will be repeated.	Defective totalizer	Replace defective apparatus (If trouble persists, refer to testdesk for loop analysis i.e. bridge tap or excessive loading).
			No immediate announcement. <i>Note:</i> Coin signals of improper level and/or frequency are not recognized and are treated as if no coin was deposited. If no coin is detected within 6 seconds after original request for deposit, request will be repeated for retest. If no coin is detected after three additional requests, announcement "TEST HAS ENDED" will be made and test line will disconnect.	Defective chassis	
			Test line recognized a coin other than that deposited. <i>Note:</i> This can occur during the basic sequence if improper coin is deposited or if totalizer generates an improper signal. Test line identifies coin as detected, returns coin, then repeats previous coin request announcement.	Defective totalizer	

TABLE L (Contd)  
TROUBLE ANALYSIS – 1C- AND 2C-TYPE SETS  
DIAL-TONE-FIRST

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
19	Listen for coin tones in handset as coins are deposited	Low coin tones heard in handset	Loud coin tones heard in handset	Defective chassis	Replace chassis
20 (Optional)	Deposit additional coins in any sequence if desired; however, a two minute overall time limit is placed on each test call. If this is exceeded, an announcement "TEST HAS ENDED" will be heard, a coin return signal will be generated, and the connection will be broken	Test line will identify coins as deposited	Same as Step 18	Same as Step 18	Same as Step 18
21	Hang up handset	Coins return	Coins do not return	Nonstation trouble	Refer to testdesk
22	Dial the station under test from a nearby telephone or call operator and request operator to call back. Go on hook. Wait for incoming call.	Ringer operates at maximum volume	No ringback or low volume volume	Defective ringer or leads Ringer out of adjustment Open ringer capacitor in network Improper line assignment Nonstation trouble	Refer to testdesk Replace ringer Adjust Replace chassis Verify and correct Refer to testdesk

TABLE M

TROUBLE ANALYSIS – 1E1 SET  
DIAL POSTPAY WHERE ACTS IS NOT AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
Preparation For All Tests					
1	Invert handset on switchhook to prevent armored cord from pushing handset off switchhook when cover is set down.				
2	Remove coin cover unit and hang it on a KS-20950, List 2 cover parking tool (Fig. 33). If parking tool is not available or cannot be used at the station, disconnect P1, place coin cover unit on a firm level surface and connect a P11C cord between P1 and J1 of the coin chassis				
3	If set has a 51A hopper, a KS-14995, List 3 tool can be installed between coin chute and hopper to prevent loss of deposited coins. If set has a 50A hopper, test cannot be performed without losing coins.				
Dial Tone Tests					
4.	Go off hook	Dial tone heard	No dial tone	Defective handset.	Replace handset.
				Traffic overload.	Wait and repeat test.
				Switchhook contacts SH1 (NO), or SH2 & SH4 (NO), not making	Clean contacts or replace coin dial unit
				P1 and P2 reversed	Reconnect properly.
				Totalizer in CF mode	Switch to DTF mode
				TB2 not wired correctly.	Wire correctly.
				Defective totalizer.	Replace totalizer.

TABLE M (Contd)  
 TROUBLE ANALYSIS – 1E1 SET  
 DIAL POSTPAY WHERE ACTS IS NOT AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
	Dial Tone Tests				
4 (Contd)				Defective wiring in chassis, or coin dial unit	Replace defective apparatus
5	Dial operator.	Dial tone breaks.	Dial tone does not break.	Nonstation trouble.	Refer to testdesk.
				Defective dial.	Replace defective apparatus
				Defective chassis.	Verify wiring
				TB2 not wired correctly.	Refer to testdesk and correct trouble.
		Operator answers.	Transmission path not established.	Nonstation trouble	Replace handset.
<b>Totalizer Operation</b>					
6	With operator on line, deposit nickel, dime, and quarter.	Operator correctly identifies signal tones.	Operator cannot identify signals properly.	Defective totalizer.	Replace defective apparatus
				Defective chassis.	
				Defective 840708895 hopper delay circuit assembly (51A hopper only)	
				Defective 446F diode. (50A hopper only)	
				Ring and tip reversed.	Correct
				Nonstation trouble	Refer to test desk
7	Listen for coin tones in handset as coins are deposited.	Low tones may be heard	Loud tones are heard	Defective chassis	Replace chassis
8	If KS-14995, L3 tool was installed, disengage chute locking spring; <i>slowly pull top of chute forward while holding KS-14995, L3 tool.</i> Lift chute and tool out of set and retrieve coins.				

TABLE M (Contd)  
TROUBLE ANALYSIS – 1E1 SET  
DIAL POSTPAY WHERE ACTS IS NOT AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
9	Check for noise or cutout in handset cord	Noise should not be heard.	Noise is heard.	Defective handset.	Replace handset.
10	Give operator number of station under test, request operator to call back, go on hook	Ringer operates at maximum volume.	No ring or rings at low volume.	Improper line assignment. Defective ringer. Ringer out of adjustment. Open capacitor in network. Nonstation trouble	Verify and correct. Replace ringer or chassis. Adjust. Replace chassis. Refer to testdesk
11	Repeat step 3, deposit initial rate, and request operator to identify coin signal	Identification properly made.	Identification cannot be made.	Nonstation trouble.	Refer to testdesk.
12	Repeat step 8. Go on hook				
13	Go off hook, get dial tone, and dial a local charge number (this should be prearranged).	Dial tone received, station number dialed, audible ringing heard, called party answers, deposits coin tone	No dial tone Audible ringing not heard Deposit coin tone not heard.	Traffic overload. Nonstation trouble	Wait and repeat test. Refer to testdesk.
14	Refer to step 3 and deposit 5 cents less than initial rate	Deposit coin tone remains	Deposit coin tone stops.	Initial rate set incorrectly Wrong code totalizer or defective totalizer.	Reset rate Replace totalizer.
15	Deposit additional coins up to initial rate.	Deposit coin tone stops. Talk path is established.	Totalizer reads out. Deposit coin tone does not stop.	Defective chassis. Initial rate set for more than the deposit. Defective hopper. Defective totalizer. Nonstation trouble	Replace chassis. Reset rate Replace defective apparatus. Refer to testdesk.



TABLE M (Contd)  
 TROUBLE ANALYSIS – 1E1 SET  
 DIAL POSTPAY WHERE ACTS IS NOT AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
16	If KS-14995, L3 tool was installed, disengage chute locking spring, <i>slowly pull top of chute forward while holding KS-14995, L3 tool.</i> Lift chute and tool out of set and retrieve coins.				
17	Hang up.	Totalizer restores.	Totalizer does not restore.	Defective coin dial unit Defective chassis Nonstation trouble	Replace defective apparatus.
18	Return set to normal operation				Refer to testdesk

TABLE N  
TROUBLE ANALYSIS — 1E1 SET  
DIAL POSTPAY WHERE ACTS IS AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
1	If set has a 51A hopper, a KS-14995, List 3 tool can be inserted between coin chute and hopper to prevent loss of deposited coins. If set has a 50A hopper, test cannot be performed without losing coins.				
2	Go off-hook	Dial tone heard	No dial tone	Defective handset Traffic overload Switchhook contacts SH1 (NO), or SH2 & SH4 (NO), not making	Replace handset Wait and repeat test Clean contacts or replace coin dial unit
				P1 and P2 reversed	Reconnect properly
				Totalizer in CF mode	Switch to DTF mode
				TB2 not wired correctly	Wire correctly
				Defective totalizer	Replace totalizer
				Defective wiring in chassis, or coin dial unit	Replace defective apparatus
				Nonstation trouble	Refer to testdesk
3	Dial ACTS test line	Announcement "COIN TEST" is heard. After one second silence, announcement "PLEASE DEPOSIT NICKEL" is heard.	Announcement not heard. Note: If coin test line is busy, recorder tone will be heard.	Nonstation trouble	Refer to testdesk

TABLE N (Contd)  
TROUBLE ANALYSIS – 1E1 SET  
DIAL POSTPAY WHERE ACTS IS AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
4	Deposit a nickel <i>Note:</i> Dime and quarter are verified in the same manner	Test line identifies coin by announcement "NICKEL" <i>Note:</i> Dime and quarter are verified in the same manner as a nickel	Announcement "TIMING ERROR" is heard <i>Note:</i> If retest is desired, do not hang up. After 1/2 second, "PLEASE DEPOSIT NICKEL" announcement will be repeated  No immediate announcement. <i>Note:</i> Coins signals of improper level and/or frequency are not recognized and are treated as if no coin was deposited. If no coin is detected after three additional requests, announcement "TEST HAS ENDED" will be made and test line will disconnect	Defective totalizer  Defective chassis  Defective totalizer	Replace defective apparatus and repeat test  Replace defective apparatus and repeat test in 2.02. (If trouble persists refer to testdesk for loop analysis ie, bridge tap or excessive loading)
5	Listen for coin tones in handset as coins are deposited.	Low coin tones heard in handset	Test line recognizes a coin other than that deposited. <i>Note:</i> This can occur during the basic sequence if improper coin is deposited or if totalizer generates an improper signal. Test line identifies coin as detected, then repeats previous coin request announcement.	Defective totalizer	
6	Go on-hook		Loud coin tones heard in handset	Defective chassis	Replace chassis

TABLE N (Contd)  
 TROUBLE ANALYSIS -- 1E1 SET  
 DIAL POSTPAY WHERE ACTS IS AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
7	Go off-hook, dial operator, and give operator number of station under test, request operator to call back, go on-hook.	Ringer operates at maximum volume	No ring or rings at low volume	Improper line assignment	Verify and correct
				Defective ringer	Replace ringer or chassis
				Ringer out of adjustment	Adjust
8	Go off-hook. Request operator to identify nickel as it is deposited in handset cord	Identification properly made	Identification cannot be made	Open capacitor in network	Replace chassis
				Nonstation trouble	Refer to testdesk
9	Check for noise or cutout in handset cord	Noise should not be heard	Noise is heard	Defective handset	Replace handset
10	Hang up. Retrieve coins				
11	Set with 51A hopper, insert the KS-14995, L3 tool				
12	Go off-hook, get dial tone, and dial a local charge number (this should be prearranged)	Dial tone received, station number dialed audible ringing heard, called party answers, switches to deposit coin tone.	No dial tone	Traffic overload	Wait and repeat test
			Audible ringing not heard	Nonstation trouble	Refer to testdesk
13	Deposit 5 cents less than initial rate	Deposit coin tone remains	Deposit coin tone stops	Initial rate set incorrectly	Reset rate
			Totalizer reads out	Wrong code totalizer or defective totalizer	Replace totalizer
				Defective chassis	Replace chassis

TABLE N (Contd)  
 TROUBLE ANALYSIS – 1E1 SET  
 DIAL POSTPAY WHERE ACTS IS AVAILABLE

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
14	Deposit additional coins up to initial rate	Deposit coin tone stops. Talk path is established	Deposit coin tone does not stop	Initial rate set for more than the deposit Defective hopper Defective totalizer	Reset totalizer Replace defective apparatus
15	Hang up	Totalizer restores	Totalizer does not restore	Nonstation trouble Defective coin dial unit Defective chassis	Refer to testdesk Replace defective apparatus
16	If KS-14995, L3 tool was installed, disengage chute locking spring; <i>slowly pull top of chute forward while holding KS-14995, L3 tool.</i> Lift chute and tool out of set and retrieve coins				
17	Return set to normal operation				

TABLE O  
TROUBLE ANALYSIS – 1E3 SET  
MANUAL POSTPAY

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION	
Preparation For All Tests						
1	Invert handset on switchhook. <i>Note:</i> Prevents armored cord from pushing handset off switchhook when cover is set down.					
2	Remove coin cover unit and hang it on a KS-20950, L2 cover parking tool (Fig. 33). If parking tool is not available or cannot be used at the station, disconnect P1, place coin cover unit on a firm level surface and connect a P11C cord between P1 and J1 of the coin chassis					
3	Insert KS-14995, L3 tool between coin chute and hopper to prevent loss of deposited coins.					
Dial Tone Tests						
4	Go off hook.	Operator answers	Operator does not answer	Defective handset.	Replace defective apparatus.	
				Defective chassis.		
				Defective switchhook.		
				TB2 not wired correctly.		Verify and correct.
				Nonstation trouble		Refer to testdesk
Totalizer Operation						
5	With operator on line, deposit nickel, dime, and quarter	Operator identifies pro- per coin tone signals	Operator cannot properly identify coin signals	Defective totalizer.	Replace defective apparatus	
				Defective chassis		
				Ring and tip reversed		Correct
				Totalizer mode switch in CF position		Reposition switch to DTF

TABLE O (Contd)  
TROUBLE ANALYSIS – 1E3 SET  
MANUAL POSTPAY

STEP	ACTION	VERIFICATION	FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION
6	Listen for coin tones in handset as coins are deposited.	Low tones may be heard.	Loud tones are heard.	Defective chassis.	Replace chassis.
7	Disengage chute locking spring, slowly pull top of chute forward while holding KS-14995, L3 tool. Lift chute and tool out of set and retrieve coins.				
8	Check for noise of cutout in handset cord.	Noise should not be heard.	Noise is heard.	Defective handset.	Replace handset.
9	Repeat step 3				
10	Request operator to call back. Go on hook.	Ringer operates at maximum volume.	No ringing or rings at low volume.	Improper line assignment. Defective ringer. Ringer out of adjustment.	Verify and correct. Replace ringer or chassis. Adjust.
11	Call operator, with operator on line deposit a coin and request operator to identify coin signal.	Identification properly made.	Identification cannot be made.	Open capacitor in network. Nonstation trouble.	Replace chassis. Refer to testdesk.
12	Thank operator and hang up.				
13	Disengage chute locking spring, slowly pull top of chute forward while holding KS-14995, L3 tool. Lift chute and tool out of set and retrieve coins.				
14	Return set to normal operation.				

TABLE P

OPERATE VALUES OF COIN RELAYS

MAKING ON RELAY	OPERATING TIME	OPERATE CURRENT	NONOPERATE CURRENT
P-15E687 (Note 1)	Remove from Service		
1A*	450 ± 50 milliseconds	41 milliamps	30 milliamps
1A (Note 2)			

**Note 1:** On all routine and maintenance visits, replace the existing P-number relay with a 1A-type. P-number relays (650 ms) will not operate proper with No. 5 XBR and ESS offices, and are incompatible with the coin station test line and the KS-21250 test set. P-type relays may be identified by the smaller 5/32-inch diameter restoral spring as compared to the larger 9/32-inch restoral spring on 1A relays as shown in Fig. 7 and 8 or the Public Services Maintenance Check Booklet.

**Note 2:** Coin relays marked 1A without the asterisk symbol have bifurcated rather than solid contact springs.

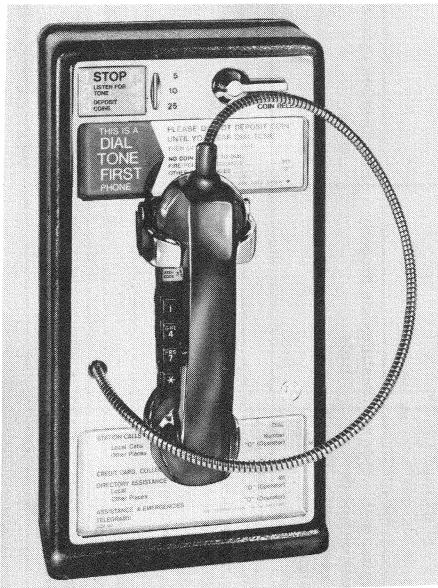


Fig. 37—Coin Cover Unit With Handset Inverted

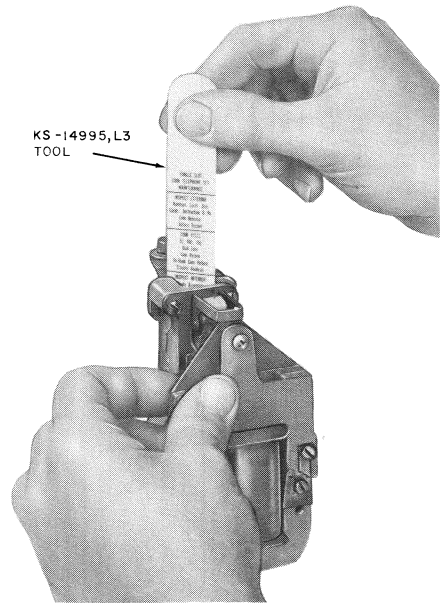


Fig. 38—Trap and Vane Release Test



## 5. MAINTENANCE

### A. Clearing Chute of Foreign Material or Stuck Coin

5.01 When troubles indicate foreign objects or stuck coins in chute.

- (a) Operate coin release lever in attempt to clear coins from chute.
- (b) If trouble does not clear.
  - (1) Remove coin cover unit (1-type) or open door and faceplate assembly (2-type).
  - (2) Remove chute-totalizer.
  - (3) Swing upper plate assembly open (Fig. 39).
  - (4) Where possible, use an orange stick to remove any foreign objects or stuck coins. Do not use screwdriver. Do not loosen chute assembly screw.
  - (5) Clean off any foreign material adhering to chute magnets using a suitable typewriter brush or equivalent.



***Exercise extreme care when closing the upper plate assembly. If the quarter divider is not positioned properly, it will become damaged when the upper plate assembly is closed against it.***

- (6) Replace 20A coin chute if dime is caught at exist of lower portion of chute (manufactured prior to May, 1978) and chute does not have shims to increase dime exit opening as shown in Fig. 40.

5.02 If trouble cannot be cleared using an orange stick, use a 787A tool (Fig. 41) as follows.

- (a) Remove totalizer from chute.
- (b) Swing upper plate assembly open per Fig. 41.

**Note:** Several conditions can be encountered with dime jams. Most jams involve only two or three dimes but others may involve as

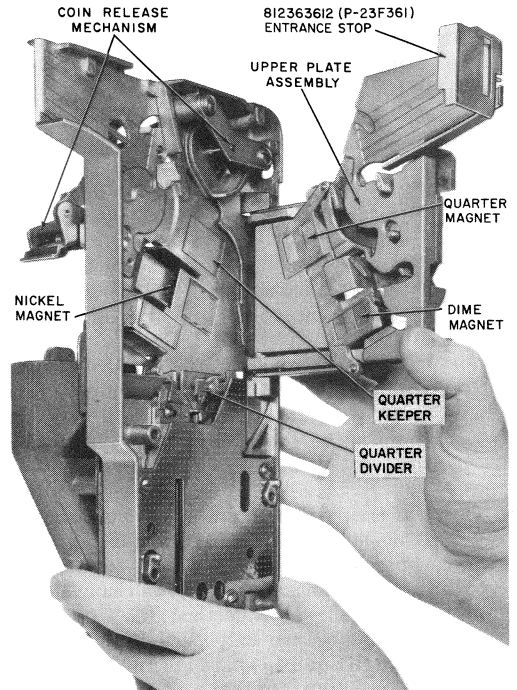


Fig. 39—Chute

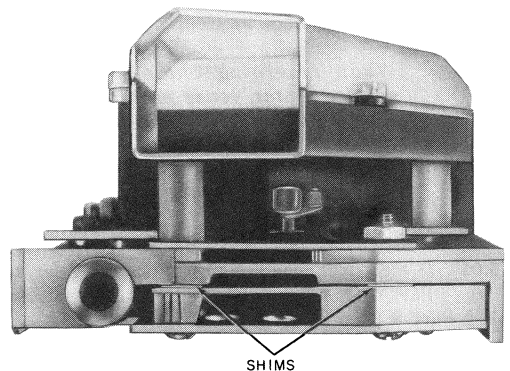


Fig. 40—20A Coin Chute (Manufactured Prior to May, 1978) With Dime Opening Shimmed

many as six dimes blocked at both ends as shown in Fig. 42, with the top two overlapped.

- (c) If two dimes are partially overlapped, the top dime can be hooked on the face and pulled out as shown in Method I (Fig. 43).
- (d) If two dimes are completely overlapped as shown in Fig. 42, proceed as follows.
  - (1) Begin unjamming the dimes by inserting the 787A tool as shown in Method II (Fig. 43), hooking onto the dime's edge, and pulling up.

**Caution:** Do not pull the two overlapped dimes past the lower dime divider leg with the tool hooked on the dime's edge.

- (2) If the overlapped dimes move up together as shown in Method II, any dimes below can probably be shaken out. Access to the overlapped dimes is through the channel from below as shown in Method III. Once the two dimes become only partially overlapped (Method III), utilize Method I to finish extracting them.

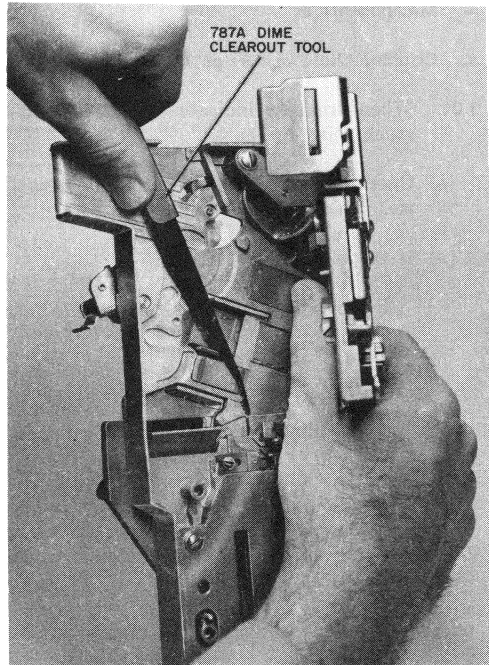


Fig. 41—Using a 787A Dime Clearout Tool in Chute

5.03 Test chute by depositing coins with cover unit assembly both off and on housing (1-type) or with door and faceplate assembly both opened and closed (2-type).

5.04 If trouble cannot be cleared, replace chute.



**When returning chute-totalizer to service center, reuse packing material from which the new item was removed.**

## B. Electrical Troubles

5.05 If electrical troubles are indicated, refer to Part 4 (Operation Tests and Trouble Analysis) and Part 9 (Connections).

5.06 Refer to Part 3 for the removal and replacement of the following components.

- Chute-totalizer
- Chute

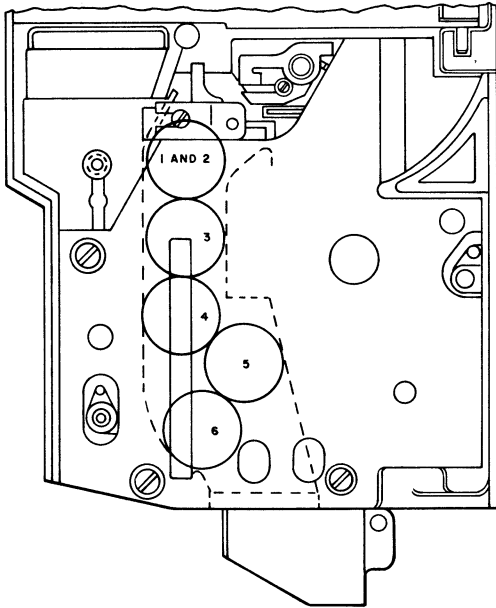
- Totalizer
- Coin chassis
- Instruction cards
- Number cards
- Fingerwheel.

5.07 Components other than those listed in paragraph 5.06 can be removed as outlined below.

## C. 1A Coin Relay (1A/2A/1C/2C Sets Only)

5.08 To remove 1A coin relay without removing hopper assembly.

- (1) Disconnect (BK) and (Y) leads.



**Fig. 42—Lower Portion of Coin Chute With Six Dimes Jammed**

- (2) Remove two relay mounting screws on top front of coin relay (Fig. 13).
- (3) Remove two slotted hex head screws on sides of coin relay.
- (4) Check that the hopper trigger (Fig. 44) is in horizontal (up) position and pull off coin relay. **Do not damage hopper trigger.**



**When returning defective 1A coin relays to service center, reuse packing material from which the replacing item was removed.**

**5.09** To install 1A coin relay (Fig. 44).

- (1) Move coin vane to left (collect) position.
- (2) With hopper trigger in nonoperated (horizontal) position, move relay into position until trigger enters T-shaped slot in hopper and trap lever tab just enters opening in selector card.

- (3) Press down slightly on ear of left side of selector card and manually move armature forward to its operated position. Hold armature in this position.
- (4) Move coin relay forward until square stem on vane enters hole in cam and mounting screw holes line up.

**Note:** Do not attempt to install relay if trigger support bracket is so distorted that mounting holes do not engage hopper bosses.

- (5) Place and tighten evenly two mounting screws on top of coin relay and two slotted hex head mounting screws in each side of relay.

**Note:** Ensure that top screws are tightened first so that bosses (Fig. 13) will be properly seated.

- (6) Make sure that trigger, armature, trap, and vane operate without binding. Refer to trap and vane release test in Table K.
- (7) Reconnect (Y) lead to terminal G and (BK) lead to terminal 3.

**D. Coin Hopper**

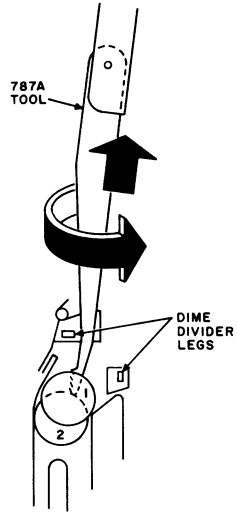
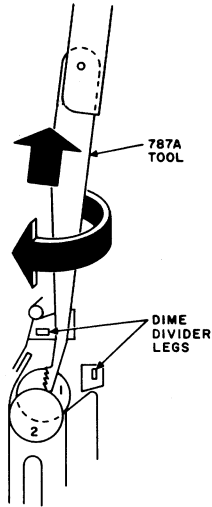
**5.10** To remove coin hopper.

- (1) Remove coin relay from 1A/2A/1C/2C sets.
- (2) In 1E1 sets, disconnect (G) and (S-R) leads from hopper.
- (3) Remove vault door and coin receptacle.
- (4) Remove two 811058098 hex socket head cap screws from inside vault.
- (5) Lift hopper out of set.

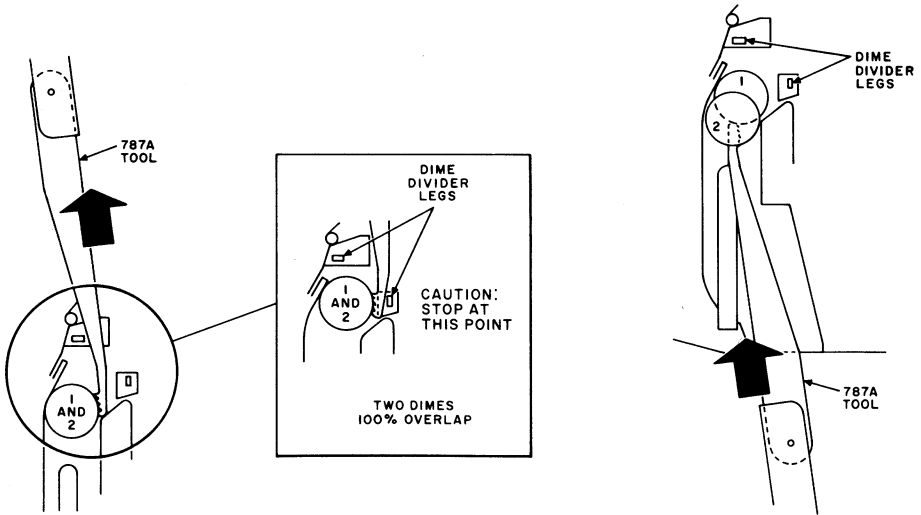
**5.11** To install coin hopper, use reverse procedure.

- (1) For 1E1 sets, connect (G) and (S-R) leads to hopper in accordance with Fig. 73.

**Caution:** Observe polarity of diode on 50A hopper. Do not torque the terminal screws excessively to avoid canting the spring pile-up.



METHOD I



METHOD II

METHOD III

Fig. 43—Method for Removing Jammed Dimes From Chute

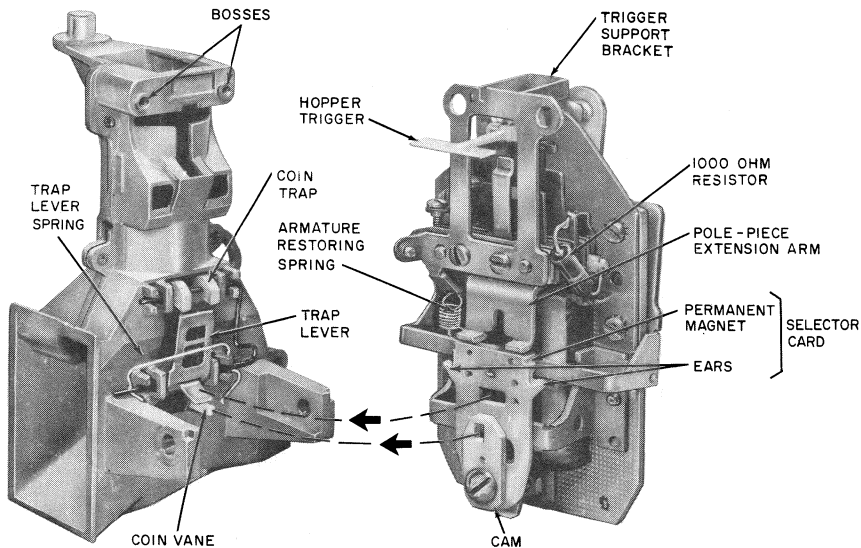


Fig. 44—Coin Hopper and Rear View of Coin Relay

**Note:** The 840708895 delay circuit assembly on the 51A hopper is replaceable.

#### E. Coin Trap and Associated Parts (1A/2A/1C/2C Sets Only)

##### 5.12 Check coin trap spring tension as follows.

- (1) Manually operate the coin relay armature to its fully closed position by pushing down on selector card ear (Fig. 44).
- (2) Allow relay to slowly return to its nonoperate position.
- (3) Insert KS-14995, List 3 tool into hopper (Fig. 38). Apply firm downward pressure (approximately 1/2 pound) with tool on coin trap in hopper throat; but **DO NOT FORCE** down enough to bend or break parts.
- (4) If this firm **but not excessive** downward force does not cause the trap lever spring to release the trap, the existing spring is operating adequately. If the armature of the coin relay moves by this action, a new 840157333 wire spring (Fig. 45) should be installed as directed in paragraph 5.13. However if the armature of

the coin relay still moves with the preceding test after spring replacement the trap lever must be replaced.

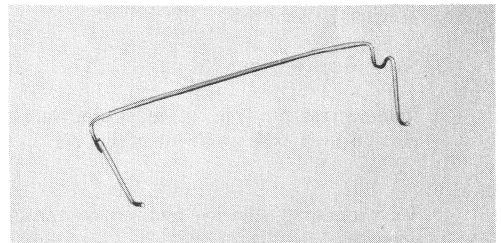


Fig. 45—840157333 Trap Lever Spring

##### 5.13 Install 840157333 trap lever spring as follows (Fig. 46).



**The 840157333 trap lever springs may become deformed or twisted when several are intermixed together. This situation can be corrected by grasping each leg of a loose spring with**

**one's fingers and countertwisting them until both legs are aligned properly as illustrated in Fig. 45.**



**Always use the wire-type trap lever spring (5.13) when installing or replacing a coin trap.**

**Note:** The phosphor bronze spring should be removed before the new wire type spring is installed.

- (1) Remove coin relay, if not previously removed.
- (2) Move trap pin to the right so that left end of pin is flush with hopper guide (Fig. 46, Step 1).
- (3) Holding notched left leg of new spring at an angle away from hopper, slide the right notched leg of the spring under trap pin (Fig. 46, Step 2).
- (4) Swing loose end of spring across face of trap lever and position notch of left leg in alignment with end of trap pin (Fig. 46, Step 3).
- (5) Push trap pin to the left, over and through the left leg notch of the new spring, until the trap pin detents (Fig. 46, Step 4).
- (6) Install coin relay, if applicable.

**5.14 To remove trap lever and coin trap.**

- (1) Remove coin relay from hopper, if not previously removed.
- (2) Move vane to right.
- (3) Remove trap pin (Fig. 47) by sliding vertical portion over boss on front of hopper.
- (4) Turn coin trap sideways and remove through opening.

**5.15 To replace coin trap and trap lever.**

- (1) Partially insert trap pin into hole in hopper (Fig. 48) and place trap lever on trap pin.
- (2) Insert coin trap in hopper and engage pin in trap (Fig. 49).

- (3) Push trap pin into position.
- (4) Check operation per Table K.
- (5) Install relay on hopper, if applicable.

**F. Return Chute Assembly**

**Note:** Latest return chute assemblies are made of plastic and require special removal techniques.

**5.16 To remove return chute assembly.**

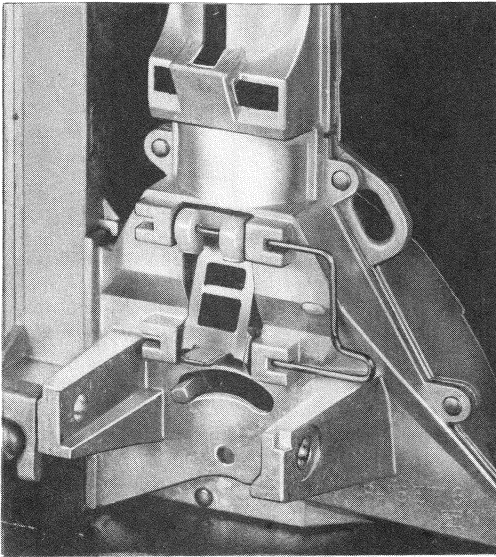
- (a) Metal return chute.
  - (1) Remove chute-totalizer.
  - (2) Loosen return chute screw (Fig. 13).
  - (3) Lift chute assembly up and off.
- (b) Plastic return chute.
  - (1) Remove chute-totalizer.
  - (2) Loosen return chute screw (Fig. 13).
  - (3) Raise assembly enough to clear round head screw.
  - (4) Holding chute assembly run the screw fully in (this will clear the chute slot and permit removal without chute damage).
  - (5) Lift chute assembly up and off.

**5.17 To replace return chute assembly, reverse procedure.**

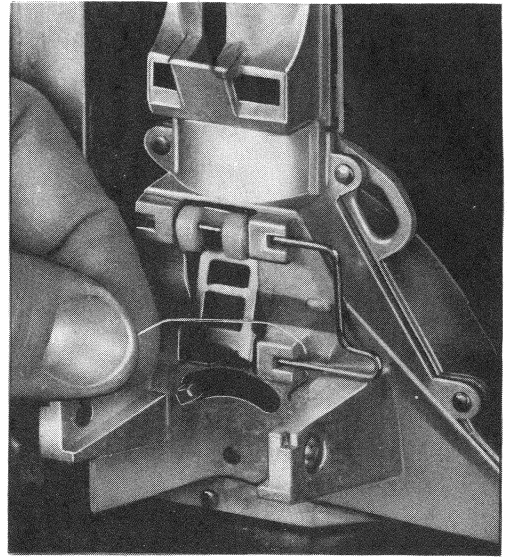
**Note:** Do not use excessive force when torquing down screw on plastic return chutes. Use only sufficient torque to hold assembly in position.

**G. Coin Return Assembly**

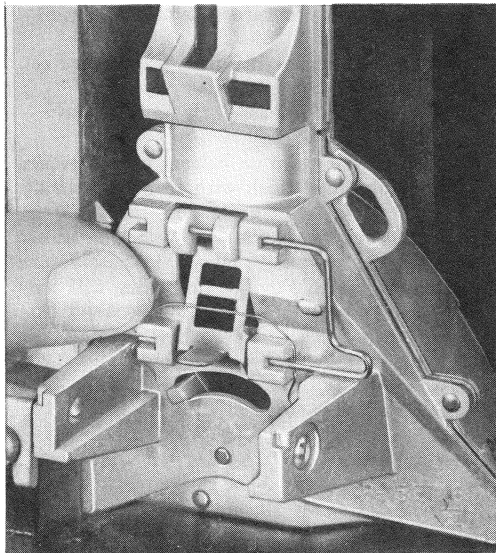
**5.18 To remove coin return assembly.**



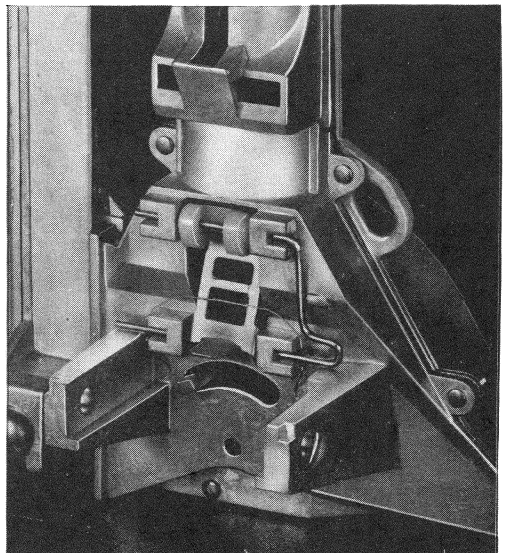
STEP 1



STEP 2



STEP 3



STEP 4

Fig. 46—Installing 840157333 Trap Lever Spring (Typical)

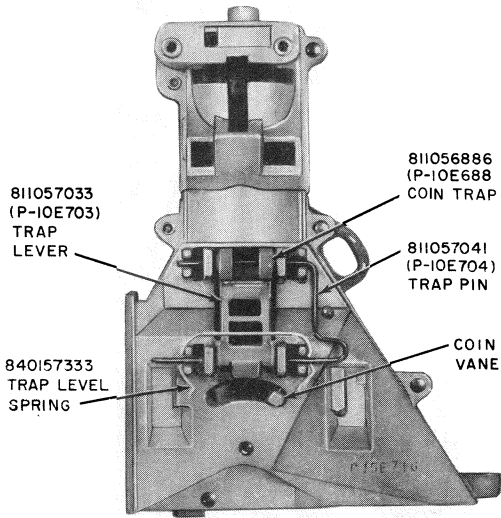


Fig. 47—Coin Trap and Trap Level Assembly

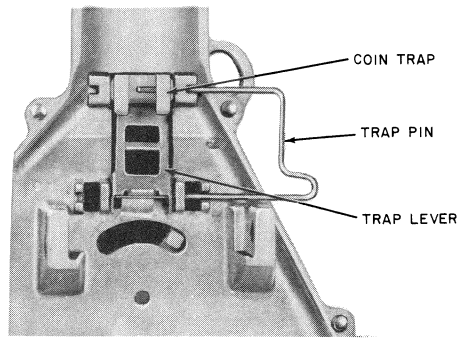


Fig. 49—Placing Coin Trap in Hopper

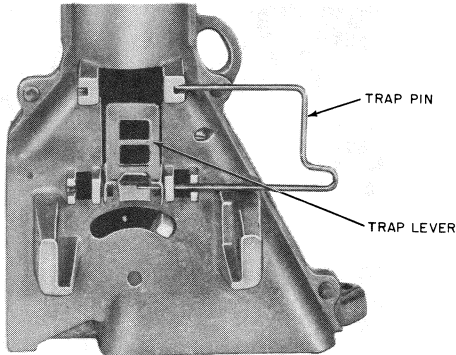


Fig. 48—Placing Trap Lever Pin on Hopper

- (1) Remove chute-totalizer.
- (2) Remove return chute assembly.
- (3) Remove coin return assembly locking screw (Fig. 13).

- (4) Insert finger in coin return and tilt top forward.
- (5) Lift coin return. Pull coin return assembly out and up.

**5.19 To install coin return assembly.**

- (1) Tilt top of coin return assembly toward set.
- (2) Push coin return assembly into set.
- (3) Push in and down on bottom of coin return assembly until flush with front of housing.
- (4) Install coin return assembly locking screw. Tighten screw only enough to hold return assembly in place. Further tightening will bend screw.
- (5) Replace return chute assembly.
- (6) Replace chute-totalizer.

**H. Ringer**

**5.20 To remove C4A ringer.**

- (1) Remove chute-totalizer.
- (2) Remove coin chassis.
- (3) Disconnect four ringer leads; two from TB1 and two from network.



- (4) Remove two ringer mounting screws and lift off ringer.

**5.21** To install C4A ringer, reverse procedure making sure that locating pin on bottom of ringer is in grommet on chassis assembly. Make connections per Table Q.

#### I. Auxiliary Ringer

**5.22** Where high ambient noise makes it difficult to hear the C4A ringer in the coin telephone set, a 687A subscriber set can be used to improve the situation. Install the 687A subscriber set as follows.

- (1) Disconnect, insulate, and store the four ringer leads from the ringer in coin telephone set.
- (2) Install an 840362024 capacitor board assembly (Fig. 50).
  - (a) Install capacitor board assembly (Fig. 50) on backplate in 1-type sets.
  - (b) Install capacitor board assembly on rear of 7A clip in panel sets (Fig. 52).
- (3) Interconnect 687A subset and capacitor board assembly, using inside wire, as shown in Fig. 53.

#### J. Handset

**Note:** A G13D amplified handset can be used. Refer to Section 501-211-102 for complete information. If G13D handset should require replacement it should only be replaced with another G13D amplified handset.

**5.23** The G3AD- and G3AF-type handsets previously used on single slot coin telephone sets are replaced with G3AH- and G3AK-type coded handsets respectively, which have the following features.



**Replace handset with black or gray grommets with handsets containing blue grommets.**

- (1) They are equipped with an LB-type receiver unit and special field coil adapter in the handset which provides a uniform magnetic field

of use to hard-of-hearing customers having inductive pick up-type hearing aids.

- (2) They are identified by the blue rubber grommet around the armored cord at the transmitter end of the handle.

- (3) G3AHF and G3AKF are optional flame retardant handsets.

- (4) The G3AK and G3AKF handset are equipped with a moisture-proof transmitter barrier and special transmitter cap. (Refer to Section 501-210-102.)

- (5) Transmitter and receiver caps are bonded to the handle.

**5.24** To test the field coil adapter in the G3AH, G3AHF, G3AK, or G3AKF handset —

- (1) Place a KS-21468, List 1 tone pick-up coupler (Fig. 54) around the receiver cap of handset.
- (2) Connect a lineman's test set to the two tone coupler terminals.
- (3) Place the TALK-MONITOR switch in the TALK position.
- (4) Dial the 1000 Hz test number from the coin telephone set. Listen in the test set for the 1000 Hz tone.
- (5) If tone is not heard, the field coil adapter is defective and the coin phone handset should be replaced.

**5.25** To remove handset.

- (1) Disconnect handset leads from terminal board (TB2) on rear of coin dial unit.
- (2) Remove 801816786 (P-181678) BHM screw, and 811554443 (P-15E444) coverplate (Fig. 1 and 2) which secure handset cord to dial housing.
- (3) Loosen stay-hook screw and remove handset cord.

**5.26** To install handset, reverse procedure. Make connections per Table Q.

TABLE Q

## COMPONENT CONNECTIONS

COMPONENT	WIRE COLOR	CONNECT TO	
		COIN-FIRST MODE	DIAL-TONE-FIRST OR POSTPAY MODE
Rotary Dial	BL §	TB2-9	TB2-9
	G §	TB2-10	TB2-10
	W	TB2-2	TB2-2
	W	TB2-3	TB2-3
	Y	TB2-9	*
	Y	TB2-9	TB2-13
35T3A TOUCH-TONE Dial	G	TB2-4	TB2-4
	W	TB2-2	TB2-2
	R	TB2-5	TB2-5
	R-G	TB2-6	TB2-6
	BK	TB2-1	TB2-1
	O-BK	TB2-11	TB2-11
	O-R	TB2-12	TB2-12
	BL	TB2-3	TB2-3
	W-BL	TB2-7	TB2-7
	O-W	TB2-10	TB2-9
V	TB2-10	TB2-13	
70A (MD) or 70B TOUCH-TONE Dial	G	TB2-4	TB2-4
	W	TB2-2	TB2-2
	R	TB2-5	TB2-5
	R-G	TB2-6	TB2-6
	BK	TB2-1	TB2-1
	O-BK	TB2-11	TB2-11
	O-R	TB2-10	TB2-10
	W-BL	TB2-7	TB2-7
	O-W	TB2-10	†
	V	TB2-10	TB2-13

TABLE Q (Contd)

## COMPONENT CONNECTIONS

COMPONENT	WIRE COLOR		CONNECT TO	
			COIN-FIRST MODE	DIAL-TONE-FIRST OR POSTPAY MODE
Handset (Rotary Set)	G3-Type	G13-Type	TB2-2	TB2-2
	W	G		
	R	R	TB2-3	TB2-3
	BK	BK	TB2-6	TB2-6
	W	Y	TB2-8	TB2-8
	Handset (TOUCH-TONE Set)	W	G	TB2-7
R		R	TB2-3	TB2-3
BK		BK	TB2-5	TB2-5
W		Y	TB2-8	TB2-8
Ringer	BK		TB1-T	TB1-T
	R		TB1-R	TB1-R
	S-R		Term A on Net.	Term A on Net.
	S		Term K on Net.	Term K on Net.
Coin Chassis	G		TB3-1	TB3-2
	G-BK		TB3-2	TB3-3
	R		TB3-3	TB3-1
	S-R		TB3-3	TB3-8
	BL		TB3-4	TB3-6
	S-W		TB3-4	Insulate and Store
	G-W		TB3-5	
	V		TB3-6	
	BK		TB3-7	TB3-4
	W-BR		Insulate and Store	TB3-9
	V-O			TB3-6
R-G		TB3-8		

TABLE Q (Contd)

## COMPONENT CONNECTIONS

COMPONENT	WIRE COLOR	CONNECT TO	
		COIN-FIRST MODE	DIAL-TONE-FIRST OR POSTPAY MODE
Switch-hook (Rotary Sets)	R ‡	TB2-12	TB2-12
	<b>G</b>	<b>TB2-13</b>	<b>TB2-9</b>
	S	TB2-9	TB2-9
	BR	TB2-11	TB2-11
	BR	TB2-10	TB2-10
	O	TB2-10	TB2-10
	O	TB2-11	TB2-11
	W	TB2-8	TB2-8
	Y	TB2-3	TB2-3
Switch-hook (TOUCH-TONE Sets)	R ‡	TB2-12	TB2-12
	<b>G</b>	<b>TB2-13</b>	<b>TB2-9</b>
	S	TB2-9	TB2-9
	BR	TB2-11	TB2-11
	BR	TB2-9	TB2-9
	O	TB2-9	TB2-9
	O	TB2-11	TB2-11
	W	TB2-8	TB2-8
	Y	TB2-3	TB2-3

\* TB2-9 on dial and housing assemblies 819042748 (P-90D274) and 840152227.

TB2-12 on dial and housing assemblies 841317241 and 841317258.

† TB2-9 on dial and housing assemblies 840155402 and 840155394.

TB2-12 on dial and housing assemblies 840346977 and 840347173.

‡ The (R) switchhook lead appears on the following dial and housing assemblies only:

- 840346977
  - 840347173
  - 840155402
  - 840195394
  - 841317241
  - 841317258
- } TOUCH-TONE Dial
- } Rotary Dial

§ The 8WA dial has two (BL) wires instead of a (G) and (BL).

Note: Bold areas indicate differences between CF and DTF modes.

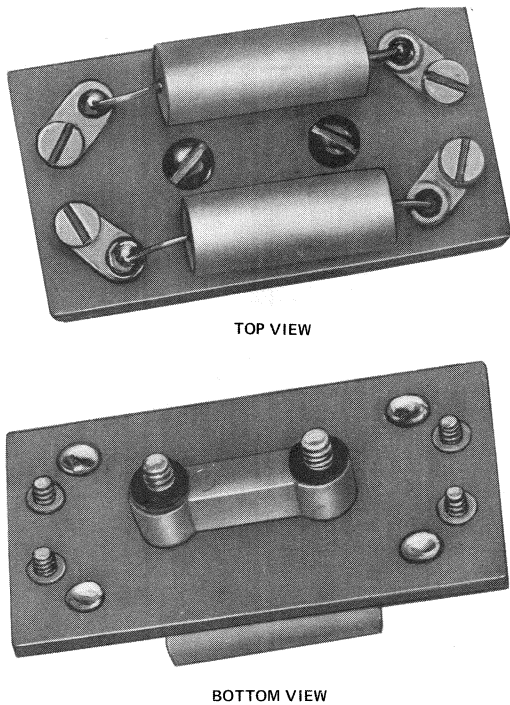


Fig. 50—840362024 Capacitor Board Assembly

**K. Coin Dial Unit**



*The 70A (MD), 70B, and 35T3A TOUCH-TONE dials cannot be physically interchanged without changing the complete dial and housing assembly.*

**5.27 To remove coin dial unit.**

- (1) Remove handset.
- (2) Remove four 840157390 locking mounting screws (Fig. 1 and 2) and remove coin dial unit from cover.

**5.28 To install coin dial unit, reverse procedure.**

**Note:** Ensure that the four mounting screws are tight to prevent coin dial unit from becoming loose due to vibration.

**5.29 To remove dial.**

- (1) Remove mounting screws and pull coin dial unit away from coin cover unit.

**Note:** It is not necessary to remove handset when removing dial.

- (2) Disconnect dial leads from TB2.
- (3) Loosen two mounting screws on sides of dial through access holes in housing.
- (4) Lift off dial.

**Note:** Before installing a new rotary dial, remove and discard the dust cover.

**5.30 To install dial, reverse procedure making sure that dial is properly seated on four locating pins. Make connections per Table Q.**

**L. Fingerwheel [8U (MD), 8W (MD), or 8WA Dial]**

**5.31 To remove fingerwheel refer to paragraph 3.37.**

**5.32 To install fingerwheel refer to paragraph 3.39.**

**M. Information Plate and Plate Assemblies**

**5.33 All current manufactured coin telephone sets are shipped with an information plate (Fig. 1 and 2) indicating mode of service.**

**5.34 Studded plates for field replacement can be ordered as follows.**

- **For Coin-First Service**—840156319 Information Plate equipped with two RM-900077371 thread-forming nuts\* and two 840702948 spacers †
- **For Dial-Tone-First Service**—840156327, Assembly, Information Plate equipped with two RM-900077371 thread-forming nuts\* and two 840702948 spacers †
- **For Postpay Service**—840156087, Assembly, Information Plate equipped with two RM-900077371 thread-forming nuts.\*

TABLE R  
D-180893 KIT OF PARTS (POLARITY GUARD) CONNECTIONS  
1C2/2C2 COIN TELEPHONE SET, DTF MODE ONLY (NOTE)

LEAD COLOR		REMOVE FROM		CONNECT TO		
TEL SET	POLARITY GUARD*	TB2	NET.	TB2	NET.	POLARITY GUARD
BR		9		11		
O†		11				1
G		4				2
R‡			F		RR	
	G			4		
	O			11		

*Note:* Can be used with 819042755 (P-90D275), 840157580, 840346977, 840347173 dial and housing assemblies and the 61A coin dial unit.

\* The (G) and (O) leads are connected to terminals 3 and 4, respectively, on the polarity guard.

† (O) lead on the 61A coin dial unit connects directly to terminal 1 of polarity guard. On the other four dial and housing assemblies it will be necessary to extend the (O) lead to terminal 1 of the polarity guard using the (O) extension lead and D-161488 connector furnished with the kit.

‡ REMOVE only the (R) lead that connects to pin 7 of component board on coin chassis.

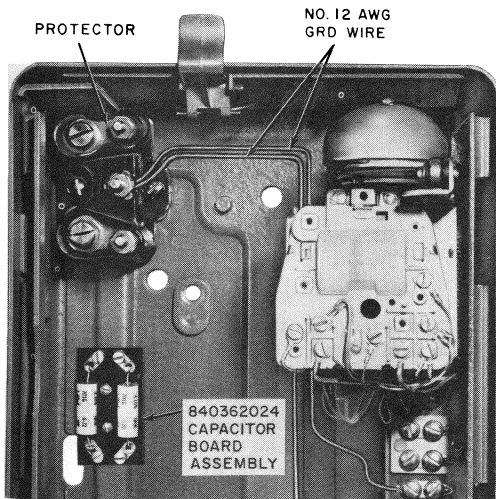


Fig. 51—Housing and Mounting Plate Assembly

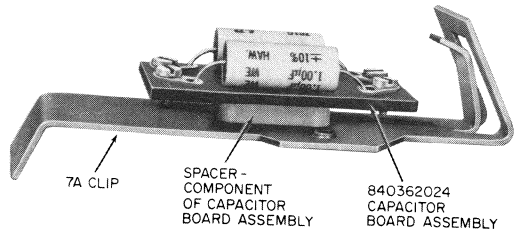


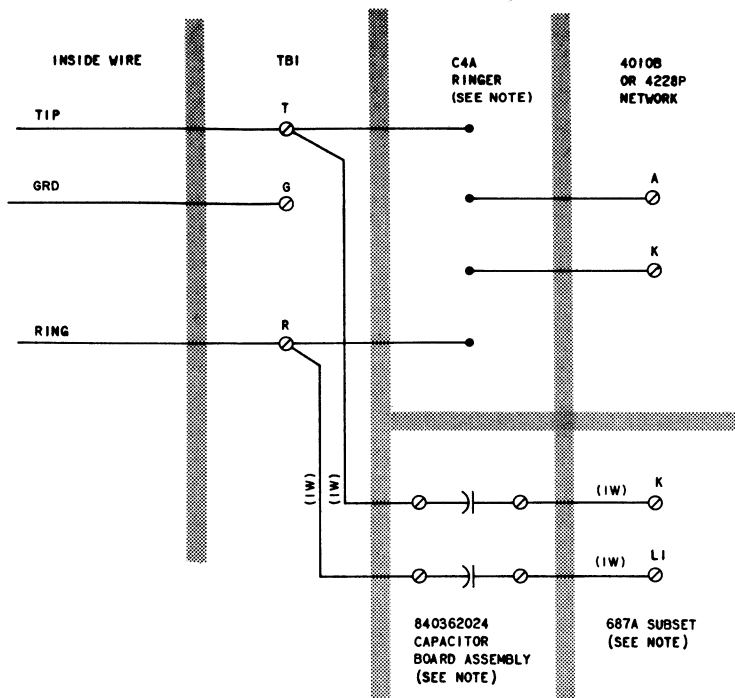
Fig. 52—Capacitor Board Assembly Mounted on 7A Clip

5.35 If sets do not have holes for studded information plates, arrangements can be made to procure studless plates and affix them to the flat surface of the undrilled faceplate.

5.36 To install studless plates on coin telephone set.

\*Use a 216B tool (3/8-inch socket wrench) to install or remove nuts from studs.

† Spacers are used on panel phones only.



**NOTE:**  
 DISCONNECT, INSULATE AND STORE THE FOUR RINGER LEADS. MOUNT AN 840362024 CAPACITOR BOARD ASSEMBLY AS DIRECTED IN PART 5. CONNECT CAPACITOR BOARD AND 687A SUBSET AS SHOWN USING INSIDE WIRE. DO NOT PUT THE CAPACITOR OF AN AUXILIARY RINGER IN SERIES WITH THE CAPACITOR BOARD.

**Fig. 53—Optional Ringer Connections**

- (1) Clean faceplate or panel of dirt and grime using KS-19578, List 1 cleaning fluid.
- (2) Wipe dry with a different, lint-free cloth.
- (3) Apply 3M Company double sided industrial tape No. 9122 (or equivalent) to the back surface of the information plate and trim neatly to size.
- (4) Peel off the back protective tape covering, carefully orient the plate on the faceplate

or front cover (Fig. 1 and 2) and press in place. Apply firm pressure to ensure complete adhesion.

**N. Magnetic Coin Stop and Information Plate (D-180848 Kit of Parts)**

**5.37** A D-180848 Kit of Parts (Fig. 55) is available to install on a 70A- or 71A-type coin cover unit. (It is not designed for a panel set).

**5.38** The kit contains a magnetic coin stop assembly with mounting hardware plus a choice of

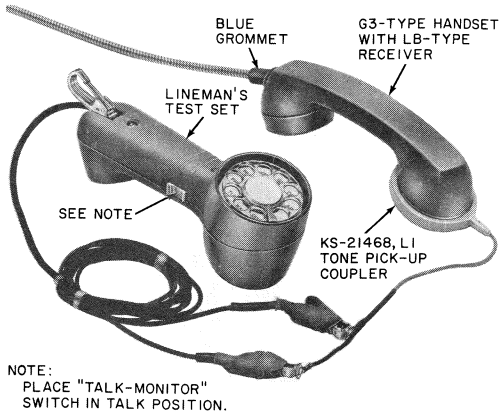


Fig. 54—KS-21468, List 1 Tone Pick-up Coupler

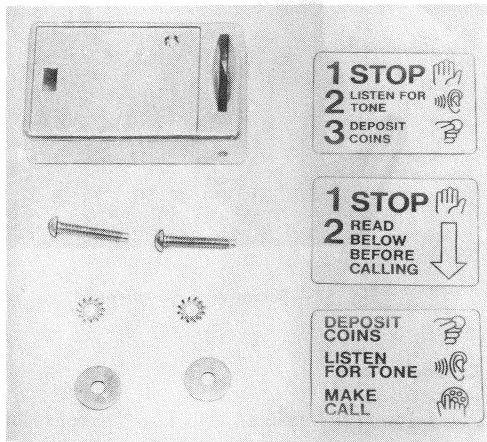


Fig. 55—D-180848 Kit of Parts (Magnetic Coin Stop)

adhesive backed information plates (CF, DTF, or PP service).

**5.39** The magnetic coin stop assembly replaces the ceramic information plate that is normally located in this position and will prevent magnetic coins (such as Canadian) from being inserted into the coin chute.

**5.40** Replace the CF, DTF, or PP ceramic information plate assembly with a magnetic coin stop assembly as follows.

**Note 1:** This kit is not adaptable to earlier sets that have an adhesive backed information plate. It is not recommended for field installation where holes for studded information plates do not exist.

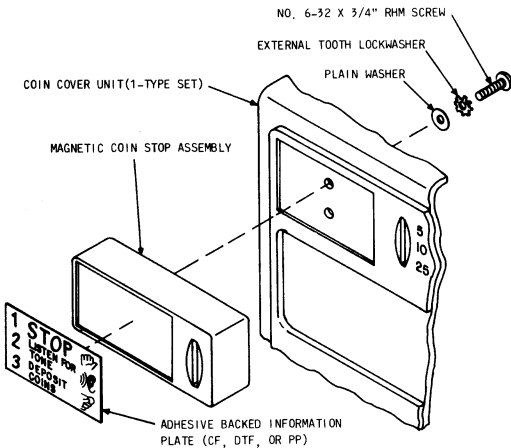
**Note 2:** Do not install this kit on sets where the entrance stop has been positioned off normal as shown in Fig. 60.

- (1) Remove the 70A or 71A-type coin cover unit.
- (2) Remove the existing information plate.
- (3) Thoroughly clean the surface from where the information plate was removed and around the coin slot using an approved cleaner.
- (4) Install the magnetic coin stop assembly over the coin slot and secure it with the two No. 6-32 by 3/4 RHM screws, two No. 6 lockwashers, and two No. 6 flat washers furnished with kit (Fig. 56).
- (5) Clean the front surface of the stop assembly with a dry cloth.
- (6) Observe the information plate removed in (2) and select one from the kit containing the same information.
- (7) Peel off the protective covering from rear and press the information plate in place (Fig. 56). Apply firm pressure to ensure complete adhesion.
- (8) The information plate assemblies (25 plates per package) can be ordered separately as follows.

- 841943467—DTF
- 841943483—CF
- 841943509—PP

**5.41** Place the coin cover unit on a flat level surface or hang it on a KS-20950, List 2 parking tool. Perform the following checks and adjustments.

**SECTION 506-410-400**



**Fig. 56—Installation of the D-180848 Kit of Parts (Magnetic Coin Stop)**

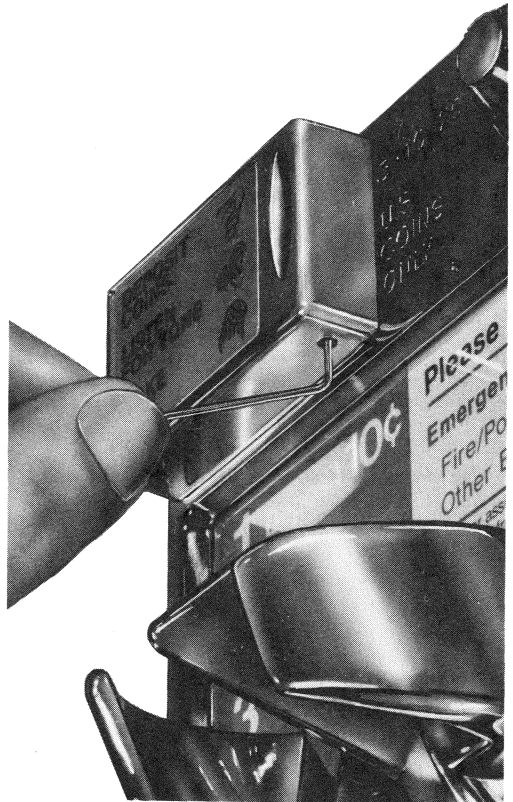
**CAUTION:** *If the coin cover unit is tilted forward more than 1-1/2 degrees, an accurate check cannot be made.*

**U.S. Coins**

- (a) A No. 4-40 set screw (Fig. 57) is provided under the coin slot to prevent a U.S. dime from being caught between the magnetic coin stop assembly and faceplate. Make the following adjustments.

**Note:** See paragraph 5.43 for adjustment using the KS-22551 gauge (optional).

- (1) Turn the set screw clockwise with a No. 4 (.050) Allen wrench until a U.S. quarter will not pass freely through the slot.
  - (2) Turn the set screw counterclockwise until the quarter barely passes through the slot.
  - (3) Turn the set screw an additional half turn counterclockwise to allow clearance for the largest possible quarter.
- (b) Insert a dime, nickel, and quarter into the slot. All coins should pass freely through the magnetic coin stop and coin cover unit.



**Fig. 57—Setscrew Adjustment**

**Canadian Coins**

- (c) Insert a Canadian coin into the coin slot.

**Note:** If a Canadian coin is not available insert a suitable screw driver or equivalent into the slot being careful not to push on the shutter when it activates.

- (d) Verify that the shutter on rear of magnetic coin stop fully activates.
- (e) Verify that the shutter returns to its normal position after removal of coin or screwdriver to allow passage of U.S. coins.

**5.42** Replace coin cover unit on set.

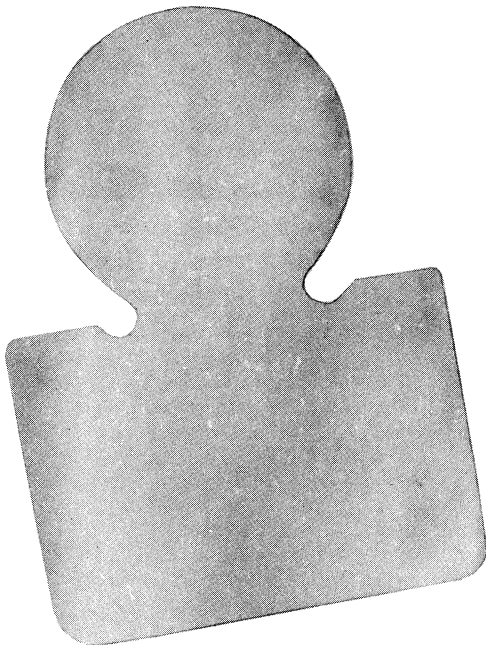


**5.43** A KS-22551 gauge (Fig. 58) is available for adjusting the No. 4-40 setscrew as outlined in paragraph 5.41(a).

- (1) Insert the KS-22551 gauge into the coin slot until it fits flush against the front of the magnetic coin stop assembly (Fig. 59). This may require turning the setscrew counterclockwise.
- (2) Turn the setscrew clockwise until it makes contact with the KS-22551 gauge.
- (3) Remove the KS-22551 gauge.

**Note:** It may be necessary to turn the setscrew counterclockwise slightly, just enough to free the gauge.

- (4) Proceed with paragraph 5.41(b).



**Fig. 58—KS-22551 (Stainless Steel Nonmagnetic) Gauge**

#### **O. 812363612 (P-23F361) Entrance Stop**

**5.44** The entrance stop (Fig. 60) is installed on the chute to minimize coin losses due to chute stuffing. When the coin release lever or knob is operated or a stuffing condition exists the entrance stop moves sideways and closes the coin slot.

**5.45** There should be no binding or rubbing of parts when coin releases lever is operated fully and allowed to return to normal without force.

**5.46** A prefabricated locking tab arrangement can be bent with a screwdriver (Fig. 60) to hold the upper plate assembly off normal. This will prevent customer coin deposits in newly installed cointelephonesetsawaitinginitialserviceconnections, or those that are out of service which require further maintenance or repair.

**Warning:** Do not put a set out of service as shown in Fig. 60 if a magnetic coin stop exists, without first removing the coin stop. The magnetic coin stop can be stored in set until service is restored at which time it can be reinstalled. Install an **OUT-OF-SERVICE** sticker.

#### **P. Modification of Cover Unit Chute Guide (Limit Stop)**

**5.47** If there is a clearance problem between chute and cover unit assembly on the 1-type set, bend the horizontal guide flange, located adjacent to the coin slot inside cover, as shown in Fig. 54.

#### **Q. 840360184 Knob and Shaft Assembly**

**5.48** The knob and shaft assembly (Fig. 62) can be used to replace the lever-type coin release handle and shaft assembly in areas where vandalism causes damage to internal linkage and other chute actuating components.

**5.49** A built-in clutch arrangement ensures that the chute actuating components are neither damaged nor destroyed if the knob is forcibly turned beyond its normal rotational limit.

**5.50** To replace the lever-type coin release with the knob-type.



**Fig. 59—KS-22551 Gauge Being Used to Adjust No. 4-40 Setscrew**

- (1) Remove cover unit assembly (1-type set) or open door and faceplate assembly (2-type set).
- (2) Remove and retain the screw which secures link and lever assembly to coin release lever shaft (Fig. 62). Remove lever and shaft assembly.
- (3) Insert knob and shaft assembly and orient arrow on knob as shown.
- (4) On a panel coin telephone set, the steel spacer must be used.

**Note:** Do not use spacer on a 1-type set.

- (5) Place link and lever assembly over rear of shaft and secure with the screw retained in (2).

#### **R. 840358725 Handle and Shaft Assembly**

**5.51** The 840358725 handle and shaft assembly (Fig. 1) can be replaced on the 1-type set as follows.

- (1) Remove coin cover unit.
- (2) Repeat paragraph 5.50(2).
- (3) Insert handle and shaft assembly through faceplate and orient it per Fig. 1.
- (4) Repeat paragraph 5.50(5).

#### **S. Radio Signal Suppression**

**5.52** For problems involving RFI, refer to Section 500-150-100.

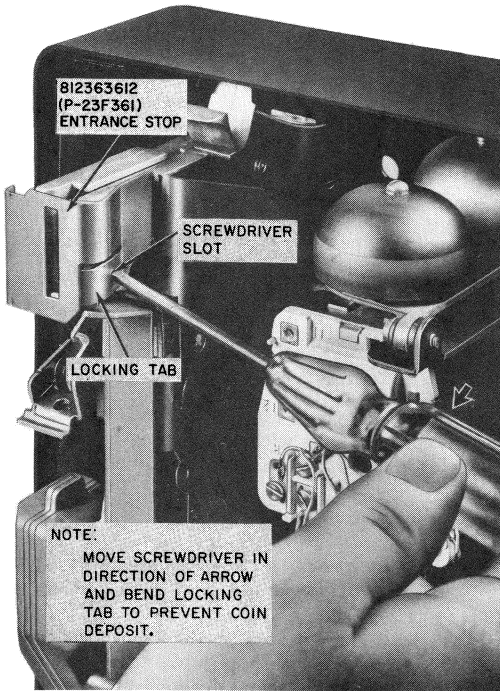
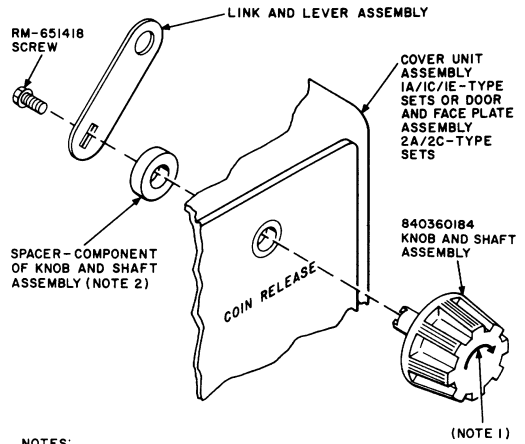


Fig. 60—Operation of Entrance Stop



- NOTES:
1. INSTALL KNOB WITH ARROW IN THIS POSITION.
  2. USE THIS SPACER ON 2A/2C-TYPE SETS ONLY.

Fig. 62—Installation of 840360184 Knob and Shaft Assembly

**T. Polarity Guard (D-180893 Kit of Parts)**

5.53 The D-180893 Kit of Parts (polarity guard) may only be used in stations that provide DTF service. The polarity guard provides an enabled TOUCH-TONE dial in the absence of a central office enablement procedure.

5.54 The D-180893 Kit of Parts (polarity guard) is mounted on the bottom left-hand corner of the dial housing (looking at the rear of the housing), directly below TB2. The lower left-hand mounting screw is removed from the housing and inserted into the mounting bracket of the kit. The kit is then fastened into place by inserting the screw into the same hole it was removed from. See Fig. 63.

5.55 For D-180893 Kit of Parts (polarity guard) connections to 1C2/2C2 coin telephone set, DTF mode only, refer to Fig. 63 and to Table R.

5.56 The D-180893 Kit of Parts causes 100 ohms of loss in loop range on nonrange extended loop. The D-180893 Kit of Parts must not be used on range extended loops. It is suggested on range extended loops the D-180707 (conversion to 1D2/2D2



Fig. 61—Bending Chute Guide (Limit Stop)

coin telephone set) Kit of Parts be used in place of the polarity guard.

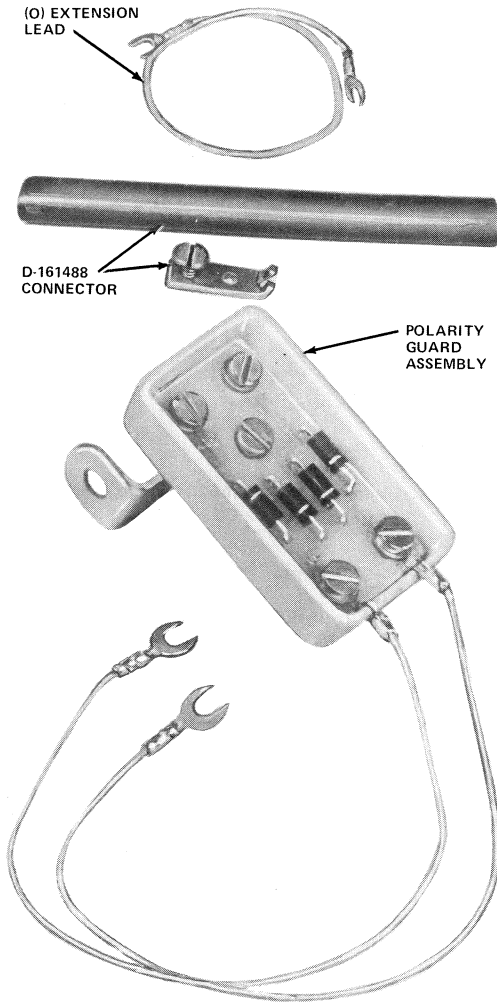


Fig. 63—D-180893 Kit of Parts (Polarity Guard)

## 6. CONVERSIONS

### 6.01 To convert a 1A/2A-type coin telephone set to 1C/2C-type.

(a) New chute-totalizer, coin chassis, and coin dial unit are required. The following are preferred.

- (1) 20A1A chute-totalizer.
- (2) 31A coin chassis.
- (3) 60-type coin dial unit with rotary dial or 61-type coin dial unit with TOUCH-TONE dial.

**Note:** On a 1-type set, a complete coin cover unit equipped with appropriate dial can be used.

(b) Replace chute-totalizer, coin chassis, and coin dial unit with components listed in (a). Refer to Parts 3 and 5 for installation procedures.

(c) Verify connections per Table Q.

### 6.02 To convert a 1C/2C-type set from CF to DTF mode.

(a) Use Table Q as a guide and relocate the following where applicable. Bold print in Table Q indicates wiring differences between CF and DTF.

- Two (Y) leads on TB2 (rotary dial only)
- (O-W) and (V) leads on TB2 (TOUCH-TONE dial only)
- All leads on TB3
- (G) switchhook lead on TB2.

(b) Move slide switch on totalizer to DTF position.

(c) Change information plate and instruction cards.

## 7. MANUAL EXTENSION STATION

7.01 A manual extension station can be used with a 1C/2C-type and 1E3 sets using a 500C desk set equipped with a D-180405 Kit of Parts or a 554-type wall set equipped with a D-180406 Kit of Parts (Section 506-100-108). Do not use a kit-equipped extension set with a 1A/2A-type or 1E1 set.



***Not more than one manual extension station should be associated with a coin set if the coin set privacy control feature is needed.***

## **8. CLEANING AND TOUCH-UP**

**8.01** When necessary, the external surface of the coin telephone set may be cleaned with KS-7860 petroleum spirits or a suitable liquid wax such as Johnson's No. 7700 cleaning and polishing wax emulsion.

***Warning: Use safety precautions while using highly flammable KS-7860 petroleum spirits.***

**8.02** An overspray lacquer, available in 12-ounce aerosol cans can be used for touch up work

on 1-type coin telephone set with vinyl paint finishes.

- KS-21462, List 1 [Black (-03)]
- KS-21462, List 2 [Moss Green (-51)]

**8.03** Apply per label instructions on can.



***After all maintenance is completed, refer to Part 4 and verify if the coin telephone set is working correctly.***

## **9. CONNECTIONS**

**9.01** Refer to Fig. 64 through 74 for connecting diagrams.

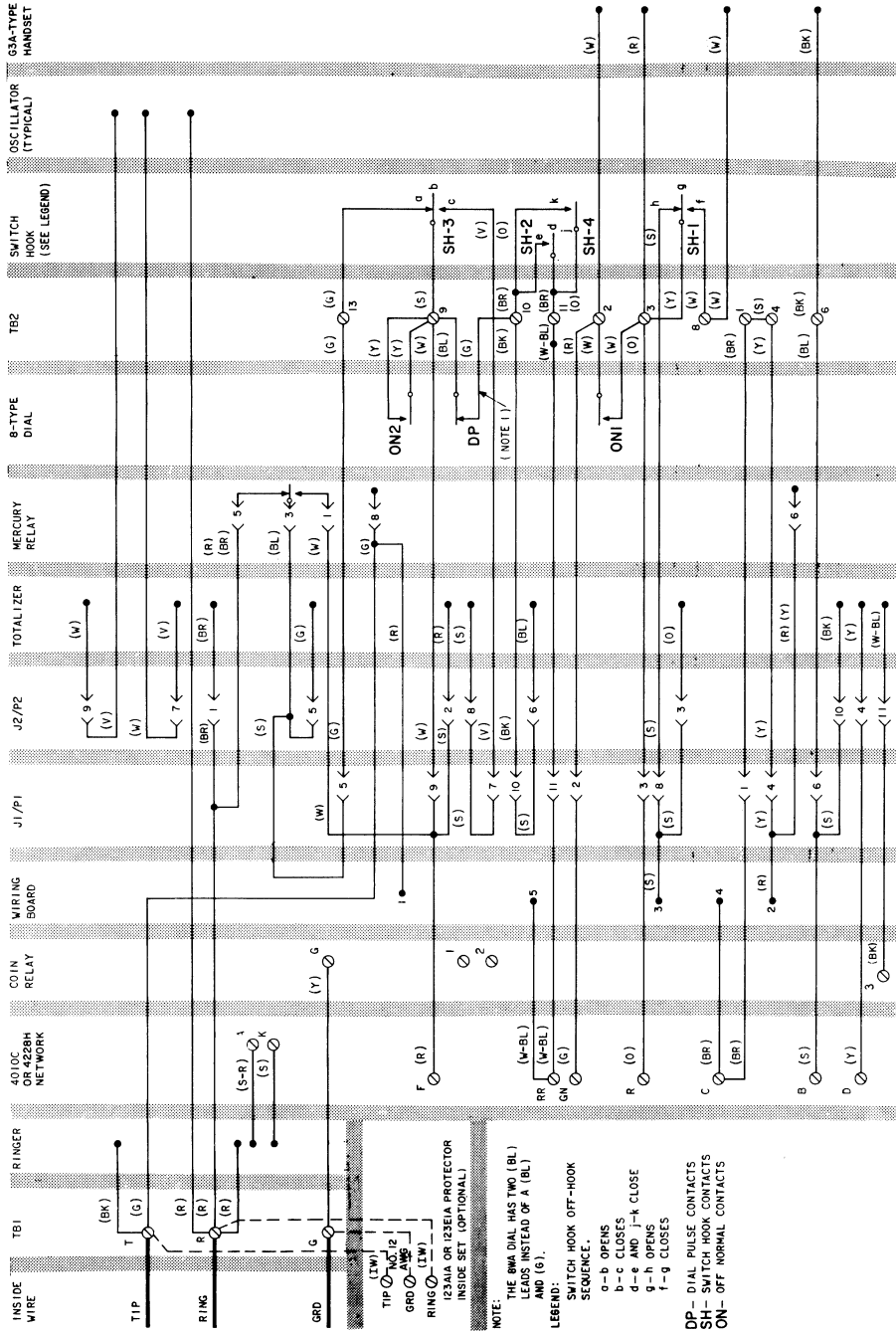


Fig. 64—1A1 of 2A1 Coin Telephone Set—Connections

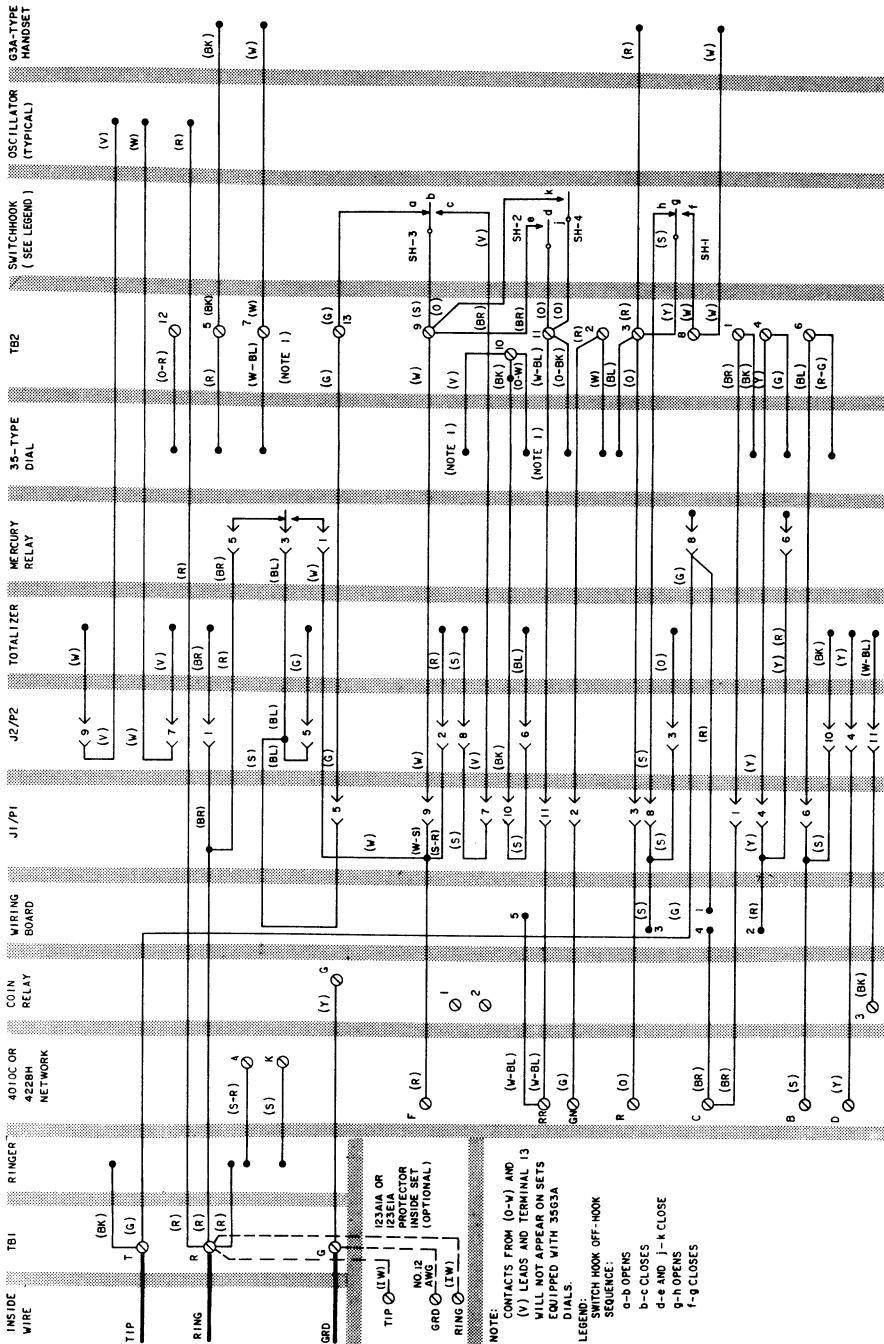


Fig. 65—1A2 or 2A2 Coin Telephone Set W/35T3A Dial—Connections

NOTE: CONTACTS FROM (O-W) AND (V) LEADS AND TERMINAL 13 WILL NOT APPEAR ON SETS EQUIPPED WITH 35G3A DIALS.

LEGEND:  
 SWITCH HOOK OFF-HOOK  
 a-b OPENS  
 b-c CLOSES  
 d-e AND j-k CLOSE  
 g-h OPENS  
 f-g CLOSES

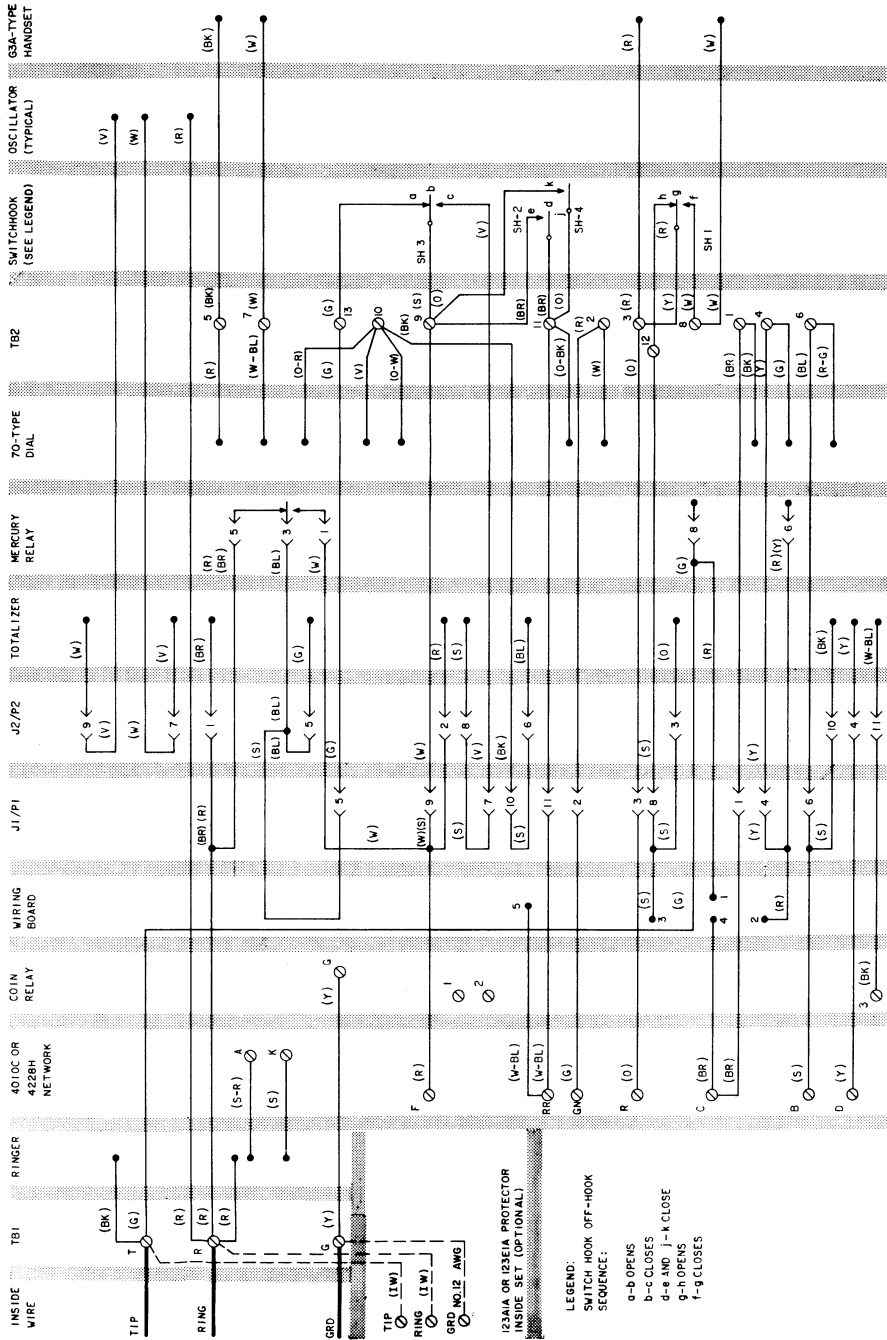


Fig. 66—1A2 or 2A2 Coin Telephone Set W/70-Type Dial—Connections



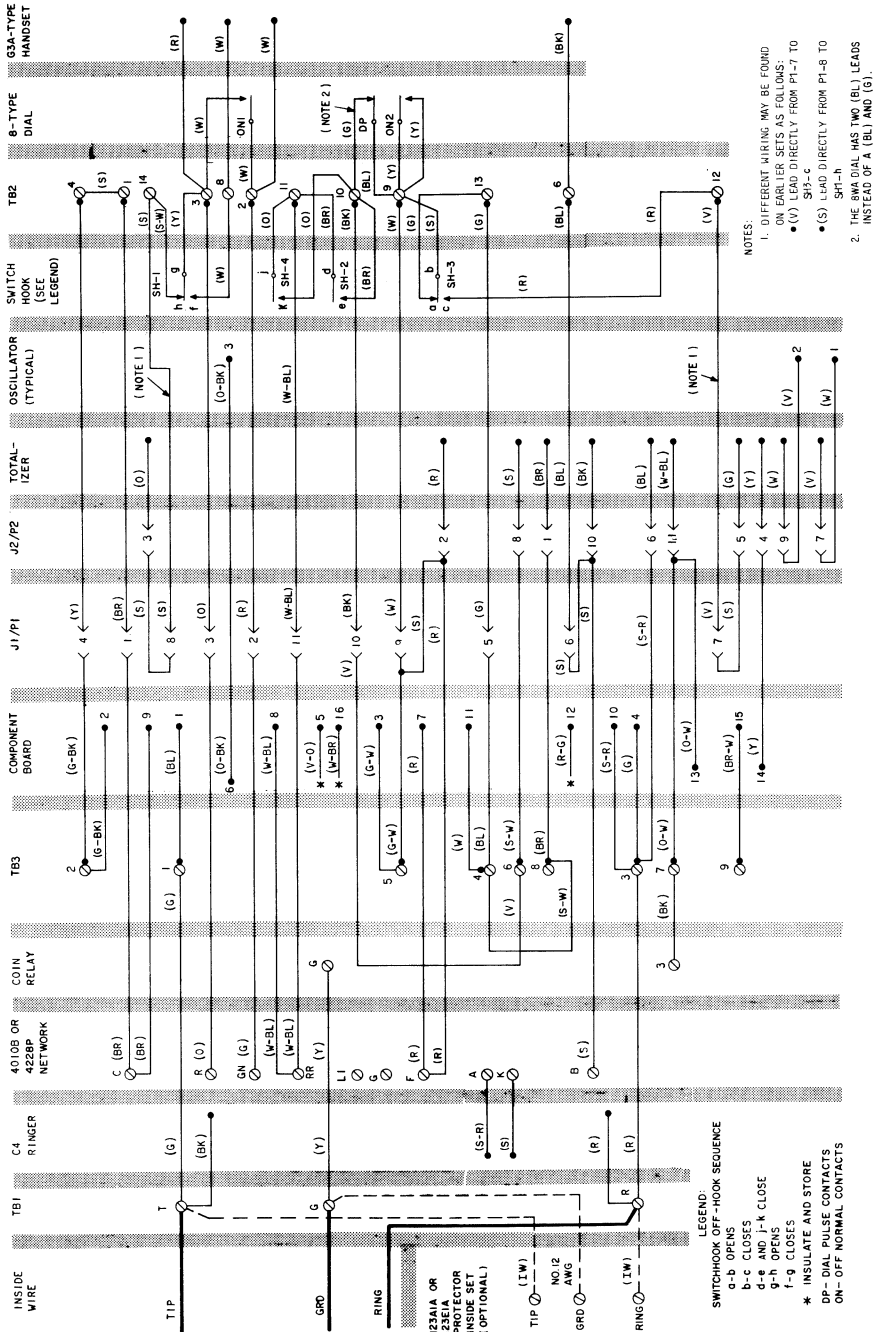


Fig. 67—1C1 or 2C1 Coin Telephone Set—CF Connections

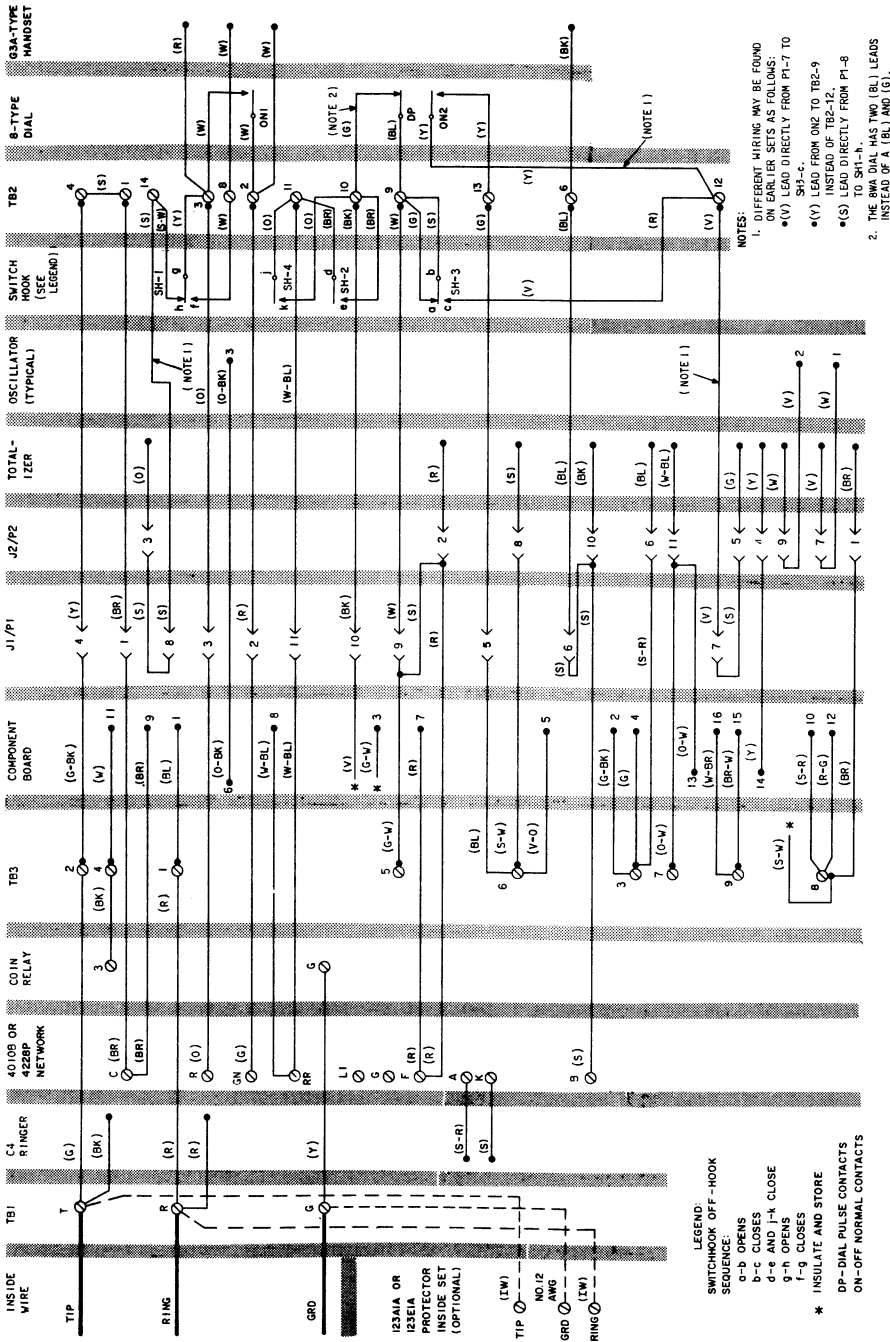


Fig. 68—1C1 or 2C1 Coin Telephone Set—DTF Connections



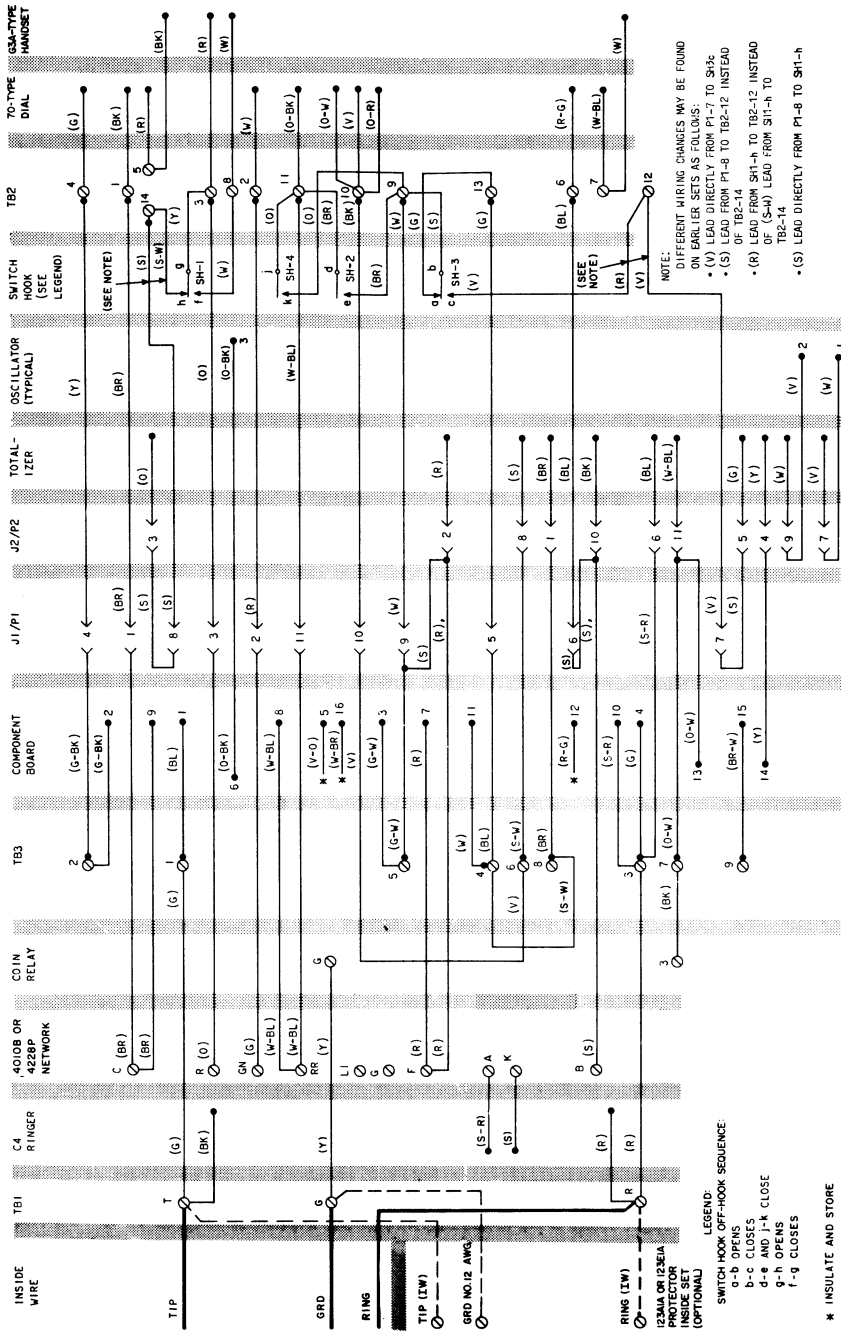


Fig. 70—1C2 or 2C2 Coin Telephone Set W/70-Type Dial—CF Connections

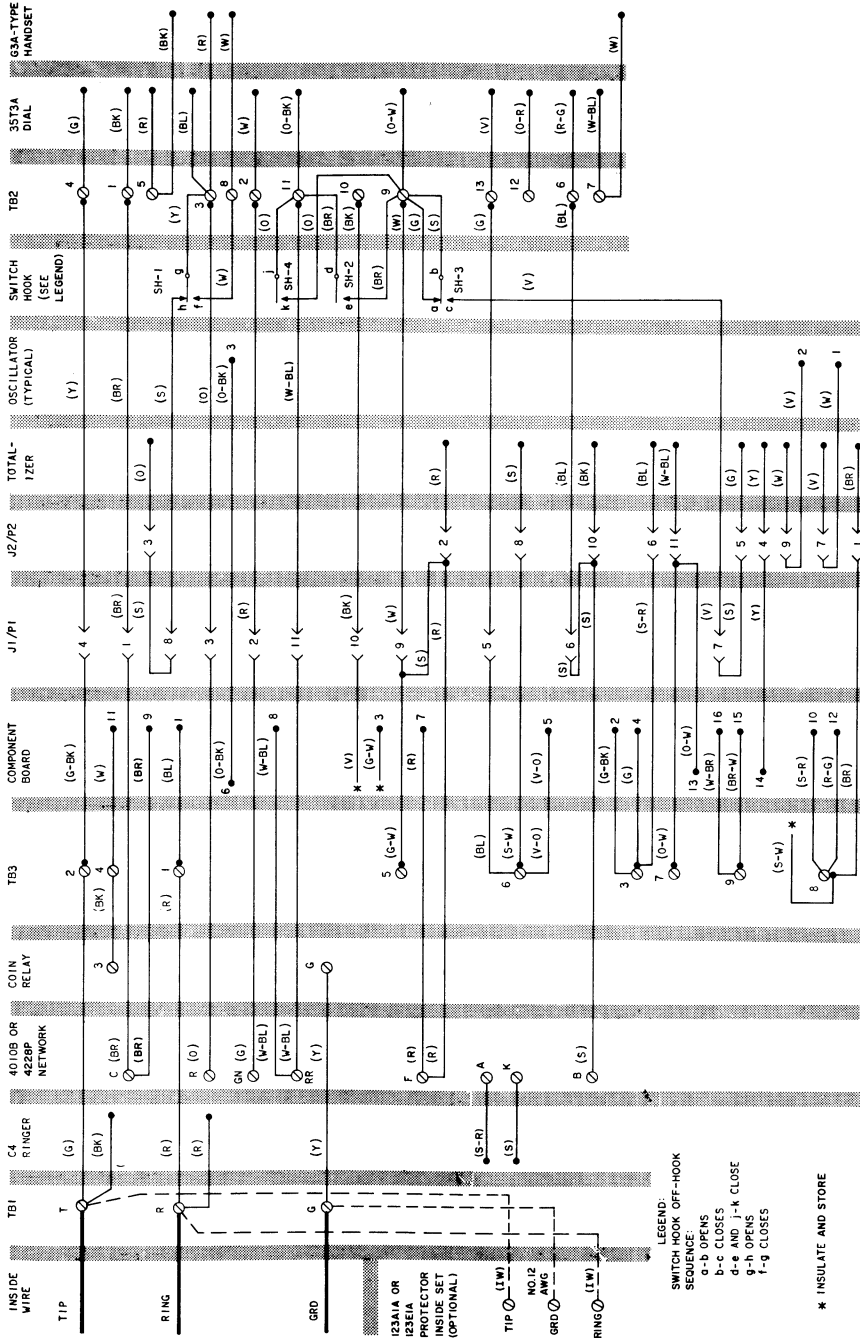
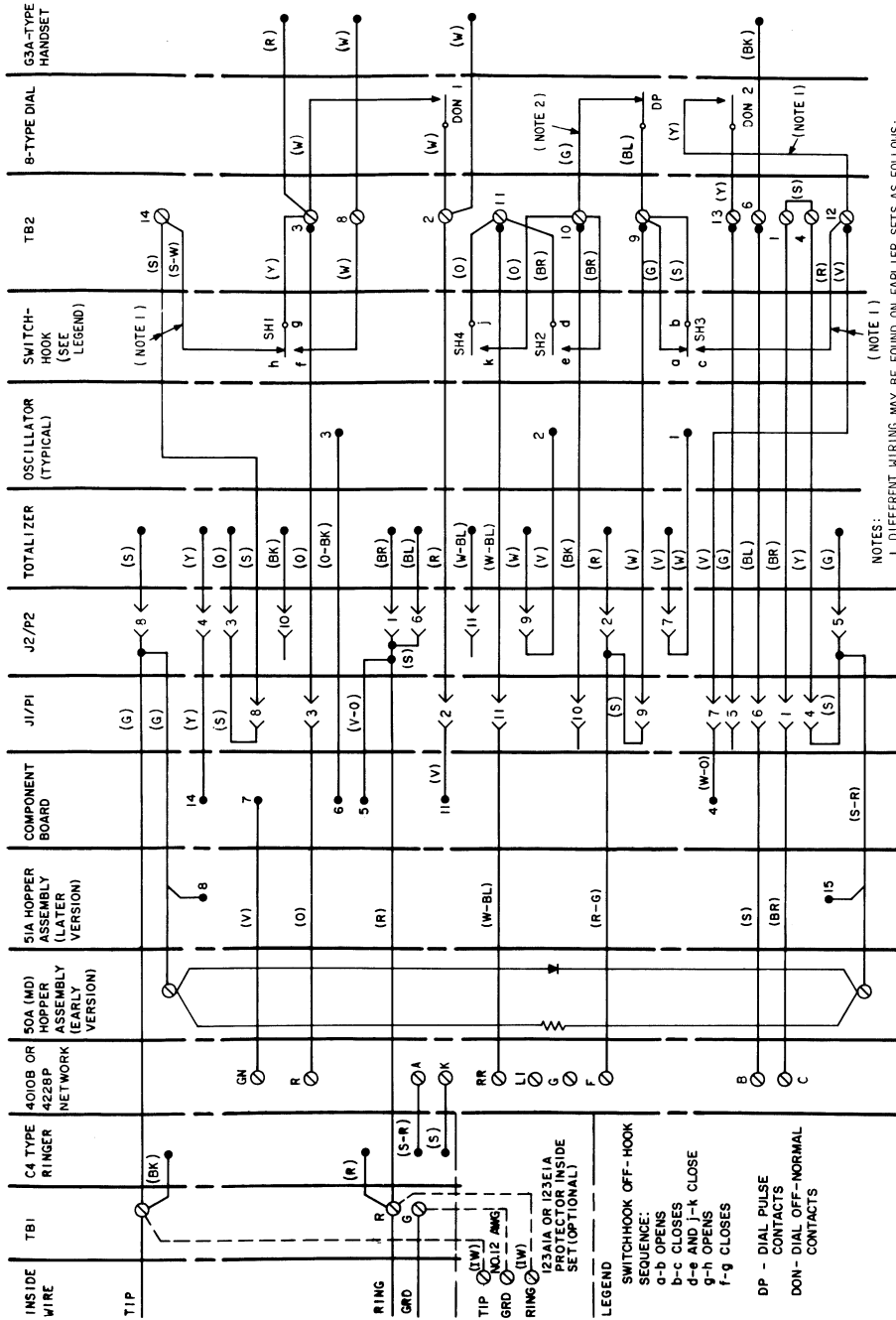


Fig. 71—1C2 or 2C2 Coin Telephone Set W/35T3A Dial—DTF Connections





LEGEND  
 SWITCHHOOK OFF-HOOK SEQUENCE:  
 a-b OPENS  
 b-c CLOSES  
 d-e AND j-k CLOSE  
 g-h OPENS  
 f-g CLOSES

DP - DIAL PULSE CONTACTS  
 DON - DIAL OFF-NORMAL CONTACTS

NOTES:  
 1. DIFFERENT WIRING MAY BE FOUND ON EARLIER SETS AS FOLLOWS:  
 ● (V) LEAD DIRECTLY FROM P1-7 TO SH3-c.  
 ● (Y) LEAD FROM DN2 TO TB2-9 INSTEAD OF TB2-12.  
 ● (S) LEAD DIRECTLY FROM P1-8 TO SH1-h  
 2. THE 8WA DIAL HAS TWO (BL) LEADS INSTEAD OF A (BL) AND (G).

Fig. 73—1E1 Coin Telephone Set—Connections

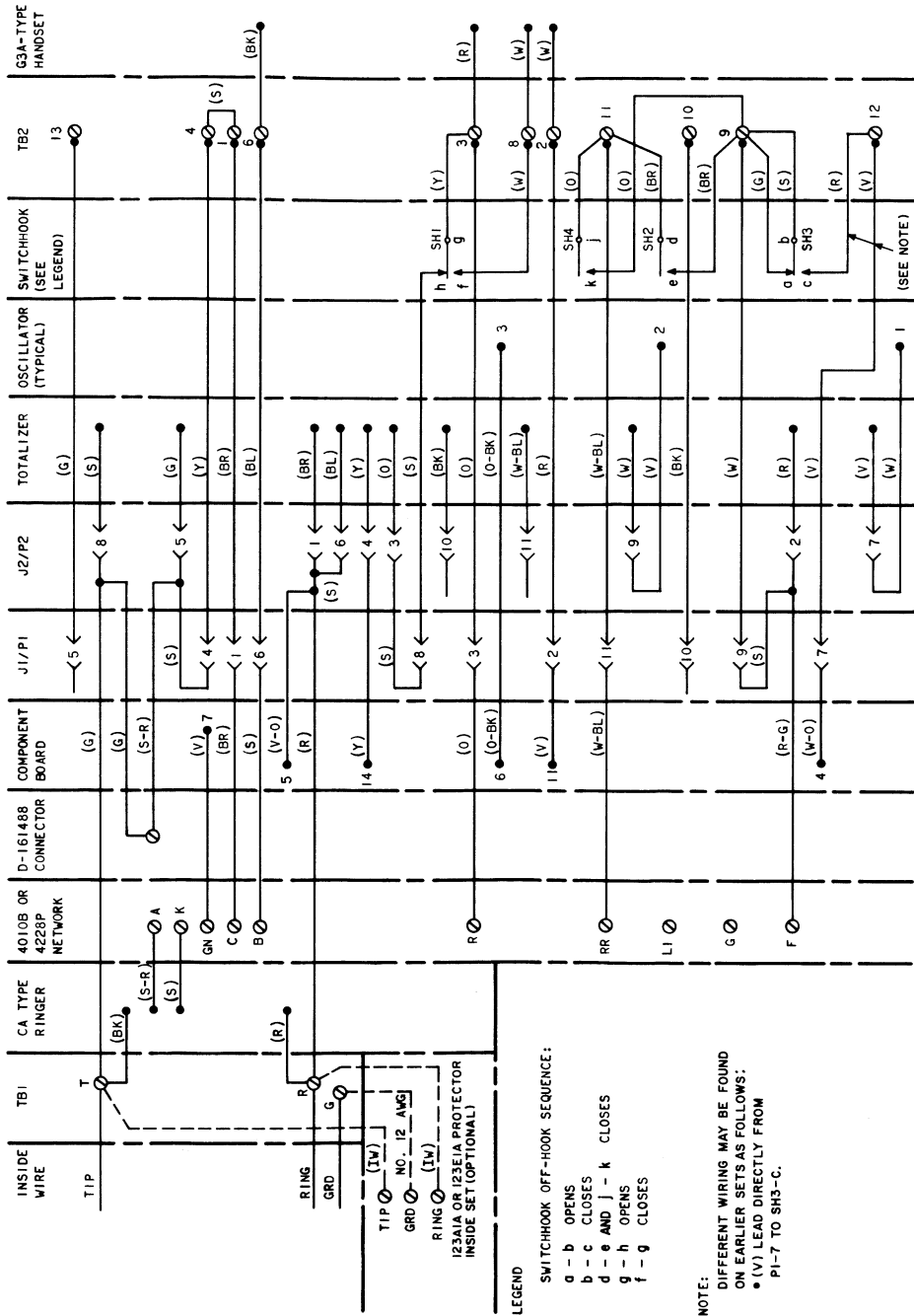


Fig. 74—IE3 Coin Telephone Set—Connections



## 1D/2D-TYPE COIN TELEPHONE SETS (DTF ONLY) IDENTIFICATION

### 1. GENERAL

**1.01** This section contains information on the 1D/2D-type coin telephone sets (Fig. 1, 2, and 3) and the D-180707 Kit of Parts (Fig. 4).

- The D-180707 Kit of Parts contains a 47A (MD) or 47A2 signal and a 32A chassis
- The kit is designed for field conversion of 1A/2A, 1C/2C, and 1E-type coin telephone sets to a 1D/2D-type.

**1.02** This section is reissued to:

- Add 70B dial
- Show 70A dial MD
- Add 47A2 signal
- Show 47A signal MD
- Revise Tables B and D
- Add information on 811057835 cover

- Add information on 840358303 hook

- Add information on Radio Frequency Interference (RFI).

**1.03** Codes are described in Table A.

**1.04** Overall dimensions of the 1D/2D sets are identical to 1C/2C sets as follows:

(a) 1D-type set:

- Height—21 inches
- Width—7-3/4 inches
- Depth—6-1/4 inches

(b) Overall dimensions of the 2D-type set are shown in Fig. 3.

**1.05** Refer to TOP 506-410-402 for installation and maintenance information.

TABLE A

CODE SIGNIFICANCE

CODE	FIG.	HOUSING	MODE OF OPERATION	DIAL TYPE
1D1	1	Box Type	Dial-Tone-First	Rotary
1D2				TOUCH-TONE
2D1	2	Panel Type		Rotary
2D2				TOUCH-TONE

### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement

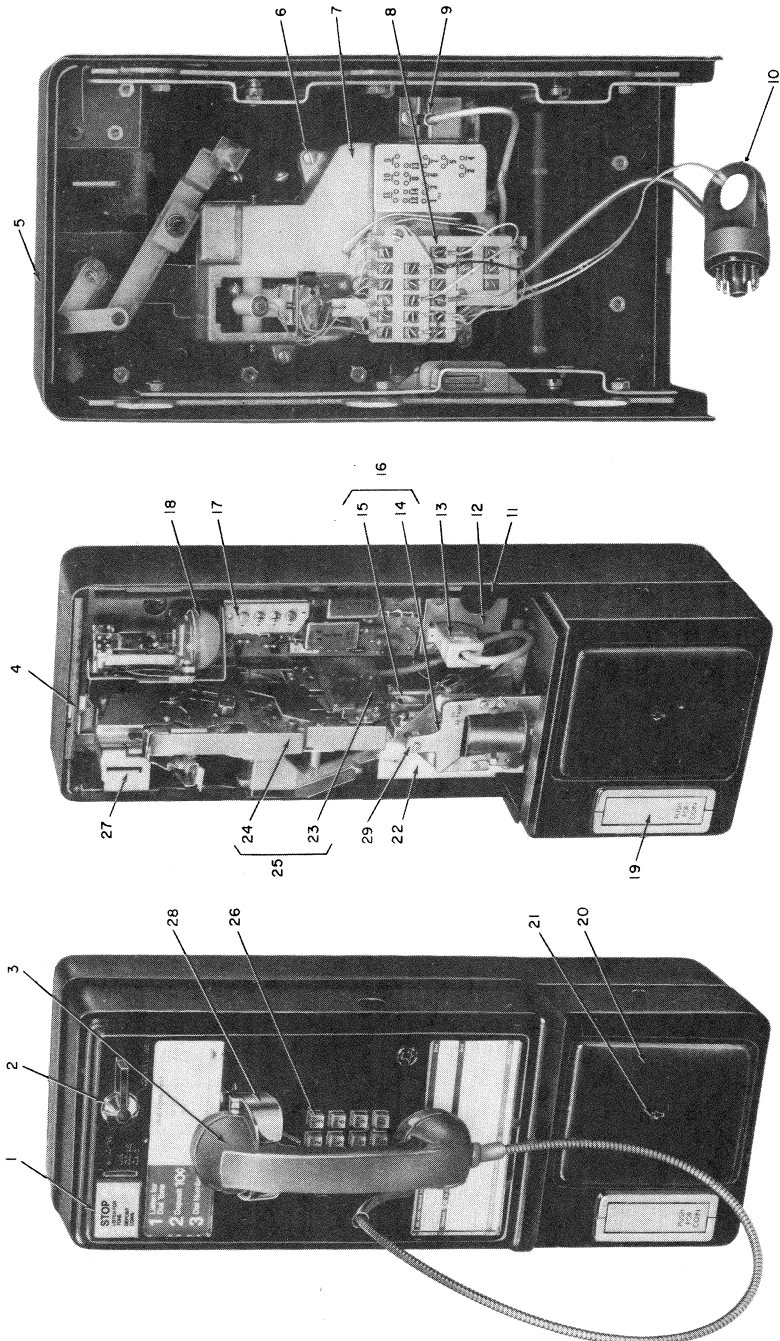


Fig. 1 — 1D-Type Coin Telephone Set

**LEGEND 1D-SET**

- 1 – 840156327 Information Plate
- 2 – 840358725 Shaft and Handle Assembly
- 3 – G3AH, G3AHF, G3AK, or G3AKF Handset
- 4 – 812755429 Chute Locking Lever and 812754976 Spring
- 5 – Coin Cover Unit\*
- 6 – 840157390 Self-locking Screw
- 7 – Coin Dial Unit\*
- 8 – TB2
- 9 – 811554443 Coverplate and 801816786 BHM Screw
- 10 – P1
- 11 – J1
- 12 – 32A Chassis
- 13 – P2
- 14 – 1A Coin Relay
- 15 – 811557172 Coin Hopper Assembly
- 16 – 1AA Coin Relay
- 17 – TB1
- 18 – C4-Type Ringer
- 19 – 812165462 Coin Return Assembly
- 20 – 2-Type Door
- 21 – Slot for 719A Tool
- 22 – 811557304 Return Chute Assembly
- 23 – 47A (MD) or 47A2 Signal
- 24 – 20A Chute
- 25 – 20A47A (MD) or 20A47A2 Chute
- 26 – Dial\*
- 27 – 812363612 Entrance Stop
- 28 – 840358303 Hook
- 29 – 811057835 Cover (not shown in Fig. 1)

\* Refer to Table B.

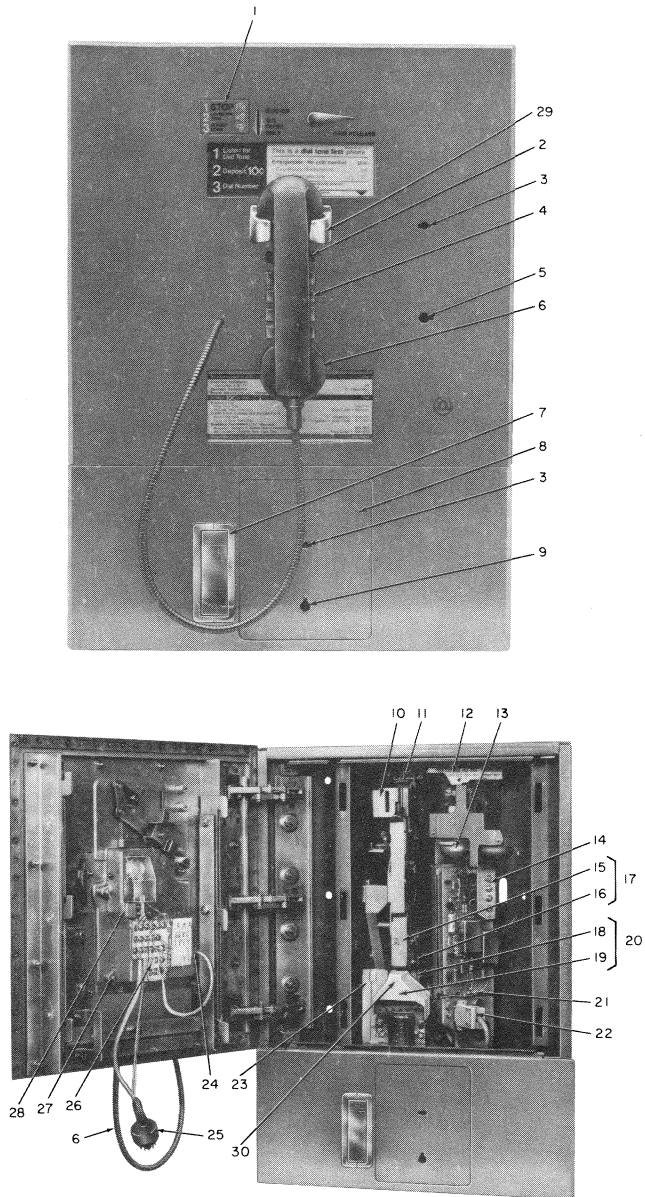


Fig. 2—2D-Type Coin Telephone Set

**LEGEND 2D-SET**

- 1 – 840156237 Information Plate
- 2 – Number Card
- 3 – Slot for 719A Tool
- 4 – Dial\*
- 5 – Slot for 29A Lock
- 6 – G3AH, G3AHF, G3AK, or G3AKF Handset
- 7 – 812165462 Coin Return Assembly
- 8 – 5A Door
- 9 – Slot for 30-Type Lock
- 10 – 812363612 Entrance Stop
- 11 – 812755429 Chute Locking Lever and 812754976 Spring
- 12 – 7A Clip
- 13 – C4-Type Ringer
- 14 – TB1
- 15 – 20A Chute
- 16 – 47A (MD) or 47A2 Signal
- 17 – 20A47A (MD) or 20A47A2 Chute
- 18 – 811557172 Coin Hopper Assembly
- 19 – 1A Coin Relay
- 20 – 1A Coin Relay
- 21 – 32A Chassis
- 22 – P2
- 23 – 811557304 Return Chute Assembly
- 24 – 811554443 Coverplate and 801816786 BHM Screw
- 25 – P1
- 26 – TB2
- 27 – 840157390 Self-locking Screw
- 28 – Coin Dial Unit\*
- 29 – 840358303 Hook
- 30 – 811057835 Cover

\* Refer to Table B

## SECTION 506-410-401

**1.06** The 1D/2D-type sets and the D-180707 Kit of Parts are designed for Bell System Standard, DTF service.

**1.07** ♦For problems involving RFI, refer to Section 500-150-100.♦

### 2. IDENTIFICATION

#### ORDERING GUIDE

##### 2.01 *Basic Telephone Set:*

- Set, Coin Telephone, 1D1,\* 1D2,\* 2D1,\* or 2D2\*

**2.02 *Components:*** See Table B and Fig. 1 and 2.

**2.03 *Associated Apparatus (Order Separately):*** See Table C.

##### 2.04 *Kit of Parts:*

- Kit of Parts, D-180707.

#### DESIGN FEATURES

##### A. 1D/2D-Type Set

**2.05** All parts are contained in a high-security steel housing. The cover unit/door and faceplate assembly has six locking points actuated by a 719A tool and secured by a 29A lock. A 32A lock may be used in 1-type sets.

**2.06** The 1-type set cash compartment door has four locking points actuated by a 719A tool. The 2-type set cash compartment door has five locking points; three are actuated by a 719A tool; two are stationary. All cash compartment doors are secured by a 30-type lock.

\*See Table B for color selection.

**2.07** Provision is made for use of four security studs.

**2.08** The set is designed to accept U.S. nickels, dimes, and quarters only.

**2.09** All sorting of coins is done internally by the coin chute.

**2.10** Sets have transmission characteristics of 500-type telephone sets.

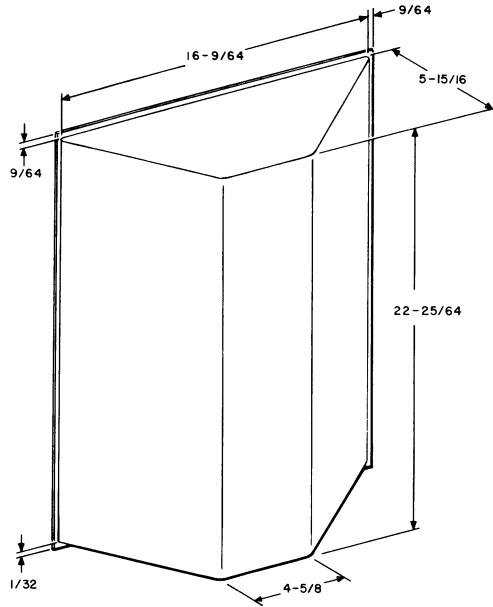
**2.11** Electrical connections of the field-replaceable cover unit and signal are made by plug and jack arrangement.

**2.12** The 47A ♦(MD) or 47A2♦ signal is the coin transducer which mounts to a 20A chute and uses piezoelectric sensors to detect the passage of nickels, dimes, and quarters in their appropriate channels. Voltage signals from the signal serve as inputs to the 32A chassis. This chassis totalizes to initial rate and controls coin signaling and set calling functions. The chassis circuit also includes an active network for speech equalization, the ringer, and an integrated circuit coin tone oscillator.

**2.13** Setting of initial rate is done by inserting one or more leads into the *negative* field (VCC-) (Fig. 5). Six leads, terminated on back side of chassis are color coded and individually plug ended. Each lead represents a specified amount. These plug-ended leads are pressed on the tubular connectors to establish an initial rate setting.

##### B. D-180707 Kit of Parts

**2.14** The D-180707 Kit of Parts is designed to convert 1A/2A, 1C/2C, and 1E-type coin telephone sets to 1D/2D-type coin telephone sets. Bell System Standard Dial-Tone-First line must be provided at time of conversion.



- NOTES:
1. ALL DIMENSIONS SHOWN ARE IN INCHES.
  2. THE SWITCHHOOK AND HANDSET EXTEND  $2 - 3/4$  INCHES IN FRONT OF THE FACEPLATE.

**Fig. 3—Rear View of Panel Set Showing Dimensions**

◆ TABLE B ◆

## COMPONENTS AND COLOR SELECTION

COIN TEL SET	COIN COVER UNIT	COIN DIAL UNIT*	DIAL†	NUMBER PLATE ASSY	INFOR- MATION PLATE	HANDSET (NOTE)
1D1-03 (Black)	70A3-03	60A3-44	8W (MD) or 8WA	818418527	840156327	G3AH, G3AK, G3AHF, or G3AKF
1D1-44 (Chrome)	70A3-44					
1D1-51 (Moss Green)	70A3-51					
1D2-03 (Black)	71A3-03	61A3-44	70A (MD) or 70B			
1D2-44 (Chrome)	71A3-44					
1D2-51 (Moss Green)	71A3-51					
2D1-67 (Brushed Stainless)		60A3-44	8W (MD) or 8WA	818720526		
2D1-84 (Bronze)				818720039		
2D2-67 (Brushed Stainless)		61A3-44	70A (MD) or 70B			
2D2-84 (Bronze)						

Note: A G13D amplified handset can be used with a 1D/2D coin telephone set. Refer to Section 501-211-102 for complete information.

\* These coin cover unit and coin dial unit codes are ordering information to obtain the unit, wired, tested, and equipped for the correct mode of operation. Since the coin-first and dial-tone-first coin cover units and coin dial units shown in Table C of Section 506-410-400 may be field converted from one type to another, maintenance, and installation should be based on the first three (3) characters of the code only. It is important therefore to ensure that the unit being used is wired properly and that the coin cover unit has the proper information plate and instruction cards for the type of service with which it is being used. All rotary coin cover units are equipped with 8W (MD) or 8WA dials and all TOUCH-TONE coin cover units are equipped with 70A (MD) or 70B dials.

† 70A (MD) dials manufactured before May, 1977 do not meet the same manufacturing electrical requirements as the D-type set. Upon conversion to D-type sets or during coin cover unit or coin dial unit replacement check the date of the dial on the dial front faceplate. Do not use a pre-May, 1977 70A dial unless the later vintage is not readily available.



◆ TABLE B (Contd) ◆

## COMPONENTS AND COLOR SELECTION

CHUTE	COIN CHASSIS	COIN RELAY AND HOPPER ASSY	RETURN CHUTE ASSY	COIN RETURN ASSY	COIN RECEPTACLE	CASH COMPT DOOR
20A47A (MD) or 20A47A2 Consists of a 20A Chute and a 47A (MD) or 47A2 Signal	32A	1AA Consists of a 1A Coin Relay and 811557172 Coin Hopper Assy	811557304	812165462	1B	5A-67
				840152219		1D
				812165462	5A-67	
				840152219	5A-84	

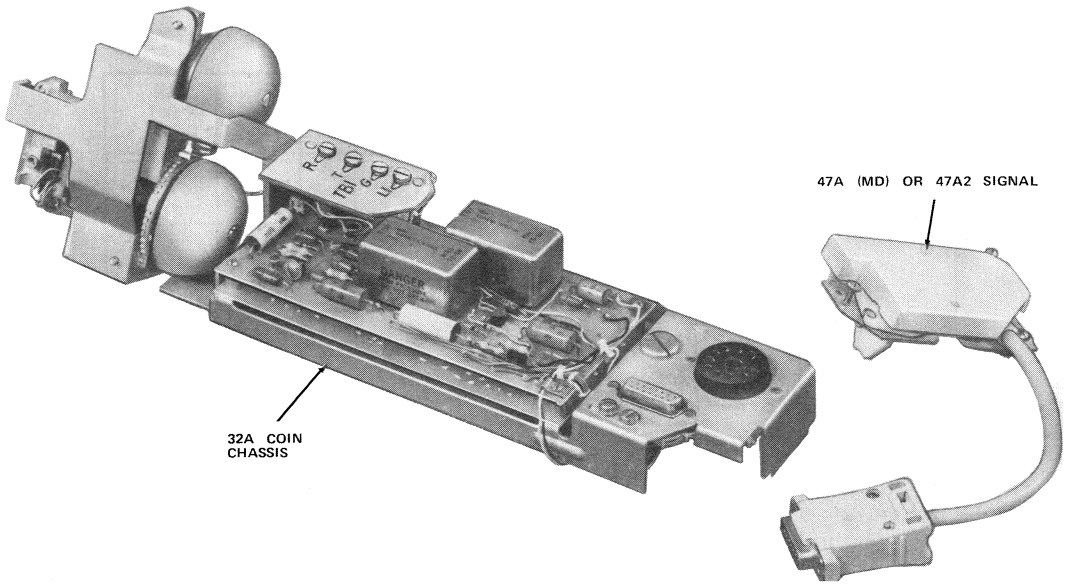


Fig. 4—D-180707 Kit of Parts

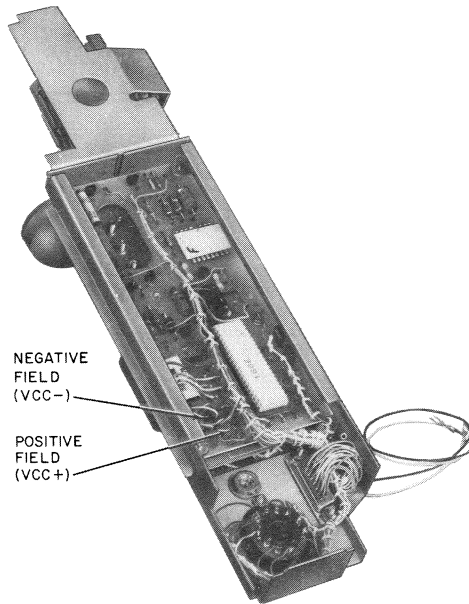


Fig. 5—32A Coin Chassis (Rear View)

**TABLE C**  
**ASSOCIATED APPARATUS**  
(Ordered Separately)

COIN TEL SET	CASH COMPT DOOR	COIN RECEP- TACLE	COIN RECEP- TACLE COVER	CASH COMPT LOCK	COVER UNIT ASSY OR DOOR AND FACEPLATE ASSY LOCK	ALARM SWITCH
1D-Type	2A-03 or 2B-03 (Black)	1C-Type	1E	30-Type	29A	1A Switch Kit and 257A Switch
	2A-44 or 2B-44 (Chrome)					
	2A-51 or 2B-51 (Moss Green)					
2D-Type	*					257A Switch

\* The cash compartment door is furnished with all 2D-type phones.

**TABLE D**  
**INITIAL RATE LEADS**

LEAD COLOR	LEAD MONETARY VALUE	OTHER END OF LEAD CONNECTED TO PIN
BR	5 Cents	36
R	10 Cents	35
Y	20 Cents	33
S	40 Cents	32
W-BL	80 Cents	30
W-BR	1 Dollar — 60 Cents	29

**Task Oriented Practice**  
**(TOP)**

**1D/2D TYPE COIN TELEPHONE SETS**

**(DTF ONLY)**

**INSTALLATION, CONVERSION, MAINTENANCE, AND CONNECTIONS**

**NOTE**

Before using TOP for the first time,  
complete the TOP-USER Plant Training  
Course-PTC No. 278.

A short version of PTC No. 278 is in  
the back of this volume.

**NOTICE**

Not for use or disclosure outside the  
Bell System except under written agreement

Printed in U.S.A.

<b>Issue 2</b>	<b>AUG 1980</b>
<b>506-410-402</b>	<b>TPG</b>
<b>TITLE PAGE</b>	

ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE	ITEM	ISSUE
CKL-000		● DLP-511		● DLP-546							
RTL-001		DLP-512		● DLP-547							
ATL-030		● DLP-513		● DLP-548							
● COL-050		DLP-514		● DLP-549							
● COP-051		DLP-515		● IXL-890							
● COP-052		DLP-516									
● COP-053		DLP-517									
● COP-054		DLP-518									
● COP-055		DLP-519									
● COP-056		DLP-520									
● COP-057		● DLP-521									
● TIL-095		● DLP-522									
● TAD-100		● DLP-523									
● TAP-101		DLP-524									
TAP-102		DLP-525									
TAP-103		DLP-526									
TAP-104		DLP-527									
TAP-105		● DLP-528									
TAP-106		● DLP-529									
TAP-107		● DLP-530									
● TAP-108		● DLP-531									
TAP-109		● DLP-532									
TAP-110		● DLP-533									
● TAP-111		DLP-534									
● DLP-500		● DLP-535									
● DLP-501		● DLP-536									
DLP-502		● DLP-537									
● DLP-503		● DLP-538									
● DLP-504		● DLP-539									
● DLP-505		● DLP-540									
● DLP-506		● DLP-541									
● DLP-507		● DLP-542									
● DLP-508		● DLP-543									
DLP-509		● DLP-544									
DLP-510		● DLP-545									

● REVISED OR ADDED ITEM

□ CANCELED ITEM

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CKL

CHECKLIST — 1D/2D-TYPE COIN TELEPHONE SET

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000

**ROUTINE TASKS**

**PROCEDURE  
NUMBER**

**NONE REQUIRED**

**ACCEPTANCE TASKS**

**PROCEDURE  
NUMBER**

**NONE REQUIRED**

COMPANY ORDER TASKS	PROCEDURE NUMBER
<b>SERVICE ORDERS</b>	
Install 1D1, 1D2 Coin Telephone Set in Dial-Tone-First Mode and Test	COP-051
Install 2D1, 2D2 Coin Telephone Set in Dial-Tone-First Mode and Test	COP-052
Convert 1C-, 2C-Type Set in Dial-Tone-First Mode to 1D-, 2D-Type Set Dial-Tone-First Mode and Test	COP-053
Convert 1C-, 2C-Type Set in Coin-First Mode to 1D-, 2D-Type Set Dial-Tone-First Mode and Test	COP-054
Convert 1A-, 2A-Type Set in Coin-First Mode to 1D-, 2D-Type Set Dial-Tone-First Mode and Test	COP-055
Convert 1E1 Dial Postpay to 1D-Type Dial-Tone-First and Test	COP-056
Convert 1E3 Manual Postpay to 1D-Type in Dial-Tone-First and Test	COP-057
<b>COMPANY ORDER LIST - 1D/2D-TYPE COIN TELEPHONE SET</b>	Issue 2   AUG 1980
	506-410-402   COL
	PAGE 1 of 1   050



ITEM	SUBTASKS	PROCEDURE NUMBER
	NOTE: Generally for new installations, Items 1 through 8 must be performed. Additional information regarding these tasks is provided in TAD-100	
1	Install Drop Wire (if required)	-
2	Install Protection and Ground (if required)	DLP-537
3	Install Inside Wire (if required)	-
4	Install Backboard (if required)	-
5	Install Shelf (if required)	-
6	Install Security Devices (if required)	-
7	Install Extension Station (if required)	-
8	Install Auxiliary or Extension Ringer (if required)	-
9	Check Location and Mounting Facilities	DLP-500
10	Remove Coin Cover Unit	DLP-501
11	Remove Coin Chute	DLP-502
12	Remove Coin Chassis	DLP-503
13	Attach Housing to Mounting Surface	DLP-504
14	Verify or Set Initial Rate	DLP-505
15	Install 32A Coin Chassis	DLP-506
16	Install Coin Chute	DLP-507
17	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508
18	Measure Loop Resistance	DLP-509
19	Measure Ground Resistance	DLP-510
20	Perform Operational Tests	DLP-511
21	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-
<b>INSTALL 1D1, 1D2 COIN TELEPHONE SET</b>		Issue 2    AUG 1980
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		PAGE 1 of 2 <b>051</b>

ITEM	SUBTASKS	PROCEDURE NUMBER
22	Install Number Card and Coin Cover Unit on 1D1 (Rotary Dial) Coin Telephone Set, if applicable	-
	1. Install Coin Cover Unit	DLP-512
	2. Remove Dial Fingerwheel	DLP-513
	3. Install Number Card	-
23	4. Install Dial Fingerwheel	DLP-514
	Install Number Card and Coin Cover Unit on 1D2 (TOUCH-TONE® Dial) Coin Telephone Set, if applicable	-
	1. Detach Coin Dial Unit	DLP-515
	2. Install Number Card	DLP-516
24	3. Secure Coin Dial Unit	DLP-517
25	4. Install Coin Cover Unit	DLP-512
25	Install Instruction Cards	DLP-518
25	Make Coin Release Lever and Call Back Test	DLP-519
<b>INSTALL 1D1, 1D2 COIN TELEPHONE SET</b>		Issue 2   AUG 1980
		506-410-402   COP
		PAGE 2 of 2   051

ITEM	SUBTASKS	PROCEDURE NUMBER
	NOTE: Generally for new installations, Items 1 through 8 must be performed. Additional information regarding these tasks is provided in TAD-100	
1	Install Drop Wire (if required)	-
2	Install Protection and Ground (if required)	DLP-537
3	Install Inside Wire (if required)	-
4	Install Backboard (if required)	-
5	Install Shelf (if required)	-
6	Install Security Devices (if required)	-
7	Install Extension Station (if required)	-
8	Install Auxiliary or Extension Ringer	-
9	Check Location and Mounting Facilities	DLP-500
10	Open Door and Faceplate Assembly	DLP-501
11	Remove Coin Chute	DLP-502
12	Remove Coin Chassis	DLP-503
13	Attach Housing to Mounting Surface	DLP-520
14	Verify or Set Initial Rate	DLP-505
15	Install 32A Coin Chassis	DLP-506
16	Install Coin Chute	DLP-507
17	Install P11C Patch Cord	DLP-508
18	Measure Loop Resistance	DLP-509
19	Measure Ground Resistance	DLP-510
20	Perform Operational Tests	DLP-511
21	Remove P11C Patch Cord	-
<b>INSTALL 2D1, 2D2 COIN TELEPHONE SET</b>		Issue 2    AUG 1980
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ITEM	SUBTASKS	PROCEDURE NUMBER	
22	Install Number Card on 2D1 (Rotary Dial) Coin Telephone Set, if applicable	-	
	1. Close Door and Faceplate Assembly	DLP-512	
	2. Remove Dial Fingerwheel	DLP-513	
	3. Install Number Card	-	
23	Install Number Card on 2D2 (TOUCH-TONE® Dial) Coin Telephone Set, if applicable	-	
	1. Detach Coin Dial Unit	DLP-515	
	2. Install Number Card	DLP-516	
	3. Secure Coin Dial Unit	DLP-517	
24	Install Instruction Cards	DLP-518	
25	Make Coin Release Lever and Call Back Tests	DLP-519	
<b>INSTALL 2D1, 2D2 COIN TELEPHONE SET</b>		Issue 2	AUG 1980
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		PAGE 2 of 2	052

ITEM	SUBTASKS	PROCEDURE NUMBER						
1	Verify Proper Protection and Ground	DLP-537						
2	Remove Coin Cover Unit or Open Door and Faceplate Assembly	DLP-501						
3	Remove Coin Chute	DLP-502						
4	Remove Totalizer From Coin Chute	DLP-521						
5	Install 47A (MD) or 47A2 Signal on Coin Chute	DLP-522						
6	Remove Coin Chassis	DLP-503						
7	Verify or Set Initial Rate on 32A Coin Chassis	DLP-505						
8	Install 32A Coin Chassis	DLP-506						
9	Install Coin Chute	DLP-507						
10	Verify Compatibility of Coin Dial Unit	DLP-525						
11	Make Wiring Changes on TB2	DLP-523						
12	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508						
13	Verify Loop Resistance	DLP-509						
14	Verify Ground Resistance	DLP-510						
15	Perform Operational Tests	DLP-511						
16	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-						
17	Install Coin Cover Unit or Close Door and Faceplate Assembly	DLP-512						
18	Make Coin Release Lever and Call Back Tests	DLP-519						
<b>CONVERT 1C-, 2C-TYPE SET IN DIAL-TONE-FIRST MODE TO 1D, 2D-TYPE SET DIAL-TONE-FIRST MODE</b>		<table border="1"> <tr> <td data-bbox="1409 1065 1490 1093">Issue 2</td> <td data-bbox="1490 1065 1555 1093">AUG 1980</td> </tr> <tr> <td data-bbox="1409 1093 1490 1121">506-410-402</td> <td data-bbox="1490 1093 1555 1121">COP</td> </tr> <tr> <td data-bbox="1409 1121 1490 1157">PAGE 1 of 1</td> <td data-bbox="1490 1121 1555 1157">053</td> </tr> </table>	Issue 2	AUG 1980	506-410-402	COP	PAGE 1 of 1	053
			Issue 2	AUG 1980				
			506-410-402	COP				
PAGE 1 of 1	053							

ITEM	SUBTASKS	PROCEDURE NUMBER	
1	Verify Proper Protection and Ground	DLP-537	
2	Remove Coin Cover Unit or Open Door and Faceplate Assembly	DLP-501	
3	Remove Coin Chute	DLP-502	
4	Remove Totalizer From Coin Chute	DLP-521	
5	Install 47A (MD) or 47A2 Signal on Coin Chute	DLP-522	
6	Remove Coin Chassis	DLP-503	
7	Verify or Set Initial Rate on 32A Coin Chassis	DLP-505	
8	Install 32A Coin Chassis	DLP-506	
9	Install Coin Chute	DLP-507	
10	Verify Compatibility of Coin Dial Unit	DLP-525	
11	Make Wiring Changes on TB2	DLP-523	
12	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508	
13	Verify Loop Resistance	DLP-509	
14	Verify Ground Resistance	DLP-510	
15	Perform Operational Tests	DLP-511	
16	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-	
17	Replace Information Plate (if provided)	-	
18	Install Coin Cover Unit or Close Door and Faceplate Assembly	DLP-512	
19	Replace Instruction Cards	DLP-524	
20	Make Coin Release Lever and Call Back Tests	DLP-519	
<b>CONVERT 1C-, 2C-TYPE SET IN COIN-FIRST MODE TO 1D-, 2D-TYPE SET DIAL-TONE-FIRST MODE</b>		<b>Issue 2</b>	<b>AUG 1980</b>
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ITEM	SUBTASKS	PROCEDURE NUMBER
1	Verify Proper Protection and Ground	DLP-537
2	Remove Coin Cover Unit or Open Door and Faceplate Assembly	DLP-501
3	Remove Coin Chute	DLP-502
4	Remove Totalizer From Coin Chute	DLP-521
5	Install 47A (MD) or 47A2 Signal on Coin Chute	DLP-522
6	Remove Coin Chassis	DLP-503
7	Verify Compatibility of Coin Relay	DLP-526
8	Verify or Set Initial Rate on 32A Coin Chassis	DLP-505
9	Install 32A Coin Chassis	DLP-506
10	Install Coin Chute	DLP-507
11	Verify Compatibility of Coin Dial Unit	DLP-525
12	Make Wiring Changes on TB2	DLP-523
13	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508
14	Verify Loop Resistance	DLP-509
15	Verify Ground Resistance	DLP-510
16	Perform Operational Test	DLP-511
17	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-
18	Install Coin Cover Unit or Close Door and Faceplate Assembly	DLP-512
19	Replace Instruction Cards	DLP-524
20	Perform Coin Release Lever and Call Back Tests	DLP-519
<b>CONVERT 1A-, 2A-TYPE SET IN COIN-FIRST MODE TO 1D-, 2D-TYPE SET DIAL-TONE-FIRST MODE</b>		<b>Issue 2</b>
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<b>PAGE 1 of 1</b>		

ITEM	SUBTASKS	PROCEDURE NUMBER
1	Verify Proper Protection and Ground	DLP-537
2	Remove Coin Cover Unit	DLP-501
3	Remove Coin Chute	DLP-502
4	Remove Totalizer From Coin Chute	DLP-521
5	Install 47A (MD) or 47A2 Signal on Coin Chute	DLP-522
6	Remove Coin Chassis	DLP-503
7	Replace 50A, 50B, or 51A Hopper Assembly With 1AA Coin Relay	DLP-534
8	Verify or Set Initial Rate on 32A Coin Chassis	DLP-505
9	Install 32A Coin Chassis	DLP-506
10	Install Coin Chute	DLP-507
11	Verify Compatibility of Coin Dial Unit	DLP-525
12	Make Wiring Changes on TB2	DLP-523
13	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508
14	Verify Loop Resistance	DLP-509
15	Verify Ground Resistance	DLP-510
16	Perform Operational Tests	DLP-511
17	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-
18	Replace Information Plate (if provided)	-
19	Install Coin Cover Unit	DLP-512
20	Replace Instruction Cards	DLP-524
21	Perform Coin Release Lever and Call Back Tests	DLP-519

**CONVERT 1E1 SET IN DIAL POSTPAY MODE TO 1D1 SET  
DIAL-TONE-FIRST MODE**

**Issue 2    AUG 1980**

**506-410-402**

**COP**

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ITEM	SUBTASKS	PROCEDURE NUMBER						
1	Verify Proper Protection and Ground	DLP-537						
2	Remove Coin Cover Unit	DLP-501						
3	Remove Coin Chute	DLP-502						
4	Remove Totalizer From Coin Chute	DLP-521						
5	Install 47A (MD) or 47A2 Signal on Coin Chute	DLP-522						
6	Remove Coin Chassis	DLP-503						
7	Replace 50A, 50B, or 51A Hopper Assembly With 1AA Coin Relay	DLP-534						
8	Verify or Set Initial Rate on 32A Coin Chassis	DLP-505						
9	Install 32A Coin Chassis	DLP-506						
10	Install Coin Chute	DLP-507						
11	Obtain New Coin Cover Unit (70A3 Rotary or 71A3 TOUCH-TONE Dial)	-						
12	Verify Wiring on TB2	DLP-523						
13	Install KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	DLP-508						
14	Verify Loop Resistance	DLP-509						
15	Verify Ground Resistance	DLP-510						
16	Perform Operational Tests	DLP-511						
17	Remove KS-20950, List 2 Cover Parking Tool or P11C Patch Cord	-						
18	Verify Correct Information Plate	-						
19	Install Number Card and Coin Cover Unit on 1D1 (Rotary Dial) Coin Telephone Set, if applicable	-						
	1. Install Coin Cover Unit	DLP-512						
	2. Remove Dial Fingerwheel	DLP-513						
	3. Install Number Card	-						
	4. Install Dial Fingerwheel	DLP-514						
<b>CONVERT 1E3 SET IN MANUAL POSTPAY MODE TO 1D1 OR 1D2 SET DIAL-TONE-FIRST MODE</b>		<table border="1"> <tr> <td data-bbox="1292 1068 1422 1093">Issue 2</td> <td data-bbox="1422 1068 1544 1093">AUG 1980</td> </tr> <tr> <td data-bbox="1292 1093 1487 1118">506-410-402</td> <td data-bbox="1487 1093 1544 1118">COP</td> </tr> <tr> <td data-bbox="1292 1118 1487 1156">PAGE 1 of 2</td> <td data-bbox="1487 1118 1544 1156">057</td> </tr> </table>	Issue 2	AUG 1980	506-410-402	COP	PAGE 1 of 2	057
Issue 2	AUG 1980							
506-410-402	COP							
PAGE 1 of 2	057							

ITEM	SUBTASKS	PROCEDURE NUMBER
20	Install Number Card and Coin Cover Unit on 1D2 (TOUCH-TONE® Dial) Coin Telephone Set, if applicable	-
	1. Detach Coin Dial Unit	DLP-515
	2. Install Number Card	DLP-516
	3. Secure Coin Dial Unit	DLP-517
	4. Install Coin Cover Unit	DLP-512
21	Install Instruction Cards	DLP-518
22	Perform Coin Release Lever and Call Back Tests	DLP-519

**CONVERT 1E3 SET IN MANUAL POSTPAY MODE TO  
1D1 OR 1D2 SET DIAL-TONE-FIRST MODE**

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TROUBLE INDICATED	MAY ALSO BE REPORTED AS	PROCEDURE NUMBER
<b>MAINTENANCE PHILOSOPHY</b>		TAD-100
<b>TROUBLE REPORTS – VISUAL INSPECTION ITEMS</b>		
Instruction Cards Mutilated or Missing		DLP-524
Fingerwheel and/or Number Card Inoperative (Rotary Dial)	Fingerwheel Bent, Number Card Missing or Mutilated	DLP-527
Number Card and/or Window (TOUCH-TONE® Dial) Mutilated		DLP-535
Rotary or TOUCH-TONE Dial Inoperative		DLP-531
Handset Broken or Missing	Handset Cord Broken	DLP-530
Switchhook (Coin Dial Unit) Broken		DLP-528
Coin Release Lever Bent or Broken		DLP-532
Coin Return Assembly Mutilated or Missing		DLP-533
Coin Cover Unit Mutilated		DLP-536
<b>TROUBLE REPORTS – NORMAL OPERATIONAL FAILURES</b>		
Telephone Set Does Not Function Properly	No Dial Tone, Doesn't Return Coins, etc.	DLP-529
<b>TROUBLE REPORTS – STATION HAS COIN TROUBLE HISTORY</b>		
Coins Collected or Returned in Error		TAP-111
<b>TROUBLE INDICATOR LIST – 1D/2D-TYPE COIN TELEPHONE SET</b>		Issue 2   AUG 1980
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		PAGE 1 of 1   095

There are many configurations and types of locations in which coin telephone service is provided. Accordingly, a general approach to maintenance of these facilities is advocated in this document, but which may be modified in accordance with local approved telephone company procedures. Because of this diversity of equipment, location, and facilities, it may be necessary to refer to other procedures and documentation to verify that operations contained herein are complete. *Refer to TABLE A* which lists basic operations not covered in this TOP, with a secondary source of information.

It is possible that normal operational testing may not detect certain marginal operating conditions, particularly in the area of coin collection and coin return. For this reason, certain tests are specified based on history for a particular set. When a set has a history of improper coin operations, *three additional tests are provided TAP-111.*

TABLE A		
SECONDARY SOURCE OF INFORMATION		
ITEM	OPERATION	INFORMATION PROVIDED IN
1	Install Drop Wire	Appropriate section in Division 460
2	Install Protection and Ground	Section 506-100-100 and Section 460-100-400
3	Install Inside Wire	Section 461-200-210
4	Install Backboard	Section 506-100-101
5	Install Shelf	Appropriate section in Division 508
6	Install Security Devices	Section 506-101-400
7	Install Extension Station	Section 506-100-108
8	Install Auxiliary or Extension Ringer	Section 506-410-400

*After any component replacement, the coin telephone set shall be tested as a standard maintenance method per DLP-529.*

## MAINTENANCE PHILOSOPHY — 1D/2D-TYPE COIN TELEPHONE SET

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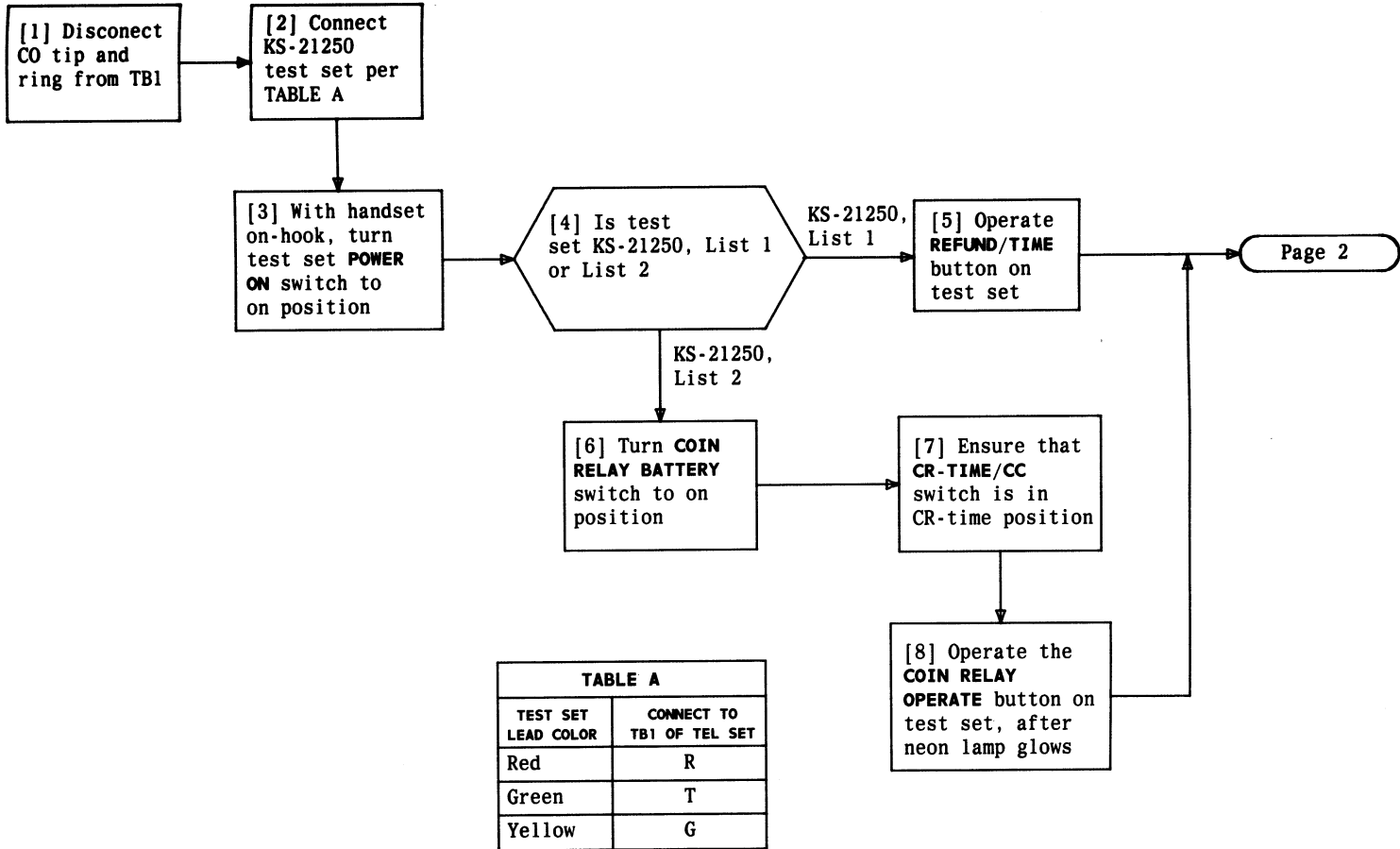
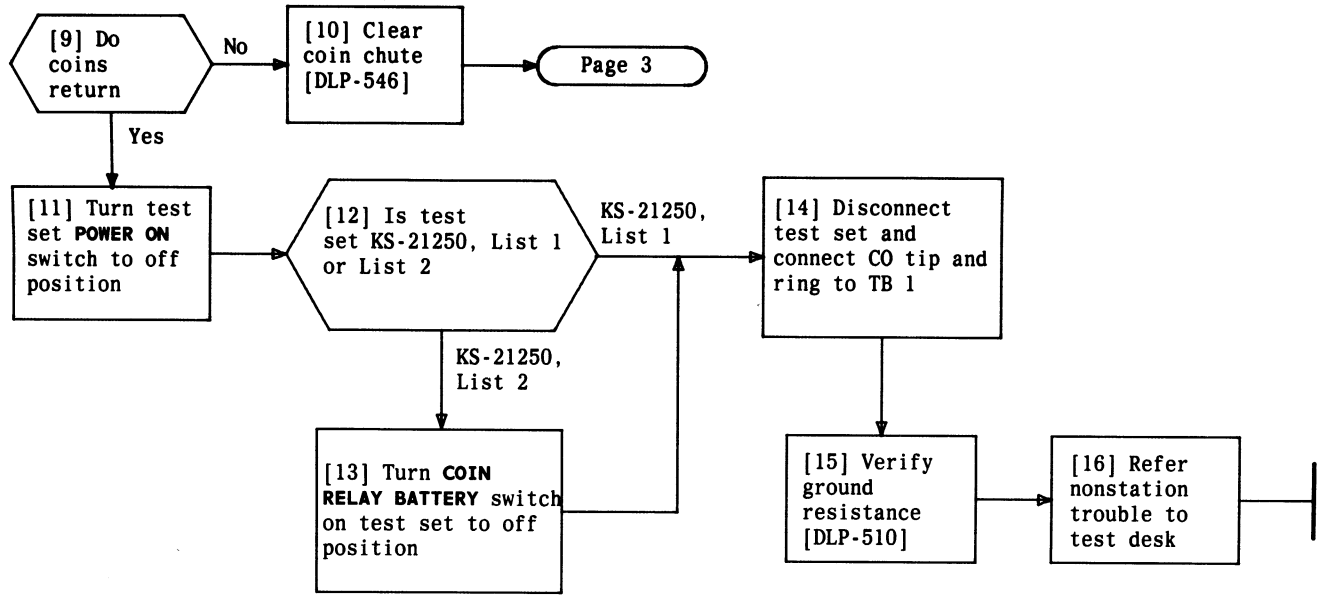


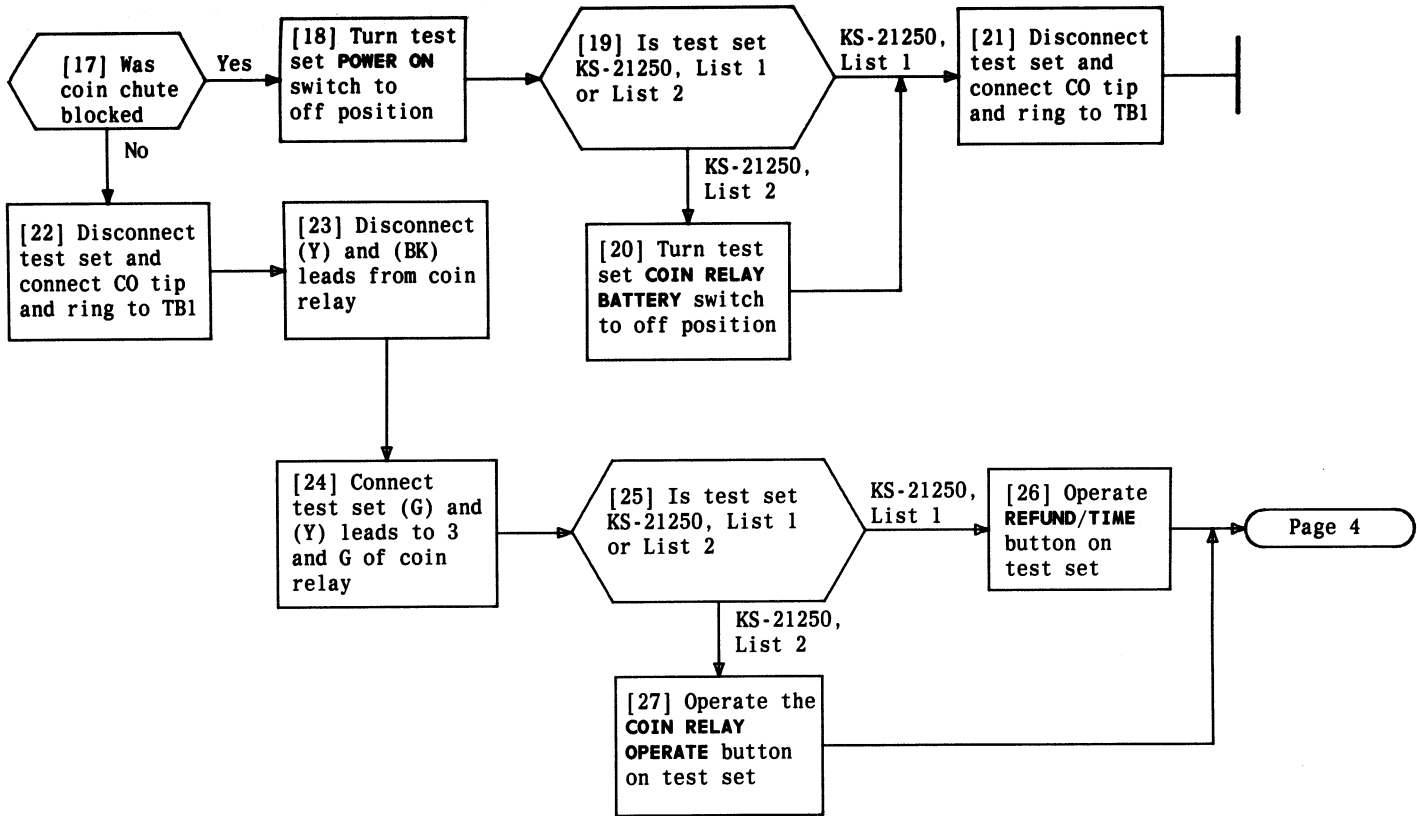
TABLE A	
TEST SET LEAD COLOR	CONNECT TO TB1 OF TEL SET
Red	R
Green	T
Yellow	G

**CLEAR COIN RETURN TROUBLE**



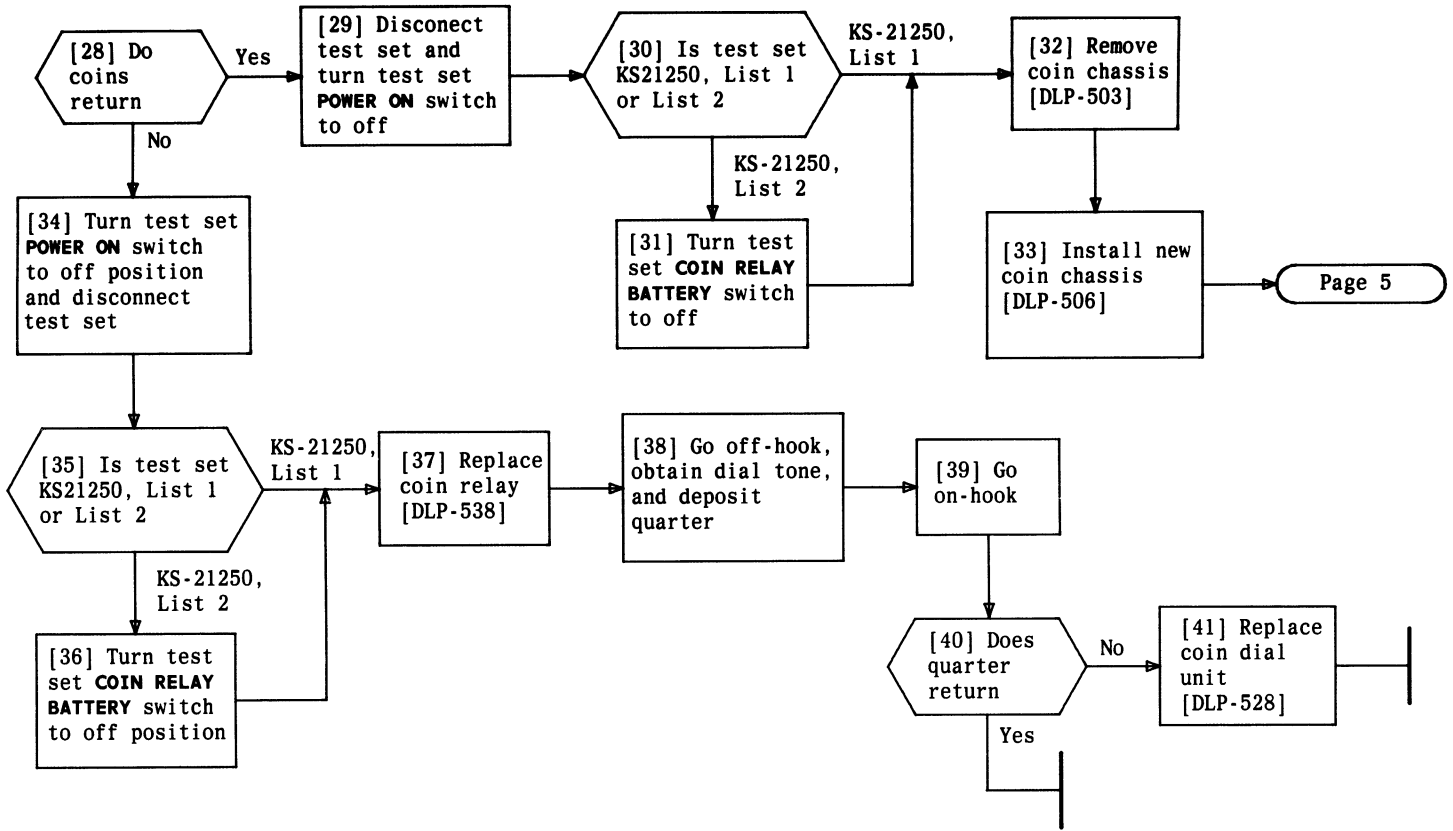
**CLEAR COIN RETURN TROUBLE**

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**CLEAR COIN RETURN TROUBLE**

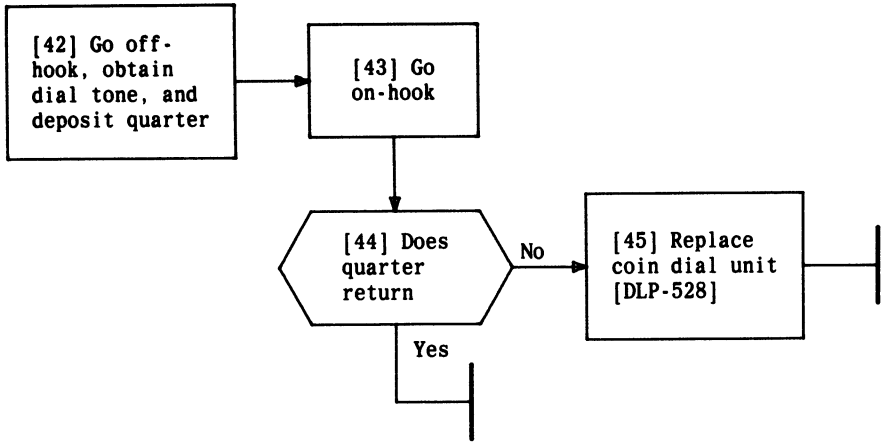
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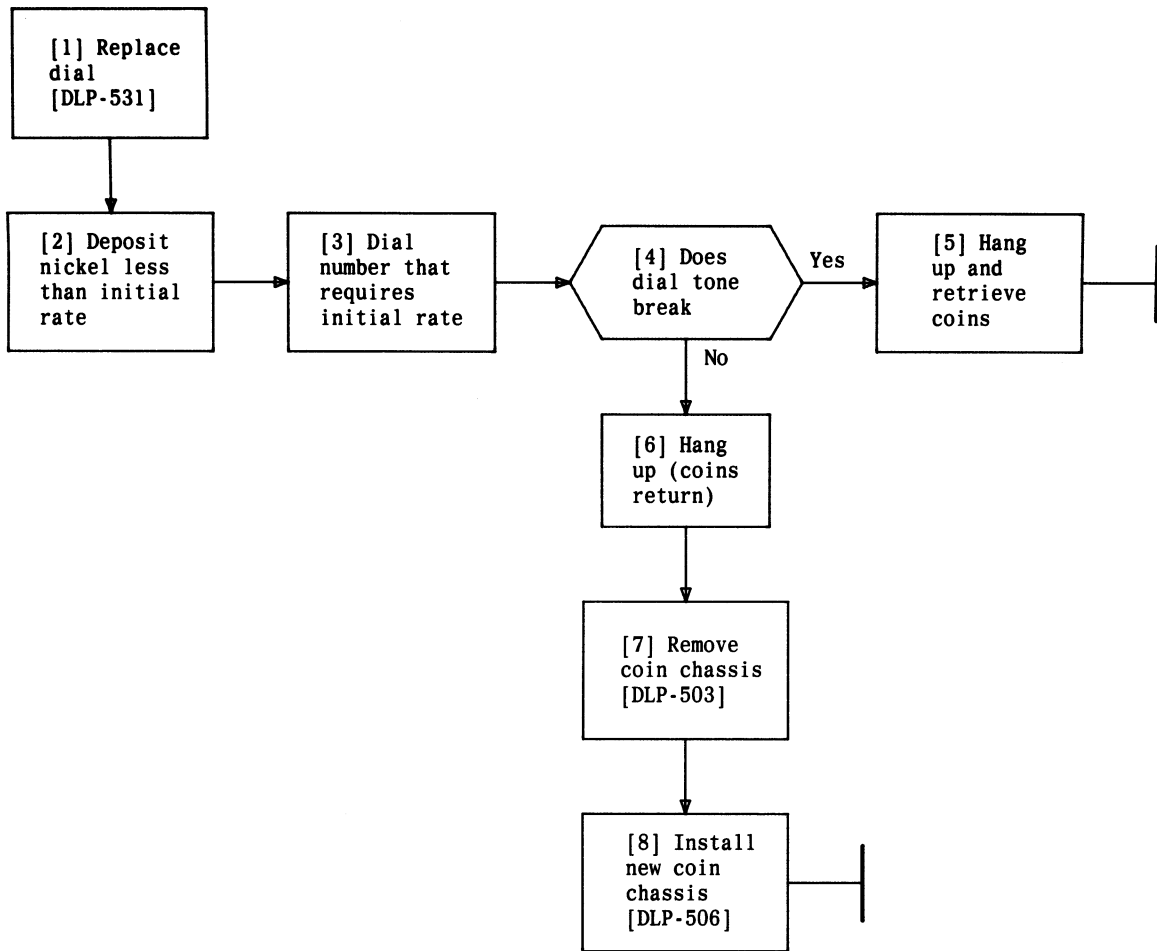
**CLEAR COIN RETURN TROUBLE**

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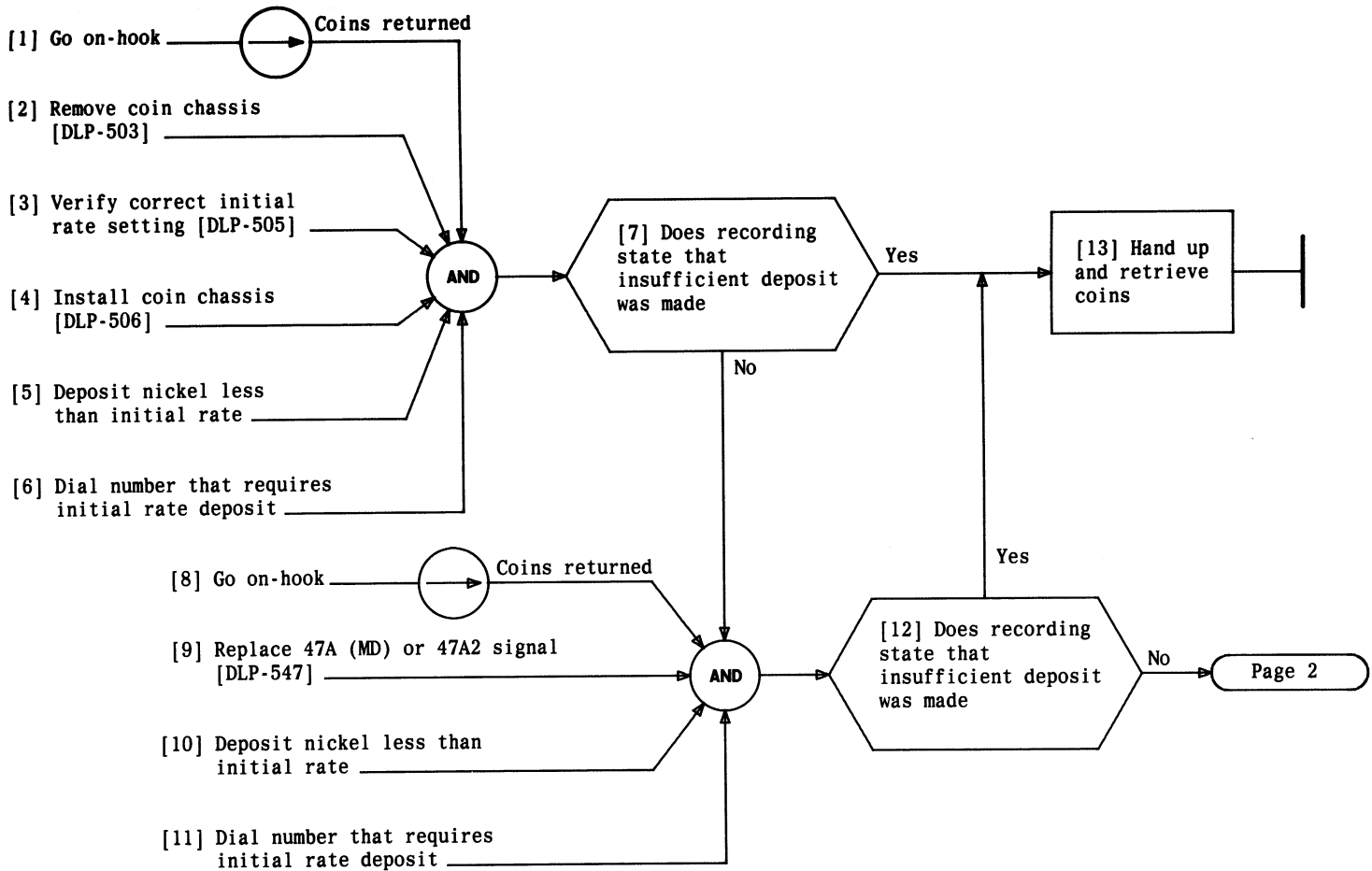


**CLEAR COIN RETURN TROUBLE**



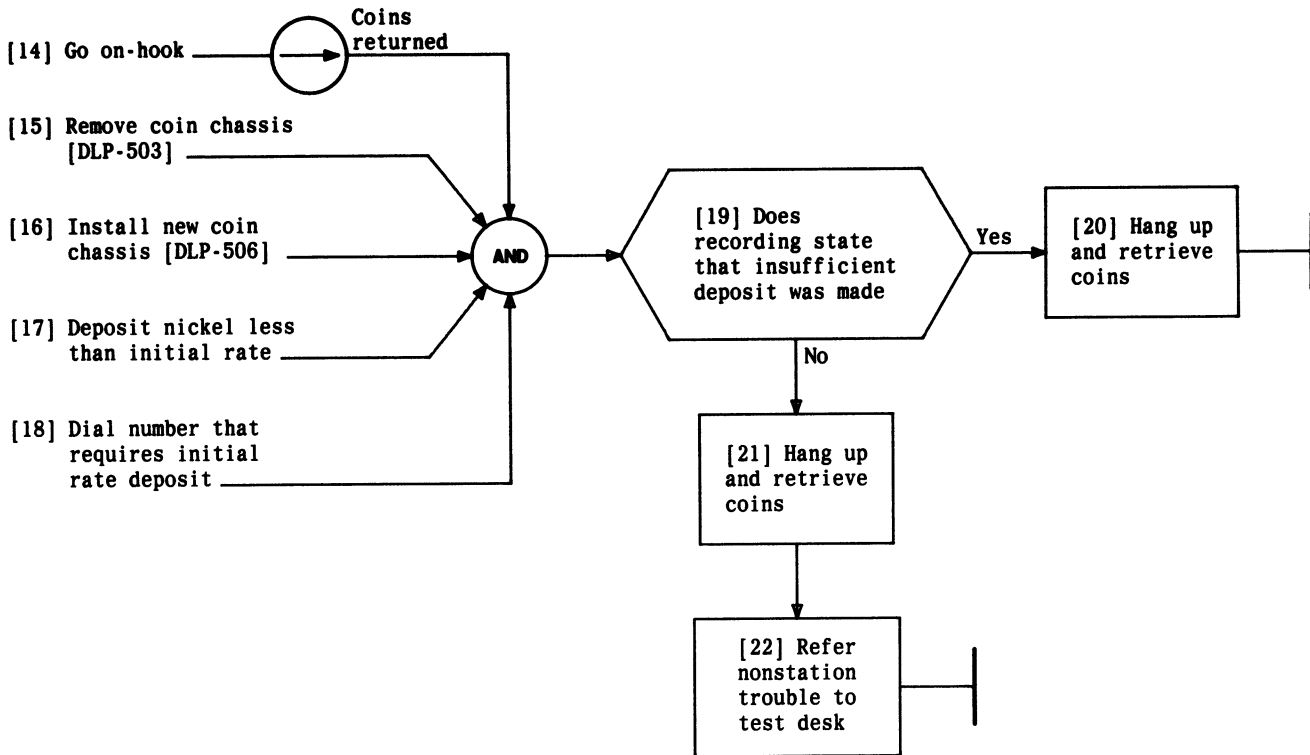
**CLEAR CAN'T BREAK DIAL TONE TROUBLE**

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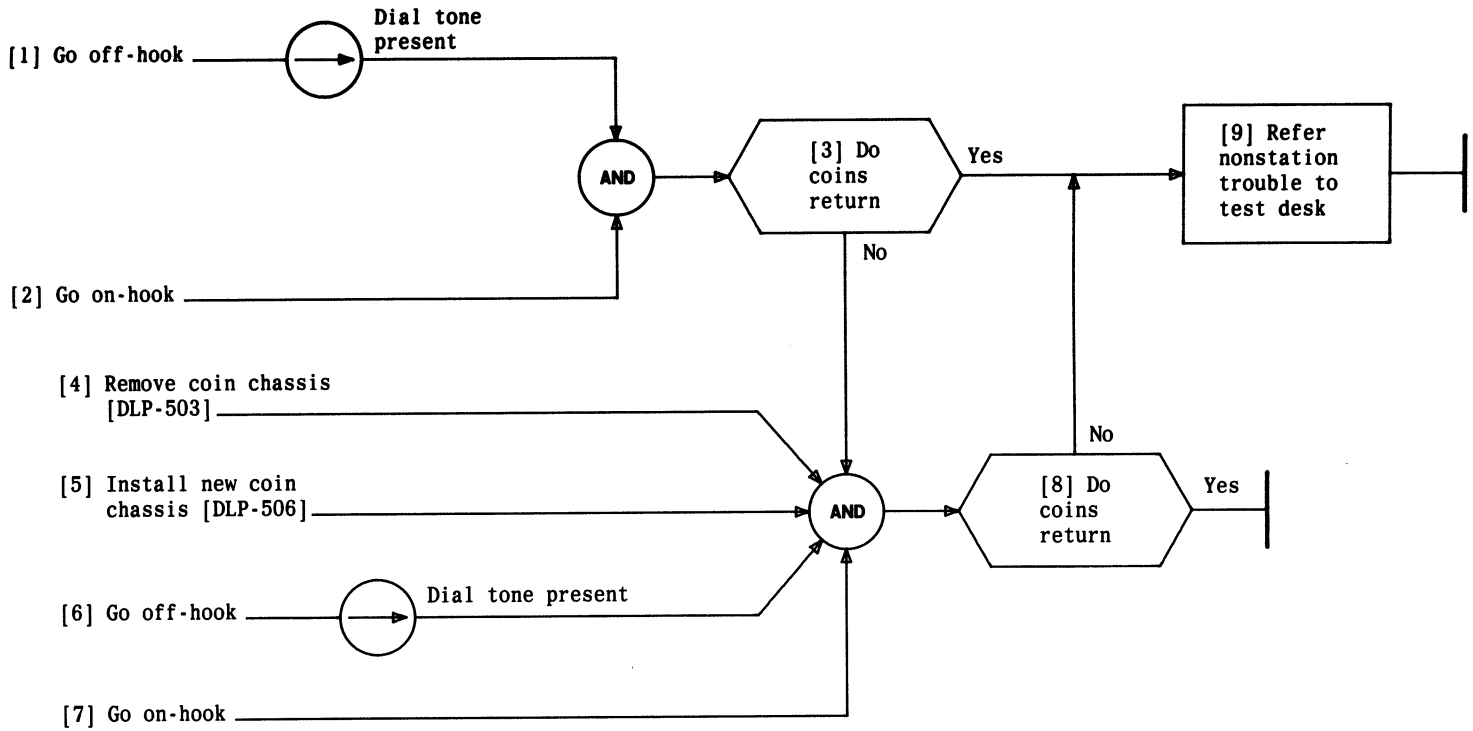
**CLEAR INSUFFICIENT DEPOSIT RECORDING TROUBLE**

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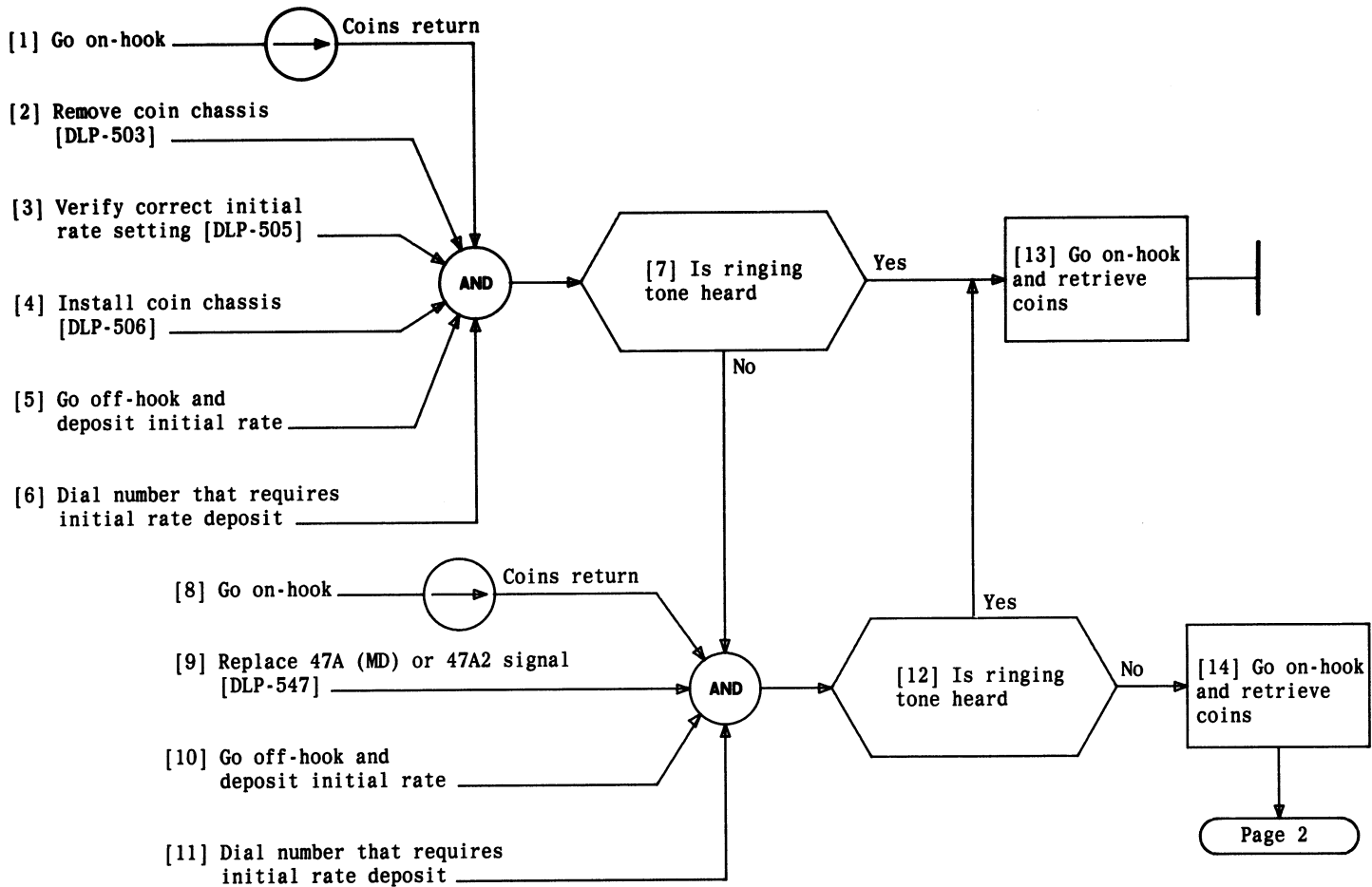
**CLEAR INSUFFICIENT DEPOSIT RECORDING TROUBLE**

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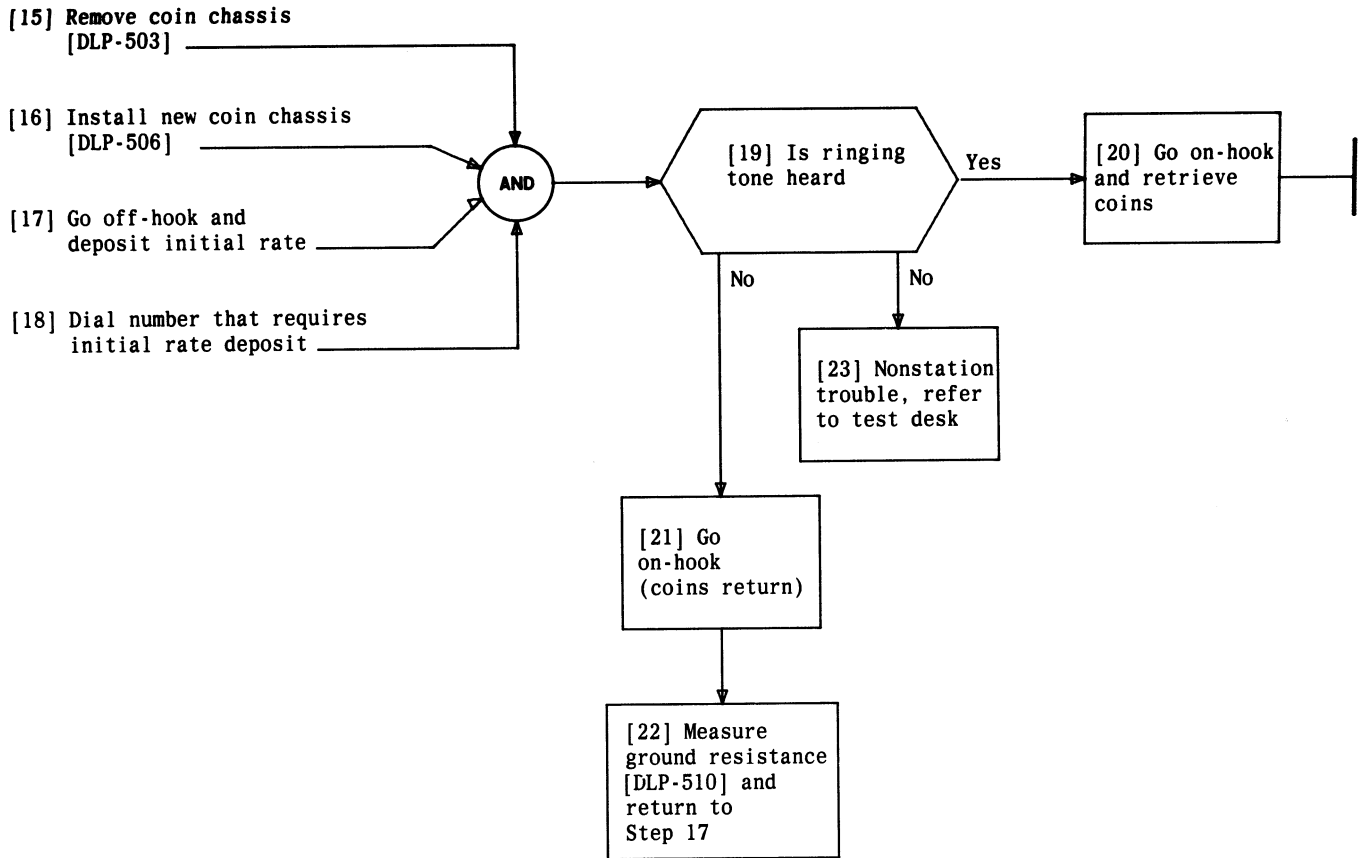
**CLEAR INSUFFICIENT DEPOSIT COIN RETURN TROUBLE**

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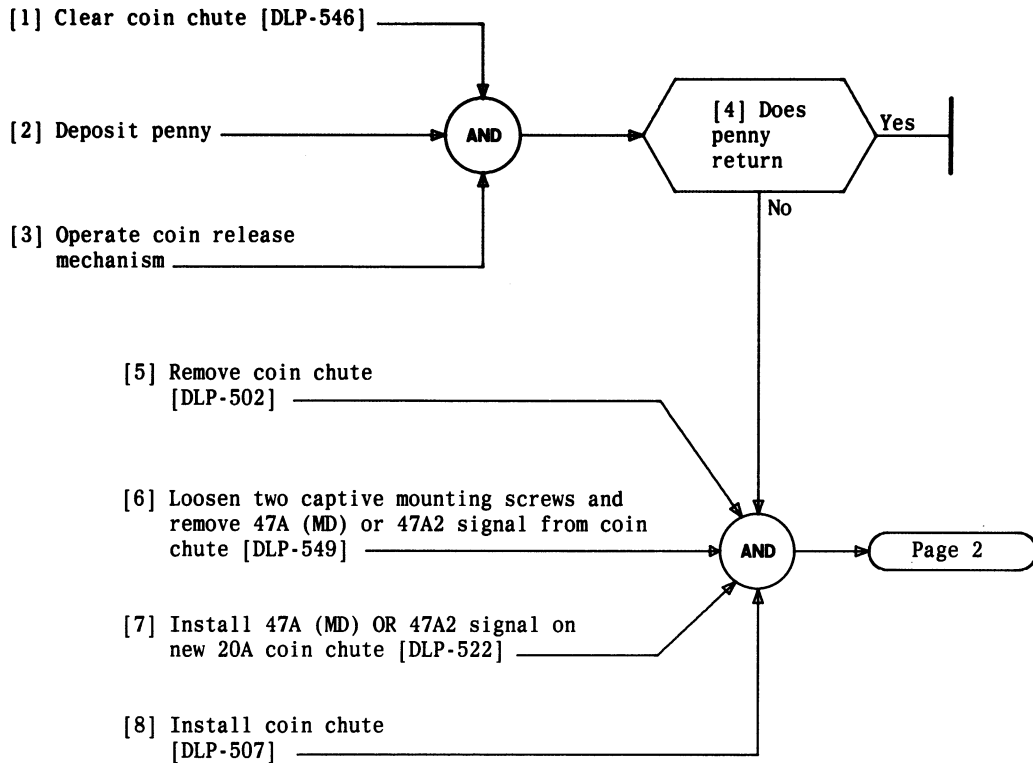
**CLEAR RINGING TONE TROUBLE**

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**CLEAR RINGING TONE TROUBLE**

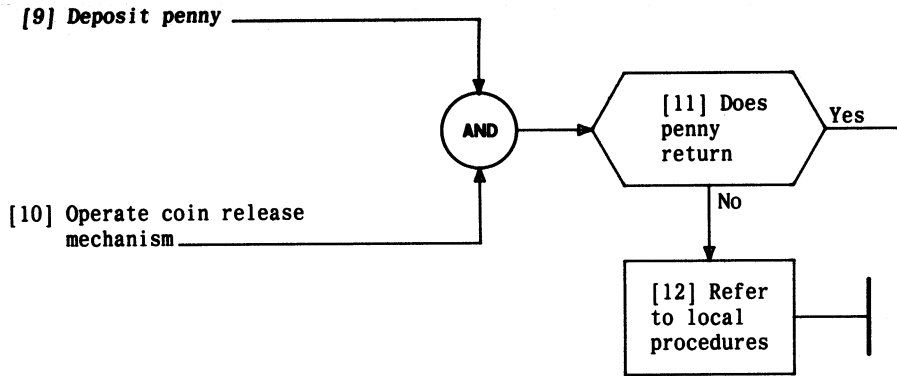
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**CLEAR PENNY RETURN TROUBLE**

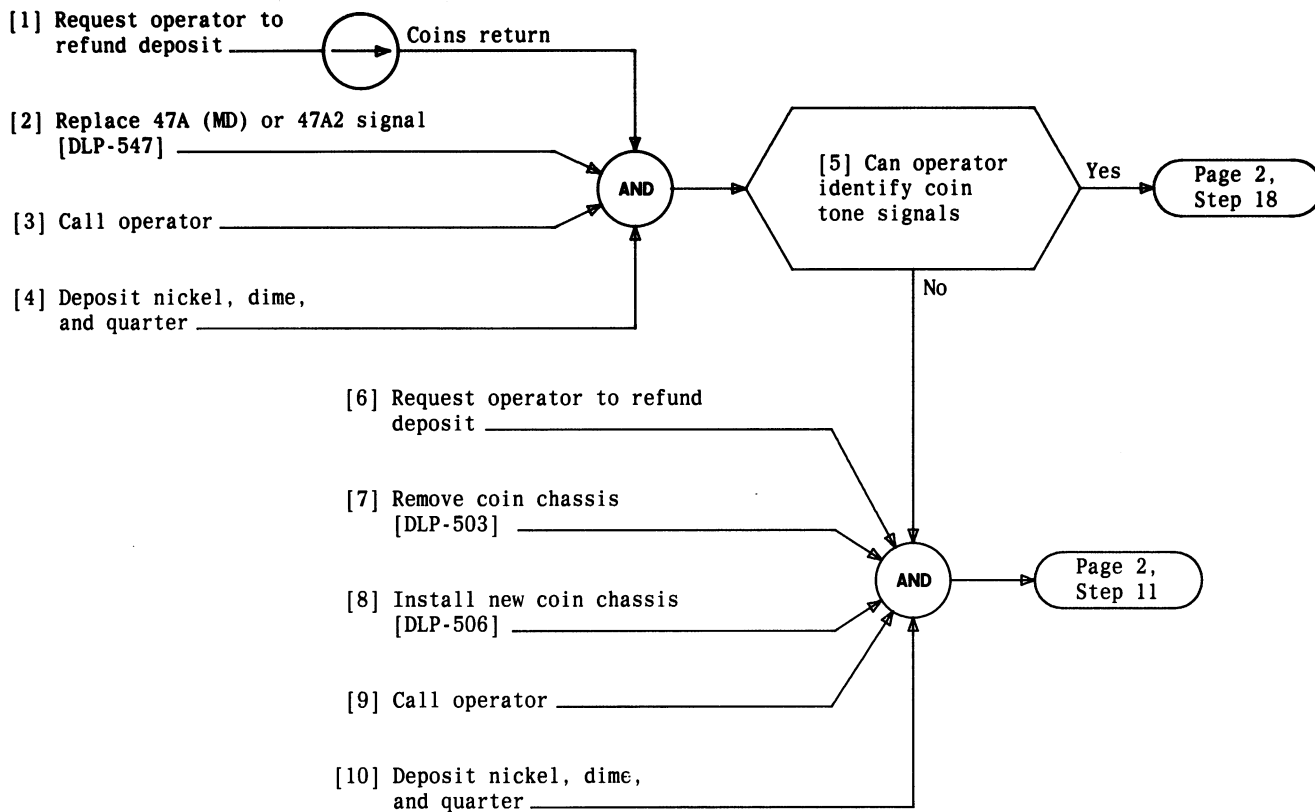
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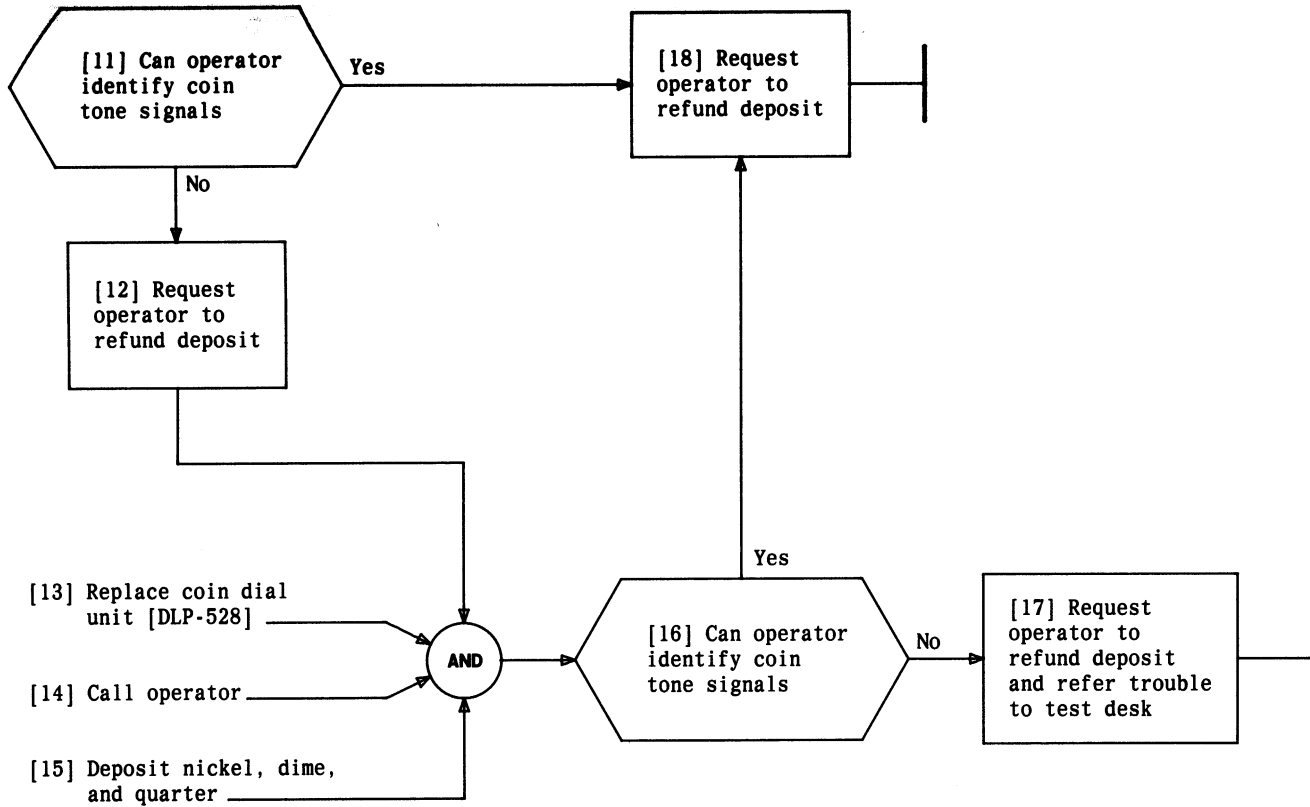
**CLEAR PENNY RETURN TROUBLE**

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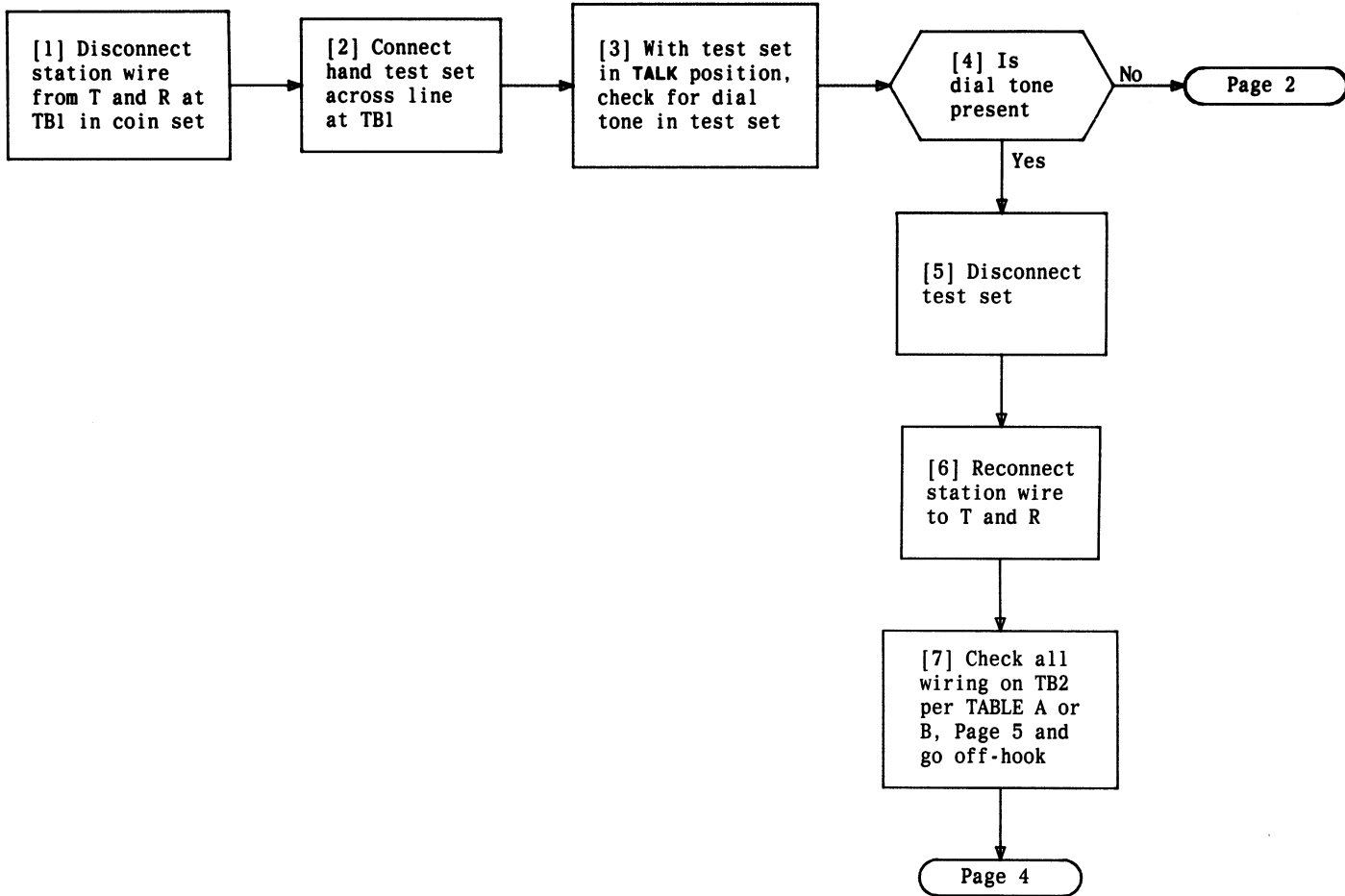
**CLEAR COIN TONE SIGNAL TROUBLE**

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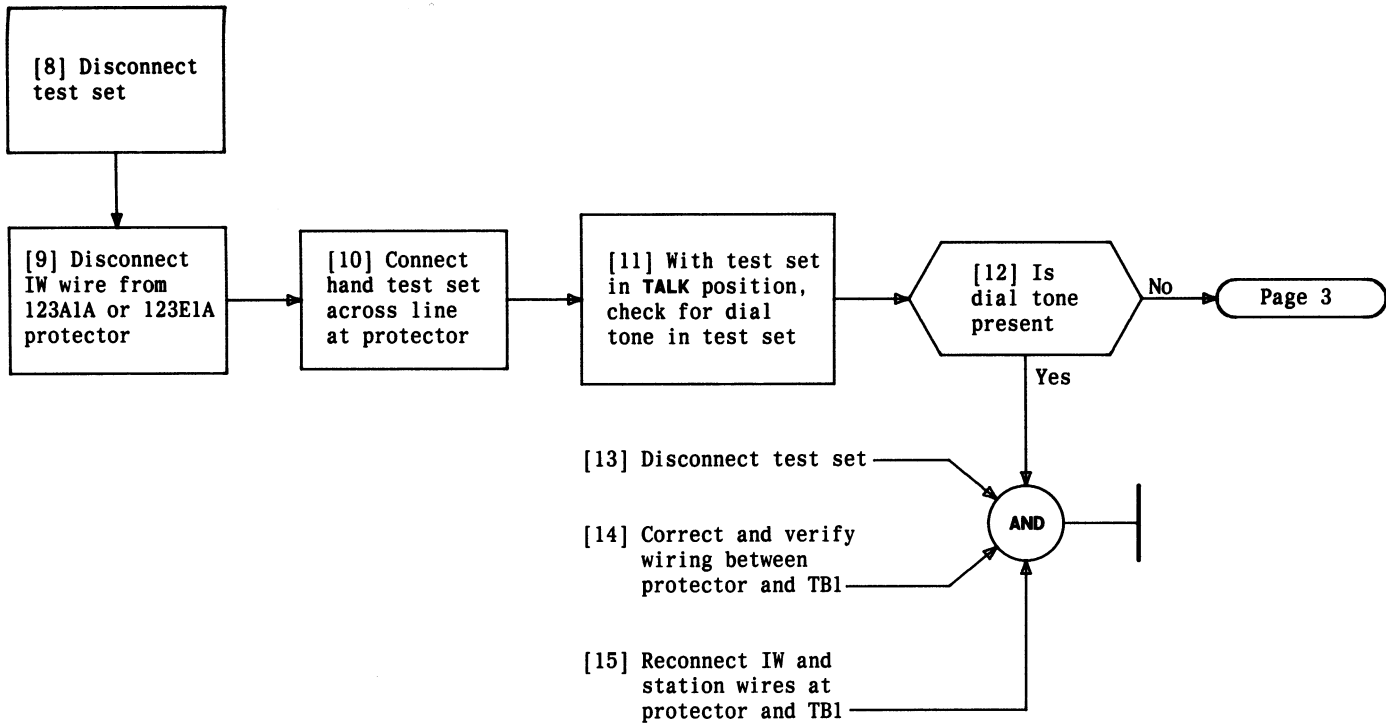
**CLEAR COIN TONE SIGNAL TROUBLE**

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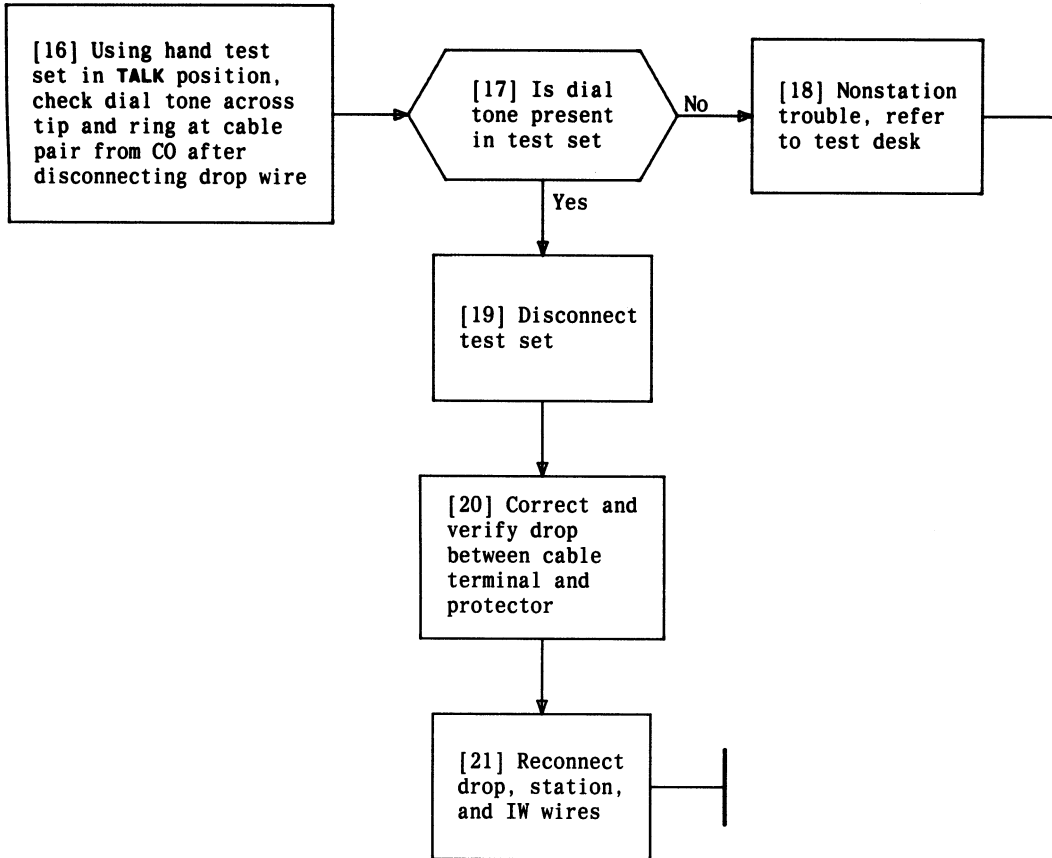
**CLEAR DIAL TONE TROUBLE**

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**CLEAR DIAL TONE TROUBLE**

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**CLEAR DIAL TONE TROUBLE**

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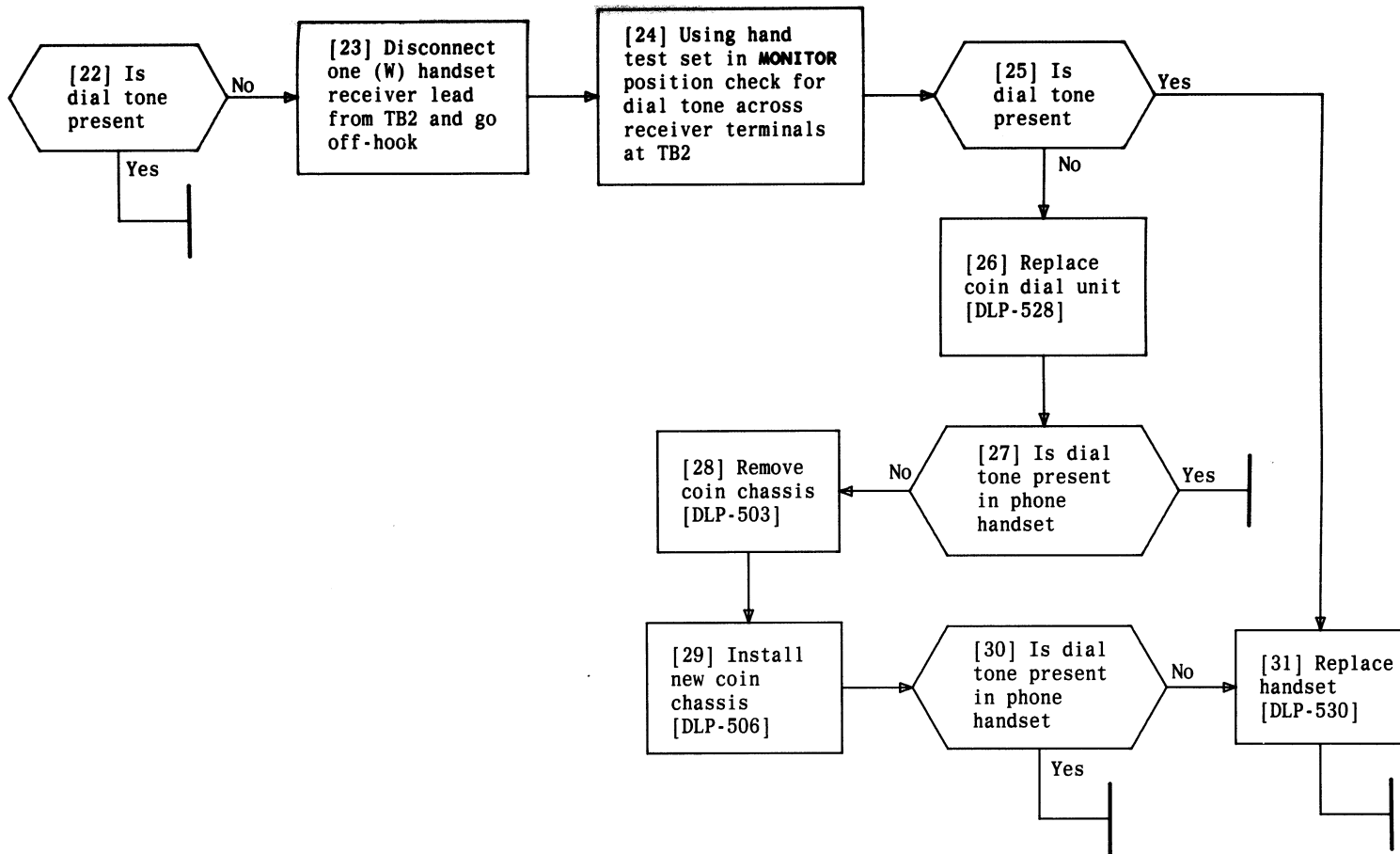


TABLE A						
ROTARY DIAL TELEPHONE SET CONNECTIONS						
COMPONENT	WIRE COLOR	TB2	COMPONENT	WIRE COLOR	TB2	
Dial	BL	11	Switchhook	BR	10	
	BL or G	8		BR	10	
	W	4		O	9	
	W	3		O	8	
	Y	10		W	2	
	Y	13		Y	7	
Handset	W	4		G	12	
	R	3		S	12	
	BK	6		S-W	14*	
	W	7		R†	12	
Strap	S	2 to 3				

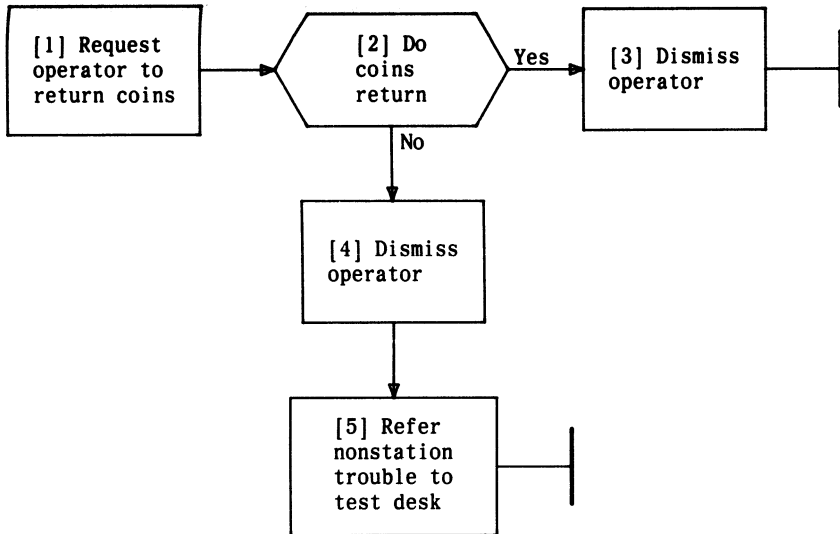
\*Terminal 14 appears on new 60A coin dial units only  
†(R) switchhook lead does not appear on 819042748 (P-90D274) dial and housing assemblies

TABLE B					
"TOUCH-TONE" DIAL TELEPHONE SET CONNECTIONS					
COMPONENT	WIRE COLOR	TB2	COMPONENT	WIRE COLOR	TB2
70A (MD) or 70B Dial	G	1	Switchhook	BR	11
	W	4		BR	9
	R	3		O	9
	R-G	2		O	11
	BK	1		W	8
	O-BK	10		Y	3
	O-R	5		G	12
	W-BL	7		S	12
	O-W	10		S-W	14*
	V	13		R	12
Handset	W	7			
	R	3			
	BK	6			
	W	8			

\*Terminal 14 appears on new 61A coin dial units only

CLEAR DIAL TONE TROUBLE





**CLEAR OPERATOR COIN RETURN TROUBLE**

[1] Set ringer volume control  
to maximum position

[2] Verify that leads are  
dressed properly and  
not touching bell

[3] Request operator  
to ring back

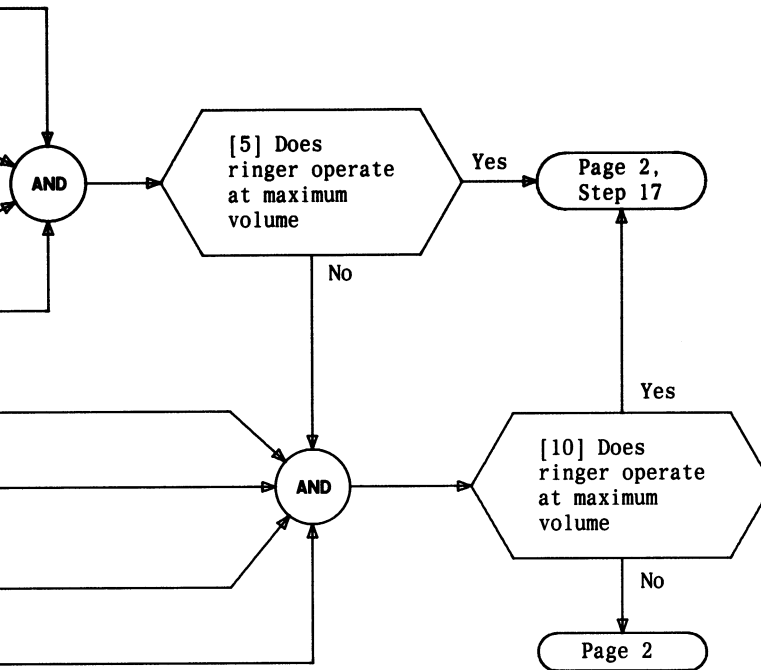
[4] Go on-hook

[6] Answer and dismiss operator

[7] Replace ringer [DLP-548]

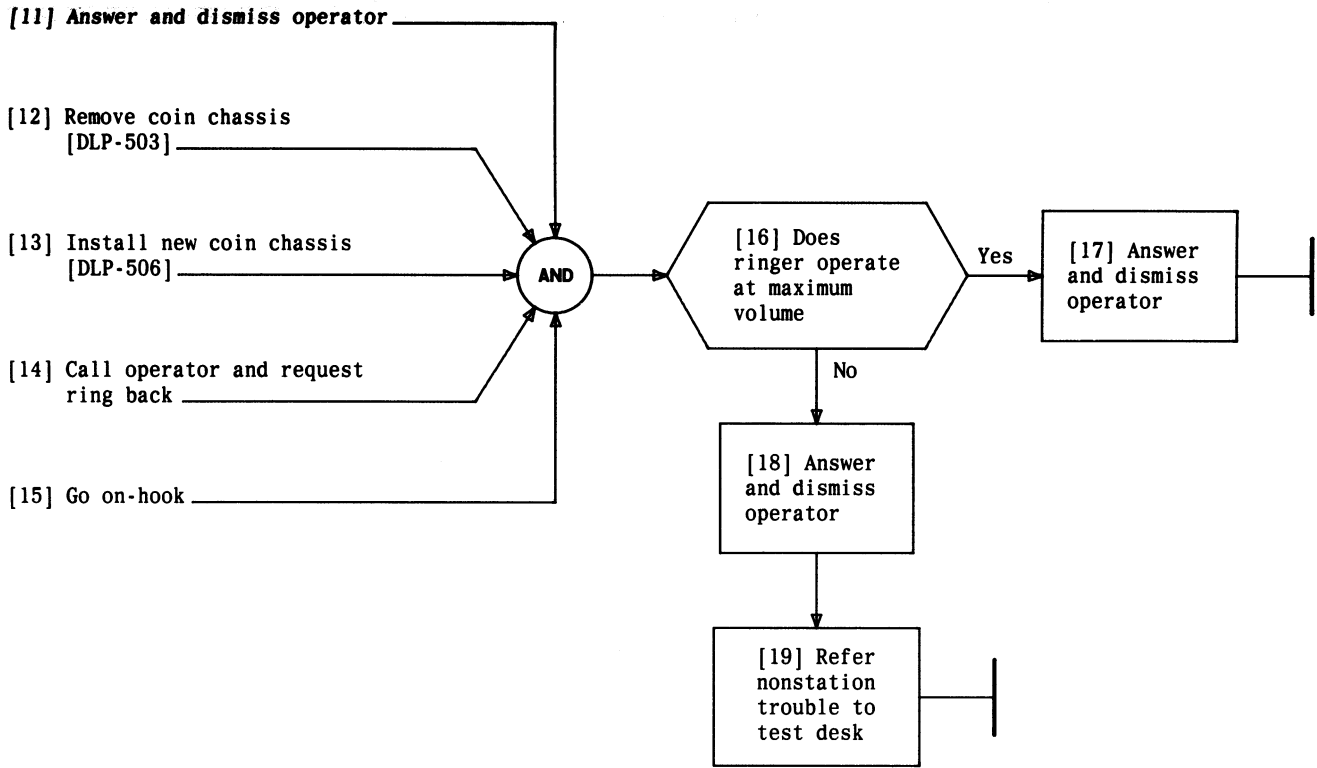
[8] Call operator and  
request ring back

[9] Go on-hook



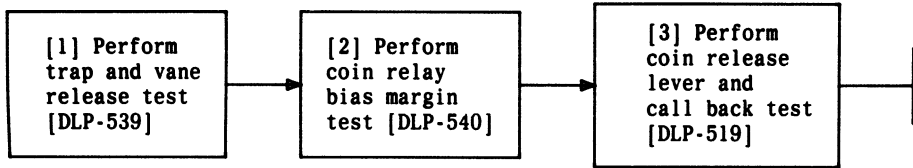
## CLEAR RINGER TROUBLE

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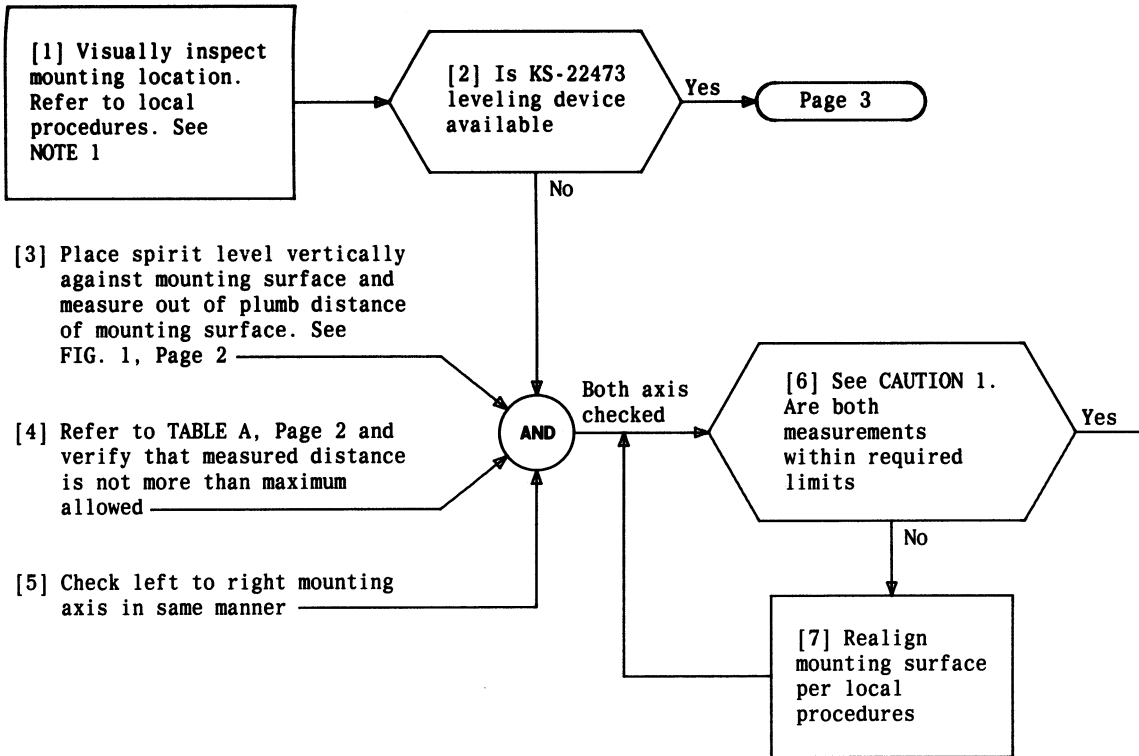
**CLEAR RINGER TROUBLE**

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**CLEAR COINS COLLECTED OR RETURNED IN ERROR TROUBLE**

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**NOTE 1**  
 Considerations for locating

- A. Protection of drop and/or inside wires.
- B. Visibility, accessibility, and possible accident hazards in selecting locations.
- C. Mounting surfaces – coin telephone set should not be located on finishes that would be expensive to repair if set is removed.
- D. Inductive effects – set and associated wiring must be at least 6 inches from neon fixtures, transformers, or other interference-causing equipment.

**CAUTION 1**  
*A tilt greater than 1-1/2 degrees in any direction can cause coin chute malfunction*

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**CHECK LOCATION AND MOUNTING FACILITIES**

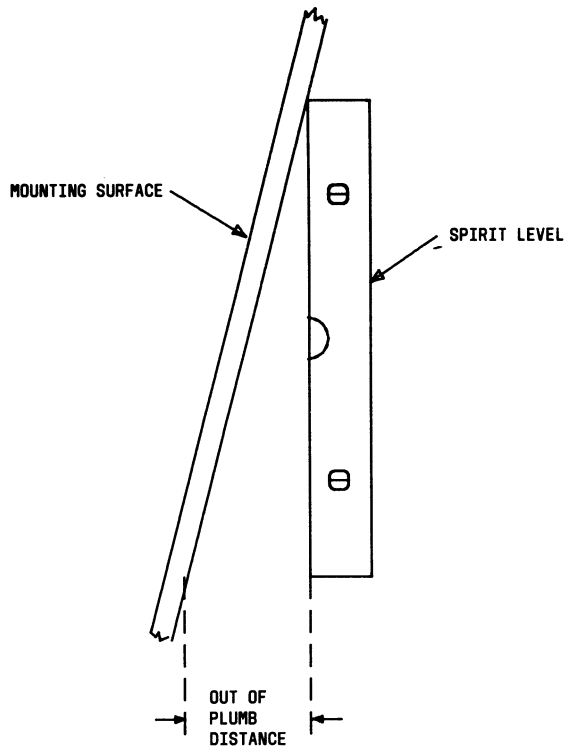


FIG. 1

TABLE A	
METHOD OF DETERMINING A VERTICAL SURFACE	
SPIRIT LEVEL LENGTH	MAXIMUM ALLOWABLE DISTANCE OUT OF PLUMB
18 inches	15/32-inch
24 inches	5/8-inch
30 inches	25/32-inch
36 inches	15/16-inch

[8] Place KS-22473 leveling device vertically against mounting surface and check the degrees out of plumb of mounting surface. See FIG. 2

[9] Verify that the number of degrees is not more than 1-1/2.

[10] Check left to right mounting axis in same manner

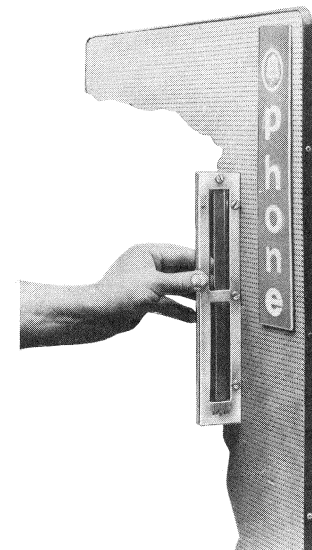
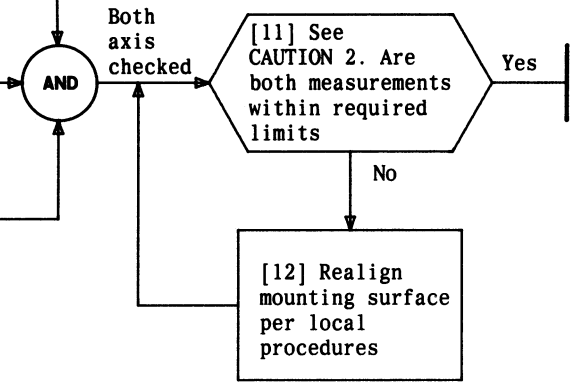
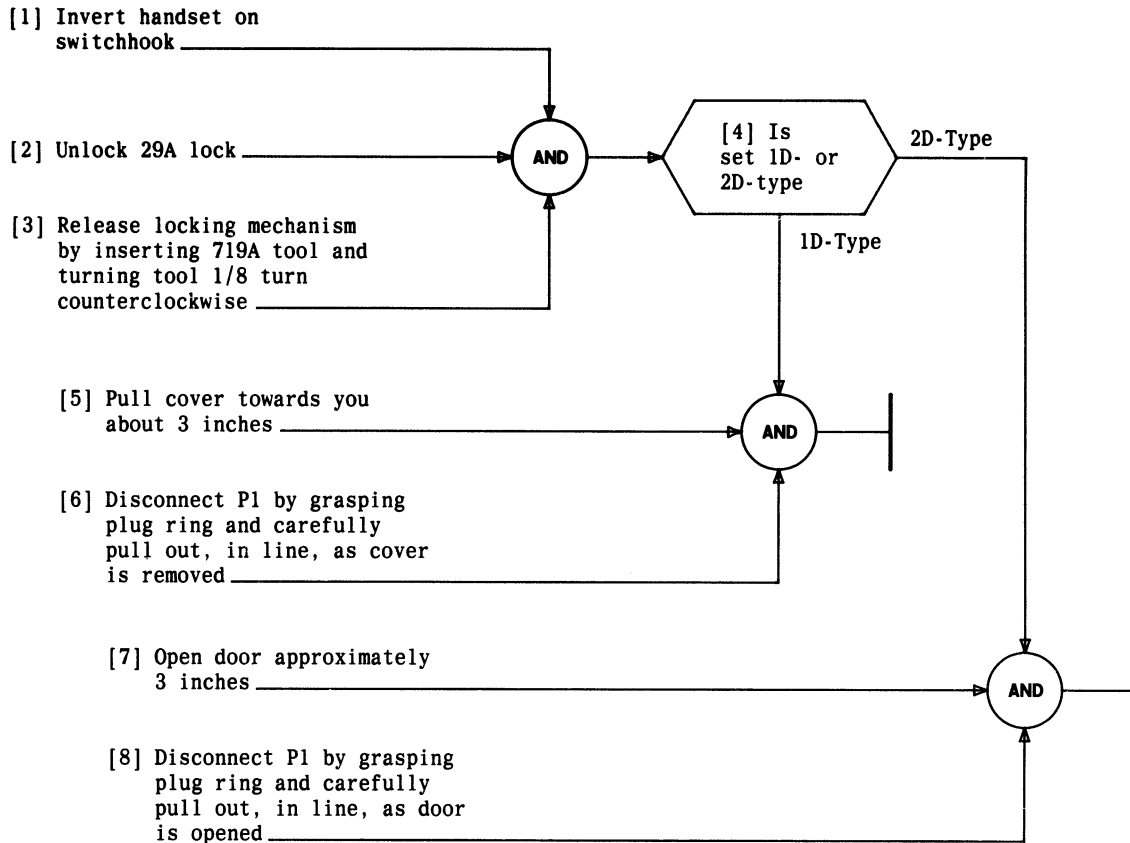


FIG. 2

<b>CAUTION 2</b> <i>A tilt greater than 1-1/2 degrees in any direction can cause coin chute malfunction</i>	
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**REMOVE COIN COVER UNIT (1D-TYPE SET) OR OPEN DOOR AND FACEPLATE ASSEMBLY (2D-TYPE SET)**

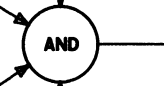


[1] Disconnect P2 by grasping ring or body of plug, and carefully pull out in line

[2] Release coin chute locking lever

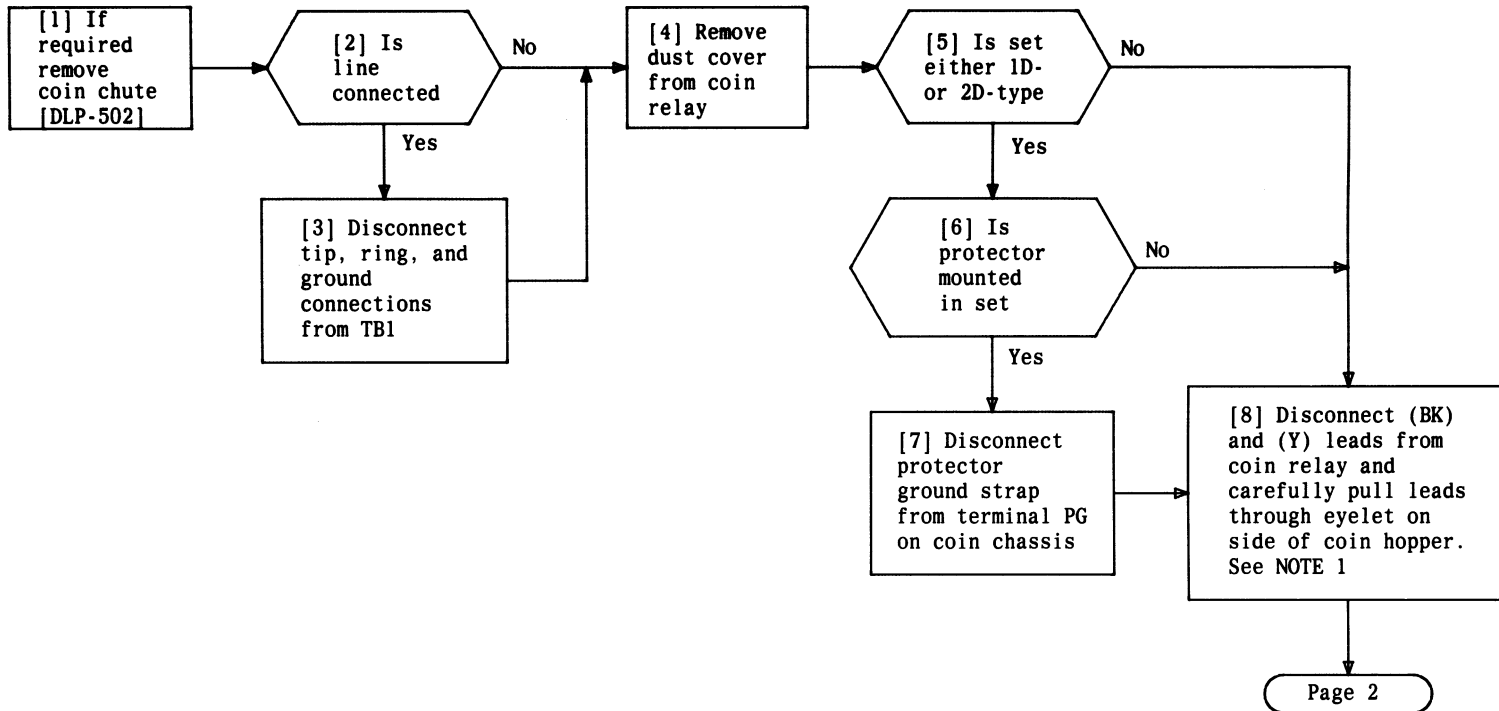
[3] Lift spring out of groove in coin chute

[4] Tilt top of coin chute forward and lift out



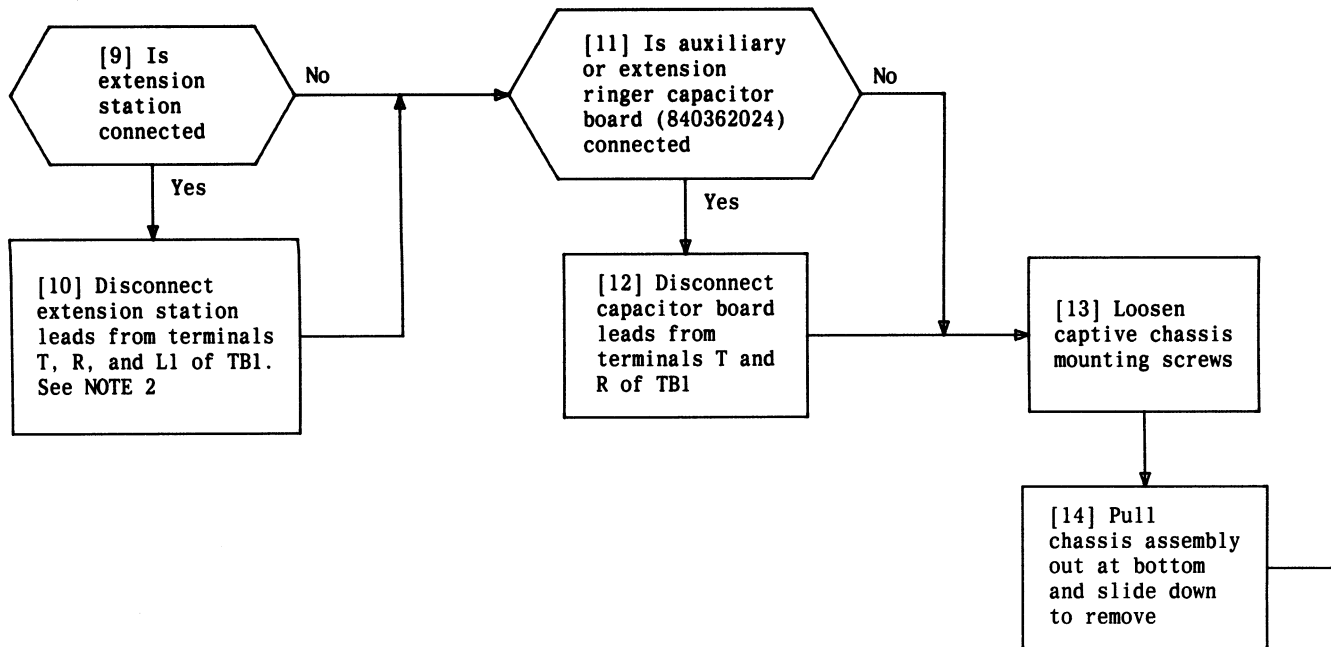
## REMOVE COIN CHUTE

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NOTE 1  
On the 1E1 telephone set these leads are (G) and (S-R) and are connected to coin hopper

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**REMOVE COIN CHASSIS**

NOTE 2		
Terminal L1 is on network in the 1C- and 2C-type telephone sets		
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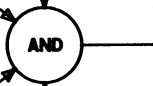
[1] Insert inside wire or drop wire  
and 12 AWG protector ground  
wire into wire entrance hole.

See FIG. 1, Page 2

[2] Insert four security studs  
(furnished locally) into back of  
housing. See FIG. 1 and TABLE A,  
Page 2

[3] Place housing on mounting  
surface by guiding security  
studs into proper holes

[4] Secure housing to mounting  
surface using seven mounting  
screws (furnished with set)  
and 1/4 ID flat washer  
(provided locally). See FIG. 1  
and TABLE A, Page 2



## ATTACH HOUSING TO MOUNTING SURFACE (1D-TYPE SET)

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TABLE A					
BACKBOARD*, BOOTH, SHELF, MOUNTING, OR KIOSK	SECURITY STUDS (4 REQUIRED)		BACKBOARD*, BOOTH, SHELF, MOUNTING, OR KIOSK	SECURITY STUDS (4 REQUIRED)	
	834080608 (P-40Y060) (SHORT SHOULDER- SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER- SHORT THREAD)		834080608 (P-40Y060) (SHORT SHOULDER- SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER- SHORT THREAD)
178A-03 or -51 Backboard	•		KS-19425 Booth		•
KS-21676, L2 Backboard	•		KS-19426 Mounting		•
10- and 11- Type Booths	•		KS-19580 Booth	•	
KS-14611 Booth	•		KS-19945 Shelf		•
KS-16797 Booth		•	KS-20194, L5 Shelf	•	
KS-19206 Booth	•		KS-20255 Kiosk (MD)		•
KS-19267 Shelf	•		KS-20842 Mounting	•	
KS-19340 Booth	•				
* Seven 1/4-20 by 5/8-inch hardened RHM screws 812367902 (P-23F790) are furnished with each coin telephone set for mounting to backbaord					

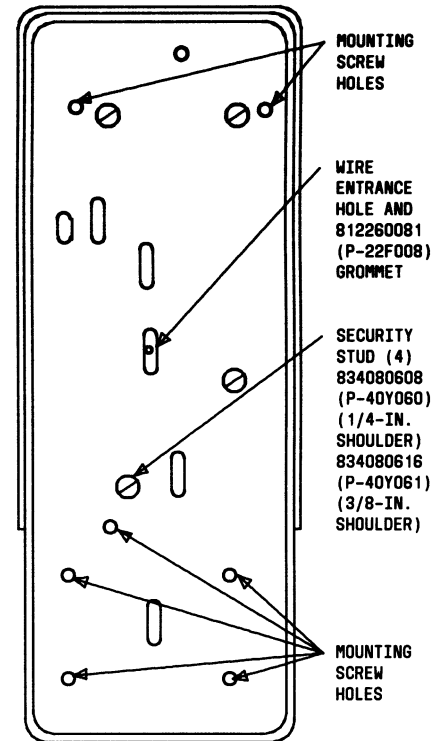


FIG. 1 - Location of Mounting Screw Holes and Security Studs in 1D-Type Set

ATTACH HOUSING TO MOUNTING SURFACE (1D-TYPE SET)

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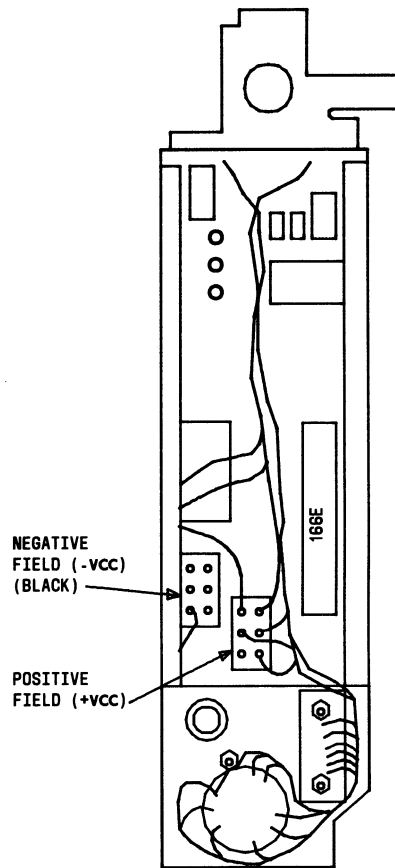
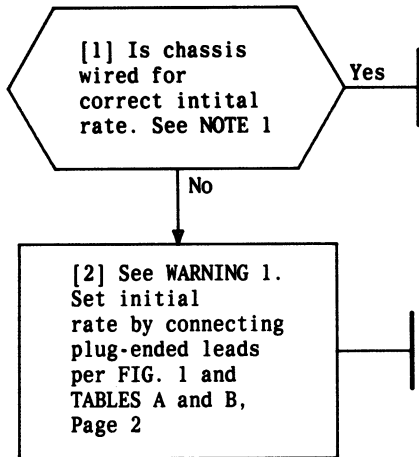


FIG. 1 - 32A Coin Chassis

**NOTE 1**  
 Set is factory-wired for 10 cent initial rate, (R) lead connected to negative field (-VCC). All other leads are connected to the positive field (+VCC)

**WARNING 1**  
*The wires can be broken if grasped by the wire instead of plug*

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**VERIFY OR SET INITIAL RATE**

TABLE A	
INITIAL RATE LEADS*	
LEAD COLOR	INDICATED RATE
(BR)	5 cents
(R)	10 cents
(Y)	20 cents
(S)	40 cents
(W-BL)	80 cents
(W-BR)	1 dollar - 60 cents
* Leads are plugged-ended	

TABLE B						
EXAMPLES OF INITIAL RATE SETTINGS						
AMOUNT OF INITIAL RATE (CENTS)	PLUG-ENDED LEADS TERMINATED IN - NEGATIVE AND + POSITIVE FIELDS					
	(BR)	(R)	(Y)	(S)	(W-BL)	(W-BR)
5	-	+	+	+	+	+
10	+	-	+	+	+	+
15	-	-	+	+	+	+
20	+	+	-	+	+	+
25	-	+	-	+	+	+
30	+	-	-	+	+	+
35	-	-	-	+	+	+
40	+	+	+	-	+	+
45	-	+	+	-	+	+
50	+	-	+	-	+	+
*	etc					
* If higher initial rates are necessary, plug leads into negative field to equal total amount						

VERIFY OR SET INITIAL RATE

[1] If required, verify or set initial rate [DLP-505]

[2] See NOTE 1. Slide chassis under tab. See [FIG. 1, Page 3]

[3] Seat chassis tabs in slot

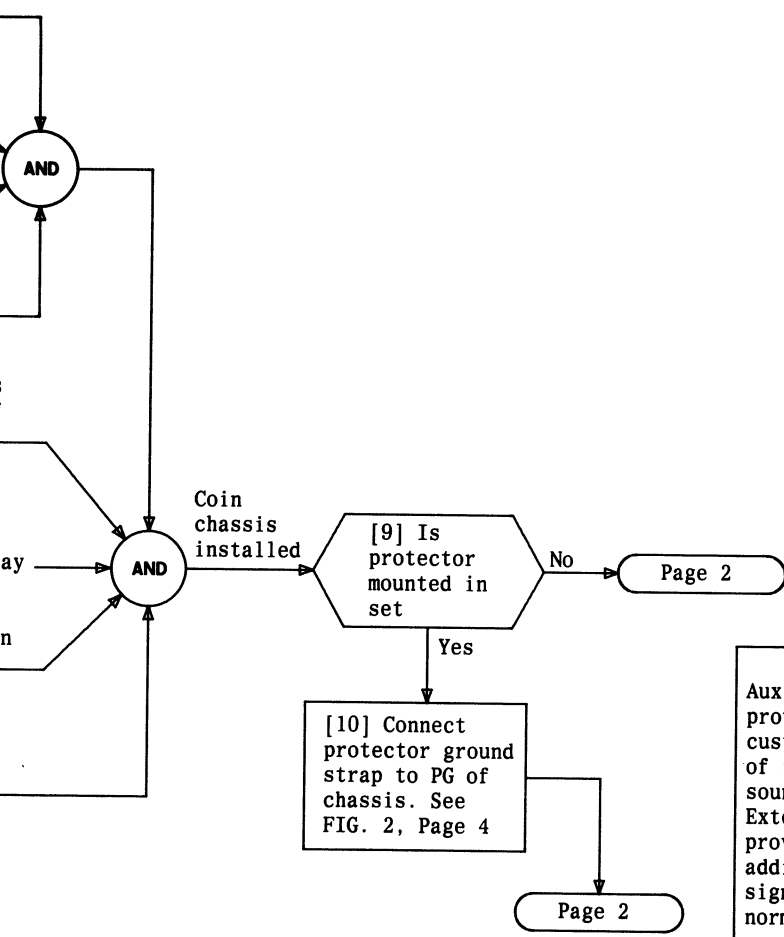
[4] Tighten captive chassis mounting screw

[5] Thread (BK) and (Y) leads through eyelet on side of hopper

[6] Connect (BK) lead to terminal 3 and (Y) lead to terminal G on coin relay

[7] Install dust cover on coin relay

[8] Connect tip, ring, and signal ground leads to TBI

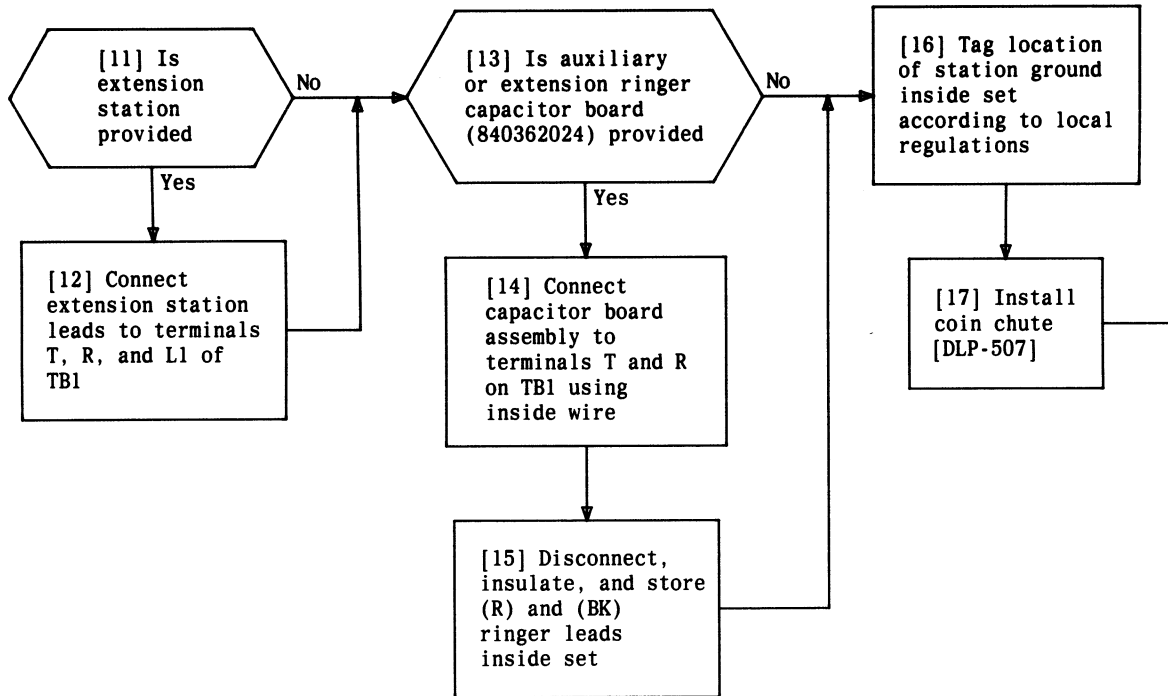


**NOTE 1**  
Auxiliary ringer is provided when customer complains of insufficient sound level. Extension ringer is provided (at additional cost) for signaling beyond the normal ringer range

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### INSTALL 32A COIN CHASSIS





**INSTALL 32A COIN CHASSIS**

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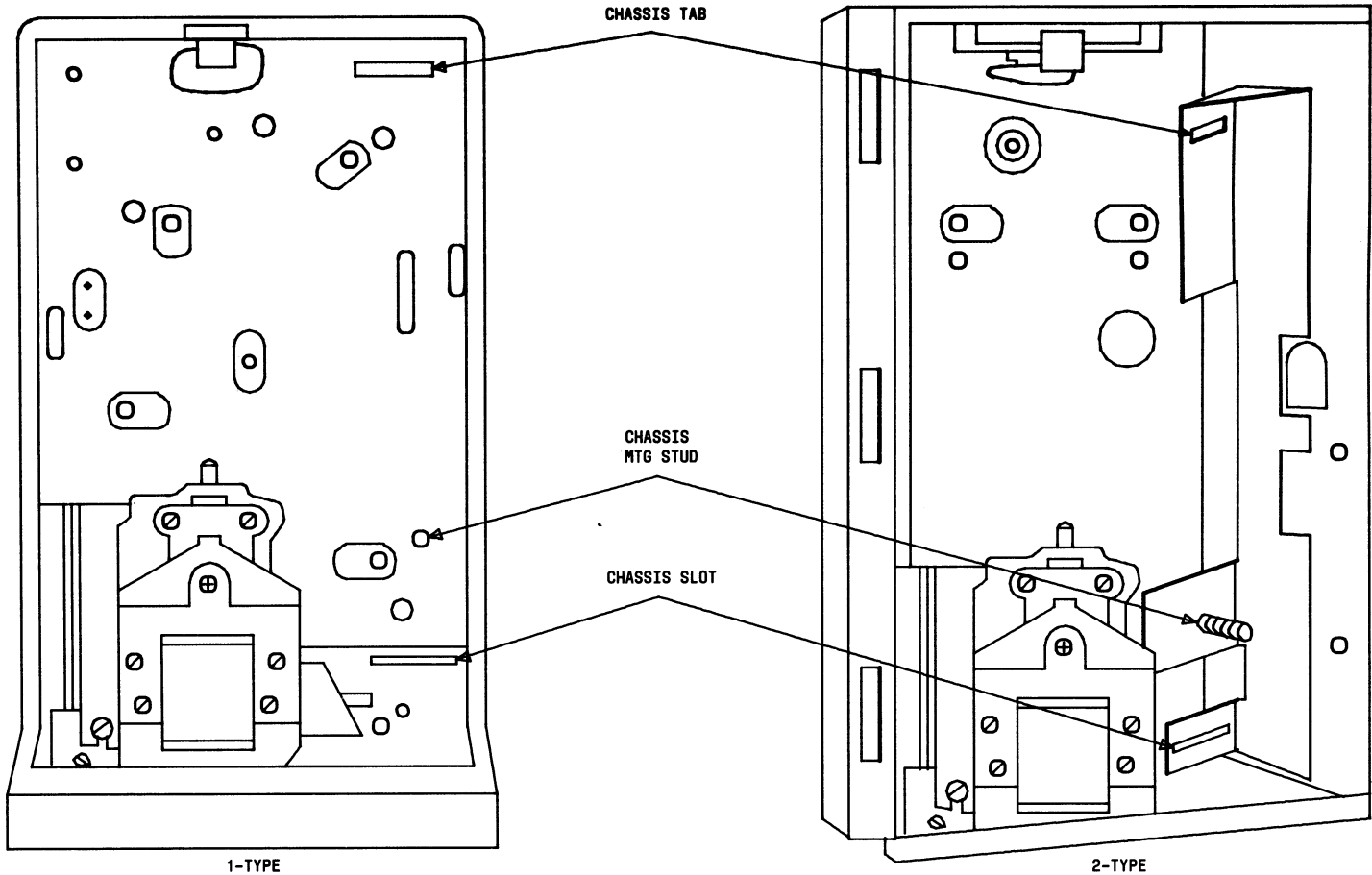


FIG. 1 - Housing and Mounting Plate Assembly

**INSTALL 32A COIN CHASSIS**

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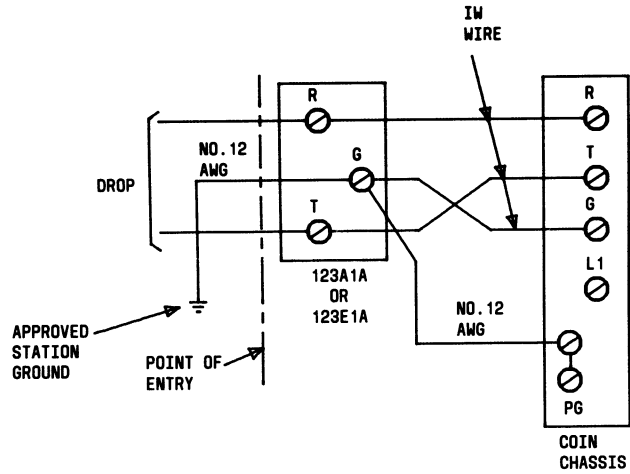


FIG. 2 - Protector Wiring When Protector is Inside Set

INSTALL 32A COIN CHASSIS

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[1] See WARNING 1. Swing upper plate open and clean off any foreign material adhering to coin magnets. See FIG. 1

[2] Place coin chute on locating pins at rear of hopper assembly and back of housing. See FIG. 2, Page 2

[3] See NOTE 1. Place spring in groove on coin chute

[4] Lock spring in place by pushing coin chute locking lever down

[5] Connect plug P2 to J2

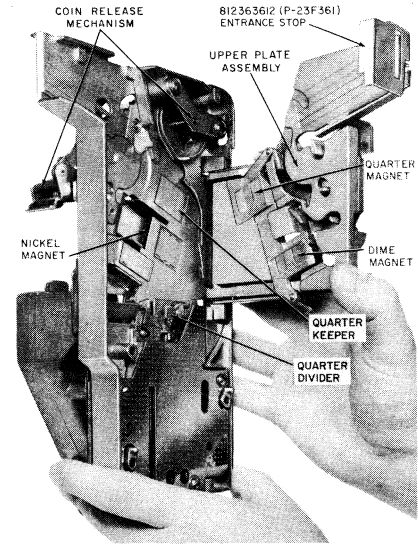
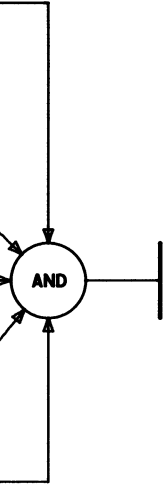


FIG. 1 - Chute

**NOTE 1**  
Reject chute, return chute and coin return assemblies must line up properly

**WARNING 1**  
*If the quarter divider is not positioned properly, it will be damaged when the upper plate assembly is closed. See FIG. 1*

**INSTALL COIN CHUTE**

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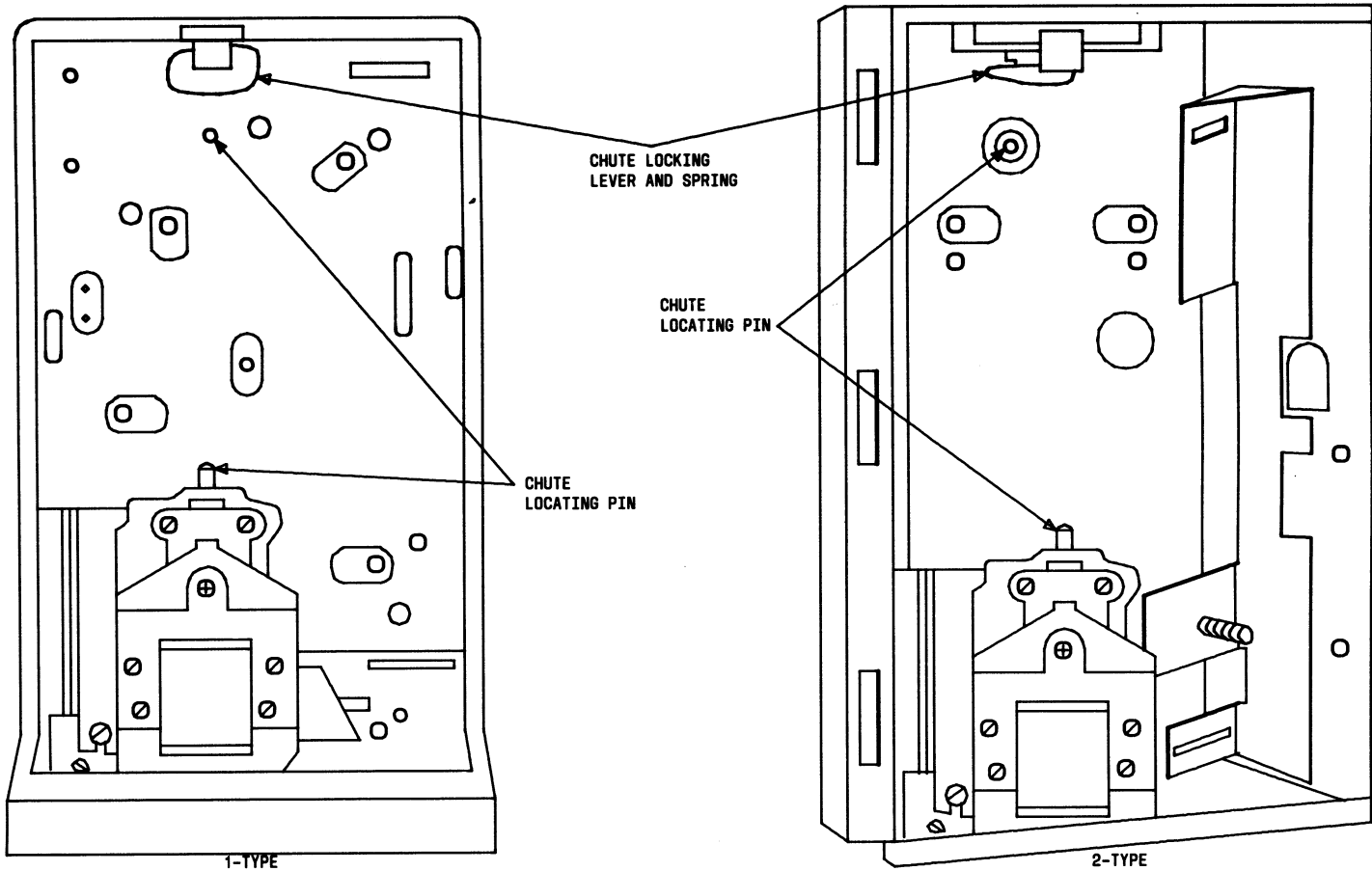
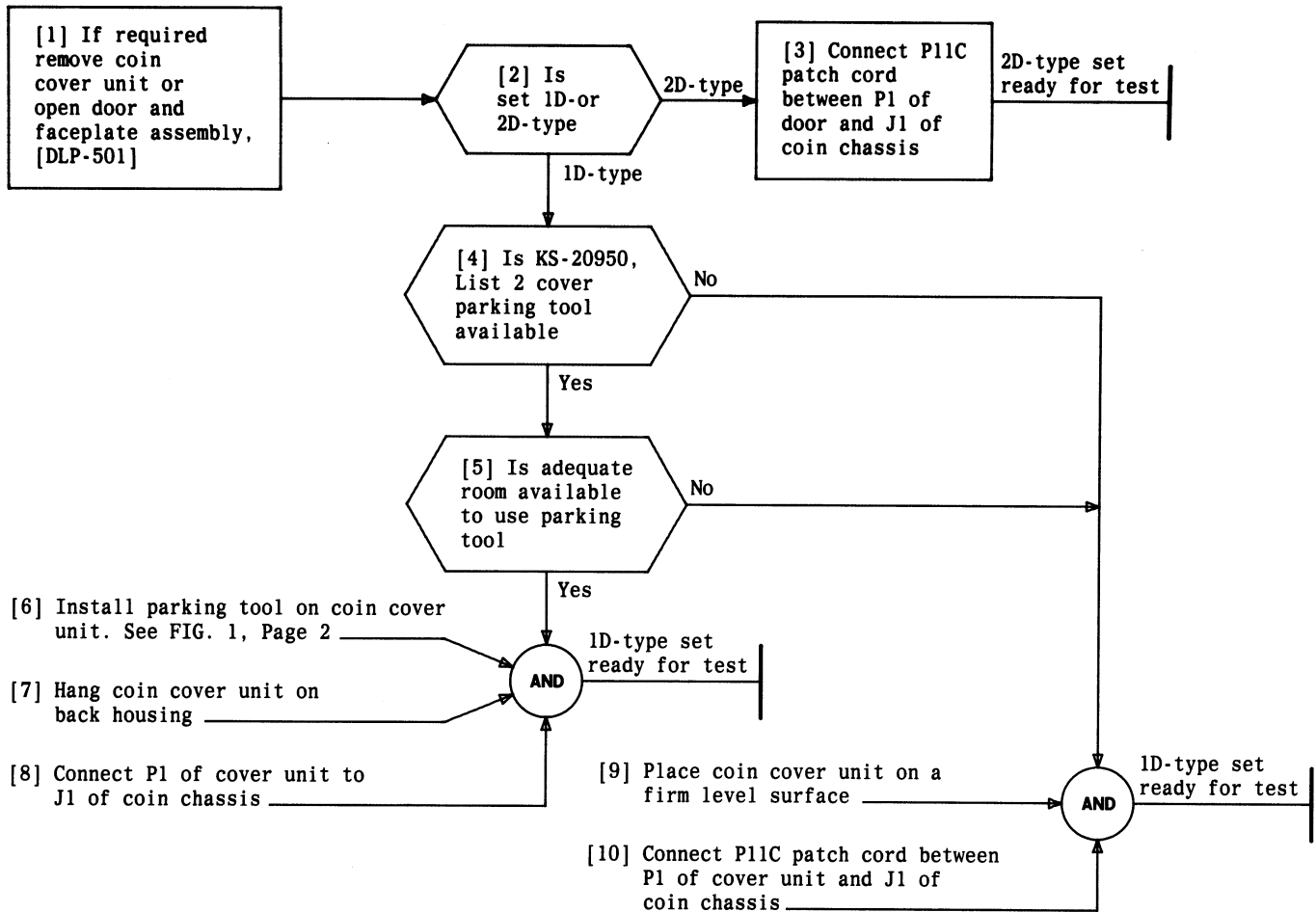


FIG. 2 - Housing and Mounting Plate Assembly

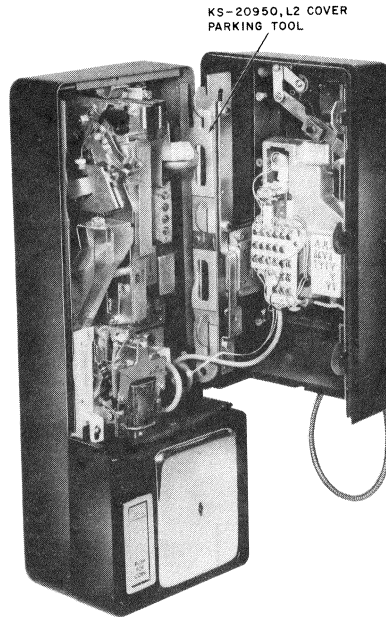
**INSTALL COIN CHUTE**

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**INSTALL KS-20950, LIST 2 COVER PARKING TOOL  
OR P11C PATCH CORD**

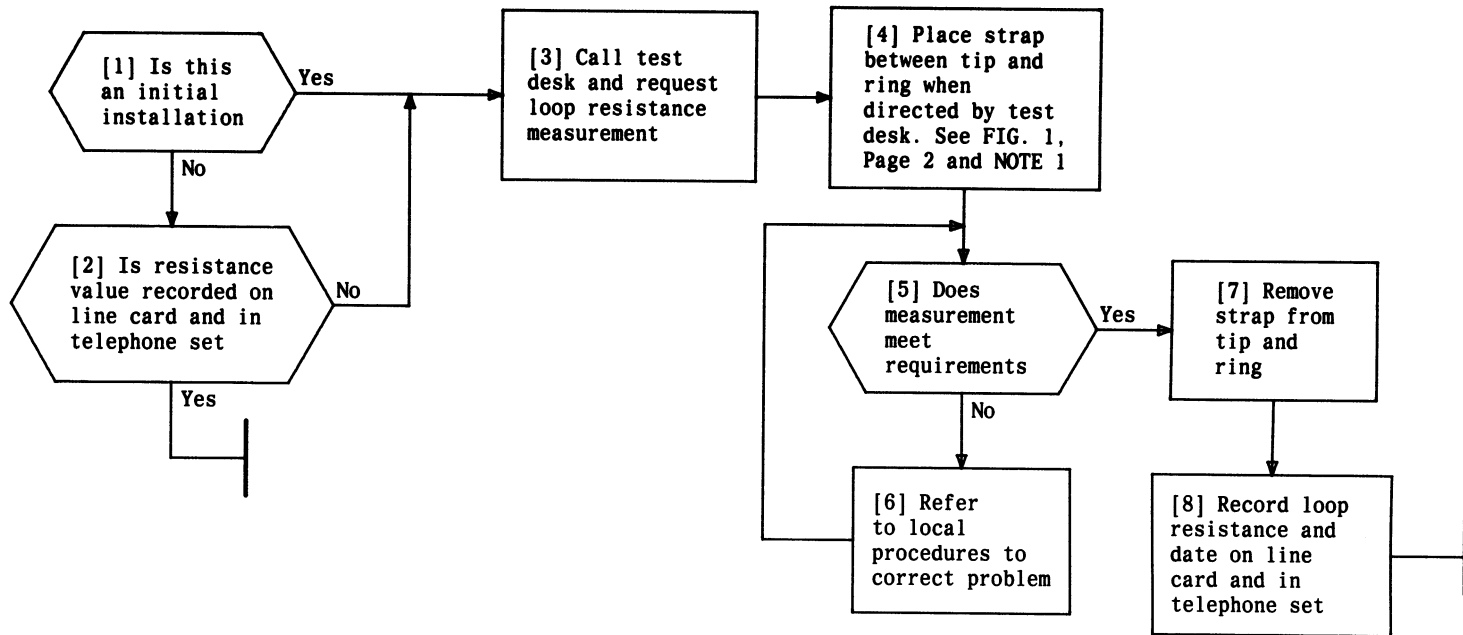
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**FIG. 1 - ID-Type Coin Telephone Set  
With Parking Tool Installed**

**INSTALL KS-20950, LIST 2 COVER PARKING TOOL  
OR P11C PATCH CORD**

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NOTE 1 Hopper trigger must not be operated		
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**MEASURE LOOP RESISTANCE**



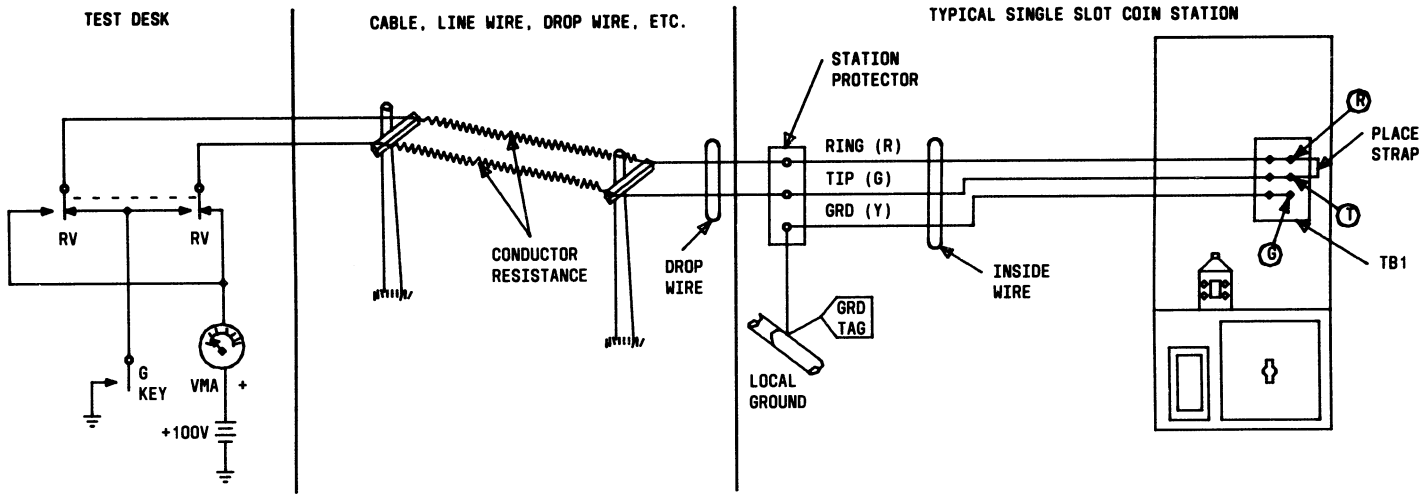
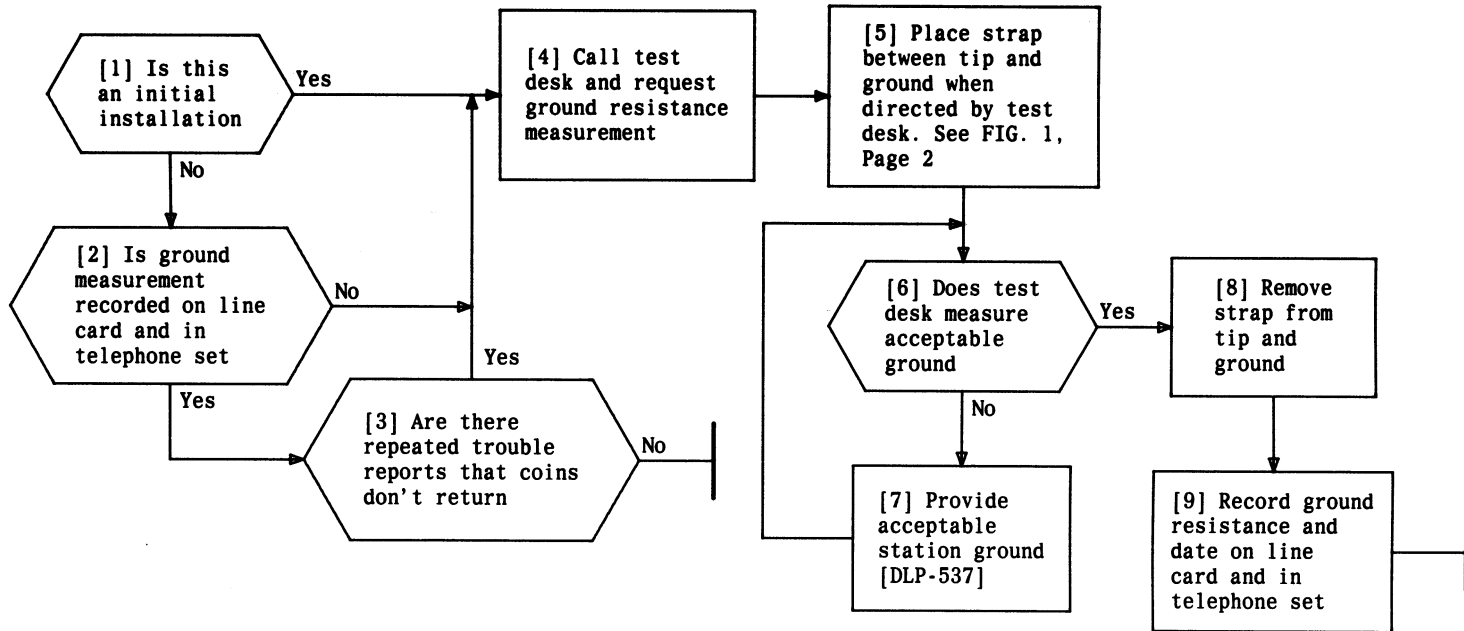


FIG. 1 - Loop Resistance Measurement



**MEASURE GROUND RESISTANCE**

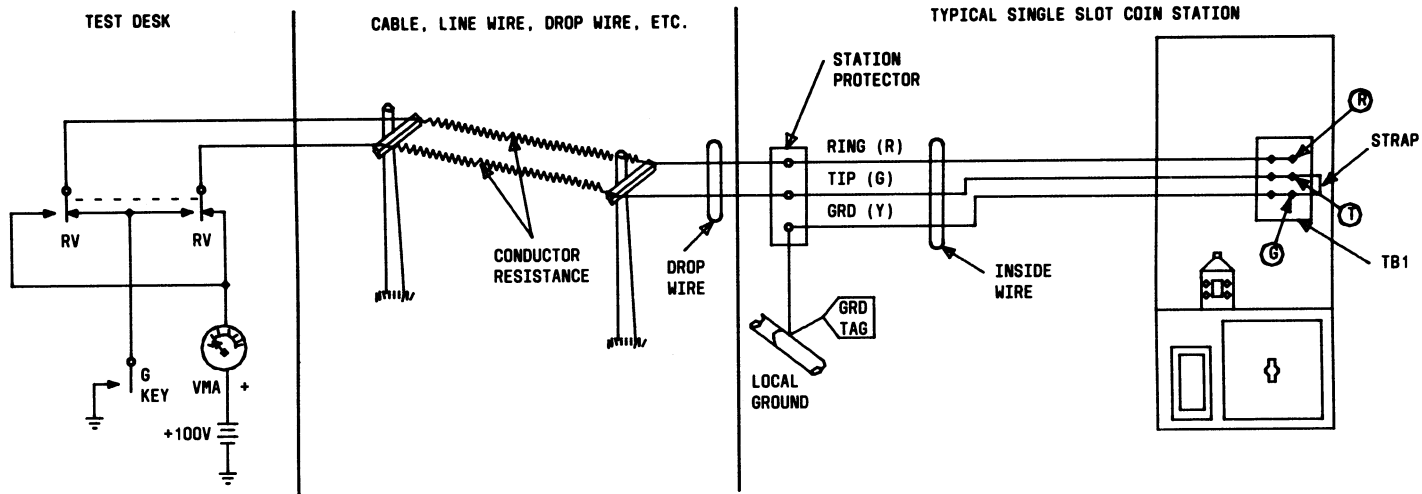
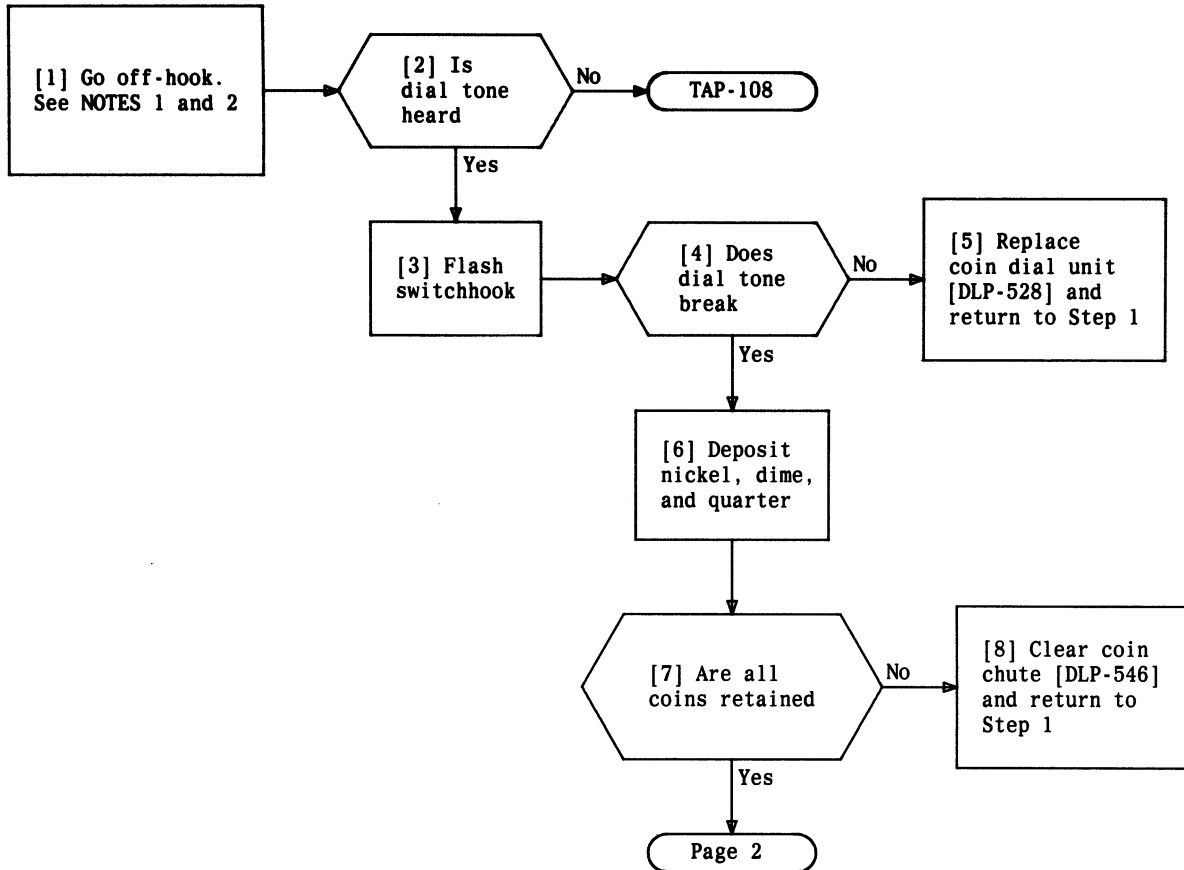


FIG. 1 - Ground Resistance Measurement



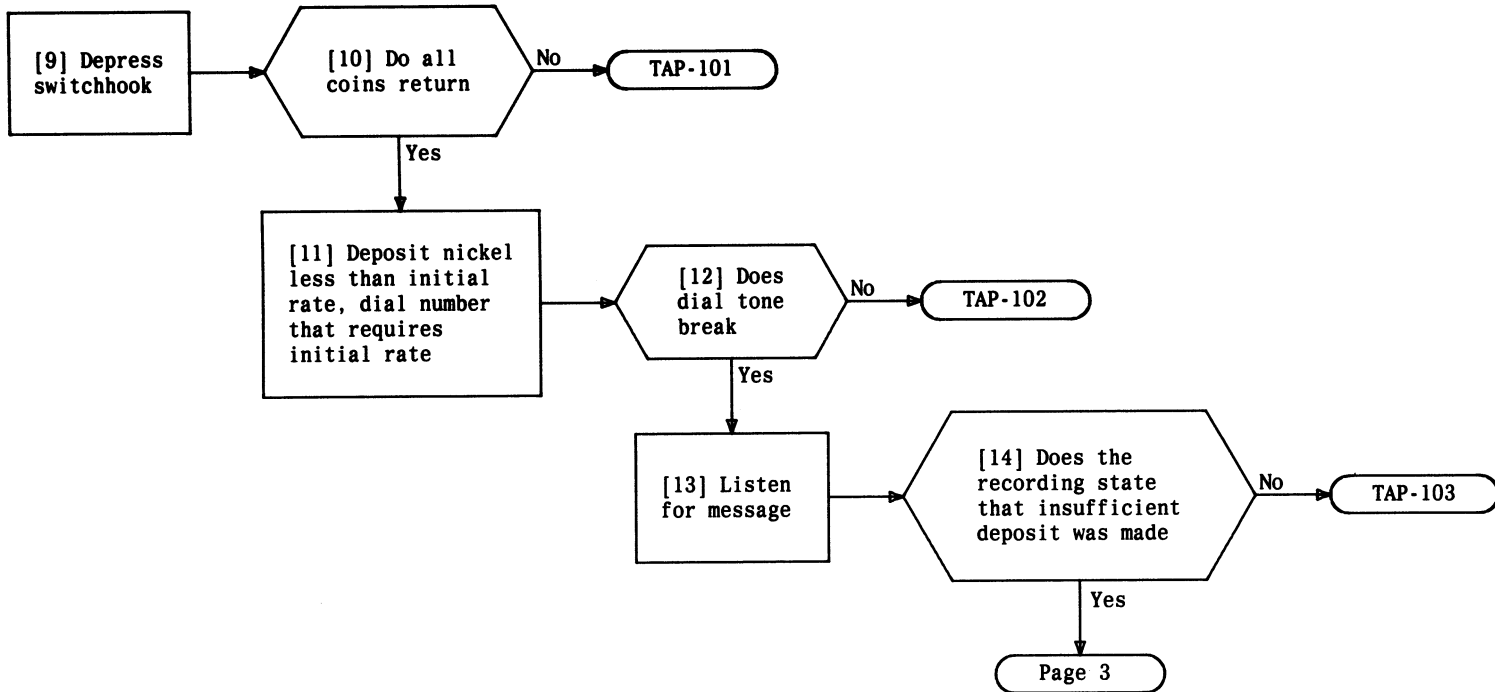
**NOTES**

1. The serving central office must be wired for dial-tone-first and the line circuit associated with the station under test properly wired for loop start prior to performing the following test
2. Any time you leave this DLP to clear trouble you should always return to Step 1 and test again

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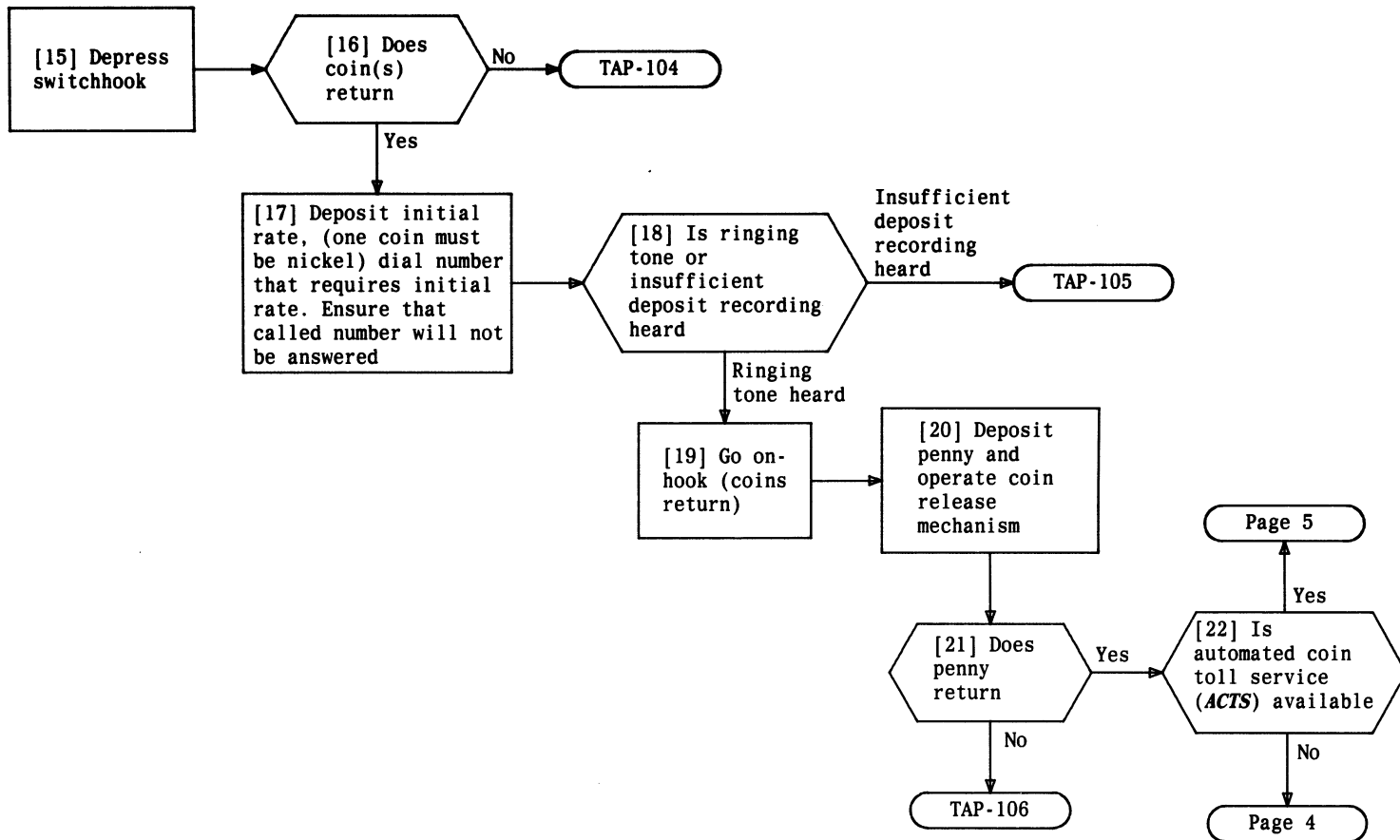
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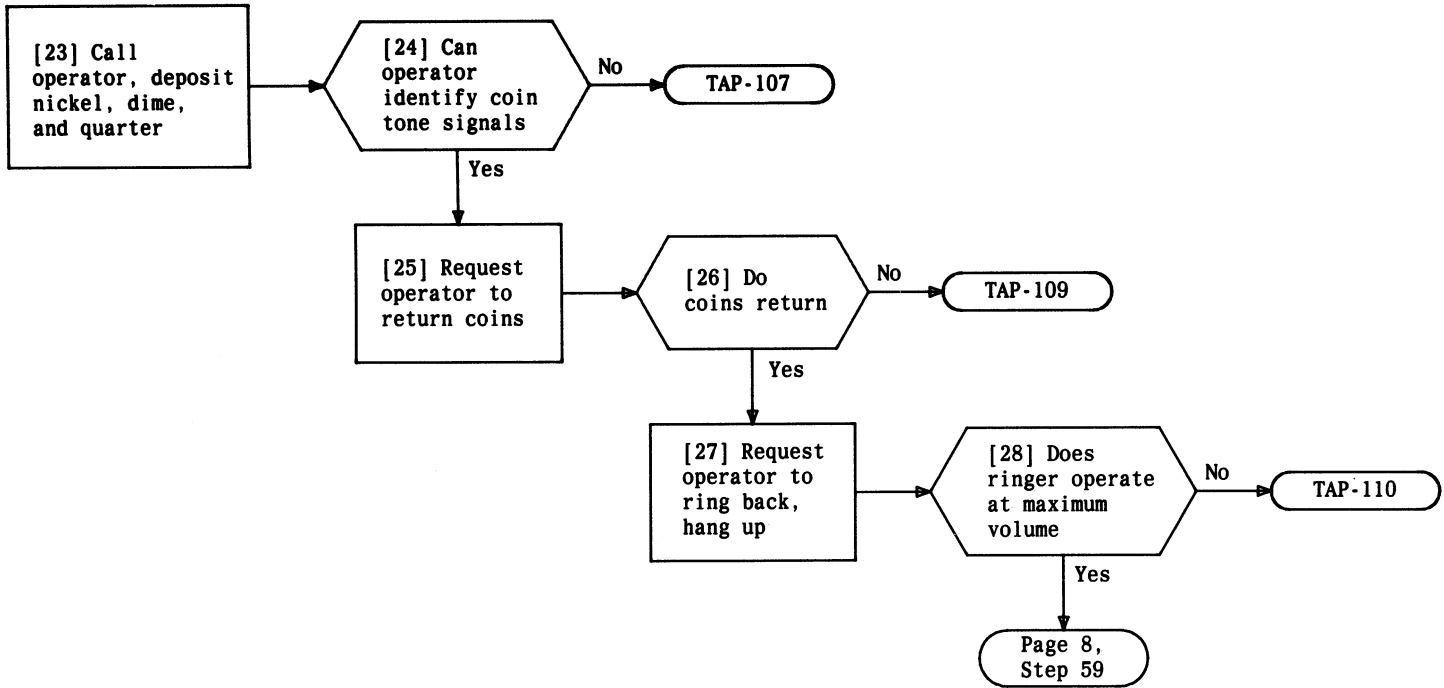
**PERFORM OPERATIONAL TEST**

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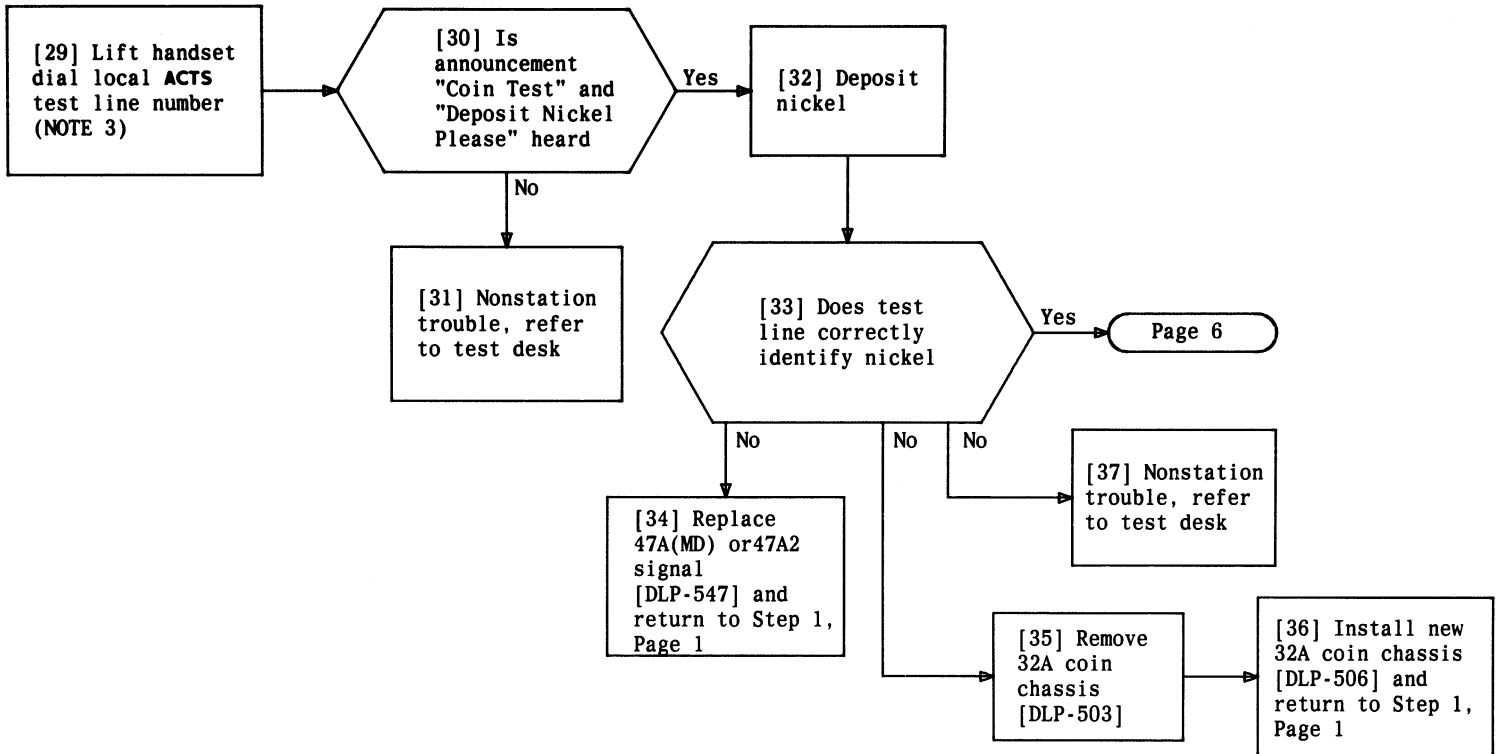
**PERFORM OPERATIONAL TEST**

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**PERFORM OPERATIONAL TEST**

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**NOTE 3**

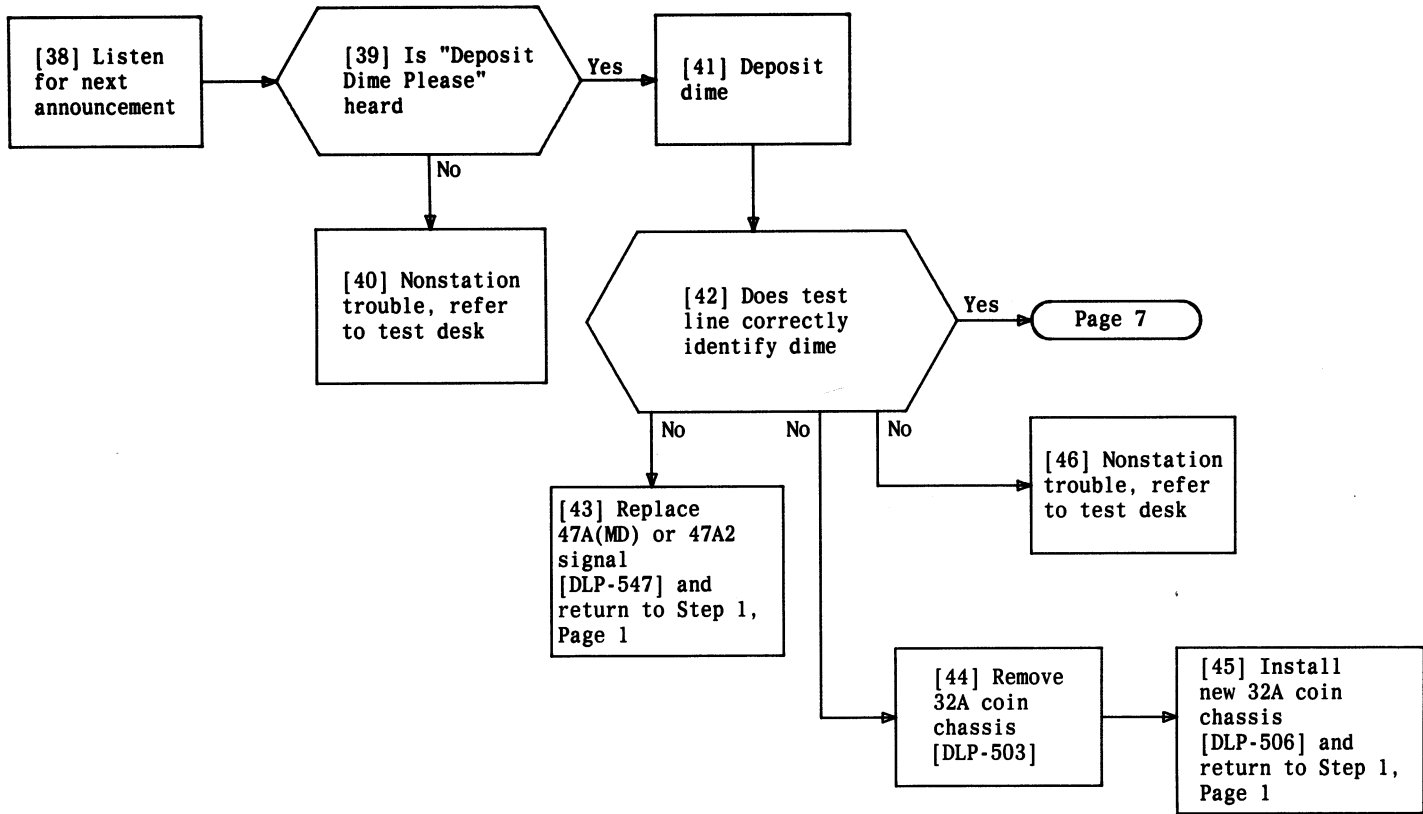
If coin test line is busy recorder tone (120 IPM) will be heard

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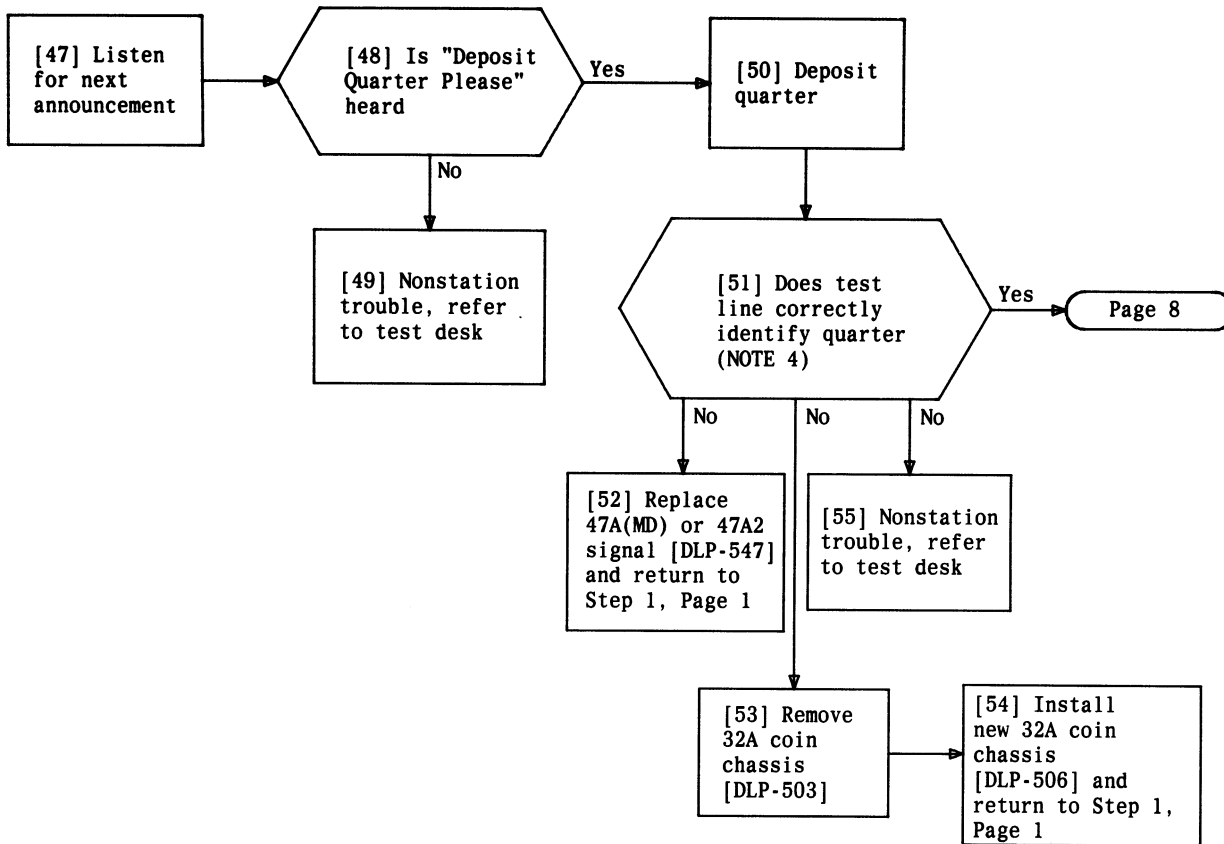
**PAGE 5 of 9** | **511**





**PERFORM OPERATIONAL TEST**

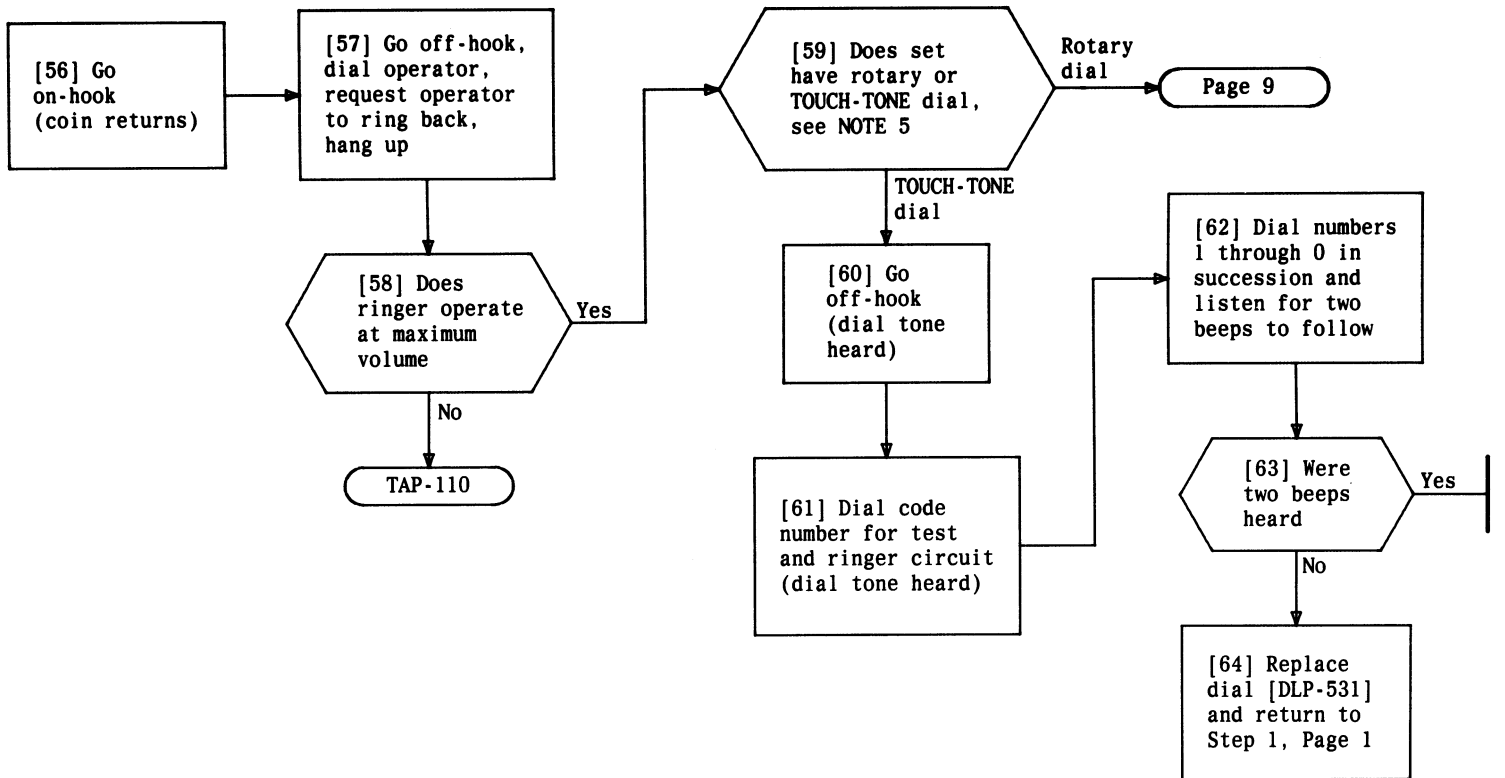
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**NOTE 4**  
 Additional coins can be deposited in any sequence; however, a two minute overall time limit is placed on each test call. If this is exceeded, an announcement "Test Has Ended" will be heard, a coin return signal will be generated, and the connections broken

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**PERFORM OPERATIONAL TEST**



**NOTE 5**

If dial test circuits are not available, be guided by local instructions for testing dials

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**PERFORM OPERATIONAL TEST**

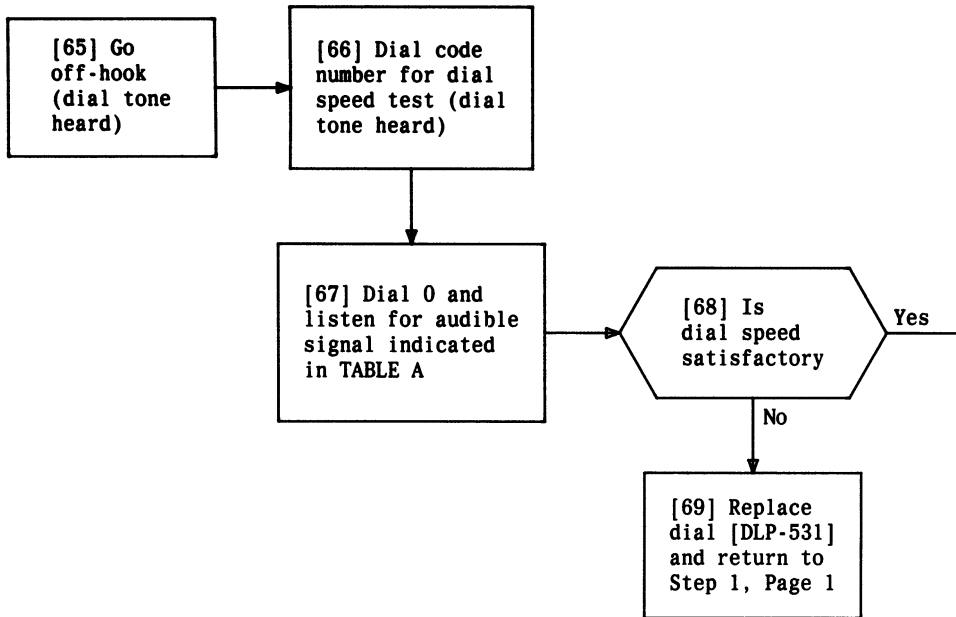
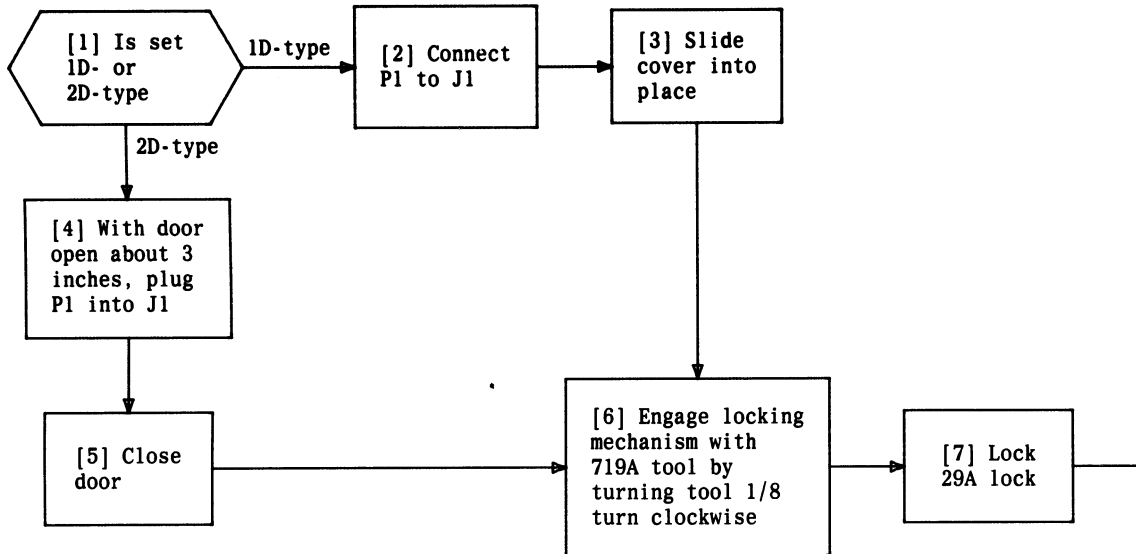


TABLE A	
AUDIBLE SIGNAL HEARD	CONDITION
Audible ringback	Dial speed satisfactory
Rapidly interrupted dial tone	Dial speed fast
Slowly interrupted dial tone	Dial speed slow

**PERFORM OPERATIONAL TEST**



**INSTALL COIN COVER UNIT (1D-TYPE) OR CLOSE DOOR AND  
FACEPLATE ASSEMBLY (2D-TYPE)**

[1] See WARNING 1. Use an allen wrench or KS-21107, List 1 releaser, turn setscrew clockwise until stop is reached. See FIG. 1 and NOTE 1

[2] Turn fingerwheel in a clockwise direction until operator hole is in the 9 position, and lift off

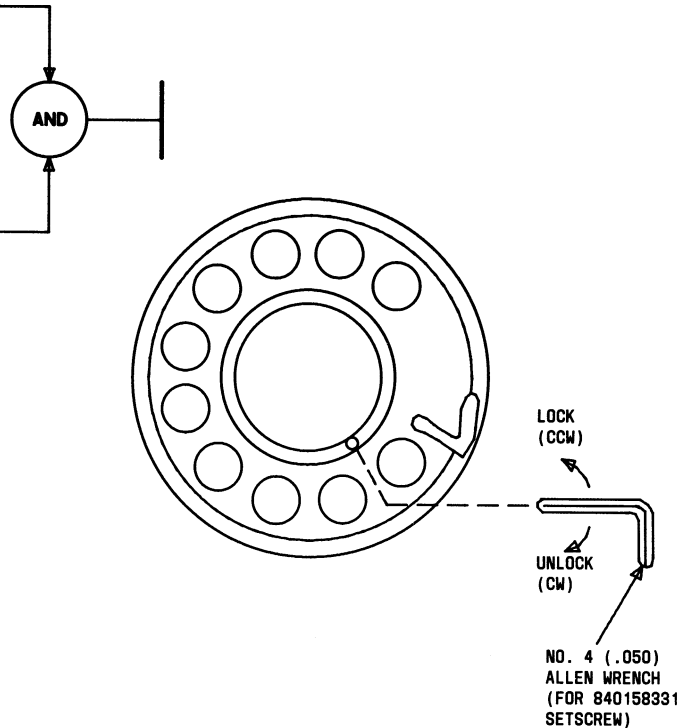


FIG. 1 - Remove Fingerwheel on 8U (MD), 8W(MD), or 8WA Dial

**NOTE 1**

Dial fingerwheel is secured with a No. 4-40 setscrew

**WARNING 1**

*When turning setscrew, 8WA dial must be in the fully run down position to prevent losing the setscrew*

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[1] Ensure that setcrew  
is all the way in,  
clockwise

[2] Place fingerwheel on  
dial with operator hole  
over the 9 position

[3] Rotate the fingerwheel  
counterclockwise until  
in its normal position

[4] Use an Allen wrench or  
KS-21107, List 1 releaser,  
turn setscrew  
counterclockwise until  
stop is reached. See FIG. 1

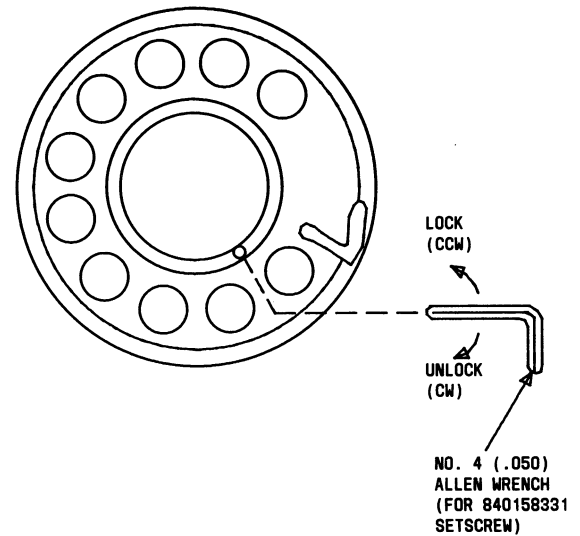
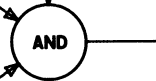


FIG. 1 - Installing Fingerwheel on 8U(MD),  
8W(MD), or 8WA Dial

## INSTALL DIAL FINGERWHEEL

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- [1] Take handset off switchhook
- [2] Remove four self-locking mounting screws. See FIG. 1
- [3] See WARNING 1. Pull coin dial unit away from cover or door and carefully pull handset cord through hole in faceplate. See FIG. 1

COIN DIAL  
UNIT MOUNTING  
SCREWS  
(840157390)

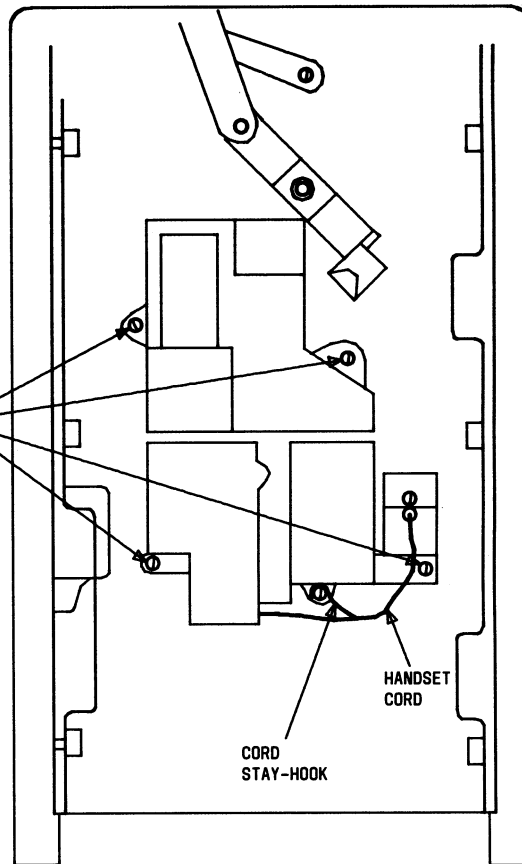


FIG. 1 - Coin Cover Unit

**WARNING 1**

*Armored handset  
cord is attached  
to coin dial unit*

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**DETACH COIN DIAL UNIT (1D2 OR 2D2 SET)**



[1] Insert window in faceplate from rear. See NOTES 1, 2 and FIG. 1

[2] Insert number card in window. See FIG. 2, Page 2

[3] Secure window and number card using card holder bracket and two thread forming nuts. See FIG. 3, Page 2

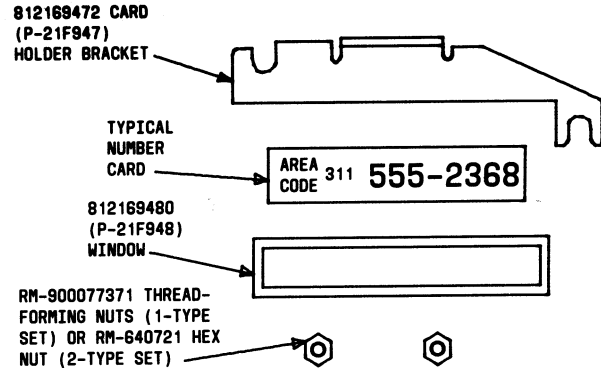
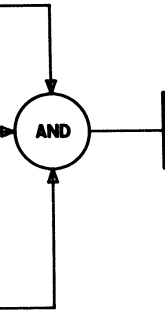


FIG. 1 - Number Card and Associated Hardware (TOUCH-TONE Set)

NOTES

1. Number card furnished locally
2. Card holder bracket, window, and (2) nuts are packaged separately and shipped from the factory in the cash compartment

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INSTALL NUMBER CARD IN 1D2 OR 2D2 COIN TELEPHONE SET

812169480  
(P-21F948)  
WINDOW

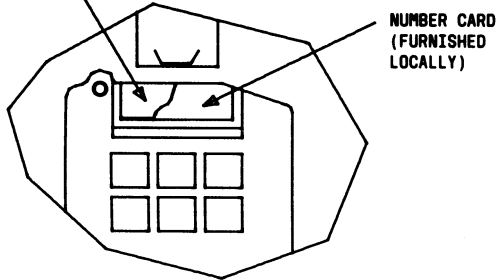


FIG. 2 - Window and Number Card  
Installed in Faceplate  
(TOUCH-TONE Set)

RM-900077371 THREAD-  
FORMING NUTS (1-TYPE  
SET) OR RM-640721 HEX  
NUT (2-TYPE SET)

812169472  
(P-21F947) CARD  
HOLDER BRACKET

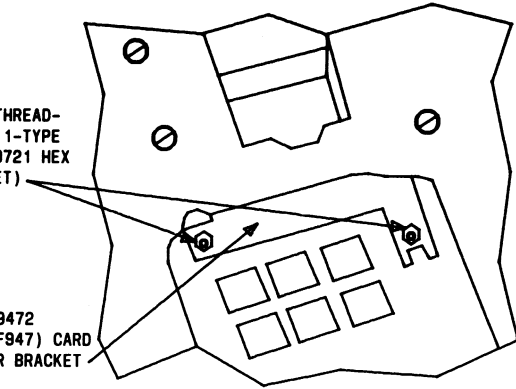


FIG. 3 - Card Holder Bracket Installed  
(TOUCH-TONE Set)

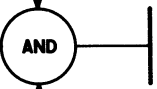
INSTALL NUMBER CARD IN 1D2 OR 2D2 COIN TELEPHONE SET

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[1] Make sure that four handset cradle mounting screws are tight

[2] See WARNING 1. Position coin dial unit by carefully pulling armored handset cord through faceplate from front side

[3] Align and secure coin dial unit using four self-locking mounting screws. See FIG. 1 and NOTE 1



COIN DIAL UNIT MOUNTING SCREWS (840157390)

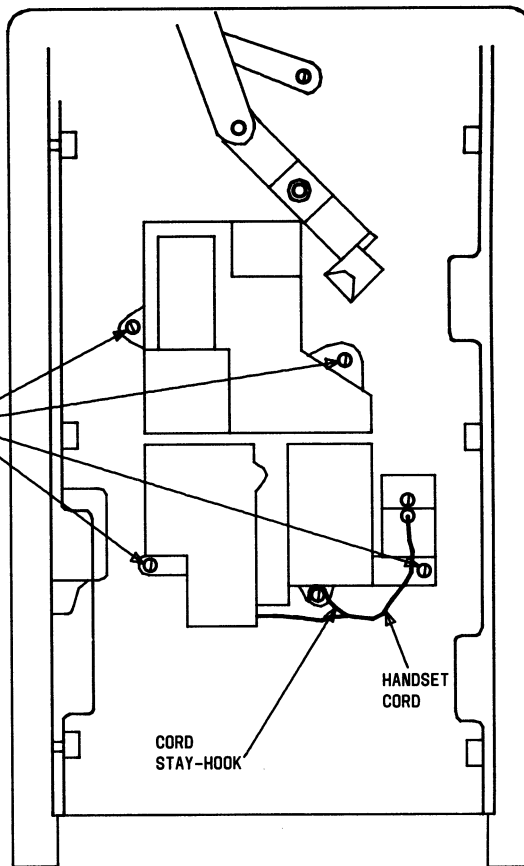
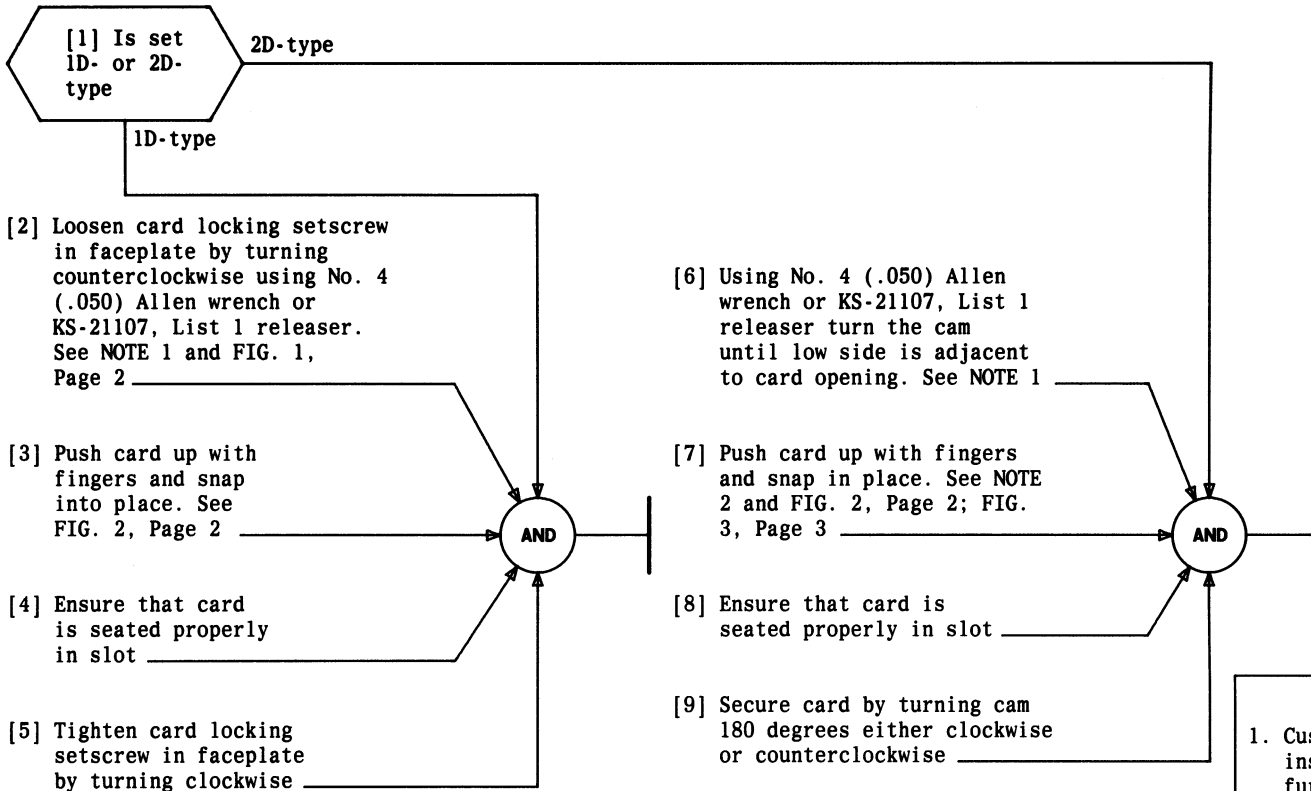


FIG. 1 - Coin Cover Unit

**NOTE 1**  
Coin dial unit mounting screws must be tight to prevent unit from becoming loose due to vibration

**WARNING 1**  
*Armored handset cord is attached to coin dial unit*

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**NOTES**

1. Customer instruction cards furnished locally
2. On early production 2-type sets instruction cards are installed by pushing down

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**INSTALL INSTRUCTION CARDS (1D- OR 2D-TYPE SET)**



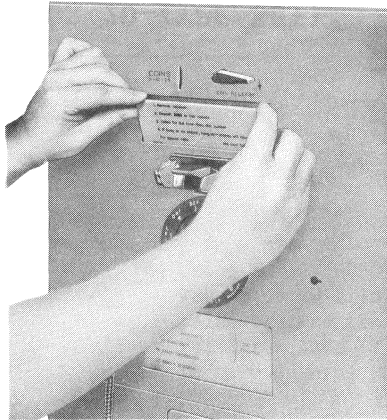
**FIG. 1 - Loosening or Securing  
Instruction Cards  
(Current Production Sets)**



**FIG. 2 - Installing Instruction  
Cards (All 1-Type and  
Current Production 2-Type)**

**INSTALL INSTRUCTION CARDS (1D- OR 2D-TYPE SET)**

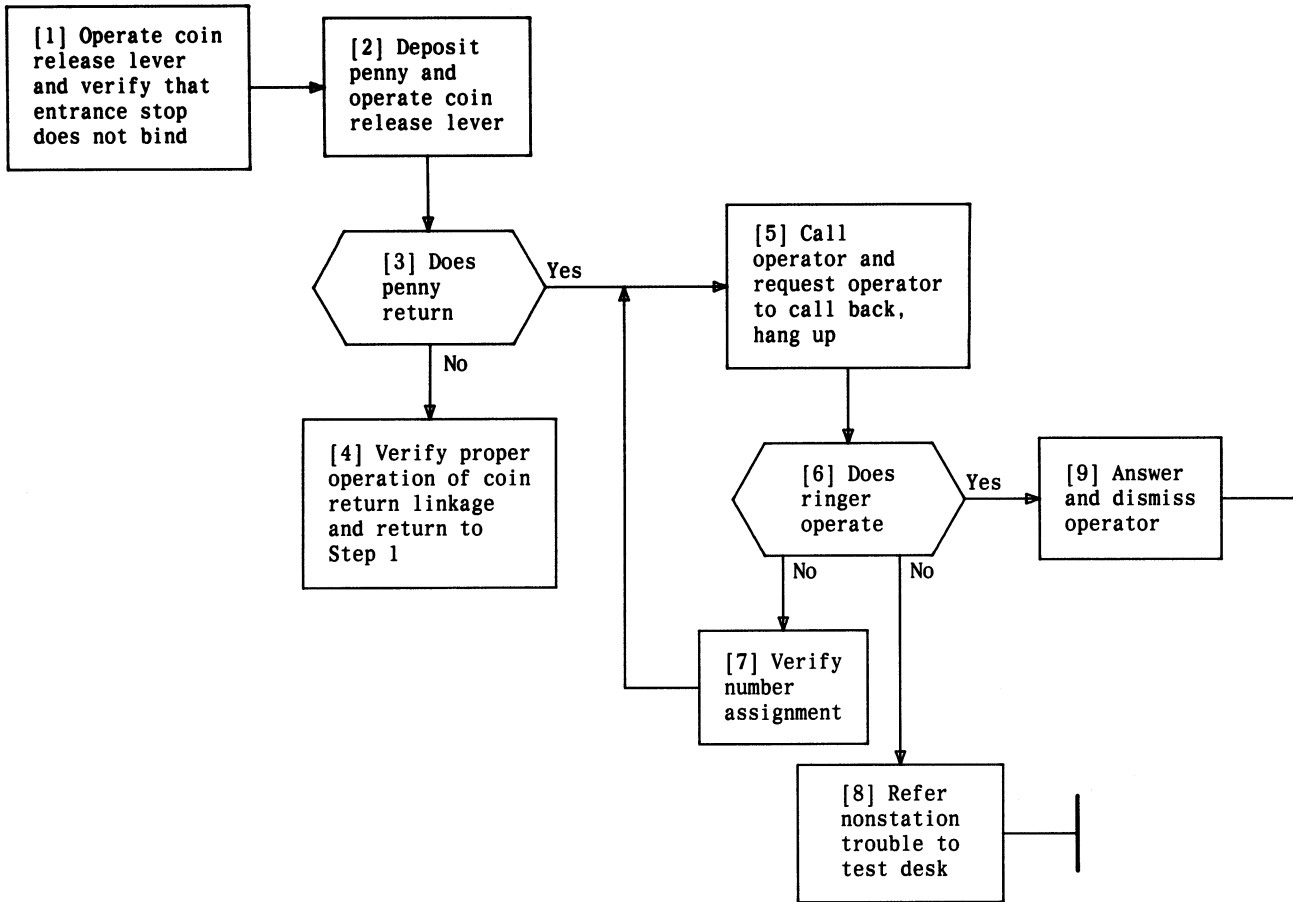
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**FIG. 3 - Installing Instruction Cards  
In Early Production 2-Type  
Set**

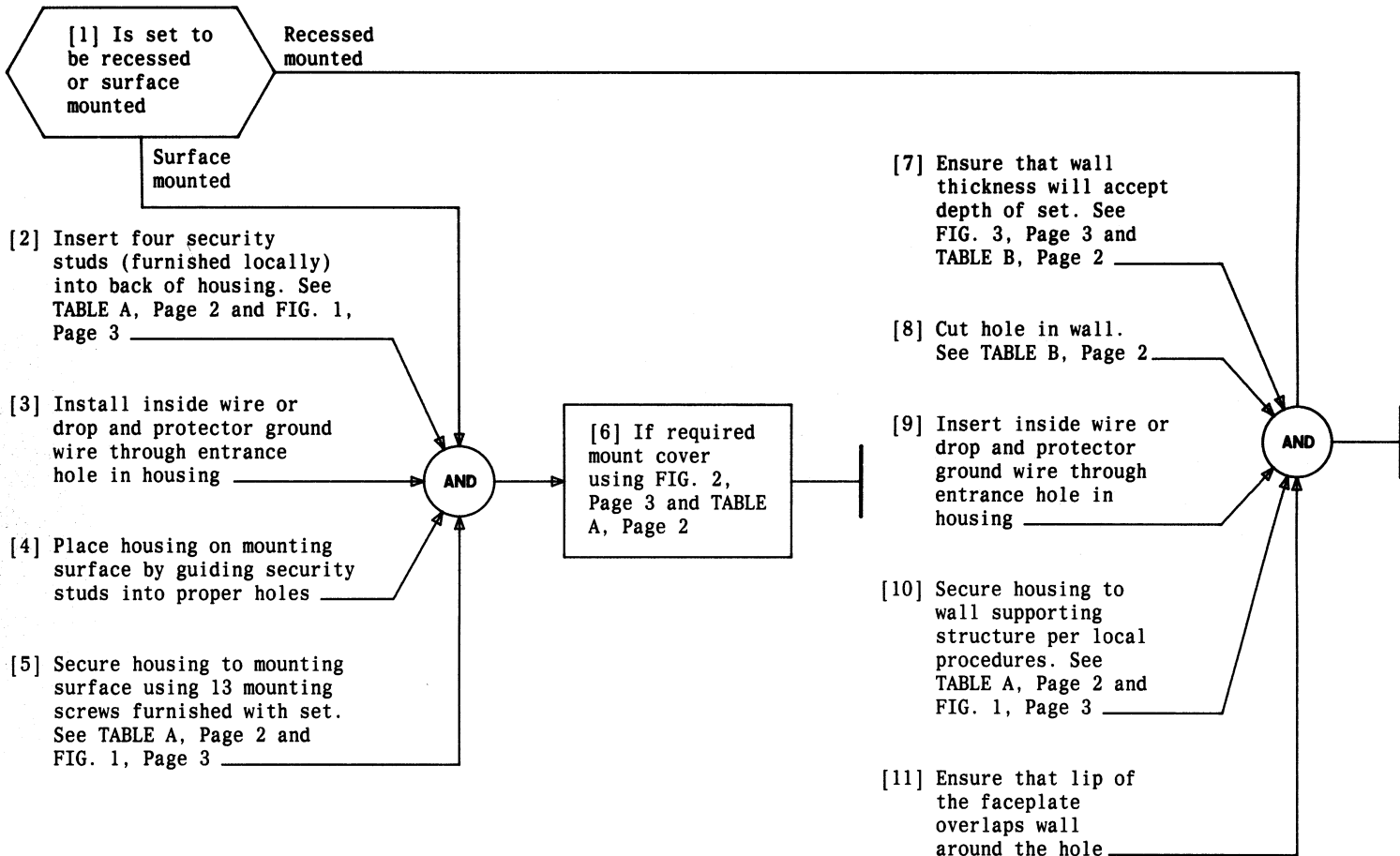
**INSTALL INSTRUCTION CARDS (1D- OR 2D-TYPE SET)**

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**PERFORM COIN RELEASE LEVER AND CALL BACK TEST**

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**ATTACH HOUSING TO MOUNTING SURFACE (2D-TYPE SET)**

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TABLE A			
MOUNTING OF 2D-TYPE SET †			
BOOTH, SHELF, OR MOUNTING	SECURITY STUDS (4 REQUIRED)		COVER REQUIRED*
	834080608 (P-40Y060) (SHORT SHOULDER- SHORT THREAD)	834080616 (P-40Y061) (LONG SHOULDER- SHORT THREAD)	
KS-19206 Booth	•		127B FIG. 2
KS-19340 Booth	•		127B FIG. 2
KS-19426 Mounting		•	KS-19426, List 34 Top Assembly
KS-19442 Booth	•		127B FIG. 2
KS-20194 Shelf	•		
<p>* Three No. 8-32 by 3/16 RHM screw are furnished with cover for installation</p> <p>† Thirteen 1/4-20 by 5/8-inch hardened RHM screws 812367902 (P-23F790) are furnished with each coin telephone set for mounting to backboard</p>			

TABLE B*
Height - 22-25/64 inches
Width - 16-9/64 inches
Depth - 6 inches
* Bottom edge of cutout should be approximately 34 inches from floor for a standard coin slot height of 54 inches

ATTACH HOUSING TO MOUNTING SURFACE (2D-TYPE SET)

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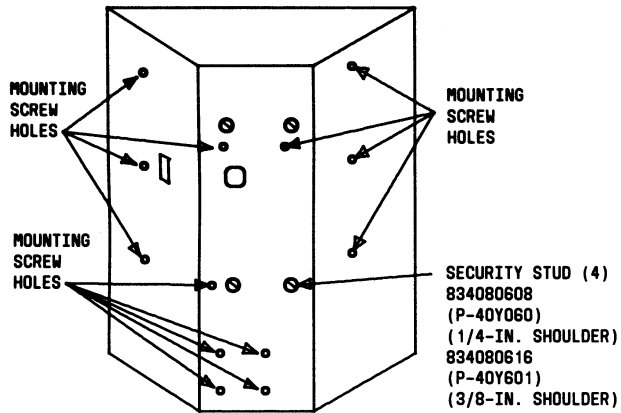
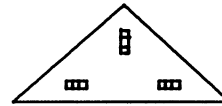
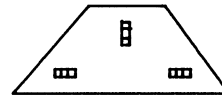


FIG. 1 - Location of Mounting Screw Holes and Security Studs In 2D-Type Set

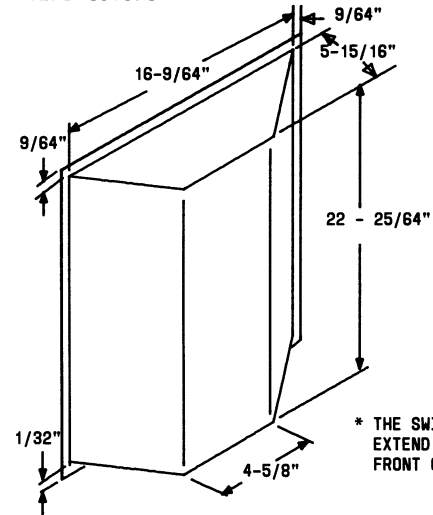


127A - BOTTOM SIDE



127B - BOTTOM SIDE

FIG. 2 - 127A and 127B Covers



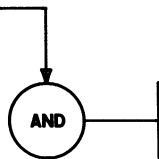
\* THE SWITCHHOOK AND HANDSET EXTEND 2-3/4 INCHES IN FRONT OF THE FACEPLATE

FIG. 3 - Rear View of Panel Set Showing Dimensions\*

ATTACH HOUSING TO MOUNTING SURFACE (2D-TYPE SET)

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[1] See WARNING 1. Unscrew three captive-type screws which attach totalizer to chute



[2] Carefully remove totalizer from chute, see NOTE 1

**REMOVE TOTALIZER FROM COIN CHUTE**

NOTE 1 Disposition of totalizer is optional	
<b>WARNING 1</b> <i>Totalizer arms are easily damaged</i>	
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- [1] Place signal on chute.  
Be sure that short guide pins  
on chute mate with signal  
bracket holes. See FIG. 1

- [2] Tighten two captive  
mounting screws

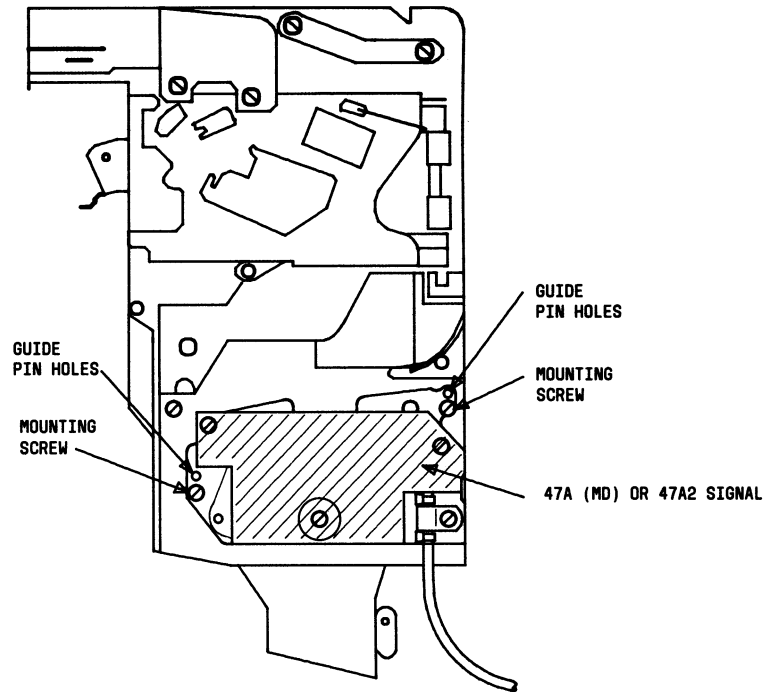
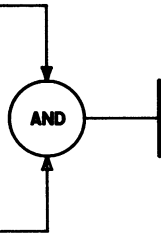


FIG. 1

INSTALL 47A (MD) OR 47A2 SIGNAL ON COIN CHUTE

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[1] Make wiring changes shown in TABLE A or B, Page 2

**TABLE A**  
**ROTARY DIAL TELEPHONE SET CONNECTIONS**

COMPONENT	WIRE COLOR	REMOVE FROM TB2		CONNECT TO TB2	COMPONENT	WIRE COLOR	REMOVE FROM TB2		CONNECT TO TB2
		1A-2A-, 1C-2C-COIN-FIRST MODE	1C-2C- DIAL-TONE-FIRST MODE	1D-2D- DIAL-TONE-FIRST MODE			1A-2A-, 1C-2C-COIN-FIRST MODE	1C-2C- DIAL-TONE-FIRST MODE	1D-2D- DIAL-TONE-FIRST MODE
Dial	BL	9	9	11	S w i t c h h o o k	BR	11	11	10
	BL or G	10	10	8		BR	10	10	10
	W	2	2	4		O	10	10	9
	W	3	3	3		O	11	11	8
	Y	9	*	10		W	8	8	2
	Y	9	13	13		Y	3	3	7
Handset	W	2	2	4		G	13	9	12
	R	3	3	3		S	9	9	12
	BK	6	6	6		S-W	-	-	14†
	W	8	8	7		R‡	12	12	12
Strap	S	1 to 4	1 to 4	2 to 3					

\* Terminal 9 on 819042748 (P-90D274) and 840152227 dial and housing assemblies  
Terminal 12 on 841317241 and 841317258 dial and housing assemblies

† Terminal 14 appears on new 60A coin dial unit only

‡ (R) Switchhook lead does not appear on 819042748 (P-90D274) dial and housing assembly

**MAKE WIRING CHANGES ON TB2**

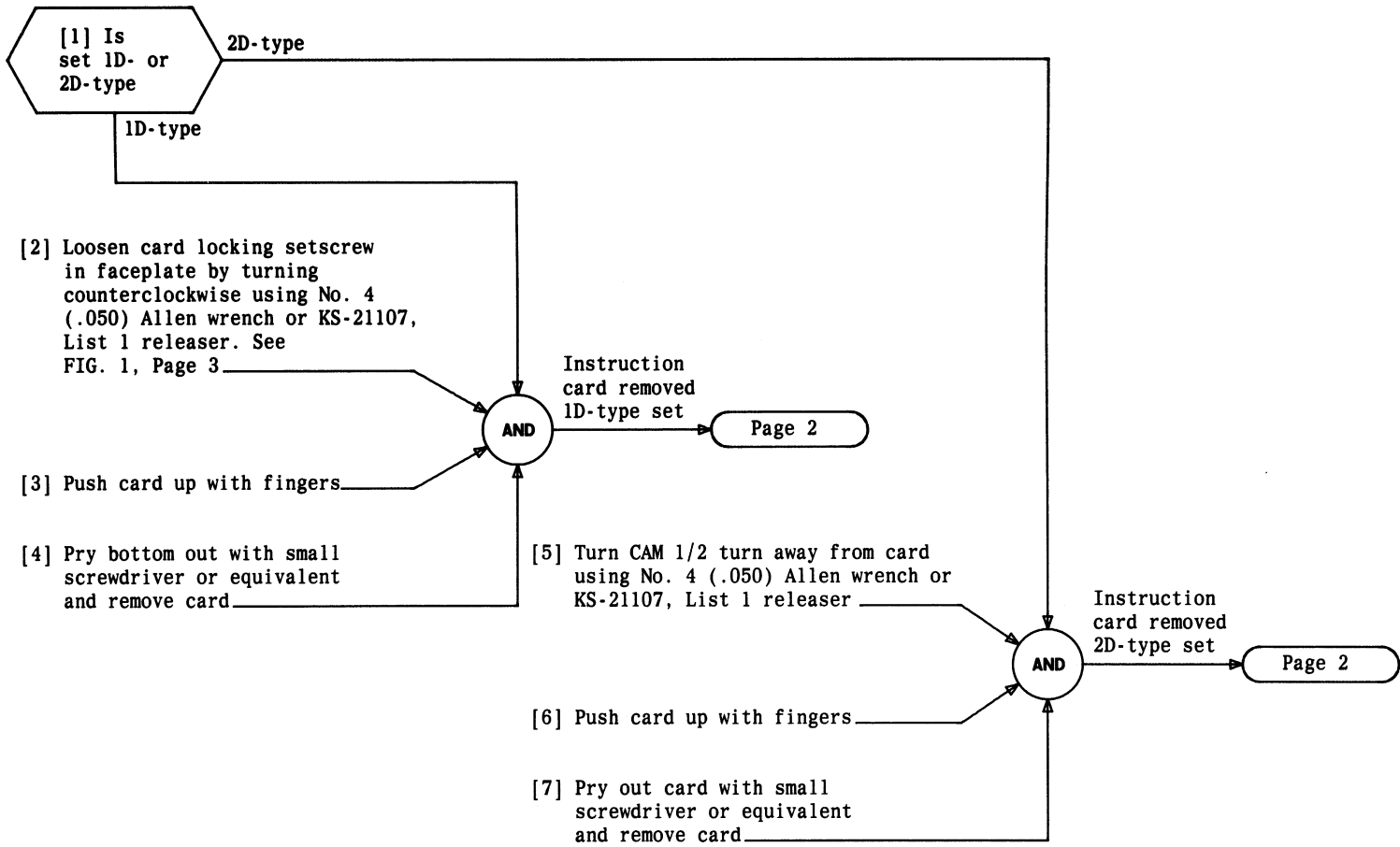
TABLE B

## "TOUCH-TONE" DIAL TELEPHONE SET CONNECTIONS

COMPONENT	WIRE COLOR	REMOVE FROM TB2		CONNECT TO TB2	COMPONENT	WIRE COLOR	REMOVE FROM TB2		CONNECT TO TB2
		1A-2A-, 1C-2C-COIN-FIRST MODE	1C-2C- DIAL-TONE-FIRST MODE	1D-2D- DIAL-TONE-FIRST MODE			1A-2A-, 1C-2C-COIN-FIRST MODE	1C-2C- DIAL-TONE-FIRST MODE	1D-2D- DIAL-TONE-FIRST MODE
70A(MD) or 70B Dial	G	4	4	1	S w i t c h h o o k	BR	11	11	11
	W	2	2	4		BR	9	9	9
	R	5	5	3		O	9	9	9
	R-G	6	6	2		O	11	11	11
	BK	1	1	1		W	8	8	8
	O-BK	11	11	10		Y	3	3	3
	O-R	10	10	5		G	13	9	12
	W-BL	7	7	7		S	9	9	12
	O-W	10	*	10		S-W	-	-	14†
	V	10	13	13		R	12	12	12
Handset	W	7	7	7					
	R	3	3	3					
	BK	5	5	6					
	W	8	8	8					

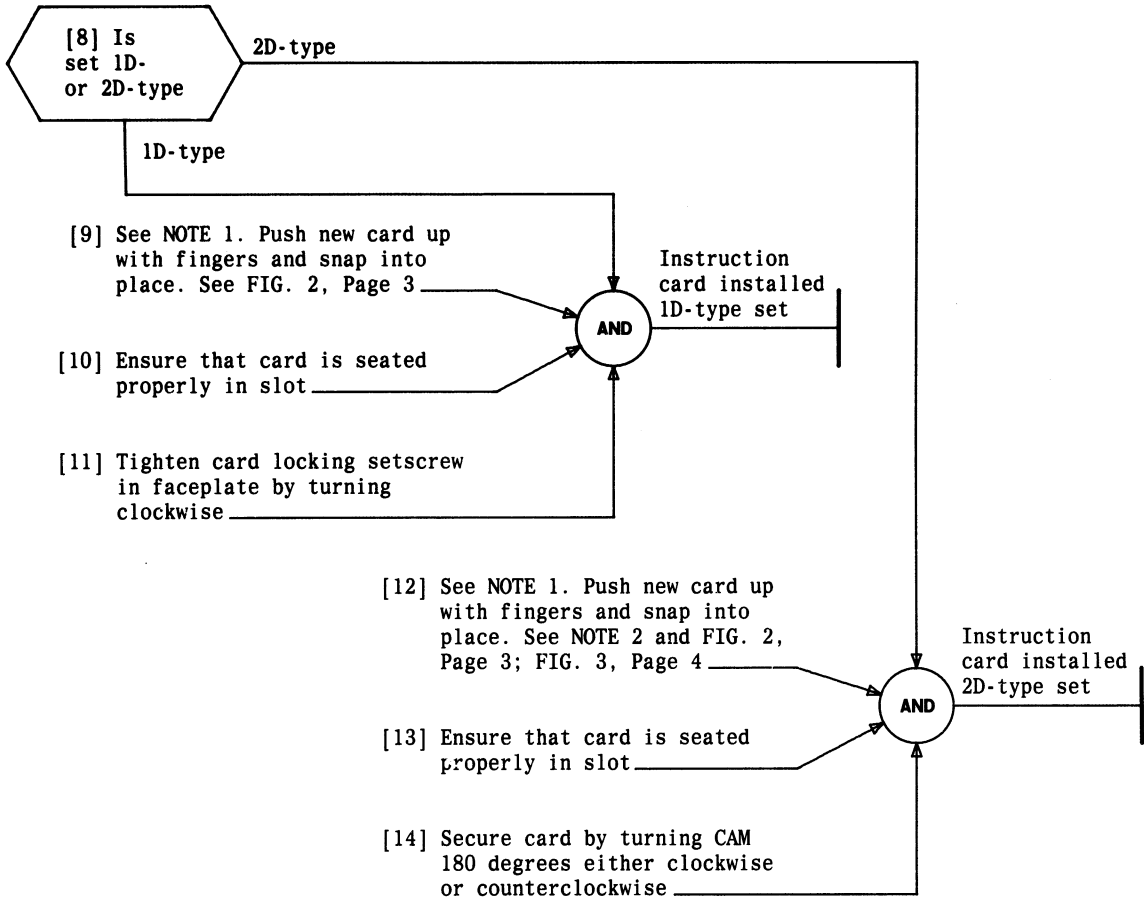
- \* Terminal 9 on 840155402, 840155394, or 840346977 (manufactured before 8-74) dial and housing assemblies.  
 \* Terminal 12 on 840347173, 61A, or 840346977 (manufactured after 8-74) dial and housing assemblies.  
 † Terminal 14 appears on new 61A coin dial unit only

MAKE WIRING CHANGES ON TB2



**REPLACE INSTRUCTION CARDS**

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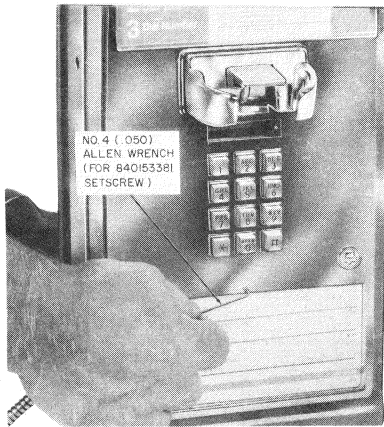
**NOTES**

1. Customer instruction cards furnished locally
2. On early production 2-type sets instruction cards are installed by pushing down

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**REPLACE INSTRUCTION CARDS**





**FIG. 1 – Loosening or Securing Instruction Cards  
(Current Production Sets)**



**FIG. 2 – Installing Instruction Cards (All 1-Type and  
Current Production 2-Type Sets)**

**REPLACE INSTRUCTION CARDS**

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**FIG. 3 - Installing Instruction Card In Early  
Production 2-Type Set**

**REPLACE INSTRUCTION CARDS**

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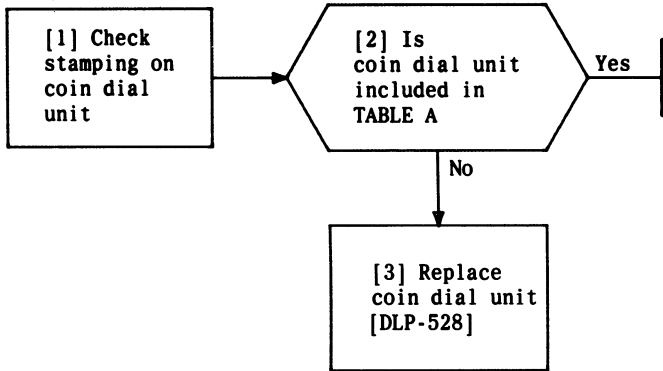
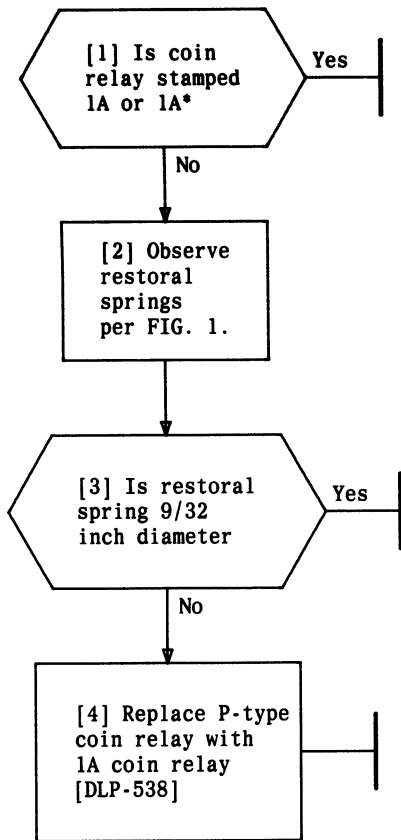
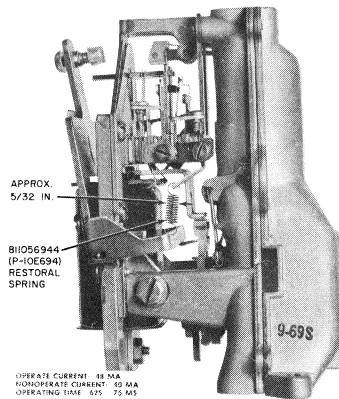


TABLE A	
COIN DIAL UNIT	
ROTARY DIAL SET	"TOUCH-TONE" DIAL SET
60A	61A
841317241	840346977
841317258	840347173
819042748 (P-90D274)	840155402
840152227	840155394

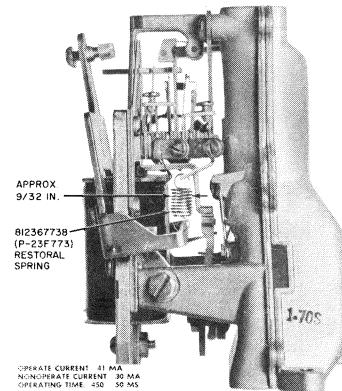
**VERIFY COMPATIBILITY OF COIN DIAL UNIT  
WITH 1D- OR 2D-TYPE SET**



**NONCOMPATABLE RELAY**



**COMPATABLE RELAY**



**FIG. 1 - Coin Relays**

**VERIFY COMPATIBILITY OF COIN RELAY**

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[1] See WARNING 1. Use Allen wrench or K5-21107, List 1 releaser, turn setscrew clockwise until stop is reached. See FIG. 1.

[2] Turn fingerwheel in a clockwise direction until operator hole is in the 9 position, and lift off.

Fingerwheel removed

AND

[3] If required replace number card. See NOTE 1

[4] Ensure that setscrew is all the way in clockwise.

[5] Place new fingerwheel on dial with operator hole over position 9.

[6] Rotate fingerwheel counterclockwise until in its normal position.

[7] Use Allen wrench or KS-21107, List 1 releaser, turn setscrew counterclockwise until stop is reached. See FIG. 1.

Fingerwheel installed

AND

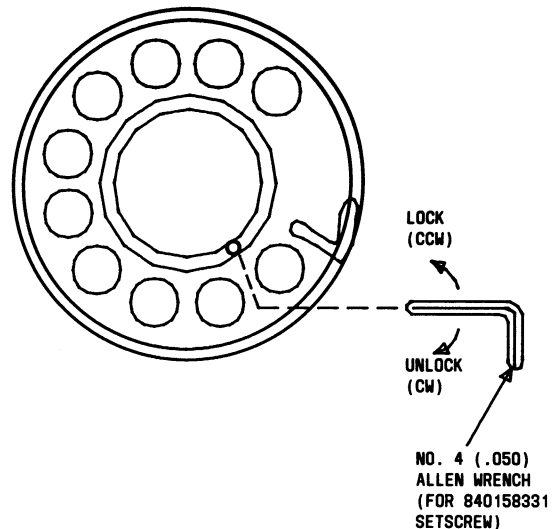


FIG. 1 - Replacing (840151872) Fingerwheel on 8U (MD), 8W (MD), or 8WA Dial

**REPLACE FINGERWHEEL AND/OR NUMBER CARD  
(1D1- OR 2D1-TYPE TELEPHONE SET)**

NOTE 1 Number card furnished locally	
<i>WARNING 1</i> When turning setcrew, dial must be in the fully run down position to prevent losing the setcrew	
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[1] If required, remove coin cover unit (ID-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Take handset off switchhook

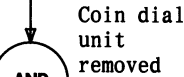
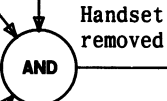
[3] Disconnect (R), (BK), and two (W) handset leads from TB2 on rear of coin dial unit

[4] Loosen stay-hook screw and move handset cord aside. See FIG. 1

[5] Remove screw and coverplate which secure handset cord to dial housing. See FIG. 1

[6] Remove four self-locking coin dial unit mounting screws. See FIG. 1

[7] Remove coin dial unit



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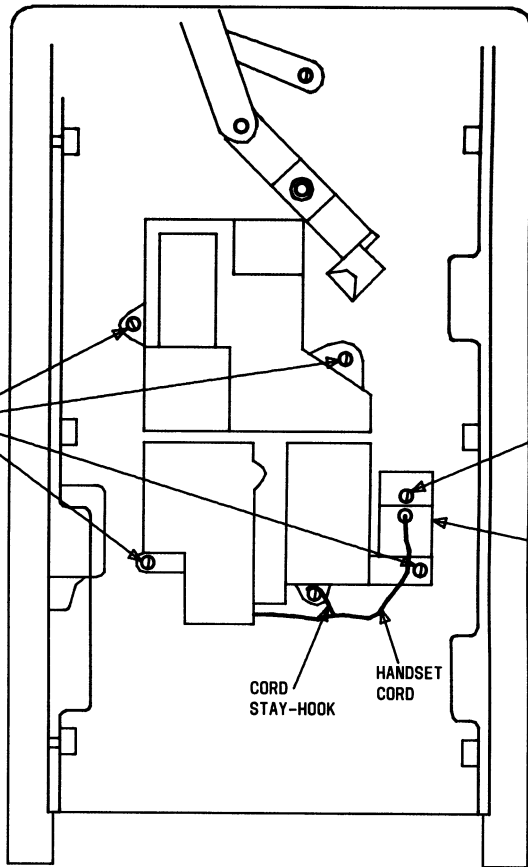


FIG. 1 - Coin Cover Unit

**REPLACE COIN DIAL UNIT**

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- [8] Make sure that four handset cradle mounting screws are tight
- [9] See TABLE A. Feed handset cord through opening in new coin dial unit
- [10] Position new coin dial unit and secure using four mounting screws. See NOTE 1
- [11] Feed armored handset cord through coverplate
- [12] Install coverplate and stayhook
- [13] Connect handset leads per TABLE B
- [14] If required, make wiring changes per DLP-523

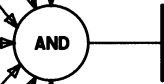


TABLE A	
COIN TEL SET	COIN DIAL UNIT*
1D1	60A3-44, 60A2-44, or 841317241
1D2	61A3-44, 61A2-44, or 840346977
2D1 (Brushed Stainless)	60A3-44, 60A2-44 (Chrome), or 841317241
2D1 (Bronze)	60A3-84, 60A2-84, (Bronze), or 841317258
2D2 (Brush Stainless)	61A3-44, 61A2-44, (Chrome), or 840346977
2D2 (Bronze)	61A3-84, 61A2-84, (Bronze), or 840347173
* 60A3- or 61A3- coin dial units are preferred for replacement	

TABLE B		
COMPONENT	WIRE COLOR	CONNECT TO TB2
Handset (Rotary Set)	W	4
	R	3
	BK	6
	W	7
Handset (TOUCH-TONE Set)	W	7
	R	3
	BK	6
	W	8

NOTE 1	
Four coin dial unit mounting screws must be tight to prevent unit from becoming loose due to vibration	
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**REPLACE COIN DIAL UNIT**

[1] If required,  
remove coin cover  
unit (1D-type set) or  
open door and faceplate  
assembly (2D-type set)  
[DLP-501]



[2] If required,  
install KS-20950,  
List 2 cover parking  
tool or P11C patch  
cord [DLP-508]

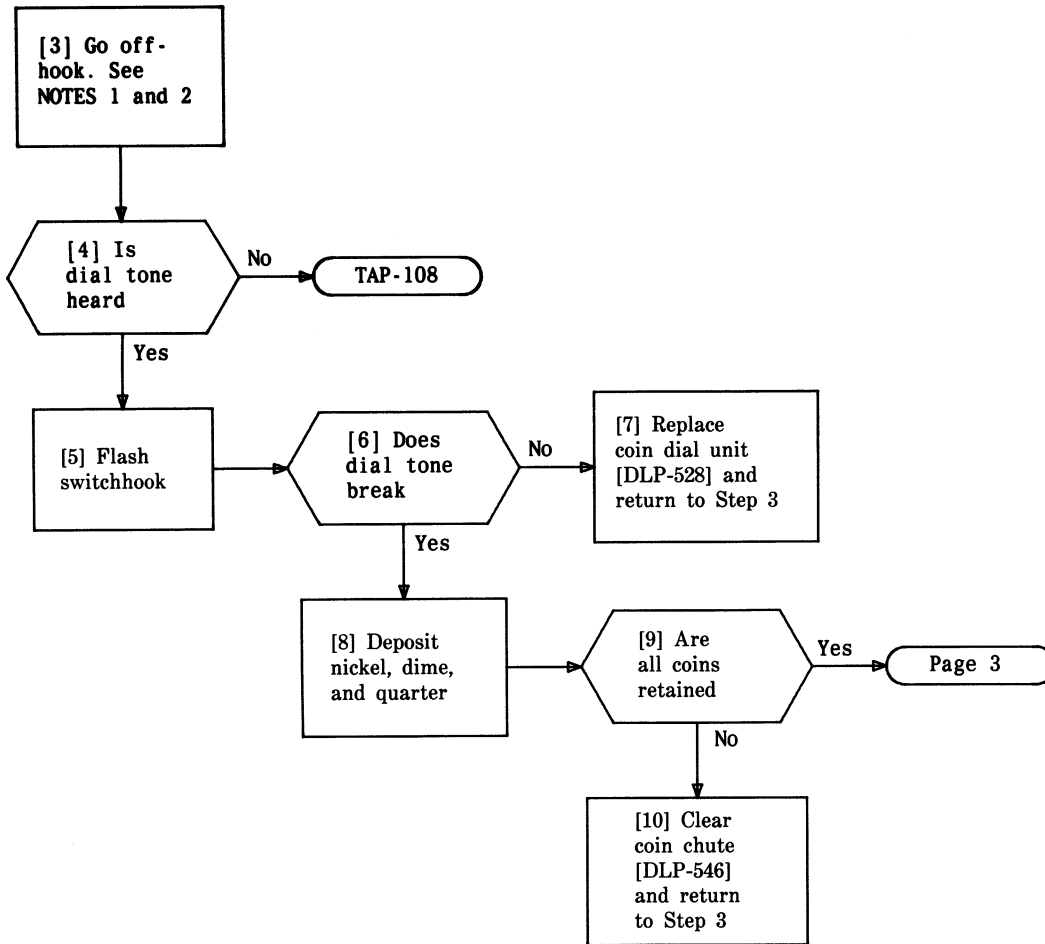


Page 2

**PERFORM TROUBLE TEST**

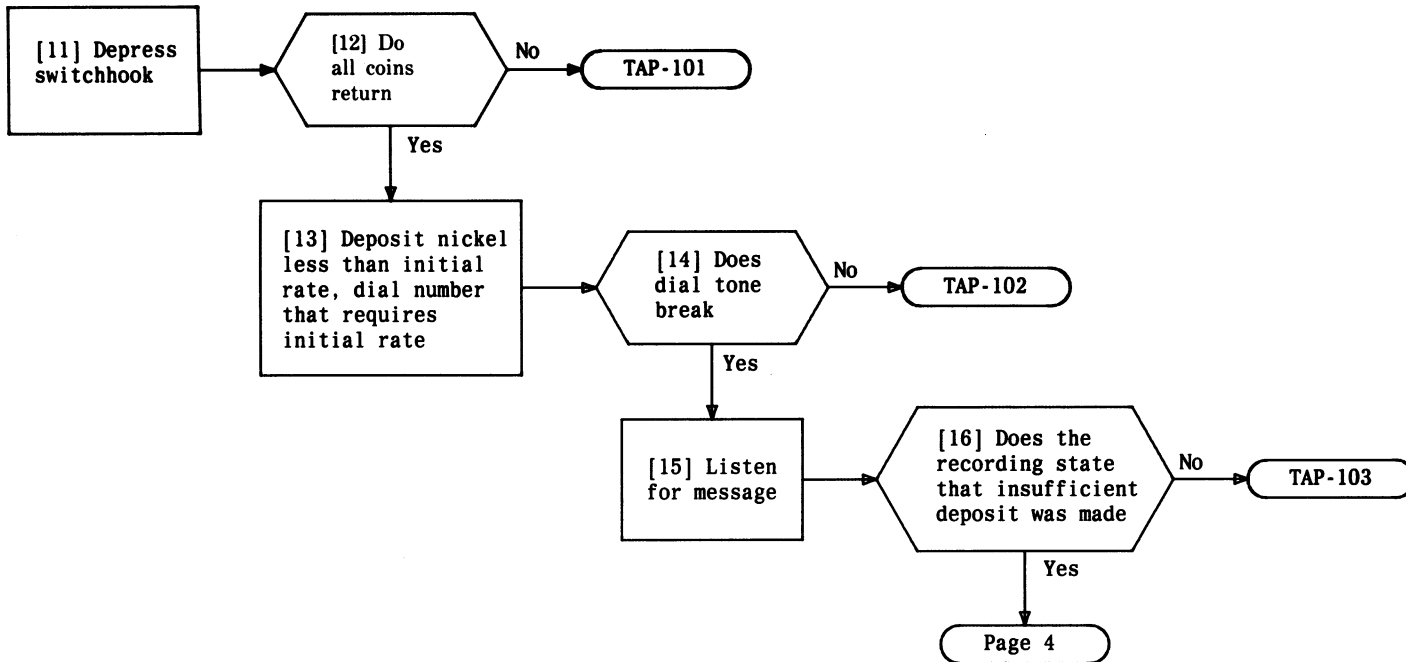
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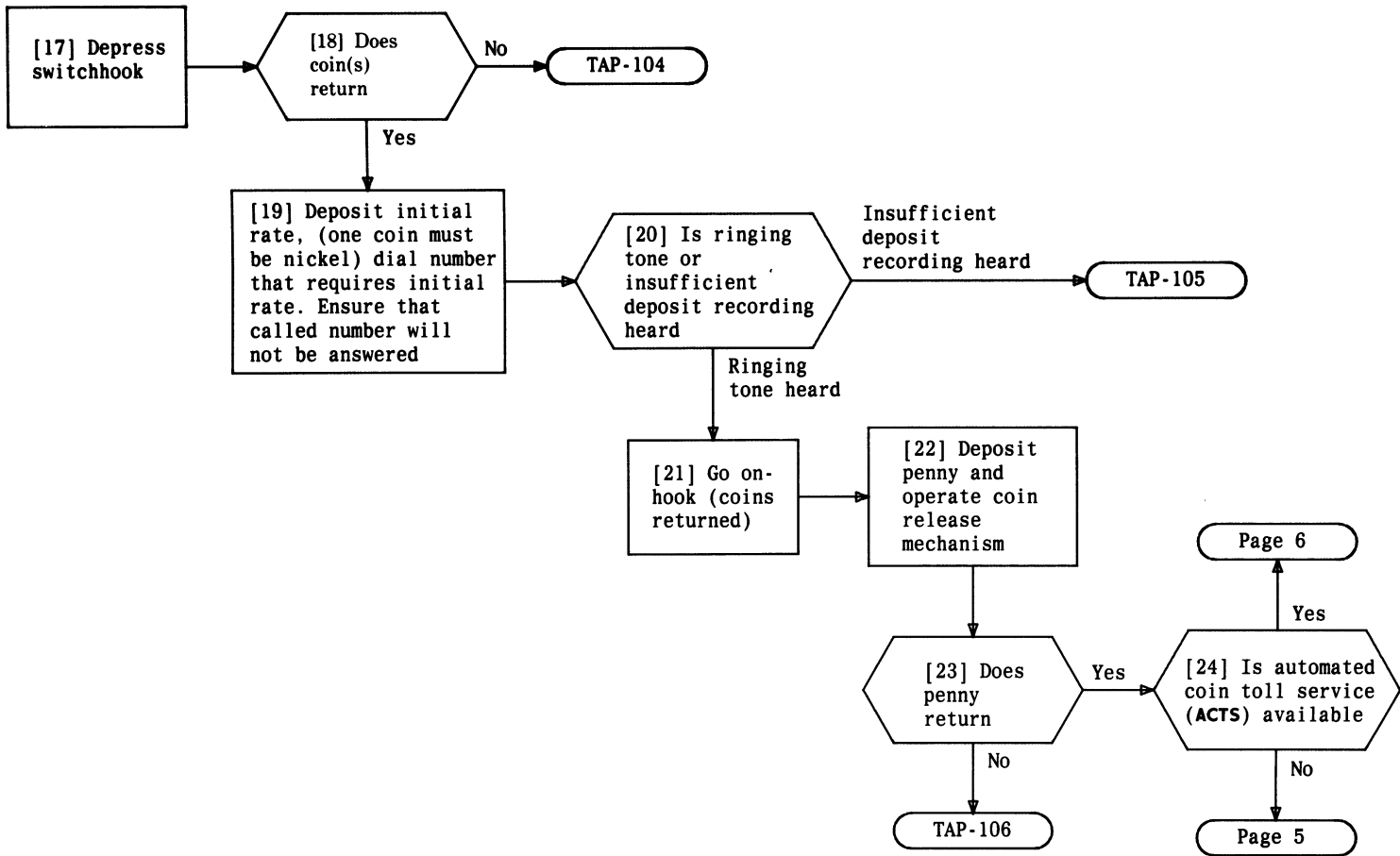
NOTES	
1. The serving central office must be wired for dial-tone-first and the line circuit associated with the station under test properly wired for loop start prior to performing the following test	
2. Any time you leave this DLP to clear trouble you should always return to Step 3 and test again	
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**PERFORM TROUBLE TEST**

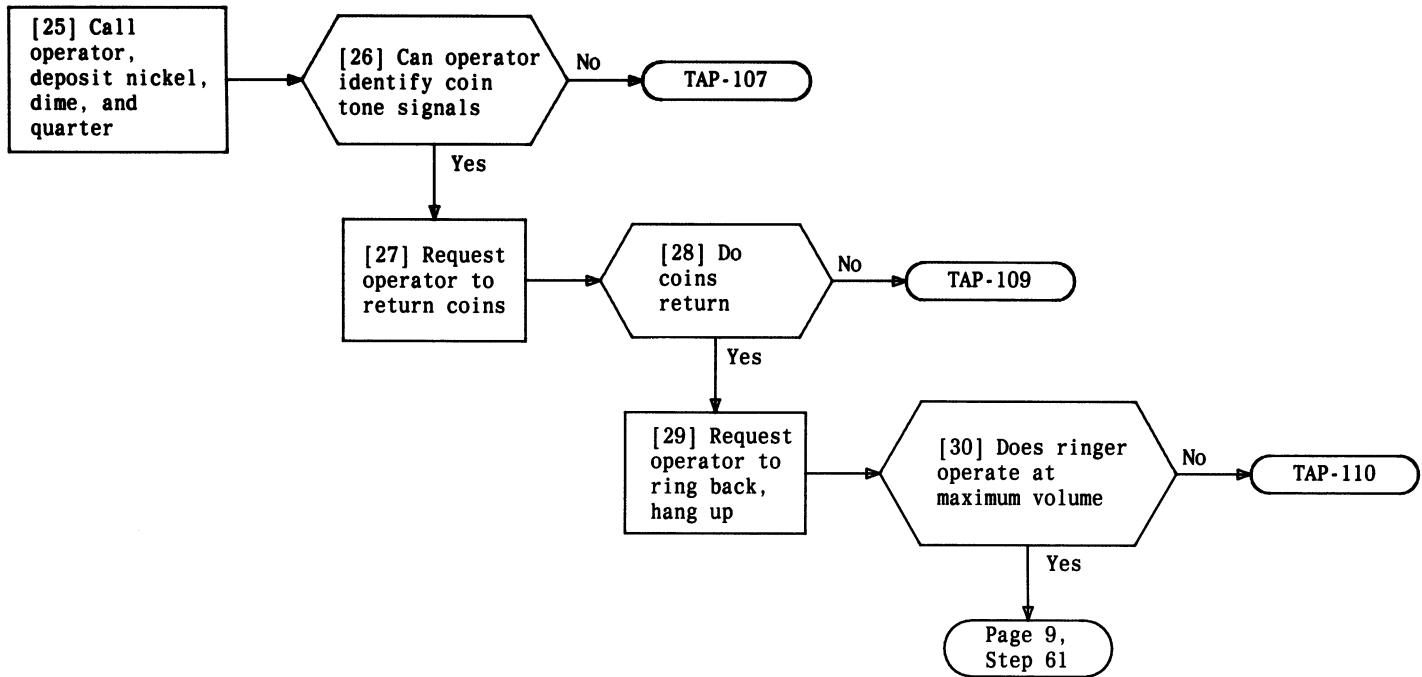


**PERFORM TROUBLE TEST**

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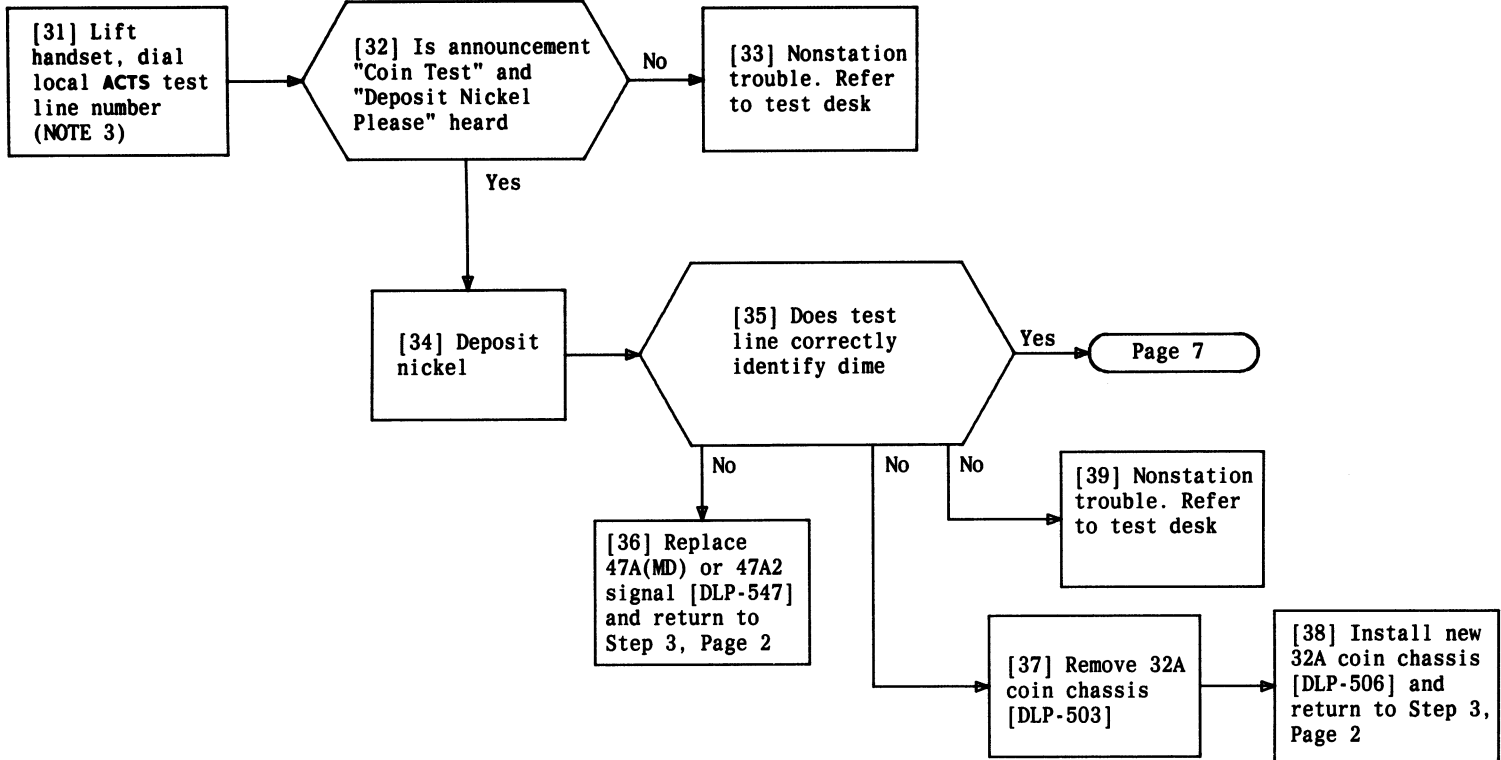


**PERFORM TROUBLE TEST**



**PERFORM TROUBLE TEST**

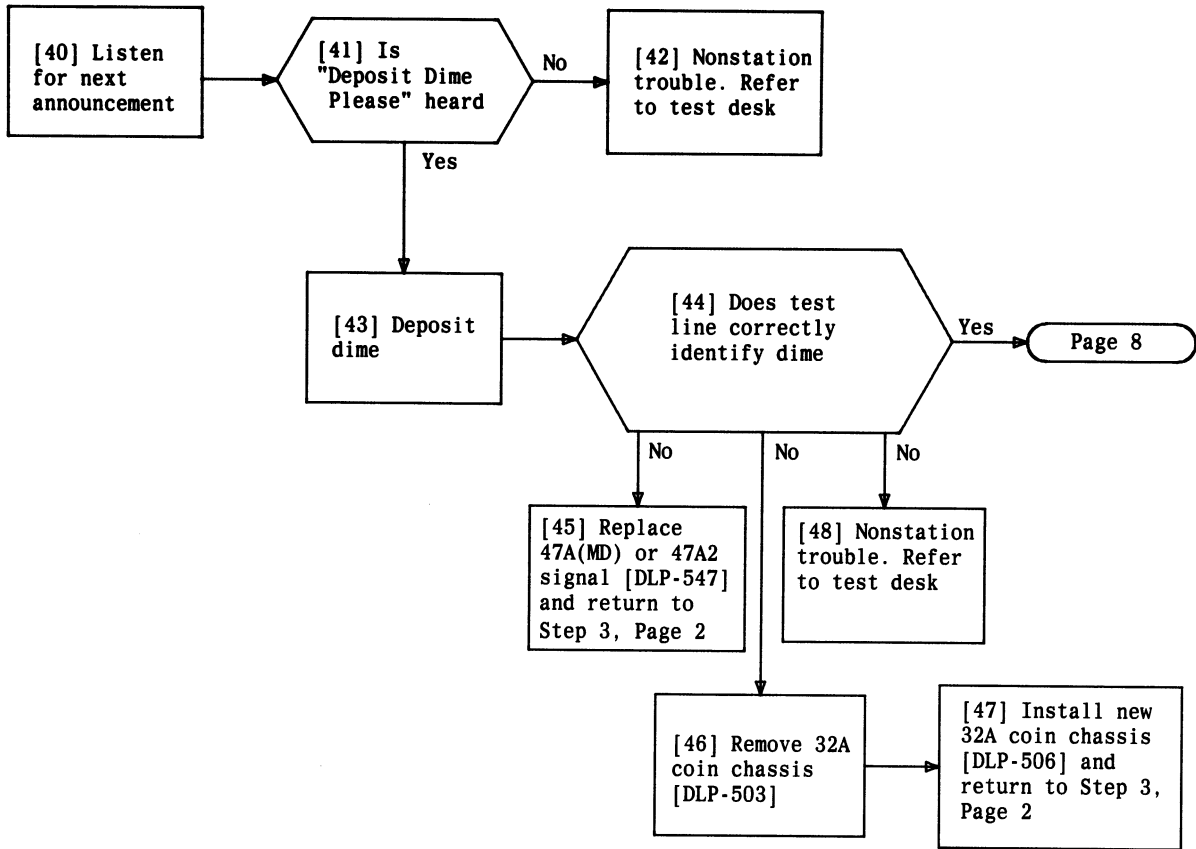
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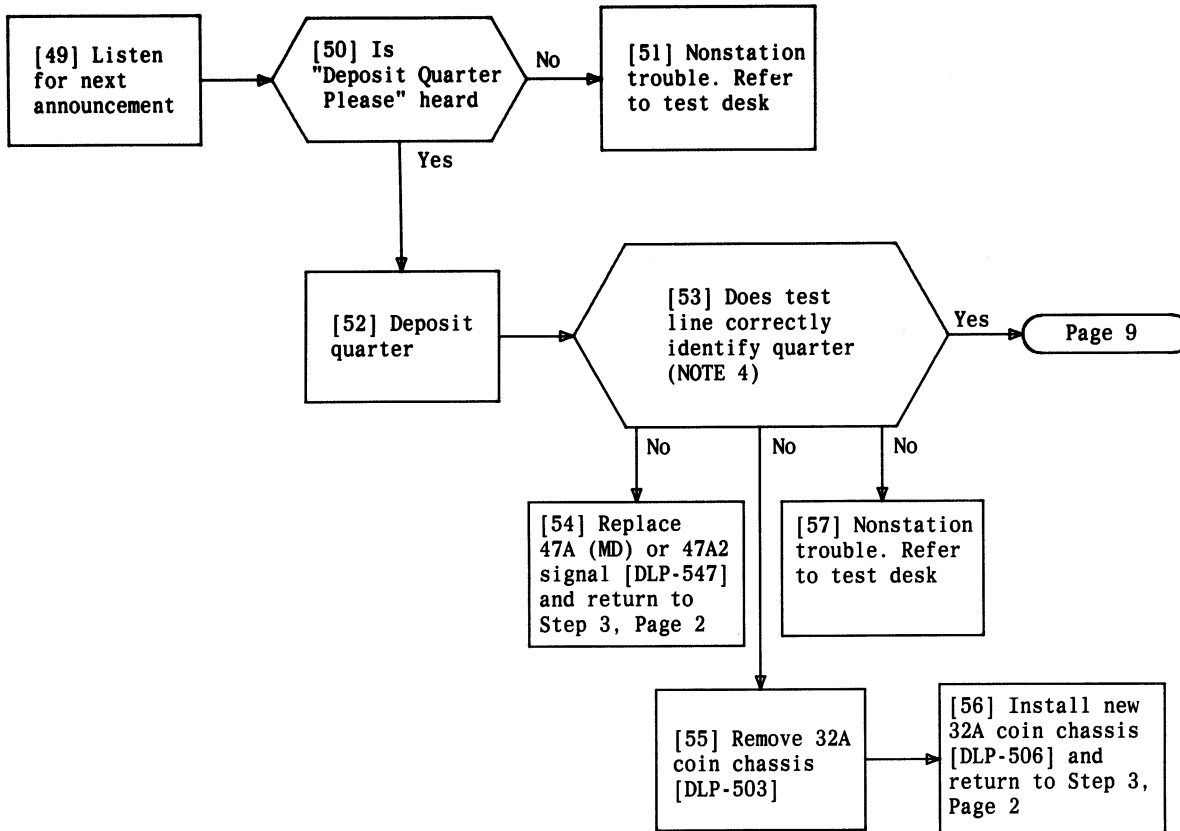
**NOTE 3**  
 If coin test line is busy reorder tone (120 IPC) will be heard

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**PERFORM TROUBLE TEST**



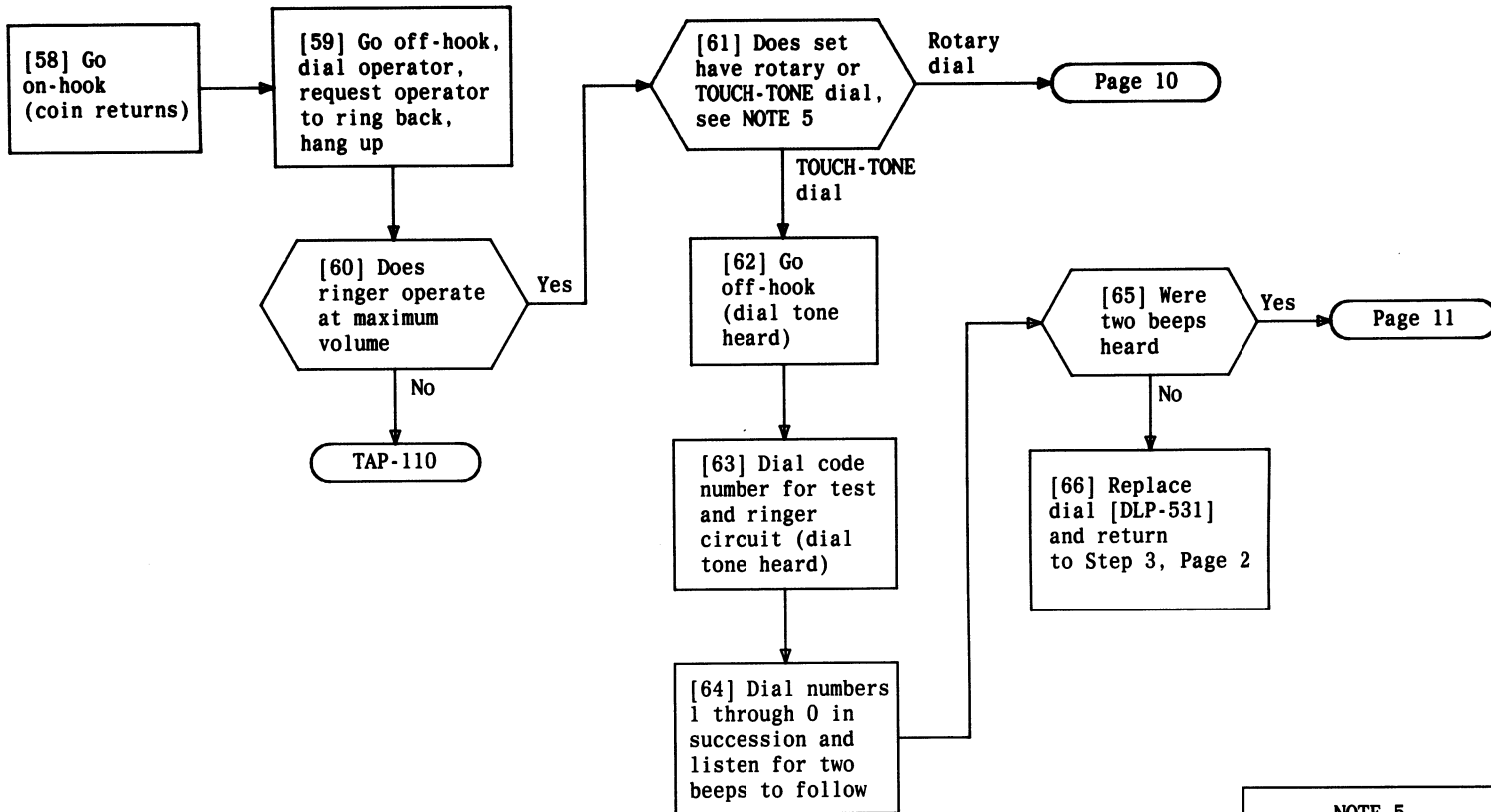
**PERFORM TROUBLE TEST**



**NOTE 4**  
 Additional coins can be deposited in any sequence; however, a two minute overall time limit is placed on each test call. If this is exceeded, an announcement "Test Has Ended" will be heard. A coin return signal will be generated, and the connections broken

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**PERFORM TROUBLE TEST**



<b>NOTE 5</b>	
If dial test circuits are not available, be guided by local instructions for testing dials	
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**PERFORM TROUBLE TEST**



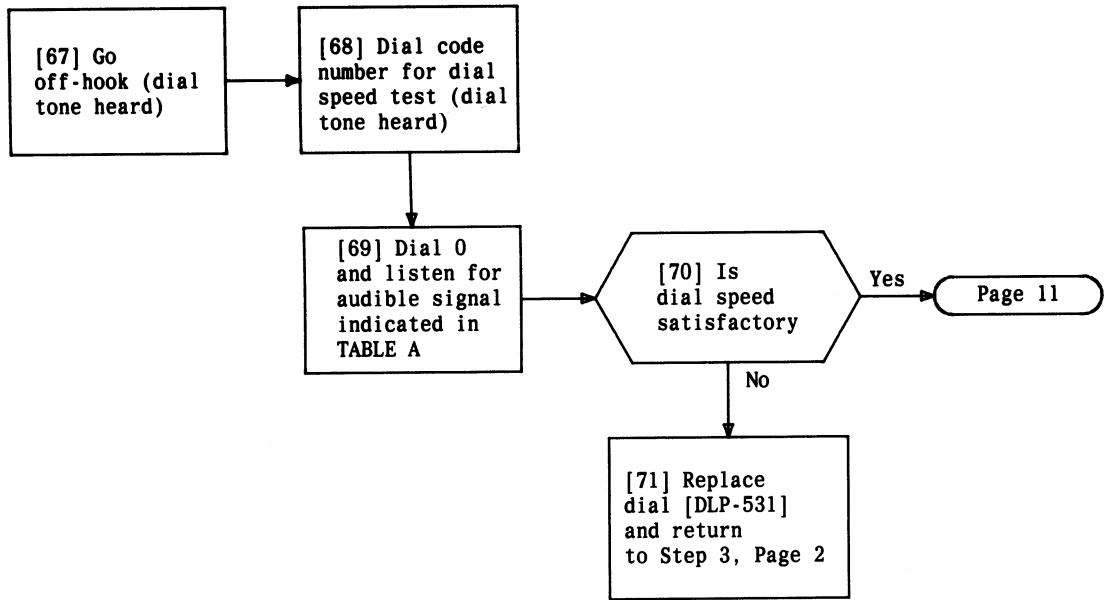
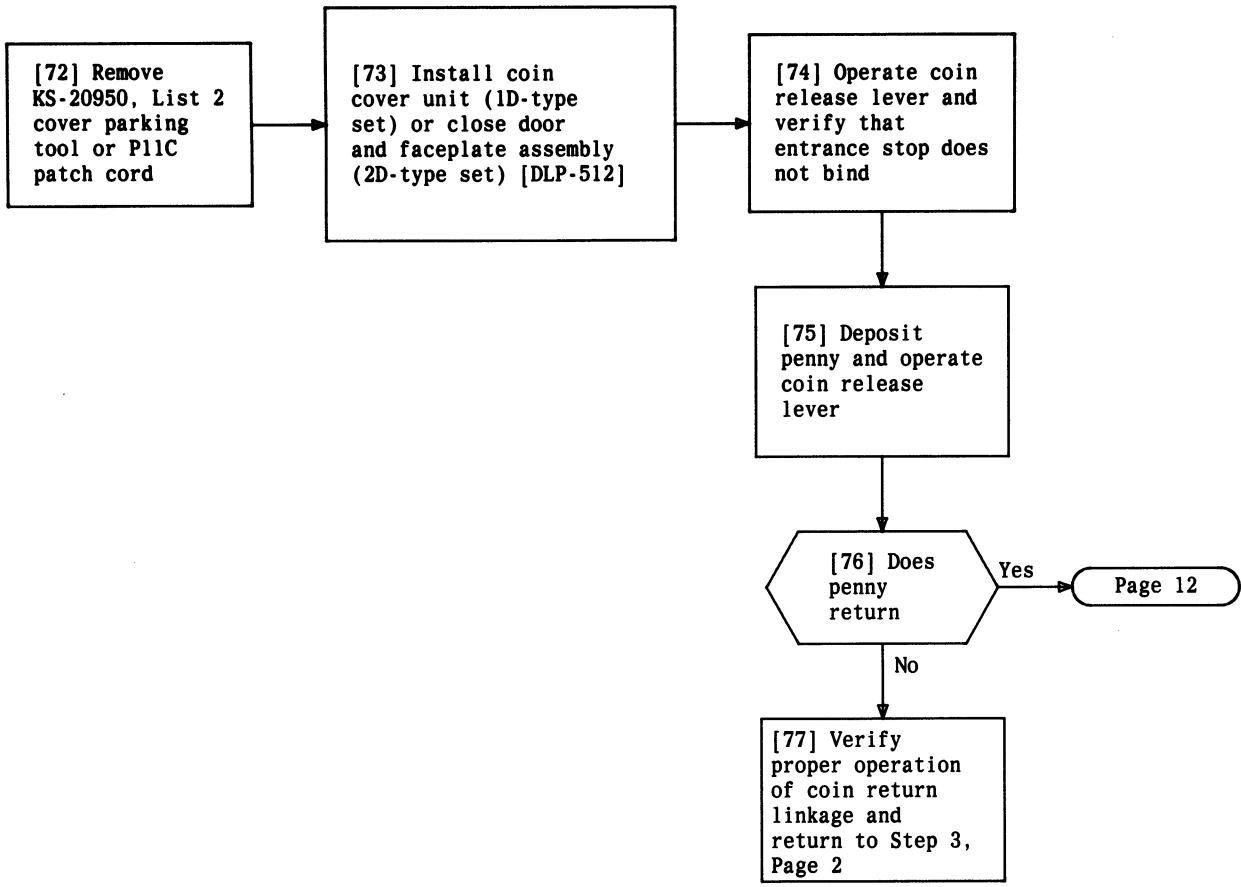


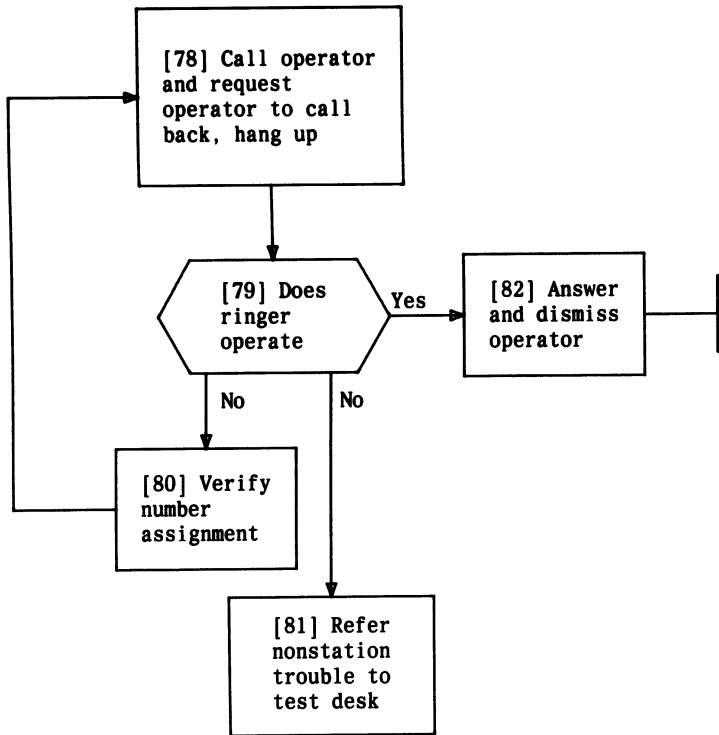
TABLE A	
AUDIBLE SIGNAL HEARD	CONDITION
Audible ringback	Dial speed satisfactory
Rapidly interrupted dial tone	Dial speed fast
Slowly interrupted dial tone	Dial speed slow

**PERFORM TROUBLE TEST**



**PERFORM TROUBLE TEST**

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**PERFORM TROUBLE TEST**

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[1] If required, remove coin cover unit (ID-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Disconnect handset leads from TB2

[3] Loosen stay-hook screw

[4] Remove BHM screw and coverplate which secure handset cord to dial housing. See FIG. 1, Page 2

[5] Pull armored handset cord through faceplate

[6] See TABLE A, Page 3. Insert new handset cord through hole in faceplate

[7] Feed cord through coverplate

[8] Secure stay-hook and coverplate to coin dial unit

[9] Secured armored handset cord and coverplate. See FIG. 1, Page 2

[10] Connect handset leads per TABLE B or C, Page 3

Handset removed

AND

Handset replaced

AND

## REPLACE HANDSET

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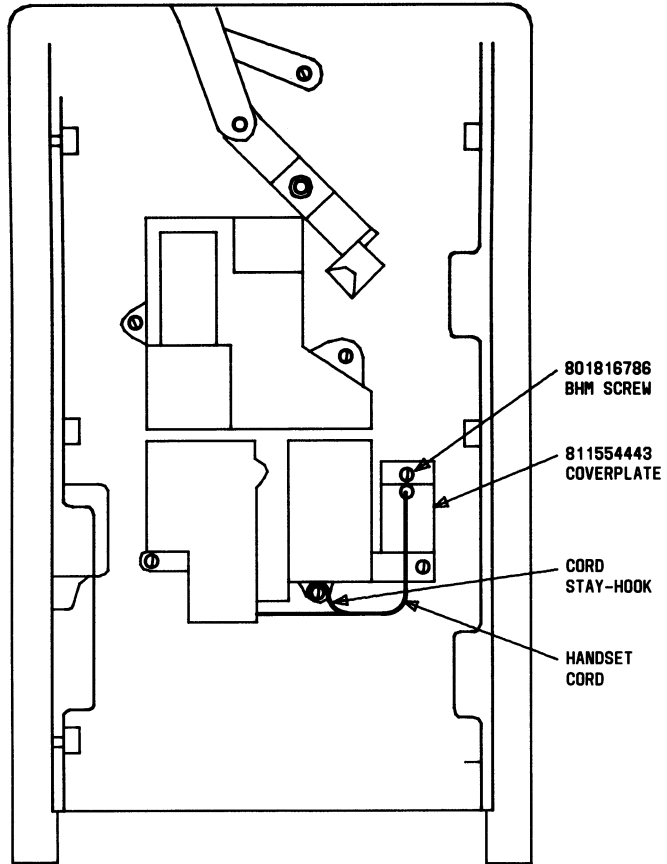


FIG. 1

REPLACE HANDSET

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TABLE A	
SET CODE	HANDSET* CODE
1D1/1D2 All Sets	G3AH-52 or G3AK-52
2D1/2D2-67	
2D1/2D2-84	G3AH-03 or G3AK-03
* Standard handsets shown. A G13D amplifier handset is optional	

TABLE B		
G3AH-52 OR G3AK-52 HANDSET		
WIRE COLOR	CONNECT TO	
	ROTARY SET	"TOUCH-TONE" SET
W	TB2-4	TB2-7
R	TB2-3	TB2-3
BK	TB2-6	TB2-6
W	TB2-7	TB2-8

TABLE C		
G13D HANDSET		
WIRE COLOR	CONNECT TO	
	ROTARY SET	"TOUCH-TONE" SET
Y	TB2-7	TB2-7
R	TB2-3	TB2-3
BK	TB2-6	TB2-6
G	TB2-4	TB2-8

**REPLACE HANDSET**

[1] If required, remove coin cover unit (ID-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Take handset off switchhook

[3] Remove four mounting screws. See FIG. 1

[4] See WARNING 1. Pull coin dial unit away from cover or door and carefully pull handset cord through hole in faceplate

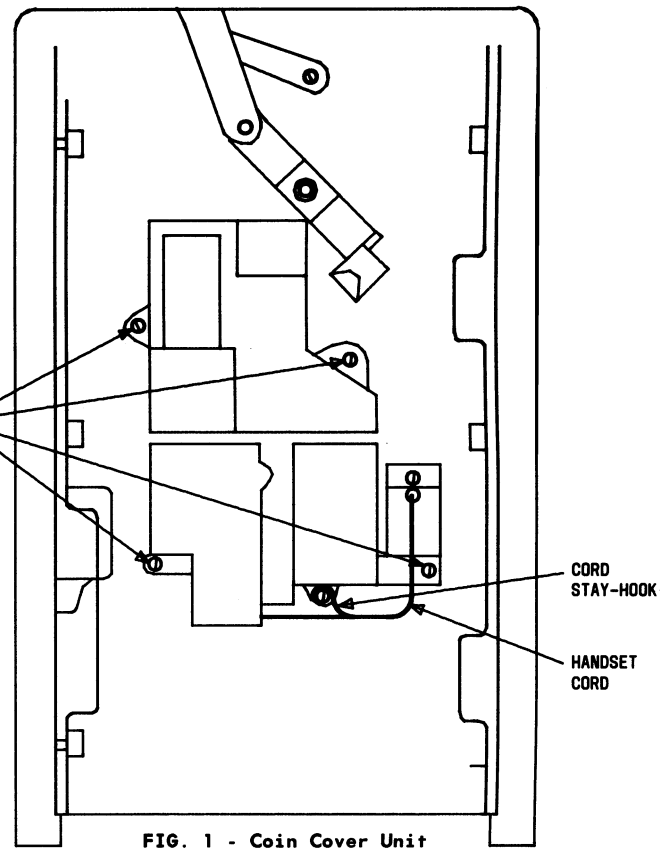
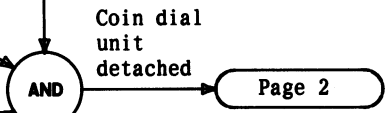


FIG. 1 - Coin Cover Unit

<b>WARNING 1</b> <i>Armored handset cord is attached to coin dial unit</i>	
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REPLACE ROTARY OR "TOUCH-TONE" DIAL

[5] Disconnect dial leads per TABLE A, see NOTE 1

[6] Loosen two mounting screws on side of dial through access holes in coin dial unit

[7] Apply pressure with screwdriver to dial mounting screw through access hole in coin dial unit to free dial locating pins

[8] Lift dial off and pull leads through hole in coin dial unit

[9] If rotary dial is being installed, remove and discard dust cover

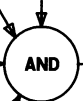
[10] Feed leads of new dial through hole in coin dial unit

[11] Install new dial making sure that four locating pins are properly seated in mounting brackets

[12] Tighten two dial mounting screws



Dial removed



Dial installed

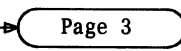
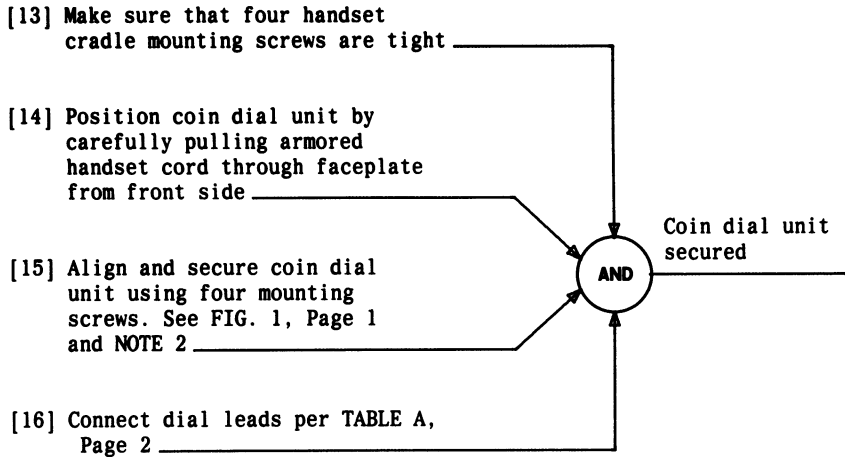


TABLE A		
DIAL CONNECTIONS		
DIAL	WIRE COLOR	TB2
8U(MD), 8W(MD), or 8WA Rotary Dial	BL	11
	BL or G	8
	W	4
	W	3
	Y	10
70A(MD) or 70B TOUCH- TONE Dial	Y	13
	G	1
	W	4
	R	3
	R-G	2
	BK	1
	O-BK	10
	O-R	5
	W-BL	7
	O-W	10
V	13	

NOTE 1	
It is not necessary to disconnect handset when removing dial	
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**REPLACE ROTARY OR "TOUCH-TONE" DIAL**





NOTE 2	
Four coin dial unit mounting screws must be tight to prevent unit from becoming loose due to vibration	
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**REPLACE ROTARY OR "TOUCH-TONE" DIAL**

[1] Remove coin cover unit (1D-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Remove screw which secures link and lever assembly to coin release lever shaft, FIG. 1

[3] Remove shaft and handle assembly

[4] Insert shaft and handle assembly through faceplate and orient per FIG. 2

[5] Place link and lever assembly over rear of shaft and secure with screw, FIG. 1

Shaft and handle assembly removed

AND

AND

LINK AND LEVER ASSEMBLY

RM-651418 SCREW

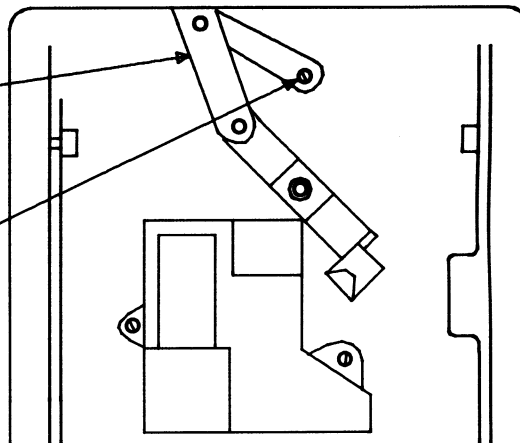


FIG. 1

840358725 SHAFT AND HANDLE ASSEMBLY

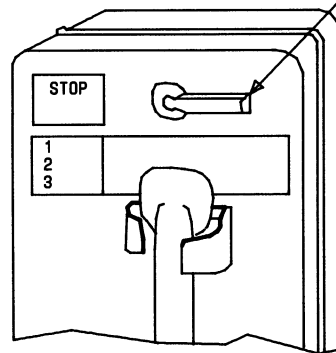


FIG. 2

## REPLACE COIN RELEASE LEVER

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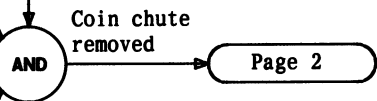
[1] Remove coin cover unit (1D-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Disconnect P2 by grasping body of plug and carefully pull out, in line

[3] Release coin chute locking lever. See FIG. 1, Page 4

[4] Lift spring out of groove in coin chute

[5] Tilt top of coin chute forward and lift out



**REPLACE COIN RETURN ASSEMBLY**

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[6] Loosen return chute screw. See FIG. 1, Page 4

[7] Lift return chute assembly up and off

[8] Remove coin return assembly locking screw. See FIG. 1, Page 4

[9] Insert finger in coin return and tilt top forward

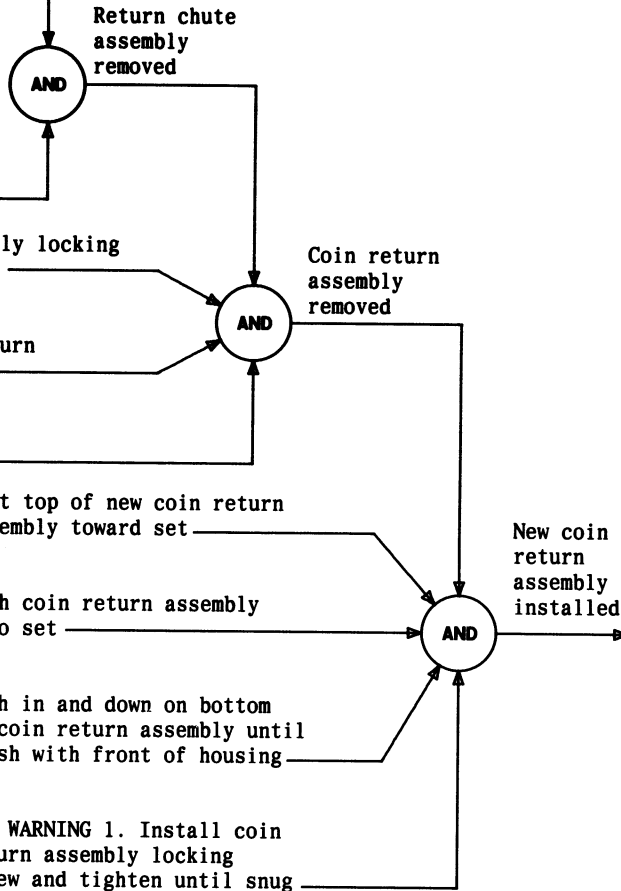
[10] Lift coin return and pull out and up

[11] Tilt top of new coin return assembly toward set

[12] Push coin return assembly into set

[13] Push in and down on bottom of coin return assembly until flush with front of housing

[14] See WARNING 1. Install coin return assembly locking screw and tighten until snug



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**WARNING 1**  
The coin return assembly is made of hardened material and overtightening will damage screw

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REPLACE COIN RETURN ASSEMBLY

[15] Place return chute assembly  
over coin return assembly

Return chute  
assembly  
installed



[16] See WARNING 2. Align and  
secure by tightening return  
chute screw. See FIG. 1,  
Page 4

[17] Place coin chute on locating pins at  
rear of hopper assembly and back  
of housing. See FIG. 1, Page 4

[18] Place spring in groove on coin  
chute. See NOTE 1

[19] Lock spring in place by pushing  
coin chute locking lever down

[20] Connect P2 to J2



Coin chute  
installed

**NOTE 1**  
Reject chute, return  
chute, and coin  
return assemblies  
must line up  
properly

**WARNING 2**  
*Two tabs on right  
side of return  
chute must be  
seated properly  
on lip on left  
side of hopper  
and key-hole slot  
on front of return  
chute (plastic  
version only) must  
be completely down  
behind mounting  
screw*

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**REPLACE COIN RETURN ASSEMBLY**

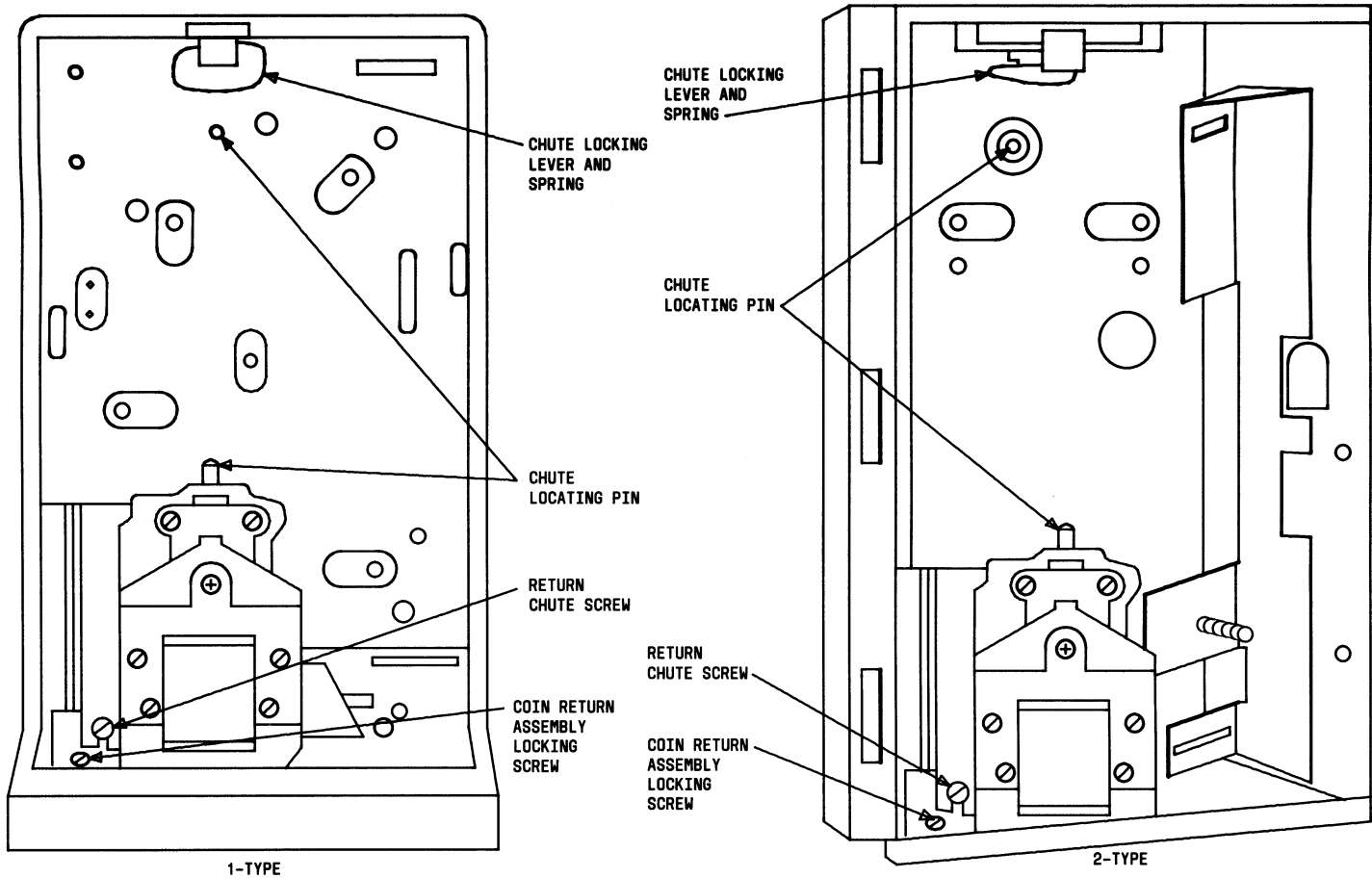


FIG. 1 - Housing and Mounting Plate Assembly

REPLACE COIN RETURN ASSEMBLY

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[1] Remove vault door and coin receptacle per local procedures

[2] From inside vault, remove two hex socket head cap screws that secure hopper to housing

[3] Lift hopper out of set

[4] Place 1AA coin relay in set in proper location, See NOTE 1

[5] Secure hopper to housing using two 811058098 hex socket head cap screws



[6] Install coin receptacle and vault door per local procedures

**REPLACE 50A, 50B, OR 51A HOPPER ASSEMBLY  
WITH 1AA COIN RELAY**

**NOTE 1**

1AA coin relay consists of 1A coin relay and 811557172 (P-15E717) coin hopper assembly

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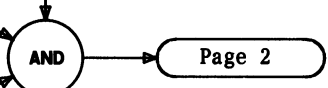
<b>PAGE 1 of 1</b>	<b>534</b>
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[1] Remove coin cover unit (1D-type set) or open door and faceplate assembly (2D-type set) [DLP-501]

[2] Take handset off switchhook

[3] Remove four mounting screws. See FIG. 1

[4] See WARNING 1. Pull coin dial unit away from cover or door and carefully pull handset cord through hole in faceplate



COIN DIAL UNIT MOUNTING SCREWS (840157390)

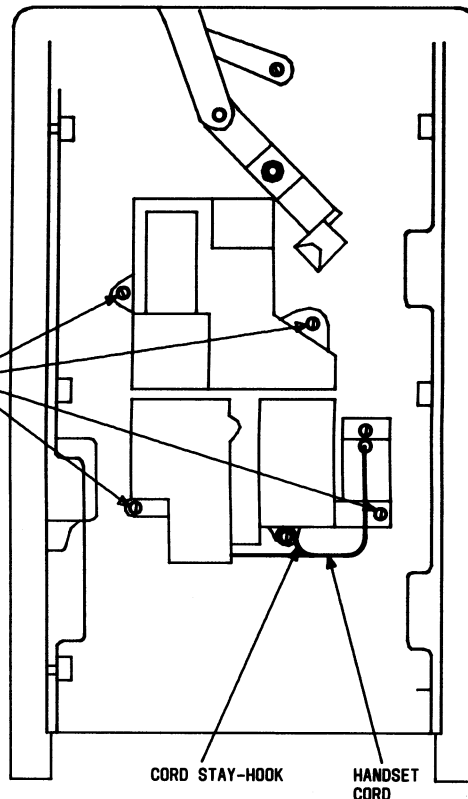


FIG. 1 - Coin Cover Unit

<b>WARNING 1</b> <i>Armored handset cord is attached to coin dial unit</i>	
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REPLACE NUMBER CARD AND/OR WINDOW IN "TOUCH-TONE" DIAL TELEPHONE SET



[5] Remove two thread forming nuts and remove card holder bracket. See FIG. 2, Page 3

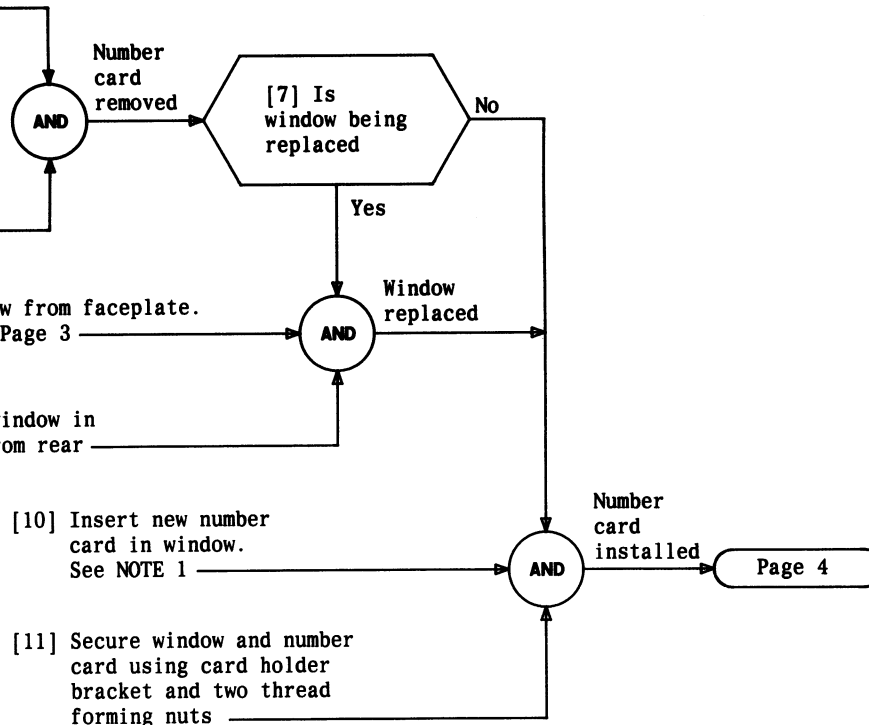
[6] Remove number card from window. See FIG. 3, Page 3

[8] Remove window from faceplate. See FIG. 3, Page 3

[9] Insert new window in faceplate from rear

[10] Insert new number card in window. See NOTE 1

[11] Secure window and number card using card holder bracket and two thread forming nuts



**REPLACE NUMBER CARD AND/OR WINDOW IN  
"TOUCH-TONE" DIAL TELEPHONE SET**

<b>NOTE 1</b>			
Number card ordered separately			
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RM-800077371 THREAD-  
FORMING NUTS (1-TYPE  
SET) OR RM-640721 HEX  
NUT (2-TYPE SET)

812169472  
(P-21F947) CARD  
HOLDER BRACKET

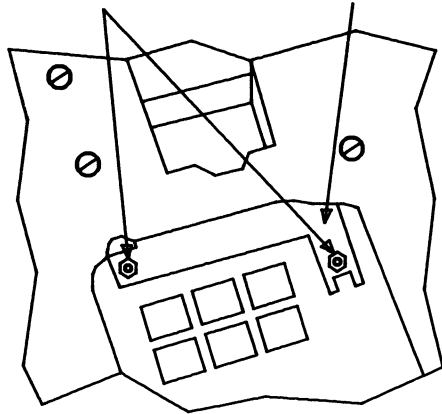


FIG. 2 - Card Holder Bracket Installed  
(TOUCH-TONE Set)

812169480  
(P-21F948)  
WINDOW

NUMBER CARD  
(FURNISHED  
LOCALLY)

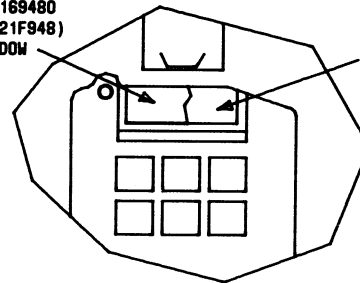


FIG. 3 - Window and Number Card  
Installed in Faceplate  
(TOUCH-TONE Set)

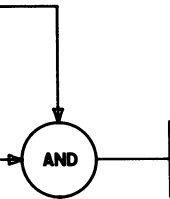
REPLACE NUMBER CARD AND/OR WINDOW IN  
"TOUCH-TONE" DIAL TELEPHONE SET

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[12] Make sure that four handset cradle mounting screws are tight

[13] Position coin dial unit by carefully pulling armored handset cord through faceplate from front side

[14] Align and secure coin dial unit using four mounting screws. See FIG. 1, Page 1 and NOTE 2



**REPLACE NUMBER CARD AND/OR WINDOW IN  
"TOUCH-TONE" DIAL TELEPHONE SET**

NOTE 2		
Four coin dial unit mounting screws must be tight to prevent unit from becoming loose due to vibration		
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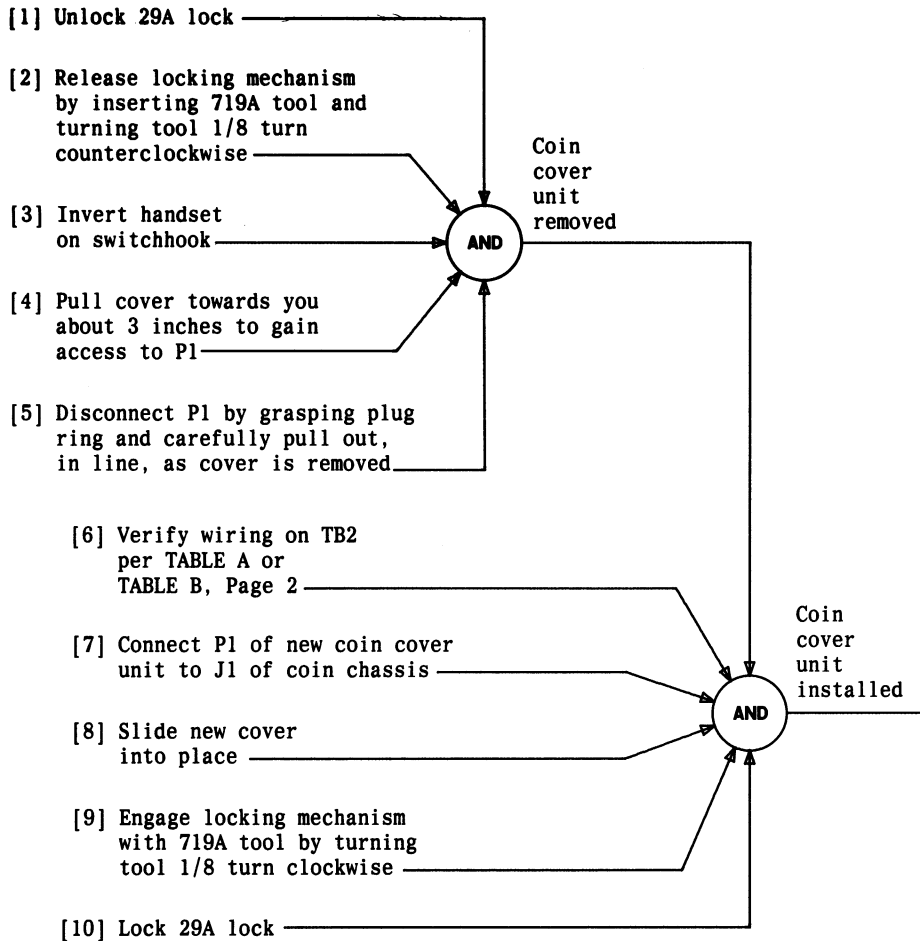


TABLE A					
ROTARY DIAL TELEPHONE SET CONNECTIONS					
COMPONENT	WIRE COLOR	TB2	COMPONENT	WIRE COLOR	TB2
Dial	BL	11	S w i t c h h o o k	BR	10
	BL or G	8		BR	10
	W	4		O	9
	W	3		O	8
	Y	10		W	2
	Y	13		Y	7
Handset	W	4		G	12
	R	3		S	12
	BK	6		S-W	14*
	W	7		R†	12
Strap	S	2 to 3			

\* Terminal 14 only appears on new 60A coin dial units

† (R) switchhook lead does not appear on 819042748 (P-90D274) dial and housing assemblies

## REPLACE COIN COVER UNIT

TABLE A					
"TOUCH-TONE" DIAL TELEPHONE SET CONNECTIONS					
COMPONENT	WIRE COLOR	TB2	COMPONENT	WIRE COLOR	TB2
70A(MD) or 70B Dial	G	1	Handset (Contd)	BK	6
	W	4		W	8
	R	3	S w i t c h h o o k	BR	11
	R-G	2		BR	9
	BK	1		O	9
	O-BK	10		O	11
	O-R	5		W	8
	W-BL	7		Y	3
	O-W	10		G	12
	V	13		S	12
Handset	W	7		S-W	14*
	R	3		R	12

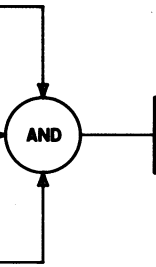
\* Terminal 14 only appears on new 61A coin dial units

REPLACE COIN COVER UNIT

[1] Select protector location. See  
FIG. 1, NOTES 1, 2, and 3, Page 2

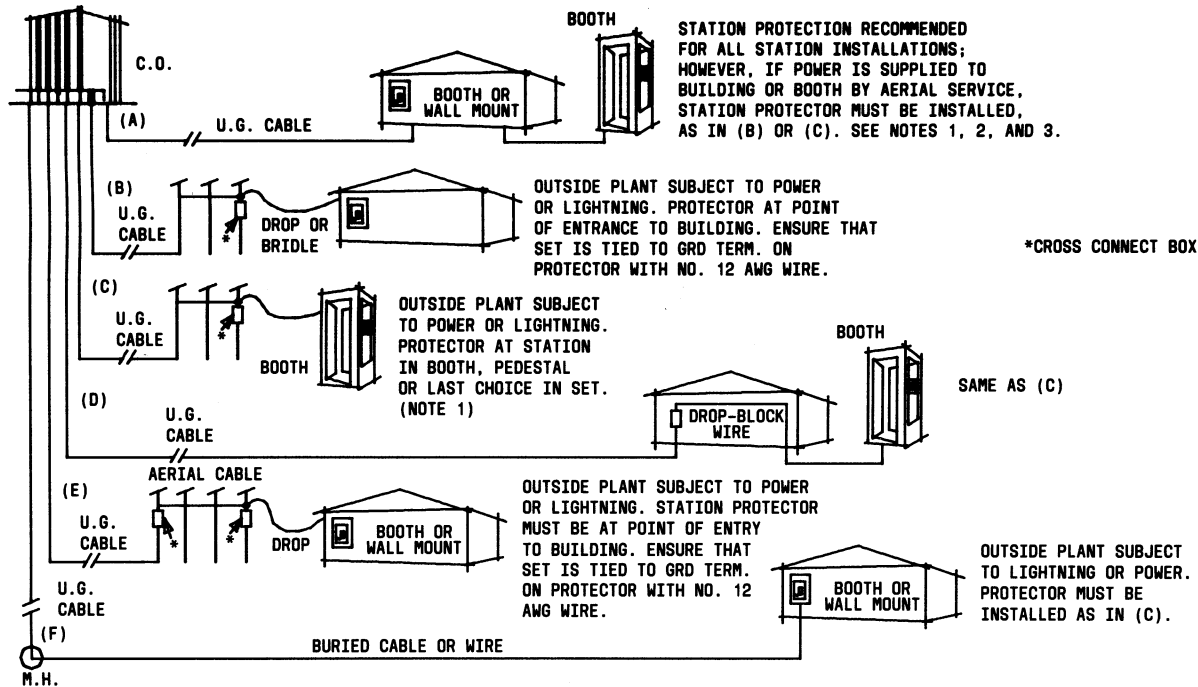
[2] Refer to FIG. 2 and NOTE 4, Page 3,  
for connections when protector is  
outside set

[3] Refer to FIG. 3, Page 3; FIG. 4 and  
5, Page 4, for connections when  
protector is inside set



## VERIFY PROTECTION AND GROUND CONNECTIONS

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**NOTES:**

1. THE PREFERRED LOCATION FOR A PROTECTOR IS AT THE POINT OF ENTRY INTO A BUILDING OR BOOTH. A PROTECTOR SHOULD BE INSTALLED IN A SET ONLY AS THE LAST RESORT. FOR ADDITIONAL INFORMATION ON STATION PROTECTOR AND SIGNALING PROTECTOR AND SIGNALING GROUNDS, SEE SECTIONS 460-100-400, 506-100-100, AND 508-100-100
2. HOUSING OF ALL OUTSIDE STATIONS MUST BE GROUNDED. IF SET IF NOT MOUNTED IN A GROUNDED ENCLOSURE, RUN A NO. 12 AWG WIRE FROM STATION TO NEAREST APPROVED GROUND
3. CARBON BLOCKS THAT BREAK DOWN PREMATURELY CAN CAUSE FAILURES OF COIN COLLECT OR REFUND. CARBON BLOCKS SHOULD BE REPLACED BY GAS TUBE PROTECTORS (123E1A) OR 11B1A PROTECTOR UNITS IN 123-TYPE PROTECTOR BASE.

**FIG. 1 - Protection Requirements**

**VERIFY PROTECTION AND GROUND CONNECTIONS**

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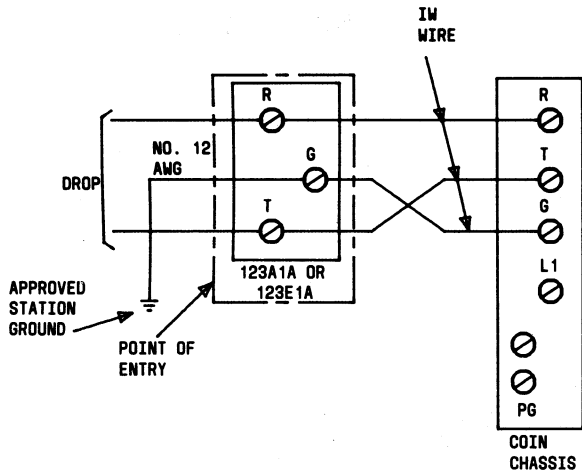


FIG. 2 - Protector Wiring When Protector is Outside Set

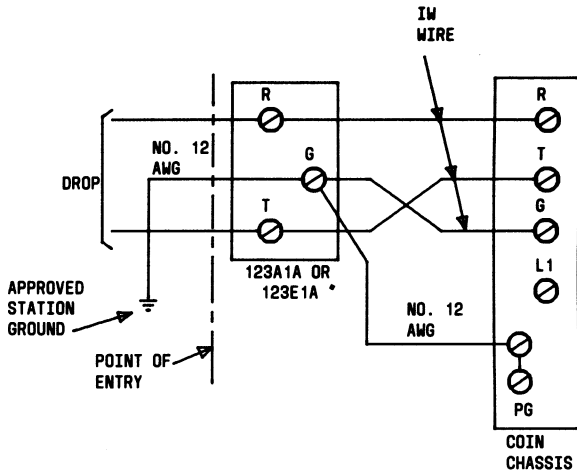


FIG. 3 - Protector Wiring When Protector is Inside Set

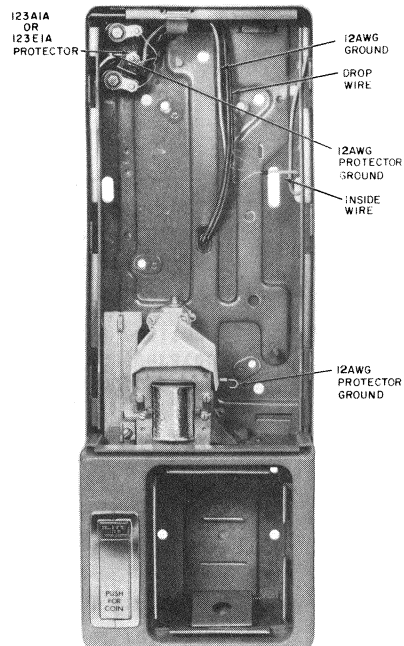
*IW Back to Original Prot.*  
 → *conduct Branch Circuit*

**VERIFY PROTECTION AND GROUND CONNECTIONS**

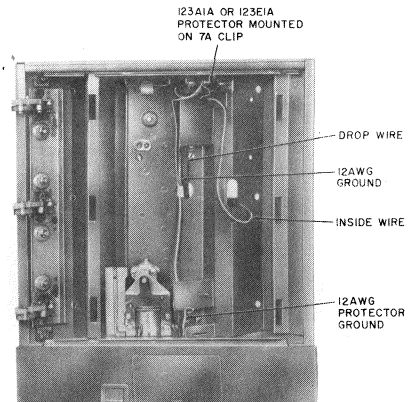
*325ft.*  
*if Y+B together*  
*608 ft max*

NOTE 4		
When wiring protector outside of set the maximum length of the (Y) 22 or 24 AWG IW signal ground is 125 feet		
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**FIG. 4 – Protector Mounted in 1D-Type Set**



**FIG. 5 – Protector Mounted in 2D-Type Set**

**VERIFY PROTECTION AND GROUND CONNECTIONS**

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[1] Remove  
coin chute  
[DLP-502]

[2] Remove dust cover  
from coin relay

[3] Disconnect (BK) and  
(Y) leads from relay

[4] Remove two relay  
mounting screws at  
top-front of relay.  
See FIG. 1, Page 2

[5] Remove two slotted  
hex head screws from  
side of relay. See  
FIG. 1, Page 2

[6] Check that hopper trigger  
is in the nonoperated  
(horizontal) position

[7] Pull relay off being  
careful not to damage  
hopper trigger, See  
NOTE 1

AND

Coin relay  
removed

Page 3

## REPLACE COIN RELAY

NOTE 1  
Disposition of  
defective coin  
relay is optional

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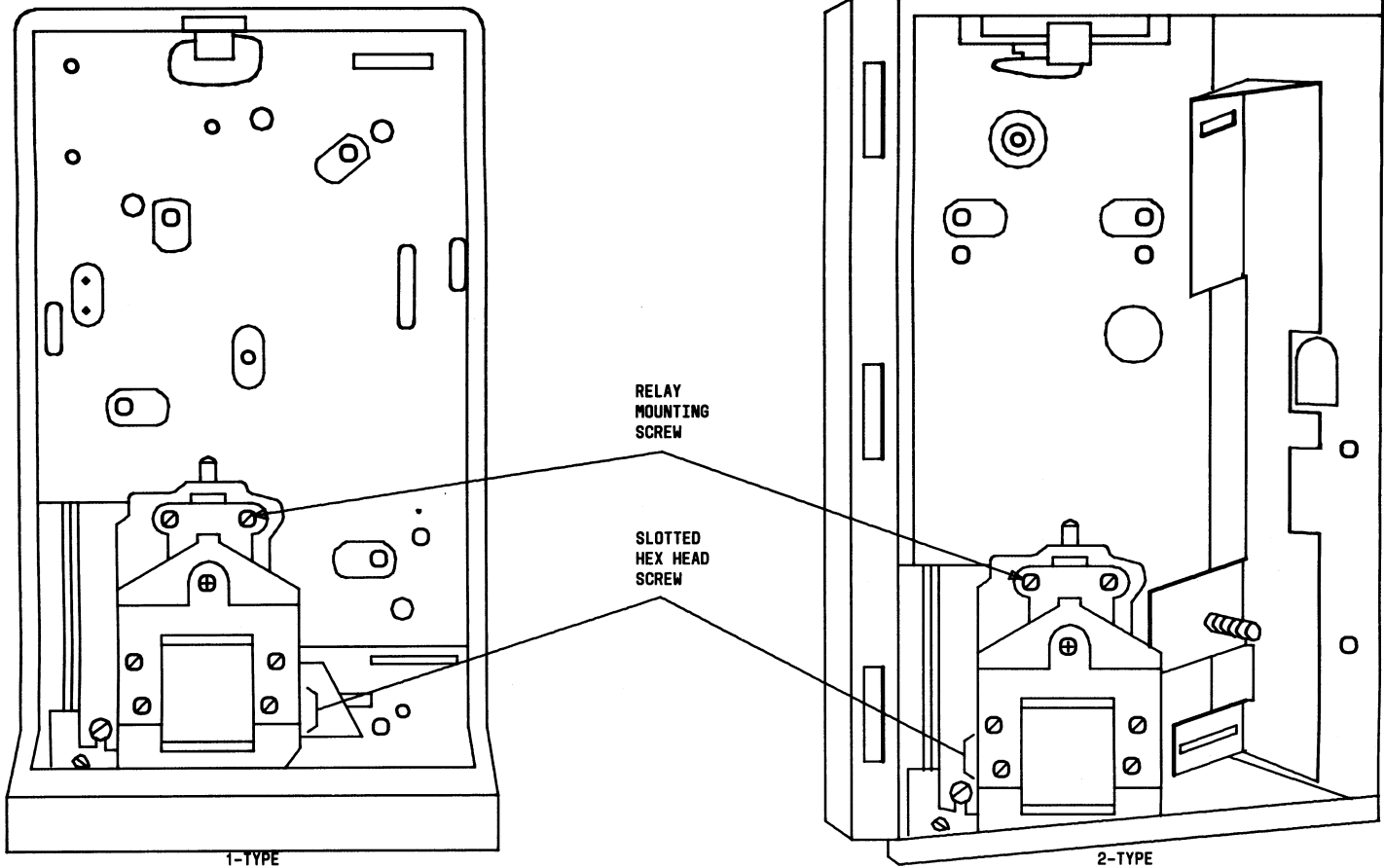


FIG. 1 - Housing and Mounting Plate Assembly

REPLACE COIN RELAY

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- [8] Move coin vane to left (collect) position. See FIG. 2, Page 4 \_\_\_\_\_
- [9] With hopper trigger in nonoperated (horizontal) position. Move relay into position until trigger enters T-shaped slot in hopper and trap lever tab just enters opening in selector card. See NOTE 2 \_\_\_\_\_
- [10] Press down slightly on ear of left side of selector card and manually move armature forward to its operated position. Hold armature in this position \_\_\_\_\_
- [11] See WARNING 1. Move coin relay forward until square stem on vane enters hole in cam and mounting screw holes line up \_\_\_\_\_
- [12] See NOTE 3. Install and tighten evenly two mounting screws on top of coin relay and two slotted hex head mounting screws in each side of relay \_\_\_\_\_
- [13] Make sure that trigger, armature, trap, and vane operate without binding \_\_\_\_\_
- [14] Reconnect (Y) lead to terminal G and (BK) lead to terminal 3 \_\_\_\_\_

Coin relay installed

AND

Page 4

**NOTES**

2. If trigger support bracket is so distorted that mounting holes do not engage hopper bosses, relay should not be installed
3. Two top mounting screws must be tightened first so that bosses will be properly seated

***WARNING 1***  
***Stem of vane should not be forced into opening in cam without proper alignment. Cam can be broken very easily***

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[15] Install  
dust cover on  
coin relay



[16] Install  
coin chute  
[DLP-507]

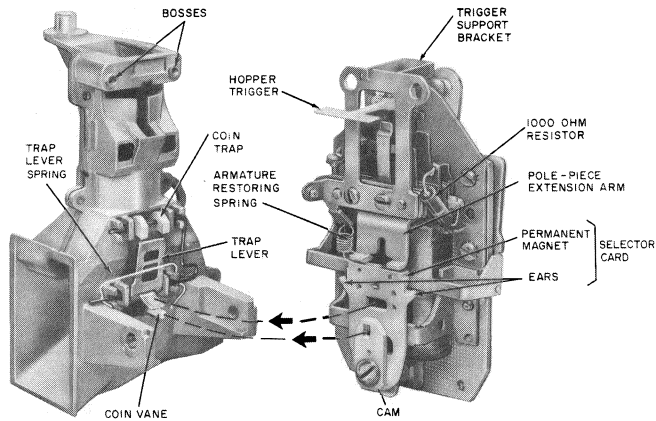
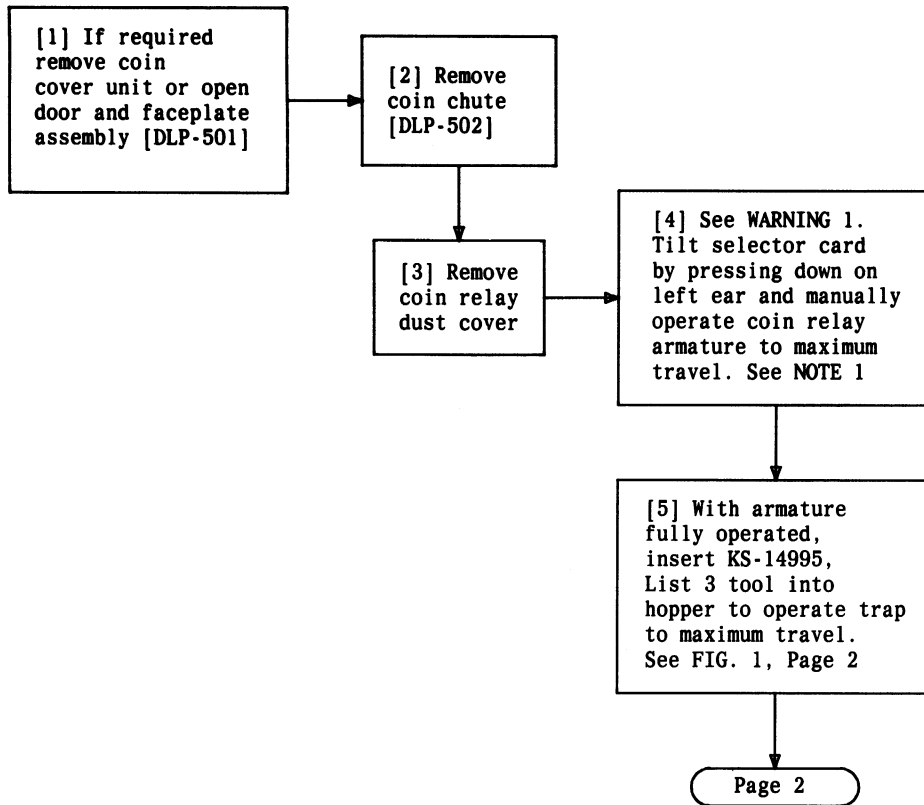


FIG. 2 - Coin Hopper and Rear View of Coin Relay

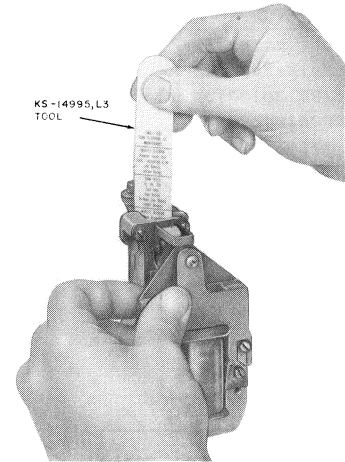
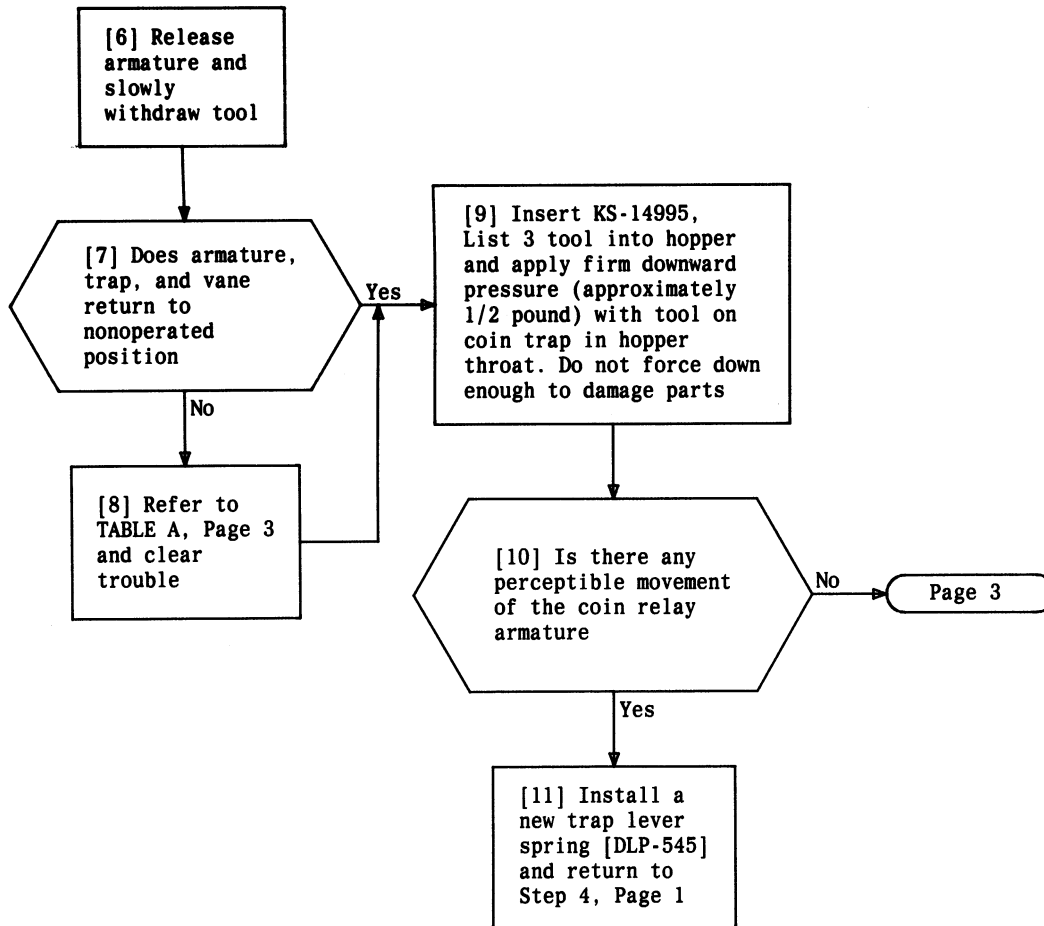
REPLACE COIN RELAY

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<b>NOTE 1</b>	
Coin vane moves to collect (left) position; coin trap moves downward	
<b>WARNING 1</b>	
<i>If selector card is not tilted, jamming will occur between selector card and cam engaging surfaces</i>	
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**PERFORM TRAP AND VANE RELEASE TEST**



**FIG. 1 - Trap and Vane Release Test**

**PERFORM TRAP AND VANE RELEASE TEST**

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[12] See WARNING 2. Press down on right ear of selector card and manually operate coin relay armature to maximum travel. See NOTE 2

[13] With armature fully operated, insert KS-14995, List 3 tool into hopper to operate trap to maximum travel. See FIG. 1, Page 2

[14] Release armature and slowly withdraw tool

[15] Does armature, trap and vane return to nonoperated position

[17] Install coin relay dust cover

[18] Install coin chute [DLP-507]

[16] Refer to TABLE A and clear trouble. Return to Step 4, Page 1

FAILURE	POSSIBLE CAUSE	REMEDIAL ACTION	PROCEDURE NUMBER
Armature, trap, or vane does not return to normal	Coin relay binding	1. Loose mounting screws, realign relay. Tighten screws	
		2. Replace coin relay	DLP-538
Vane does not restore properly	Vane binds or vane broken	1. Remove coin relay from hopper	DLP-541
		2. Free vane or replace vane	DLP-542
		3. Install coin relay	DLP-544
Trap does not operate, restore, or lock properly	Trap broken	1. Remove coin relay from hopper	DLP-541
	Trap lever spring bent or broken		
	Trap lever broken	2. Replace defective apparatus	DLP-543
	Trap pin bent or broken	3. Install coin relay	DLP-544

NOTE 2  
Coin vane moves to refund (right) position, coin trap moves downward

**WARNING 2**  
If selector tab is not tilted, jamming will occur between selector card and cam engaging surfaces

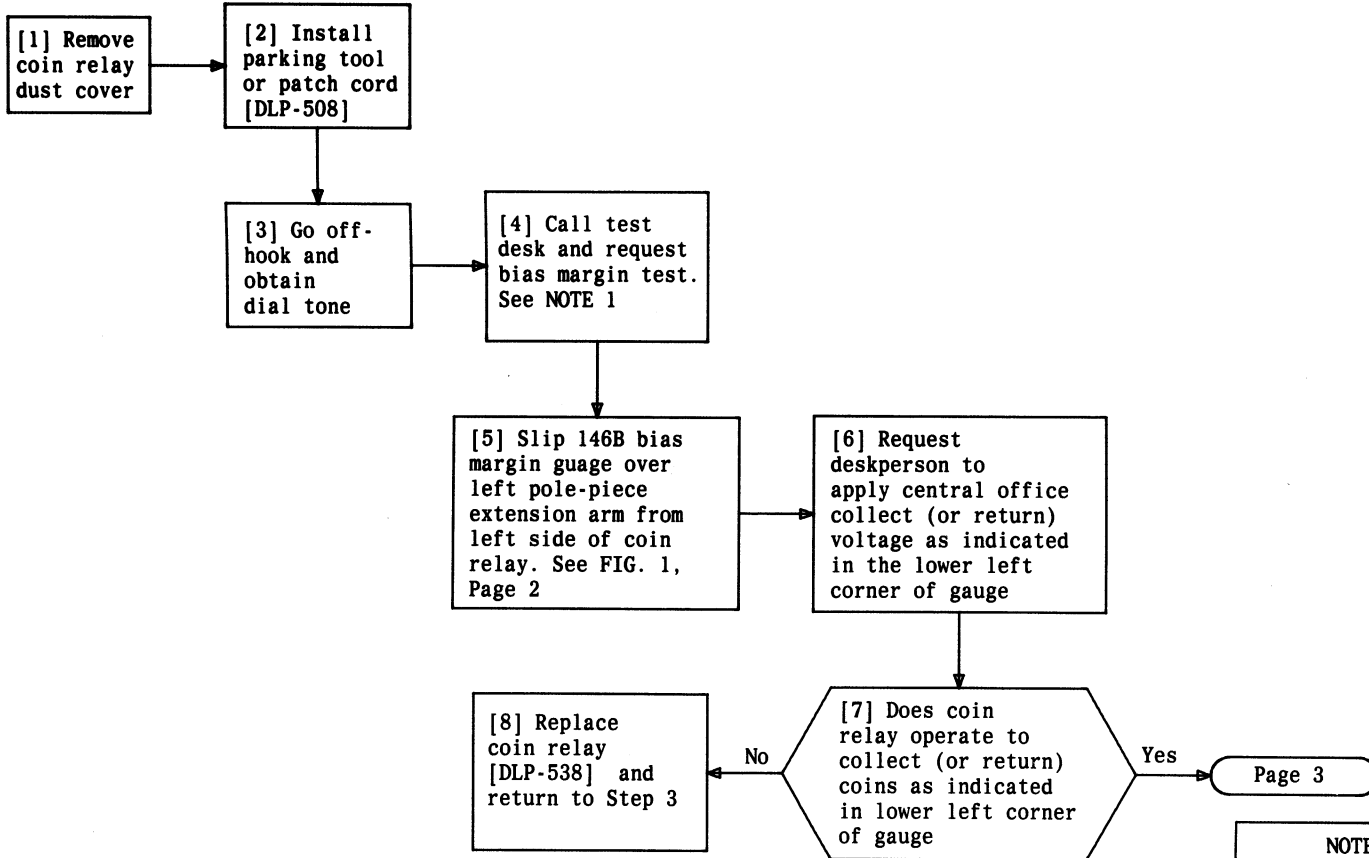
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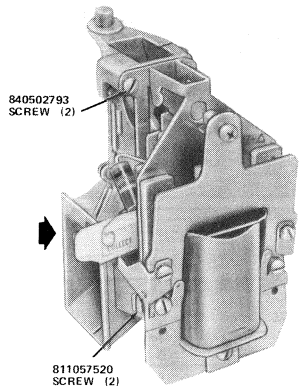
PERFORM TRAP AND VANE RELEASE TEST



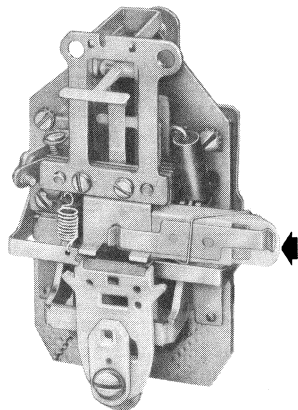


NOTE 1		
Where available central office coin test line must be used		
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**PERFORM COIN RELAY BIAS MARGIN TEST**



SIDE VIEW

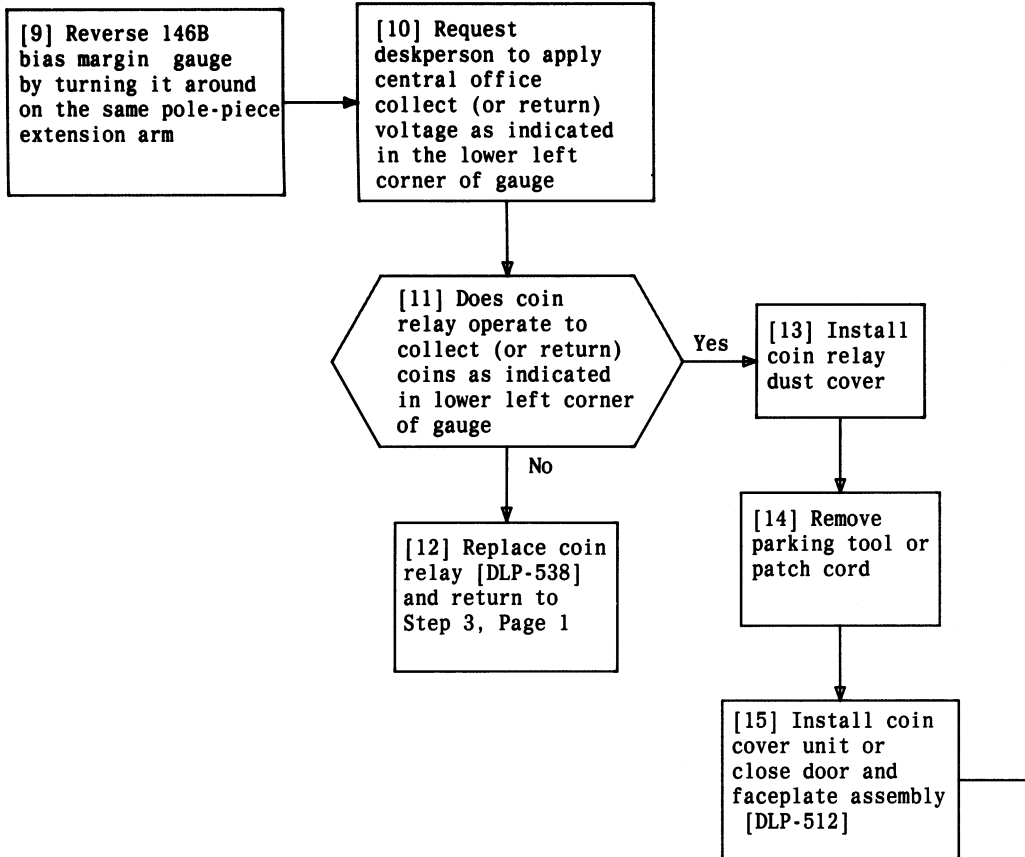


BACK VIEW

**FIG. 1 - Bias Margin Gauge In Position  
For Collect Test**

**PERFORM COIN RELAY BIAS MARGIN TEST**

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**PERFORM COIN RELAY BIAS MARGIN TEST**

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- [1] Disconnect (BK) and (Y) leads from relay
- [2] Remove two relay mounting screws at top-front of relay, see FIG. 1
- [3] Remove two slotted hex head screws from side of relay
- [4] Check that hopper trigger is in nonoperated (horizontal) position
- [5] Pull relay off, being careful not to damage hopper trigger

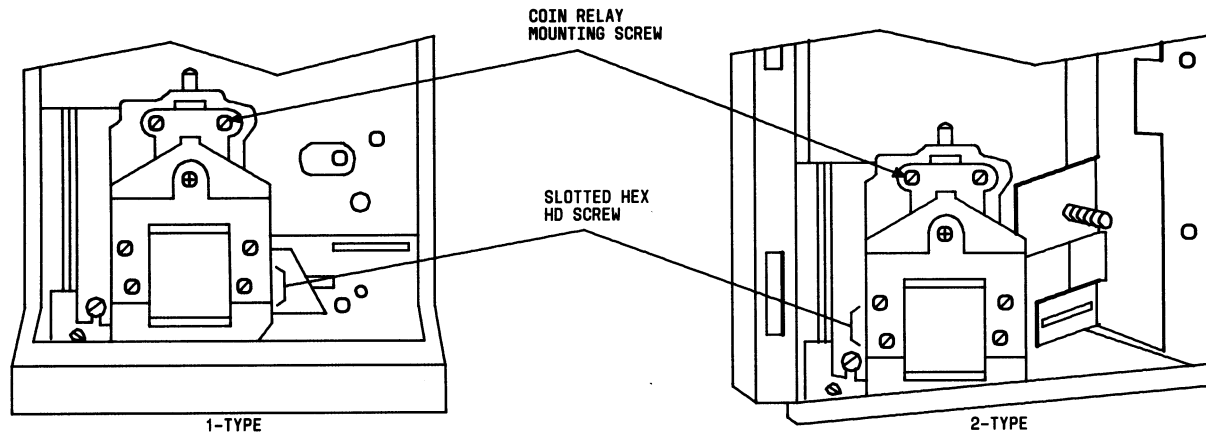
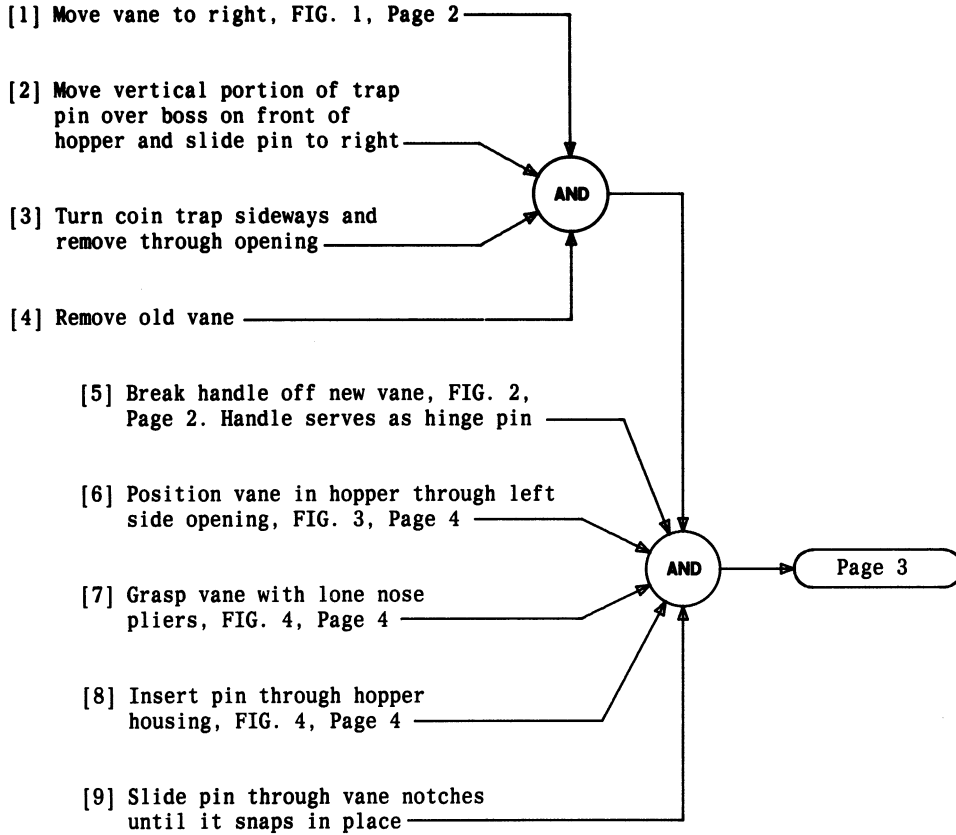


FIG. 1 - Housing and Mounting Plate Assembly

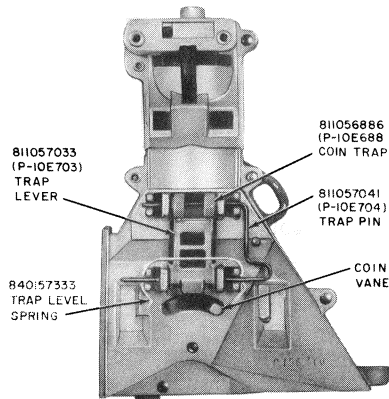
**REMOVE COIN RELAY FROM HOPPER**

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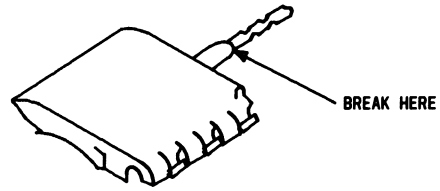


**REPLACE VANE**

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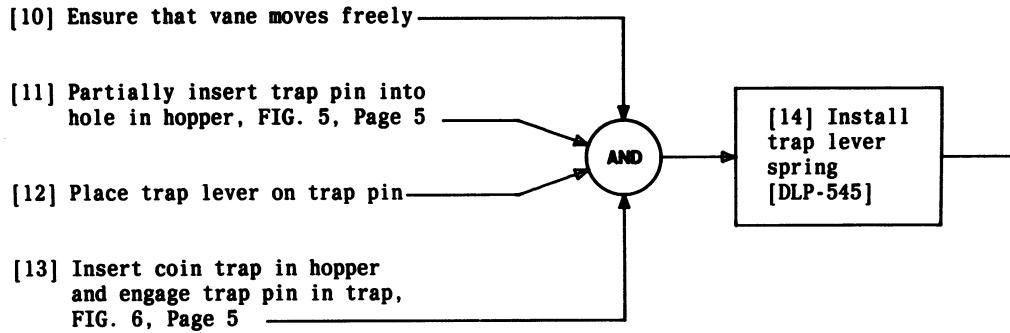
**FIG. 1 - Coin Trap and Trap Lever Assembly**



**FIG. 2 - 840360572 Replaceable Coin Vane**

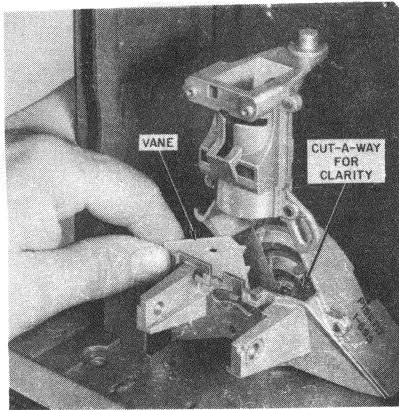
**REPLACE VANE**

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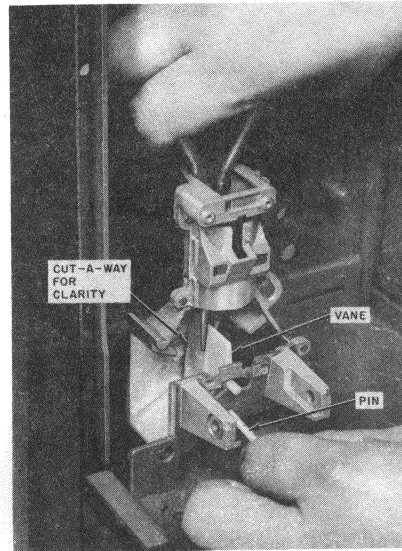


**REPLACE VANE**

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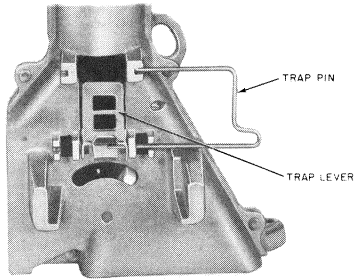


**FIG. 3 - Inserting Vane**

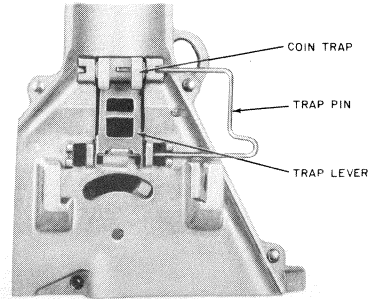


**FIG. 4 - Installing Pin in Vane**





**FIG. 5 - Placing Trap-Lever Pin in Hopper**



**FIG. 6 - Placing Coin Trap in Hopper**

**REPLACE VANE**

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[1] Move vane to right. See FIG. 1,  
Page 2

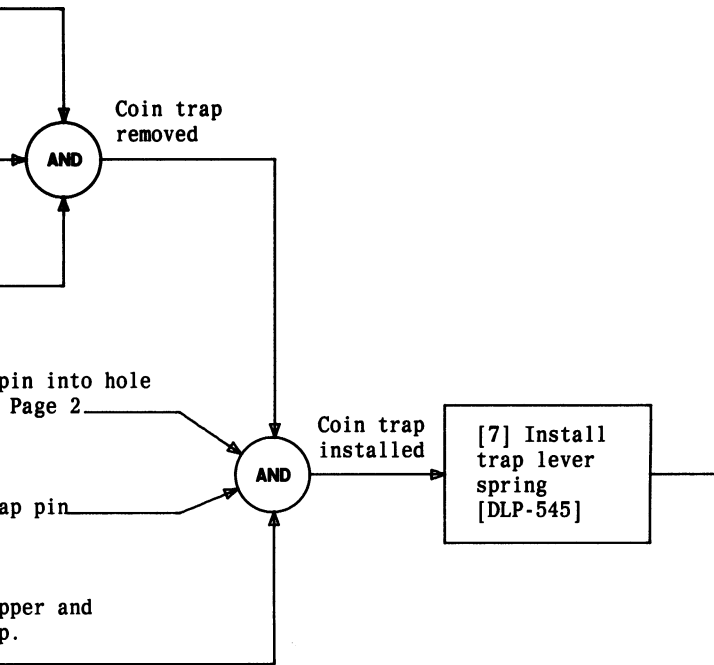
[2] Move vertical portion of trap  
pin over boss on front of  
hopper and slide pin to right

[3] Turn coin trap sideways and  
remove through opening

[4] Partially insert trap pin into hole  
in hopper. See FIG. 2, Page 2

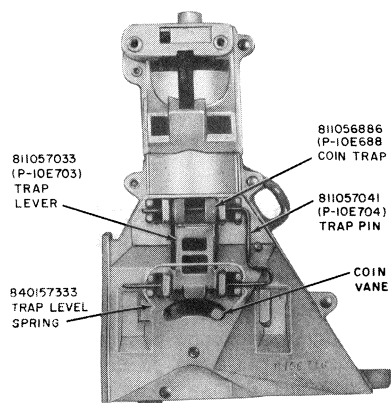
[5] Place trap lever on trap pin

[6] Insert coin trap in hopper and  
engage trap pin in trap.  
See FIG. 3, Page 2

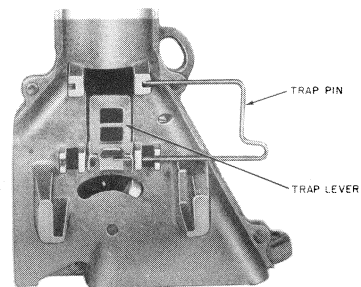


## REPLACE COIN TRAP AND ASSOCIATED COMPONENTS

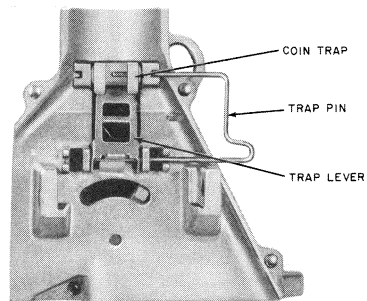
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**FIG. 1 - Coin Trap and Trap Lever Assembly**



**FIG. 2 - Placing Trap Lever Pin in Hopper**



**FIG. 3 - Placing Coin Trap in Hopper**

**REPLACE COIN TRAP AND ASSOCIATED COMPONENTS**

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[1] Move coin vane to left (collect) position. See FIG. 1, Page 2

[2] With hopper trigger in nonoperated (horizontal) position, move relay into position until trigger enters T-shaped slot in hopper and trap lever tab just enters opening in selector card. See NOTE 1

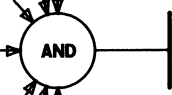
[3] Press down slightly on ear of left side of selector card and manually move armature forward to its operated position. Hold armature in this position

[4] See WARNING 1. Move coin relay forward until square stem on vane enters hole in CAM and mounting screw holes line up

[5] Place and tighten evenly two mounting screws at top of coin relay and two slotted hex head mounting screws on each side

[6] Make sure that trigger, armature, trap, and vane operate without binding

[7] Connect (Y) lead to terminal G and (BK) lead to terminal 3

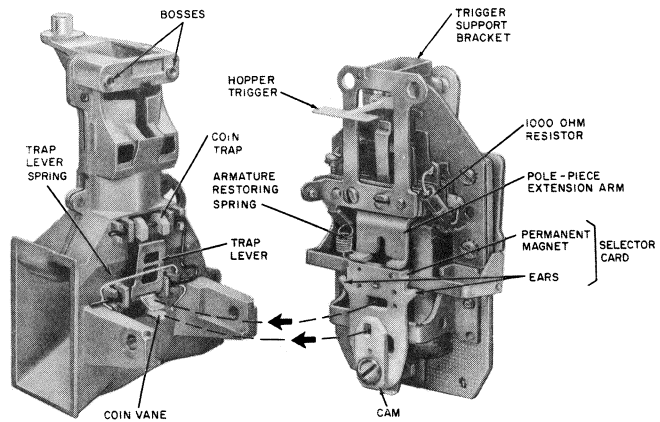


**NOTE 1**  
If trigger support bracket is so distorted that mounting holes do not engage hopper bosses, relay should not be installed

**WARNING 1**  
If stem of vane is forced into opening in cam without proper alignment, cam can be broken

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**INSTALL COIN RELAY ON HOPPER**



**FIG. 1 - Coin Hopper and Rear View of Coin Relay**

**INSTALL COIN RELAY ON HOPPER**

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[1] Remove coin relay from hopper, if required, [DLP-541]

[2] If present remove phosphor bronze trap lever spring

[3] See WARNING 1 and FIG. 1, move trap pin to the right so that left end of pin is flush with hopper guide. See FIG. 2, Step 1, Page 2

[4] Holding notched left leg of new spring at an angle away from hopper, slide the right notched leg of the spring under trap pin. See FIG. 2, Step 2, Page 2

[5] Swing loose end of spring across face of trap lever and position notch of left leg in alignment with end of trap pin. See FIG. 2, Step 3, Page 2

[6] Push trap pin to the left, over and through the left leg notch of new spring, until trap pin detents. See FIG. 2, Step 4, Page 2

[7] Install coin relay on hopper [DLP-544]

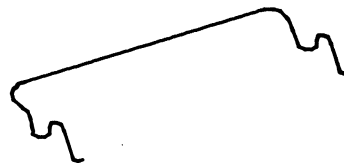
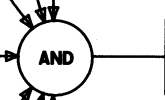
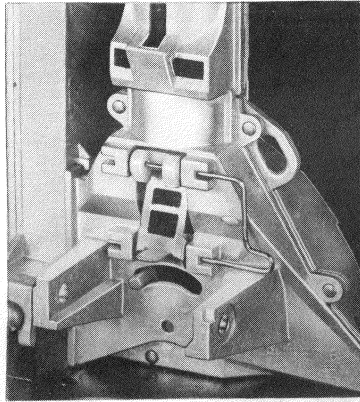


FIG. 1 - 840157333 Trap Lever Spring

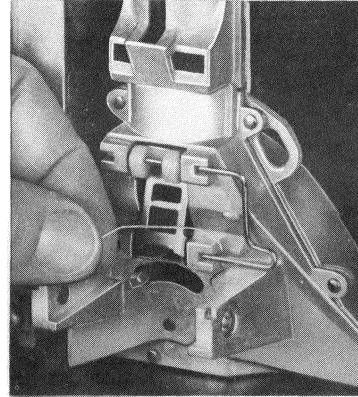


<b>WARNING 1</b>	
<i>The trap lever springs may become deformed or twisted when several are intermixed together. This situation can be corrected by grasping each leg of a loose spring with one's fingers and countertwisting them until both legs are aligned properly</i>	
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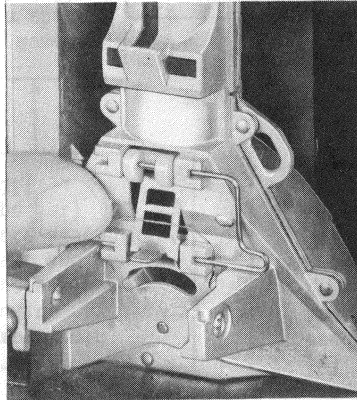
**INSTALL 840157333 TRAP LEVER SPRING**



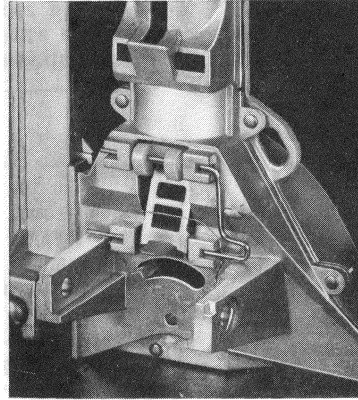
STEP 1



STEP 2



STEP 3

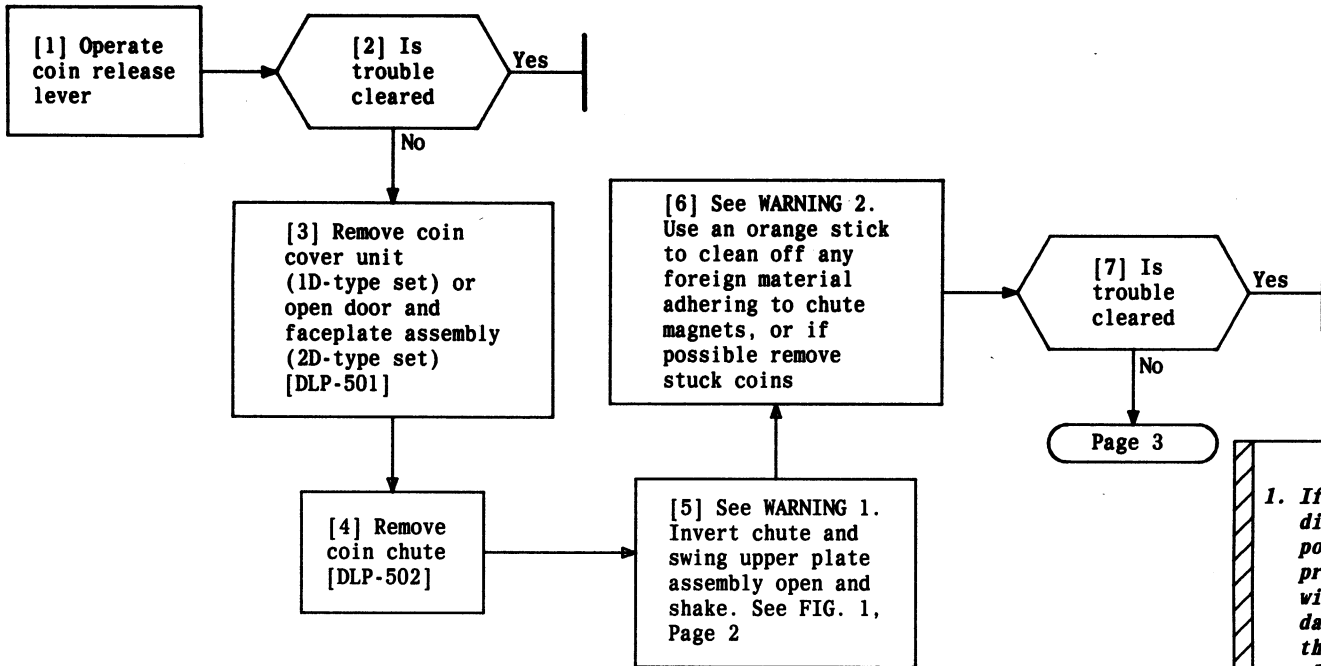


STEP 4

**FIG. 2 - Installing Trap Lever Spring (Typical)**

**INSTALL 840157333 TRAP LEVER SPRING**

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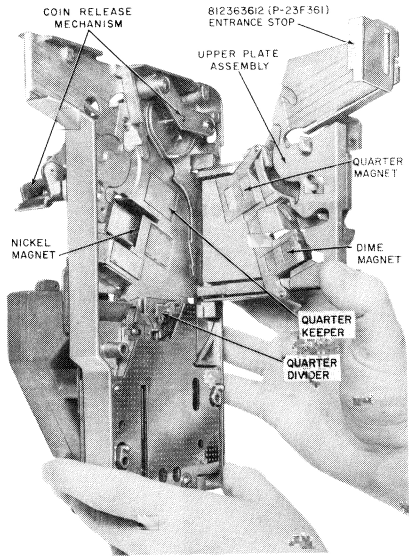
**WARNINGS**

1. If the quarter divider is not positioned properly, it will become damaged when the upper plate assembly is closed, the divider can be bent
2. The use of a screwdriver may damage chute. Chute assembly screws should not be loosened

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**CLEAR COIN CHUTE**





**FIG. 1 - Chute**

**CLEAR COIN CHUTE**

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[8] Remove 47A (MD) or 47A2 signal from chute [DLP-549]

[9] See WARNING 3. Swing upper plate assembly open. See FIG. 2

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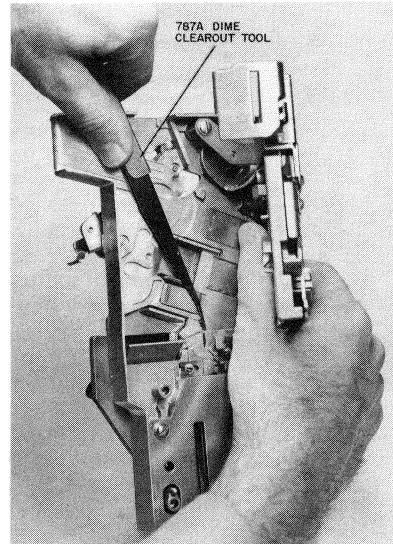


FIG. 2 - Using a 787A Dime Clearout Tool in Chute

**WARNING 3**

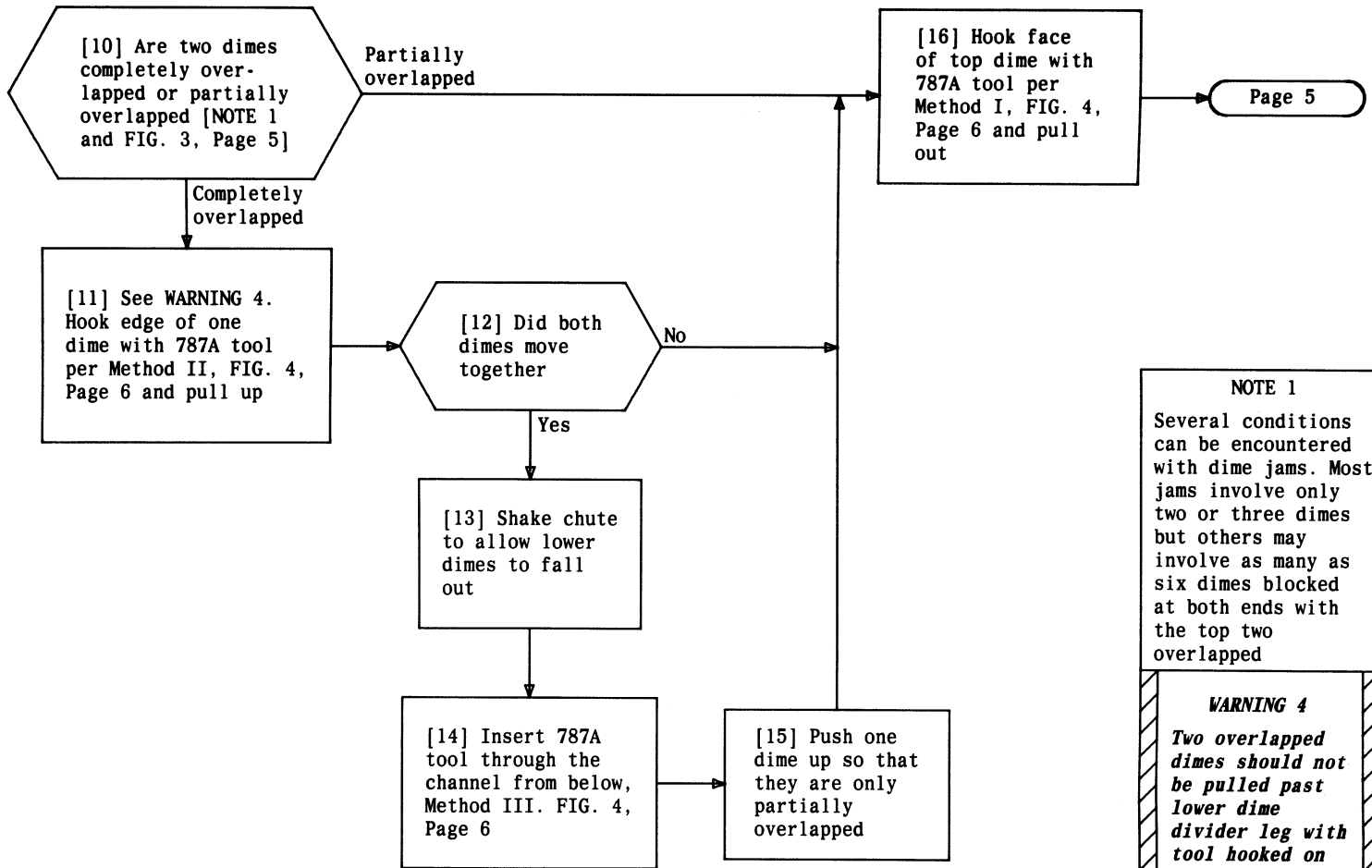
*If the quarter divider is not positioned properly, it will become damaged when upper plate assembly is closed. The divider can be bent*

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CLEAR COIN CHUTE



**NOTE 1**  
 Several conditions can be encountered with dime jams. Most jams involve only two or three dimes but others may involve as many as six dimes blocked at both ends with the top two overlapped

**WARNING 4**  
*Two overlapped dimes should not be pulled past lower dime divider leg with tool hooked on dimes edge*

[17] Install  
47A (MD) or 47A2  
signal on chute  
[DLP-522]

[18] Install  
coin chute  
[DLP-507]

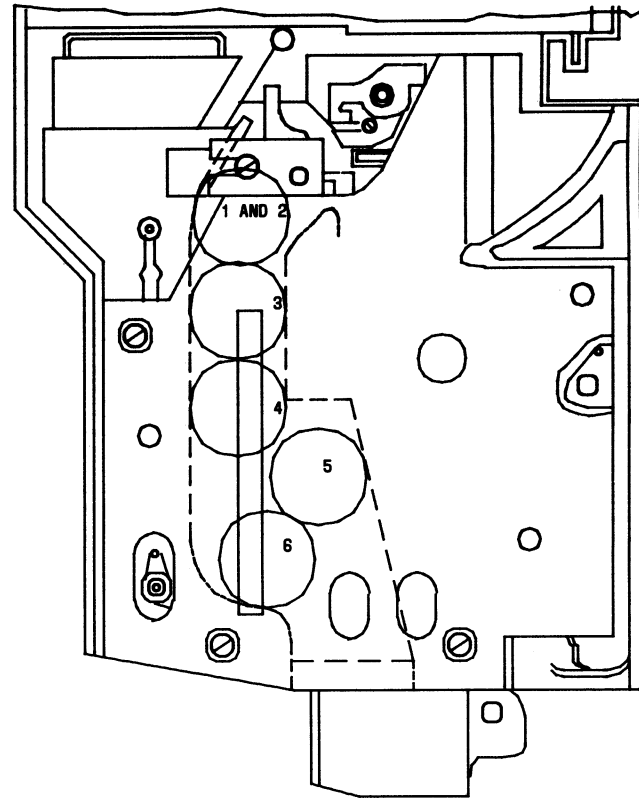
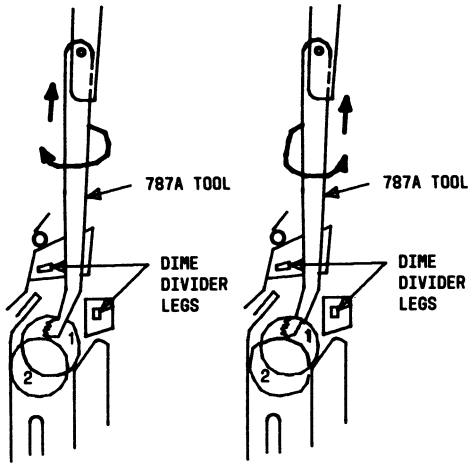


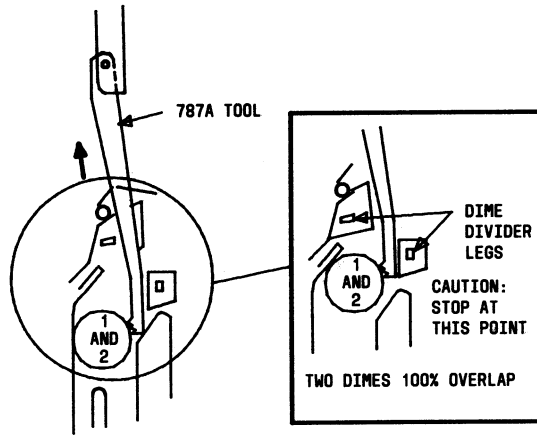
FIG. 3 - Lower Portion of Coin Chute With Six Dimes Jammed

**CLEAR COIN CHUTE**

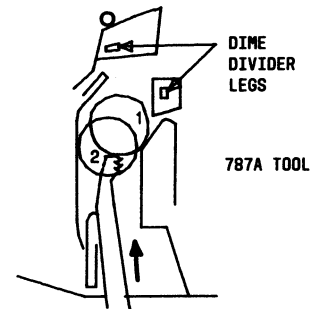
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METHOD I



METHOD II

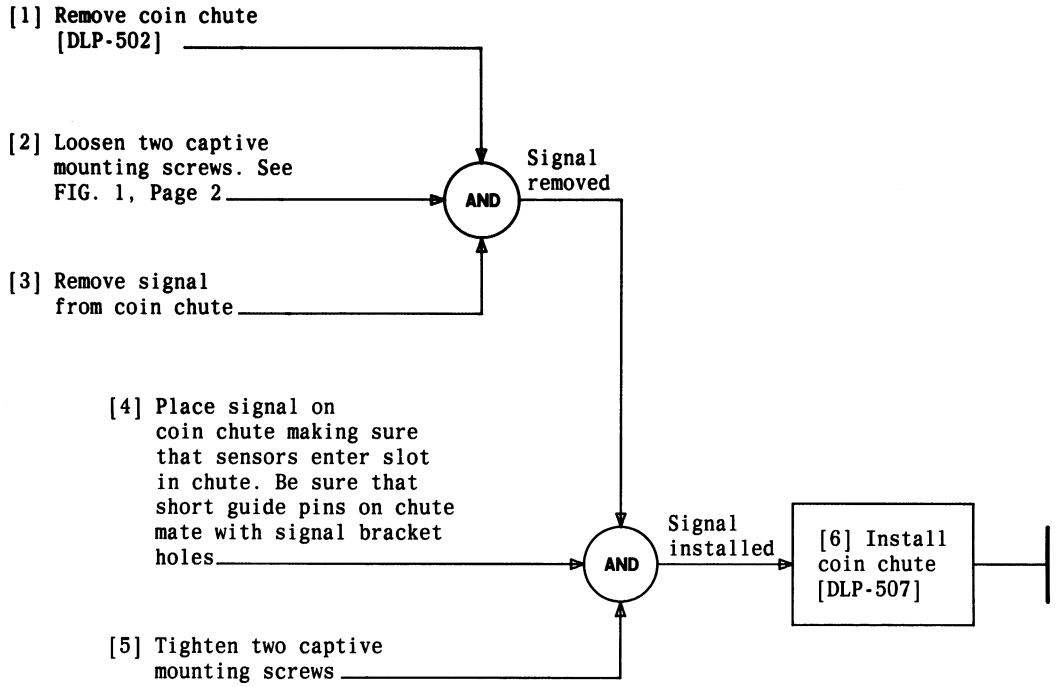


METHOD III

FIG. 4 - Method for Removing Jammed Dimes from Chute

CLEAR COIN CHUTE

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**REPLACE 47A (MD) OR 47A2 SIGNAL**

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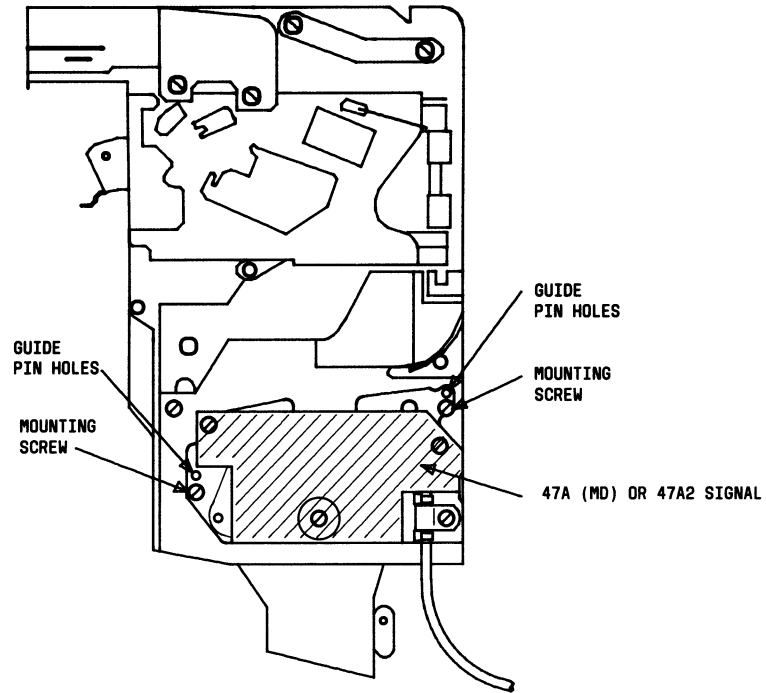
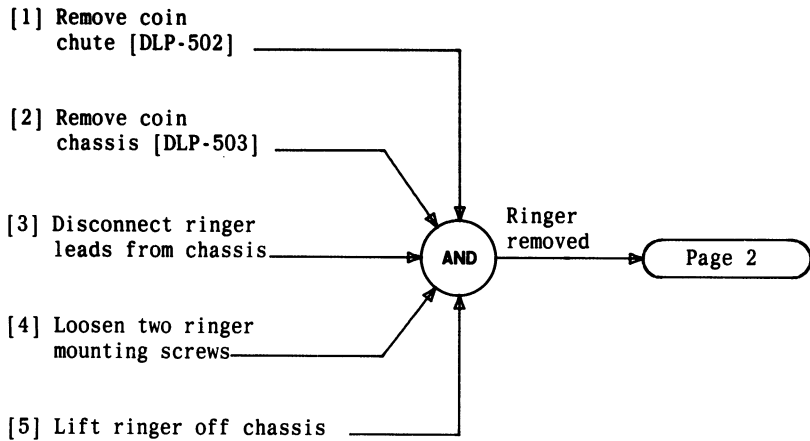


FIG. 1

REPLACE 47A (MD) OR 47A2 SIGNAL

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**REPLACE RINGER**

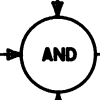
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[6] Mount ringer on chassis making sure that locating pin on bottom of ringer is in grommet on chassis

[7] Secure ringer with two mounting screws

[8] Connect ringer leads per TABLE A



Ringer installed

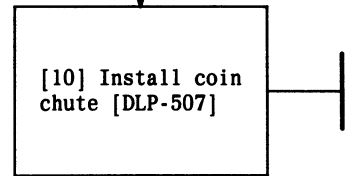
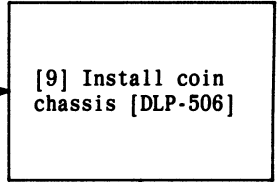
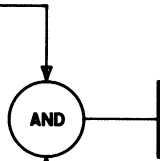


TABLE A	
WIRE COLOR	CONNECT TO
S	Term. 15
S-R	
BK	Term. 16
R	TB1-R

**REPLACE RINGER**

[1] Loosen two captive mounting screws. See FIG. 1



[2] Remove signal from chute

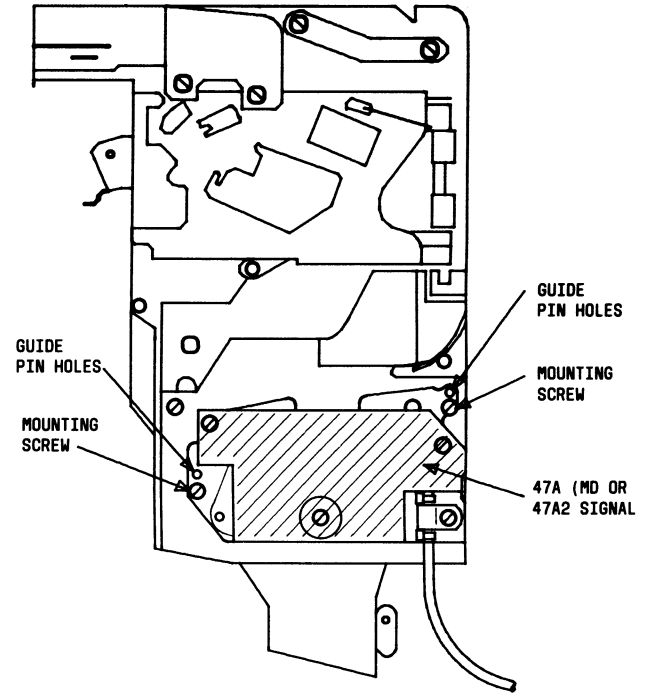


FIG. 1

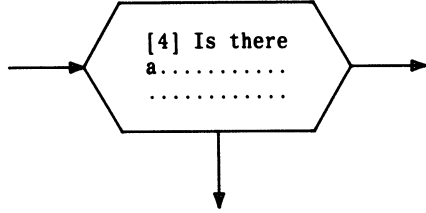
REMOVE 47A (MD) OR 47A2 SIGNAL FROM COIN CHUTE

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1D1, 1D2 COIN TELEPHONE SET ... INSTALL . . . . .	051
2D1, 2D2 COIN TELEPHONE SET ... INSTALL . . . . .	052
CHECK LOCATION AND MOUNTING FACILITIES . . . . .	500
CLEAR CAN'T BREAK DIAL TONE TROUBLE . . . . .	102
CLEAR COIN CHUTE . . . . .	546
CLEAR COIN TONE SIGNAL TROUBLE . . . . .	107
CLEAR COINS COLLECTED OR RETURNED IN ERROR TROUBLE . . . . .	111
CLEAR DIAL TONE TROUBLE . . . . .	108
CLEAR INSUFFICIENT DEPOSIT COIN RETURN TROUBLE . . . . .	104
CLEAR INSUFFICIENT DEPOSIT RECORDING TROUBLE . . . . .	103
CLEAR OPERATOR COIN RETURN TROUBLE . . . . .	109
CLEAR PENNY RETURN TROUBLE . . . . .	106
CLEAR RINGER TROUBLE . . . . .	110
CLEAR RINGING TONE TROUBLE . . . . .	105
CONVERT 1A-, 2A-TYPE SET IN COIN-FIRST MODE TO 1D-, 2D-TYPE SET DIAL-TONE-FIRST MODE . . . . .	055
CONVERT 1C-, 2C-TYPE SET IN COIN-FIRST MODE TO 1D-, 2D-TYPE SET DIAL-TONE-FIRST MODE . . . . .	054

CONVERT 1C-, 2C-TYPE SET IN DIAL-TONE-FIRST MODE TO 1D, 2D-TYPE SET DIAL-TONE-FIRST MODE . . . . .	053
CONVERT 1E1 SET IN DIAL POSTPAY MODE TO 1D1 SET DIAL-TONE-FIRST MODE . . . . .	056
CONVERT 1E3 SET IN MANUAL POSTPAY MODE TO 1D1 OR 1D2 SET DIAL-TONE-FIRST MODE . . . . .	057
INSTALL 1D1, 1D2 COIN TELEPHONE SET . . . . .	051
INSTALL 2D1, 2D2 COIN TELEPHONE SET . . . . .	052
INSTALL 840157333 TRAP LEVER SPRING . . . . .	545
INSTALL COIN RELAY ON HOPPER . . . . .	544
MAINTENANCE PHILOSOPHY - 1D/2D-TYPE COIN TELEPHONE SET . . . . .	100
REMOVE COIN RELAY FROM HOPPER . . . . .	541
REPLACE 47A (MD) OR 47A2 SIGNAL . . . . .	547
REPLACE COIN RELAY . . . . .	538
REPLACE COIN TRAP AND ASSOCIATED COMPONENTS . . . . .	543
REPLACE RINGER . . . . .	548
REPLACE VANE . . . . .	542

**INDEX**

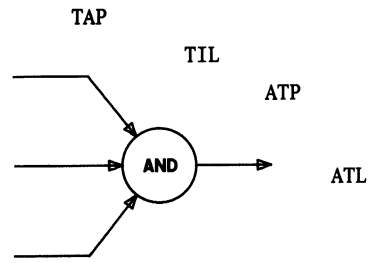


**WARNING**  
 Always be safety  
 conscious on  
 and off the job

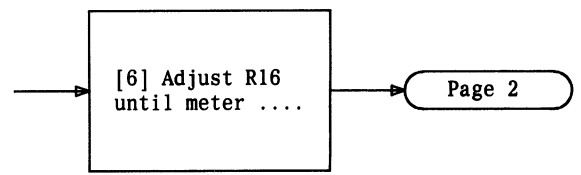
*This is a . . . . .*

# TASK ORIENTED PRACTICE..... or TOP

*The next few pages will tell  
 you how to use this document.*



[DLP-540]



## HOW TO USE THIS "TOP"

This book is called a Task Oriented Practice or a "TOP." It is a type of programmed document – one which gives you step-by-step instructions of how to do a job (or task). A TOP can be a big help in your everyday work, but you must know how to use it correctly. Take a few minutes, say 15 or 20, and study these few pages until you feel you understand how to use a TOP. Taking this time now will very likely save you time and effort later on.

An important thing to remember about TOP is that it contains all the needed instructions to complete a job. If you are doing the job for the first time, you will be directed through each action without having to guess or remember where to find the necessary information. If you are experienced on a particular job, TOP can provide just that information which you may have forgotten.

Almost all of your jobs can be classified into one of four types – *Routine*, *Acceptance*, *Company Order*, or *Trouble Clearing*. This is how TOP defines these four work types:

### *Routine*

that work you do as part of a Controlled Maintenance Plan like scheduled cleaning or scheduled tests. Routine work may also include those things you do as a "routine" part of your job like requesting a TTY printout or turning on equipment in the mornings and off in the evenings.

### *Acceptance*

that work you do to verify that equipment is installed properly. Normally this is a test or inspection you perform when Western Electric has completed a new installation or addition. It could also be a test you perform when another group from *your* Company has completed

an installation or addition of equipment. Acceptance work, however, is always related to testing or checking newly installed equipment.

### *Company Order*

that work you do in response to one of several different "orders" which may be given to you. Some of the orders you may be familiar with are Circuit Orders, Service Orders, Traffic Orders, Recent Change Orders, etc. Normally, company order type work is something done to install, establish, change, or discontinue some service offered by the telephone company.

### *Trouble Clearing*

is simply what it says – that work you do to clear and repair troubles in the system. Trouble clearing may be done in answering a customer complaint, responding to some office alarm, an abnormal TTY printout, etc.

Try to fix these four work types firmly in your mind. As you will see, you must classify each job you get in one of these four types before you will be able to look up the instructions in the TOP.

Now glance briefly at the front cover; there are several things which will be useful there. In the upper-right corner is the 9-digit volume number. Near the center is the volume title which tells you something about the contents – such things as the system (or subsystem) name and perhaps the type of jobs included in the volume. Next is a four-line index located in the lower-left corner. This index provides the location of four "lists" which are simply a listing of all the jobs in each of the four job types. If a nine-digit (XXX-XXX-XXX) number appears on

the front cover index, that particular list is located in another volume of the TOP. A three-digit number on the line means that the list is in this volume, and the list can be located by searching the lower-right corner of each page for the referenced number.

Issue 1	APR 1976
XXX-XXX-XXX	COL
PAGE 1 of 2	050

These numbers will always be arranged in numerical order; however, all numbers in the sequence will not be used.

Some TOP volumes may cover only a small part of a system, so on the inside of each front cover you will find a documentation plan. This plan will give a bird's-eye view of all the volumes in the TOP and can help you quickly determine the correct volume.

Locate one of the TOP volumes which contains a Company Order List, and note from the front cover that this list is numbered "050." Turn to that number in the TOP.

This Company Order List (COL) is simply a listing of all the Circuit Order jobs, Service Order jobs, etc, that may be done on this system. Once you know the job you have to do, use the lists as an index to find the number of the "procedure" which tells you *what to do* to complete that job.

Now pick one of these jobs from the list which references to a COP (Company Order Procedure), and using the referenced number, locate that procedure in the TOP. Look over this procedure and note that it gives all the items which must be done to complete the job.

The items are numbered and must be completed in that order; however, you may see some lettered (A, B, C...) items in the procedure. These letters are assigned to options or other items which may be done differently because of equipment variations, etc. Look over the following example to get a better idea of what is meant by the numbers (1, 2, 3...) and letters (A, B, C...) which may be used in the procedure.

ITEM	SUBTASKS	PROCEDURE NUMBER
1	Do the first thing first	DLP-XXX
2	Do the second item next	DLP-XXX
3	Do the following optional items as required by the Company Order or as is required by the system you are working on	
	A. An optional item	DLP-XXX
	B. Another optional item	-
	C. Another optional item which must be done in the sequence below	
	1. First part of Option "C"	DLP-XXX
	2. Last part of Option "C"	DLP-XXX
4	Do the next part of the job	DLP-XXX
5	Do the last part of the job	DLP-XXX

Remember that this procedure tells you *what* to do in order to complete the total job. If you know *how* to do an item in the procedure, you should go ahead and complete it. If you need further information on *how* to do part of the job, then you should turn to the referenced DLP or Detail Level Procedure. When you complete all the steps in the DLP, then you must turn back to the COP or Company Order Procedure to find the next item to be done.

TOP is designed so that you will have to read only what is necessary to get your job done. At any time when you know how to perform all the steps in an item, it is not necessary to look further for the "how to" information - simply complete the item and go on to the next one. This idea, in TOP, is known as "bypassing."

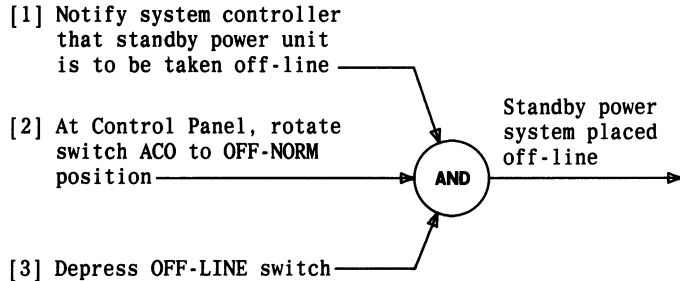
Here are some of the things designed into TOP to help you "bypass" information you may already know:

### Summary Statement

A summary statement is used with a DLP (or the flow-charted procedures). It tells you briefly what the procedure does and what type measurement or result can be observed. After reading the summary, you may be able to complete the procedure without reading further. Some shorter DLPs, of course, do not have summary statements.

### Result Statement

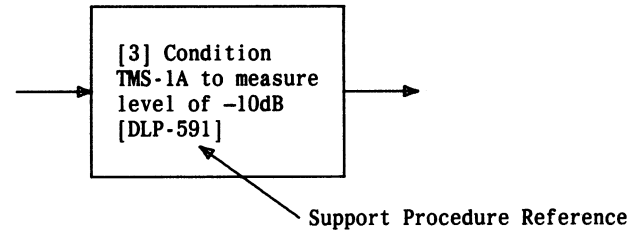
A result statement may be used in a flow-charted procedure along with the "AND" symbol. Here is an example of the "AND" symbol and a *result statement*:



When using a procedure, read the result statement first. If you know how to place standby power system in off-line status, it would be unnecessary to read steps 1, 2, and 3.

### Support Procedures

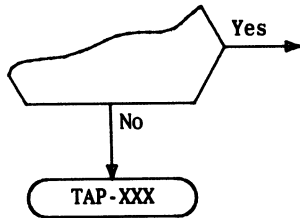
When you see this kind of reference in TOP, it refers to a support procedure.



The support procedure (DLP-591) would provide information about how to operate the TMS-1A. Of course, if you are familiar with the TMS-1A, there is no reason to look up DLP-591.

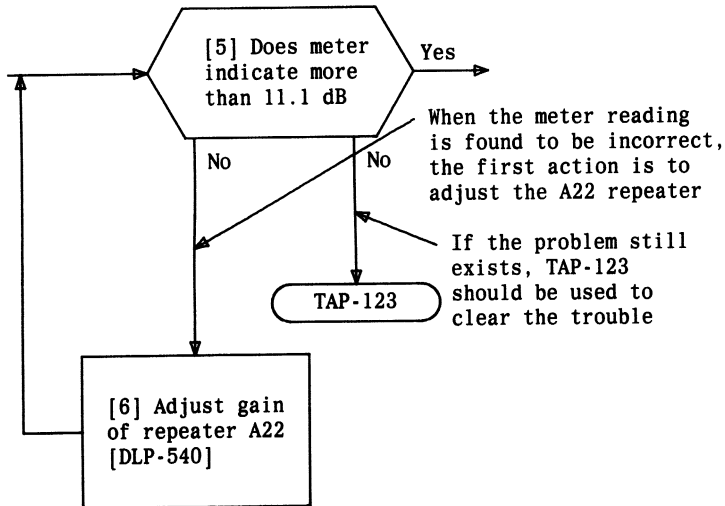
So far, the Company Order type jobs have been the main topic; however, you will find that the Routine and Acceptance categories are used in the same manner. You may come across a couple of new abbreviations in those categories, namely, Acceptance Task Procedure (ATP) and Routine Task Procedure (RTP). These categories are used in the same way that the Company Order Procedure (COP) is used in the Company Order work.

While using TOP, you probably will run across a reference similar to this:



This reference to TAP-XXX indicates that the equipment is not operating correctly and the TAP (Trouble Analysis Procedure) should be used to help you find and repair the trouble.

This idea can be carried further. In some cases, a decision block may have more than one abnormal output. This simply means that you should try more than one solution to the problem. See the example below.

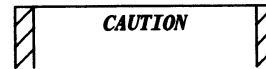


Trouble clearing information in TOP is basically used the same way as the other types. When a trouble report or equipment alarm requires you to troubleshoot a system, the Trouble Indicator List (TIL) is the place to start. This (TIL) is a listing of trouble symptoms or alarms with a reference to a Trouble Analysis Procedure (TAP). The TAP is an aid in analyzing and locating the cause of the trouble. The TAP may reference to other information such as a Trouble Analysis Data (TAD) or an Isolation Diagram (ISD) as an aid in the trouble clearing process.

Any job must always be done safely and it is no different with TOP. Here are three items which you should look for in TOP:



- means there is a possibility of personal injury



- means there is a possibility of service interruption

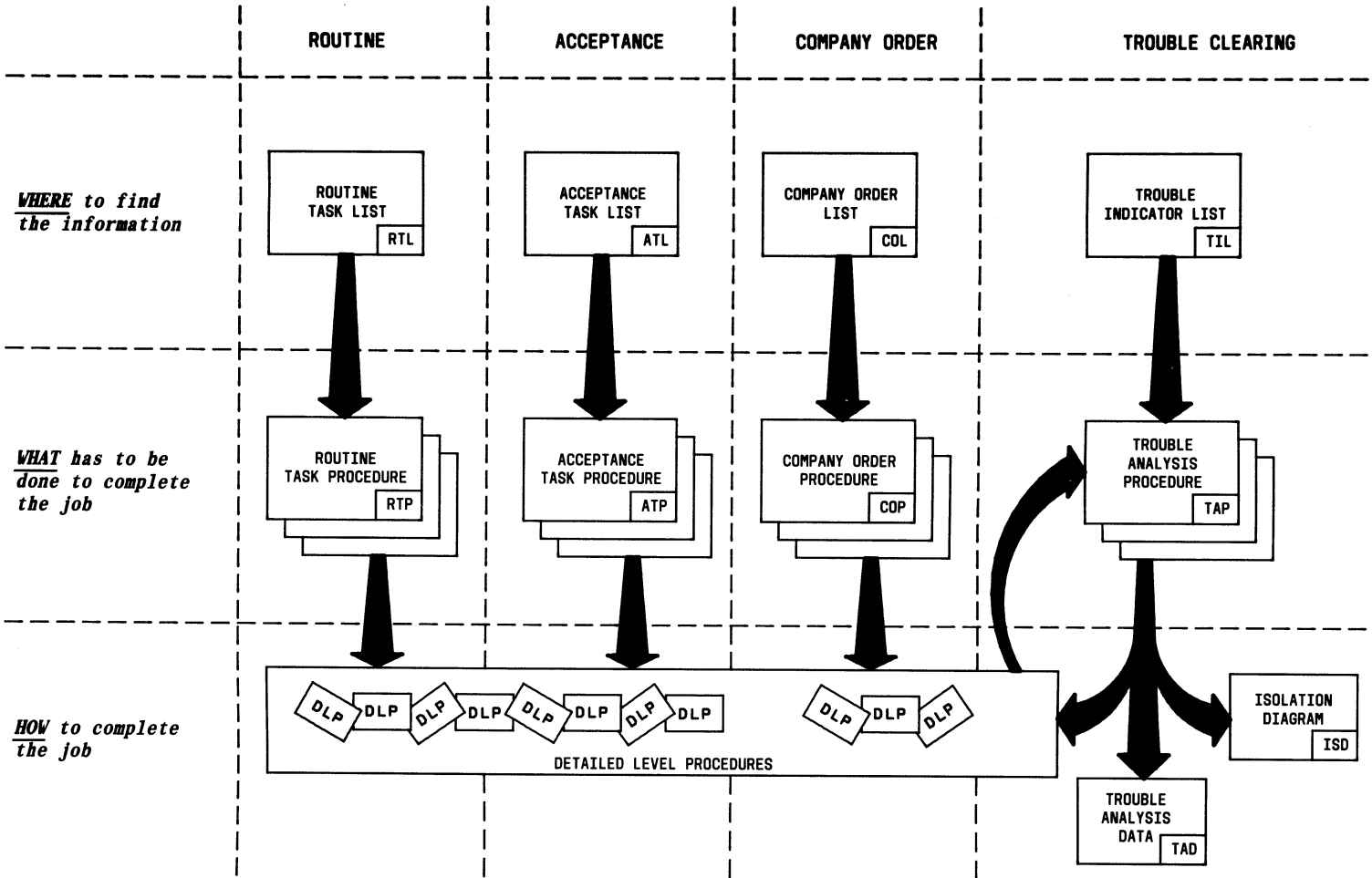


- means there is a possibility of equipment damage

The last page of this introductory section is a diagram which shows all the elements used to make up a TOP and basically how they are organized to make a complete document. The diagram may, at first, seem to be complex; but remember, TOP is a programmed document and it always tells you where to find the next bit of information required to do the job. The diagram, however, may be useful later if you need to know the words which DLP, TAP, etc, represent or simply a memory jogger about TOP in general.

While using any TOP, if you find errors, or if a procedure is inadequate or missing, your comments are greatly needed. They may be forwarded by using the standard form E3973 which is available through your Company. Thank you for helping us prepare better documentation.





# 10A AND 20A COINLESS TELEPHONE SET AND KS-22284 BACKBOARD IDENTIFICATION, INSTALLATION, TESTS, MAINTENANCE, AND CONNECTIONS

## 1. GENERAL

1.01 This section provides information on:

- (a) The 10A coinless telephone set (Fig. 1)
- (b) The 20A coinless telephone set (Fig. 2)
- (c) The KS-22284 backboard (Fig. 3)
- (d) The 2554-type telephone sets (Fig. 3).

**Note:** Modification to the 2554BM-03 and 2554BMP-03 telephone sets will be necessary to replace modular jacks with hard wire to make the set nonmodular.

1.02 This section is reissued to add:

- 20A coinless telephone set
- D-180941 Kit of Parts (illumination package)
- 70B dial.

Since this reissue covers general revision, arrows ordinarily used to indicate changes have been omitted.

1.03 The coinless telephone set is intended for use in locations where present coin phones are serving high volume of credit card, collect, or billed to a third party calls. Signs associated with this service are displayed as "Charge-a-Call."

## 2. IDENTIFICATION

A. 10A Coinless Telephone Set (Fig. 1, 4, and 6)

2.01 The 10A coinless telephone set is designed to be installed on any backboard or enclosure

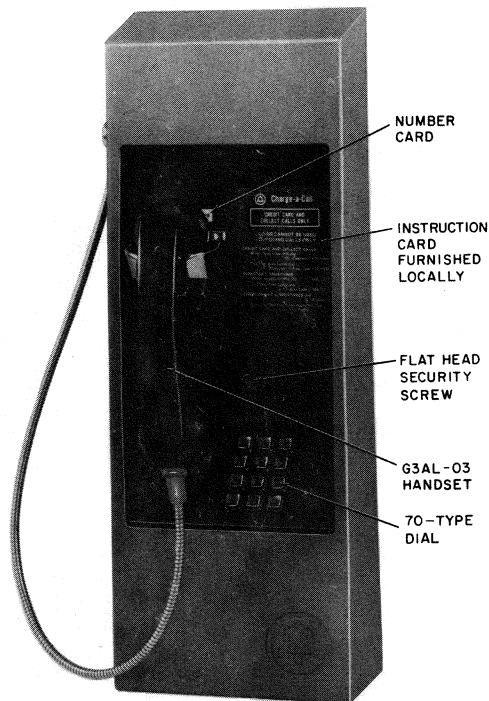


Fig. 1—10A Coinless Telephone Set

that will accept a 1-type coin telephone set; however, when a recessed enclosure is encountered, such as the SENTRY\* mounting or wedge shelf, a KS-22171, List 1 adapter (Fig. 6) is required.

\*Trademark of Western Electric

### NOTICE

Not for use or disclosure outside the  
Bell System except under written agreement

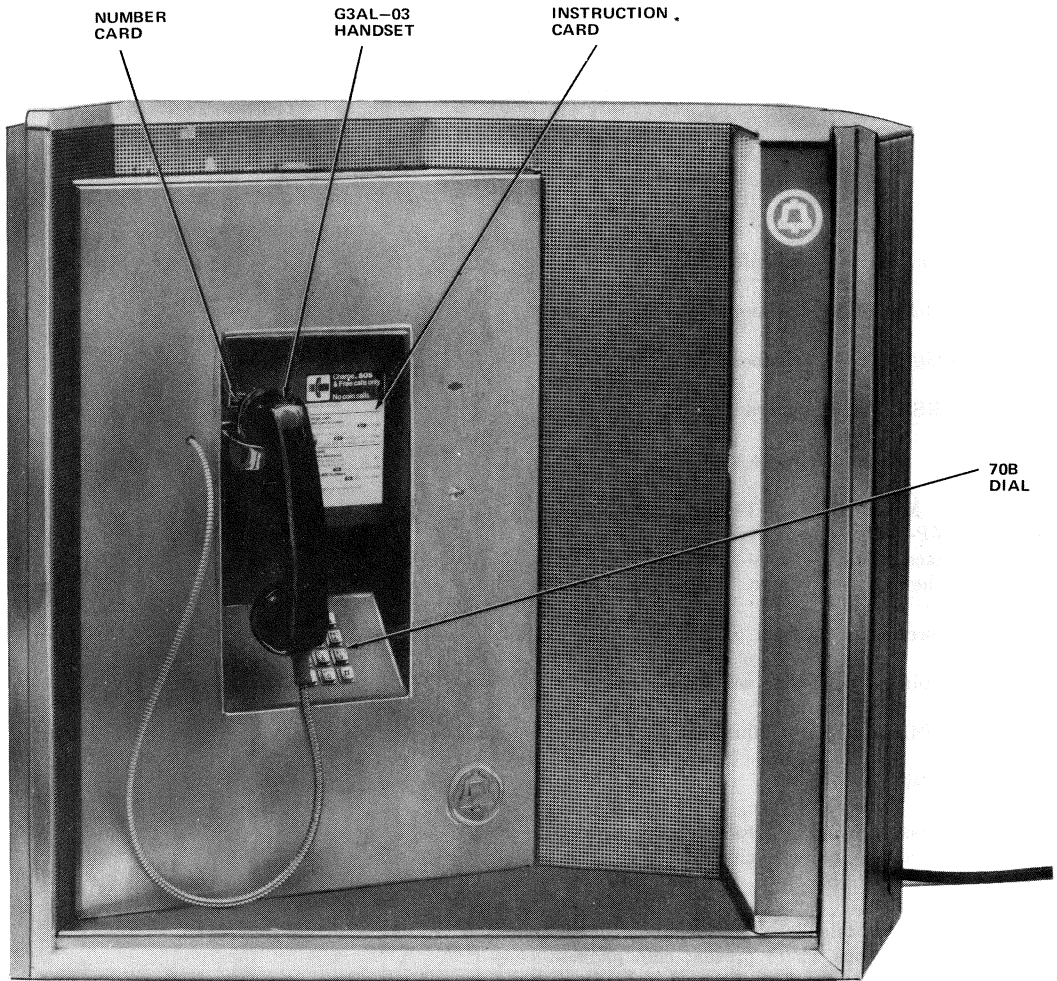


Fig. 2—20A Coinless Telephone Set

**2.02** Each set consists of a rear pan assembly and a front cover assembly (Fig. 4). These two assemblies are connected electrically by a 2-foot long D4CD-49 line cord.

**2.03** The front cover assembly is secured to the rear pan assembly with a flat head security screw.

**2.04** The set is made of steel and painted Corporate Bell Blue with a Bell symbol on the front surface.

**2.05** A terminal board (TB1) is furnished on the rear pan assembly for terminating station wiring.

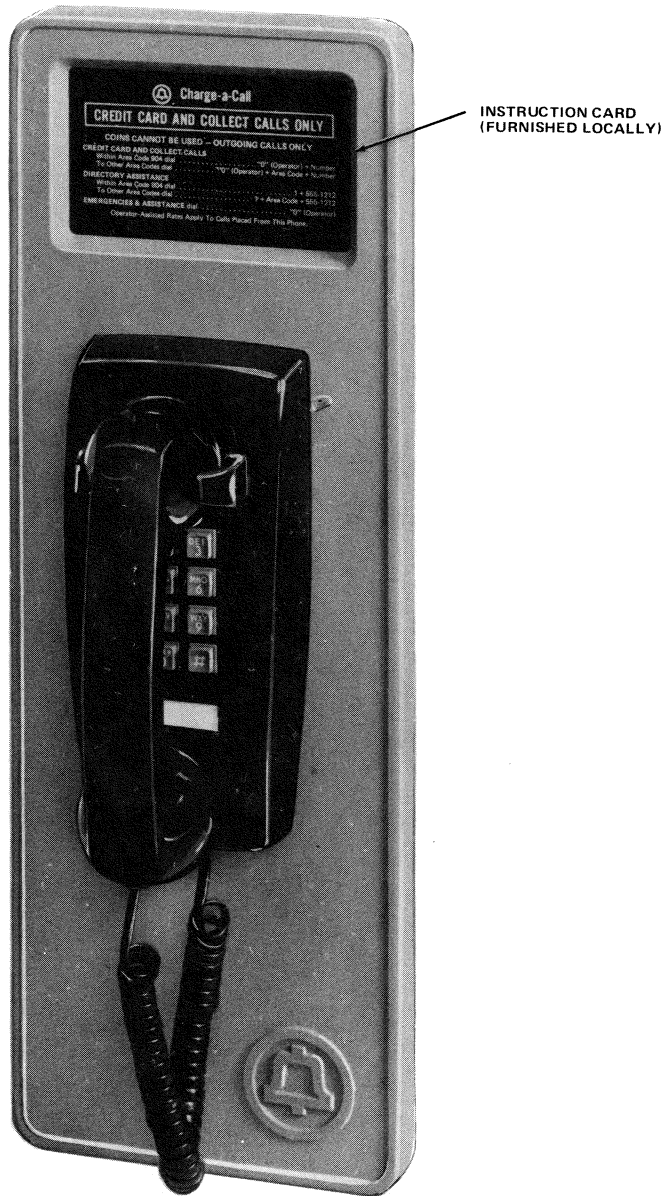


Fig. 3—KS-22284 Backboard With 2554-Type Telephone Set

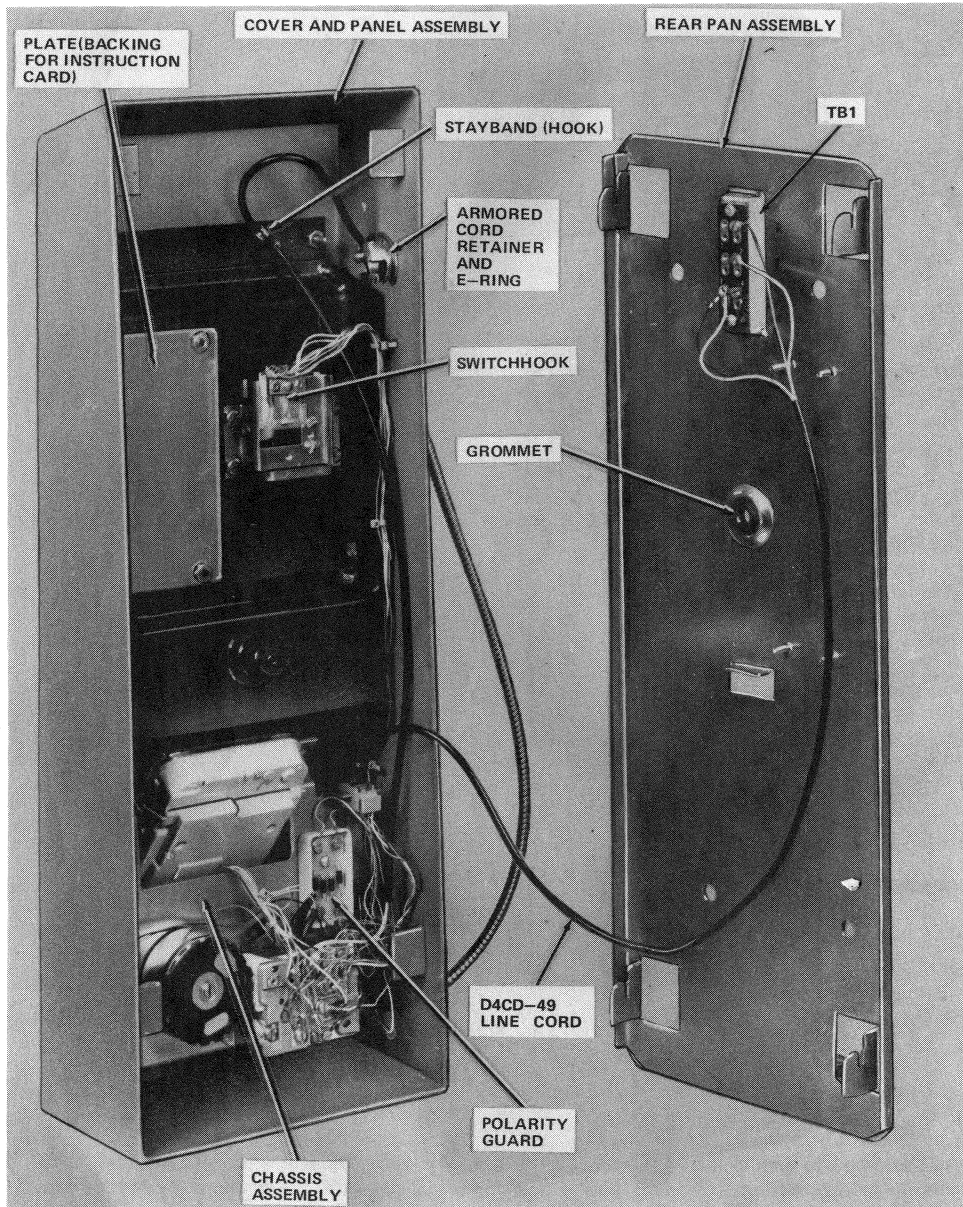
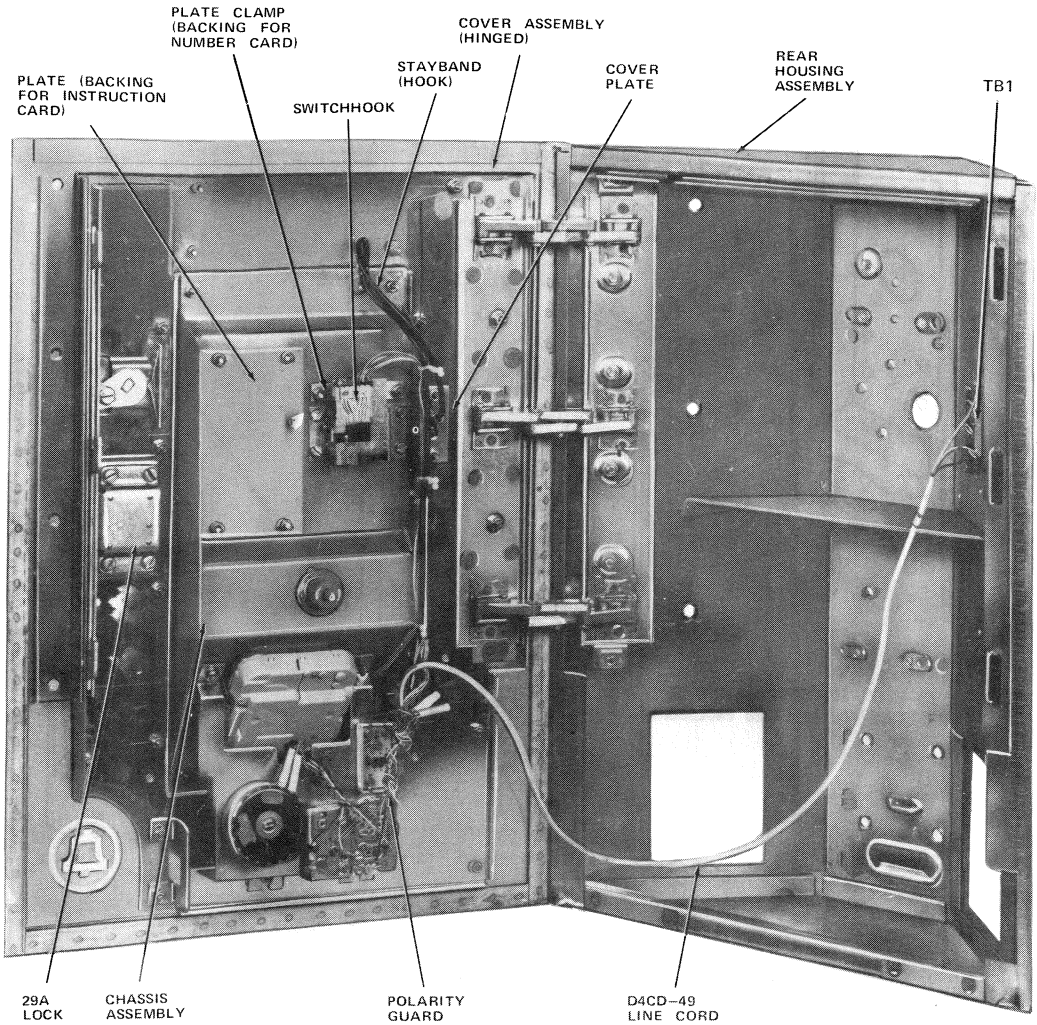


Fig. 4—10A Coinless Telephone Set With Rear Pan Assembly Removed



**Fig. 5—20A Coinless Telephone Set With Cover Assembly Opened**

**2.06** The instruction card (Fig. 1 and 7) must be fabricated and procured locally.

**2.07** The 10A coinless set contains the following components:

- 70B or 70A (MD) dial

- G3AL-03 Handset which includes a H4EJ Cord

- P1B Ringer

- 4228B Network.

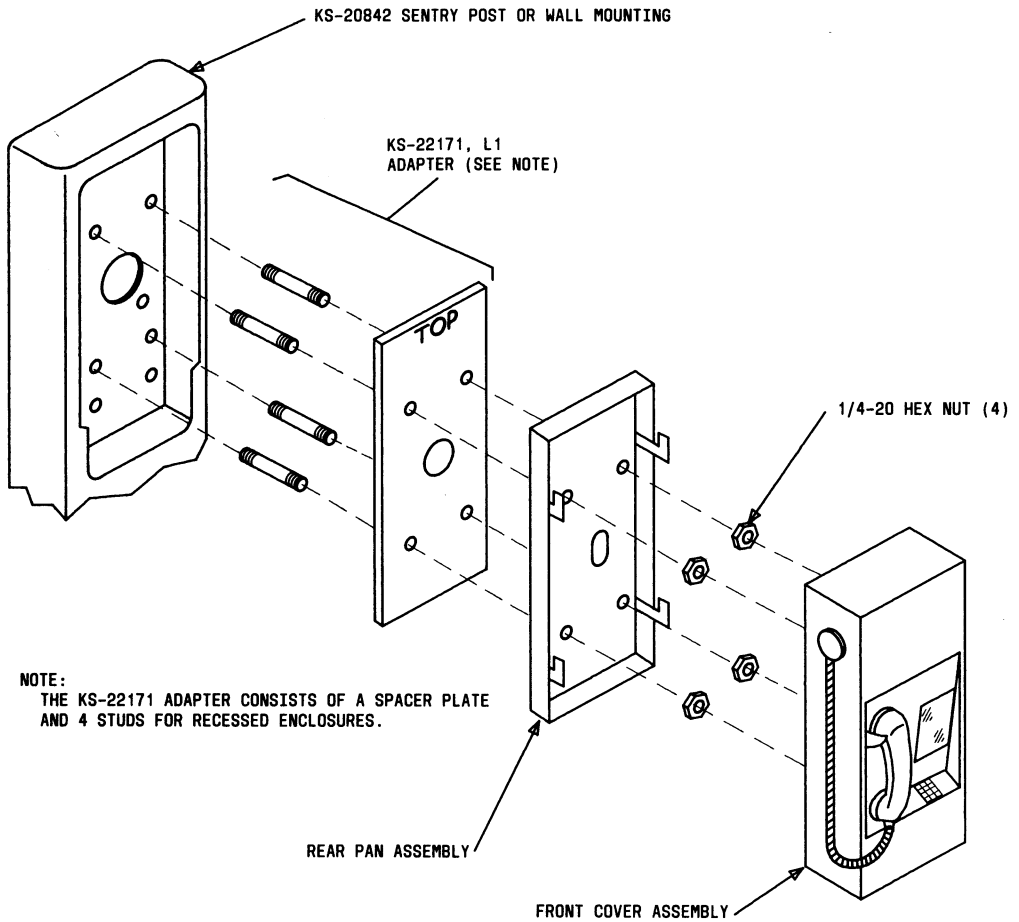


Fig. 6—10A Coinless Telephone Set Used With Adapter

**2.08** Overall dimensions of the 10A coinless set are:

- Height—21 inches
- Width—7-9/16 inches
- Depth—4 inches.

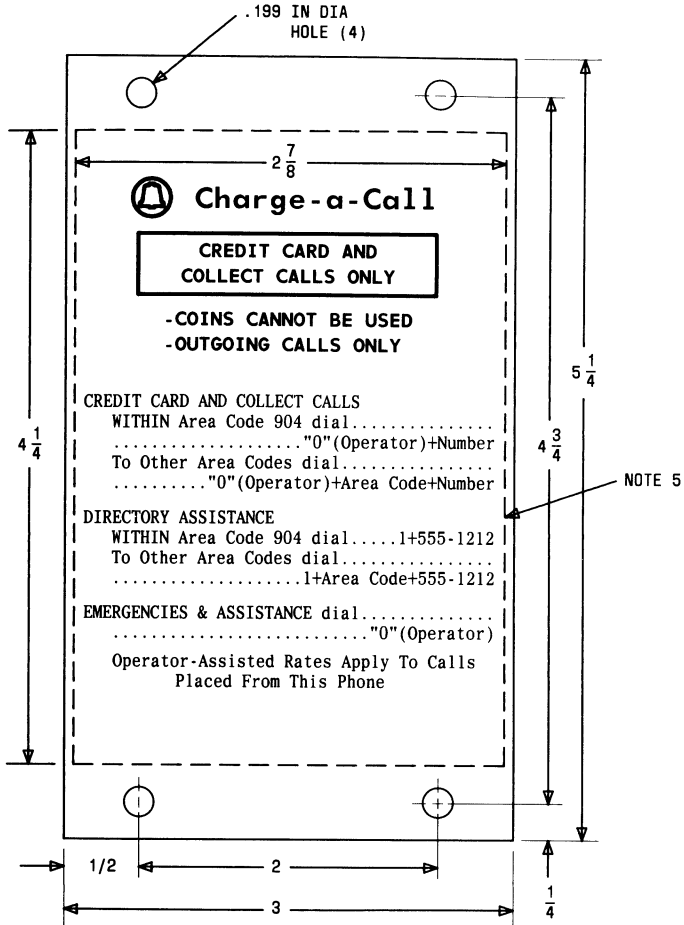
**2.09** There are no provisions for using security studs with this set.

**2.10** This set has no coin handling features.

**B. 20A Coinless Telephone Set (Fig. 2 and 5)**

**2.11** The 20A coinless telephone set is designed to be installed in any enclosure or mounting which accepts the 2-type (panel) coin telephone sets.

**2.12** Each set consists of a rear housing assembly and a hinged cover assembly (Fig. 5). The cover assembly includes a brushed stainless steel



**NOTES:**

1. INSTRUCTION CARD FORMAT IS FOR EXAMPLE ONLY.
2. MATERIAL MAY BE A RIGID LAMINATED PLASTIC OR OTHER MATERIAL WITH PROTECTED OR DURABLE SURFACE. RECOMMENDED THICKNESS - .045" TO .050".
3. ALL DIMENSION SHOWN ARE IN INCHES.
4. THE OPENING IN FRONT OF SET IS  $2 \frac{7}{8} \times 4 \frac{1}{4}$ . ENSURE THAT INSTRUCTIONS ARE NOT PRINTED BEYOND THIS VISIBLE AREA

**Fig. 7—Instruction Card for 10A or 20A Coinless Telephone Set (Typical)**



## SECTION 506-500-100

faceplate with beveled edges and a recessed panel assembly painted Corporate Bell Blue.

**2.13** The hinged cover assembly is held closed by a latching mechanism operated by the 719A tool and a 29A lock. The lock must be provided and installed by the telephone company.

**2.14** A terminal (TB1) is furnished on the rear pan assembly for terminating station wiring.

**2.15** The instruction card (Fig. 2 and 7) must be fabricated and procured locally.

**2.16** The 20A coinless set contains the following components:

- 70B Dial
- G3AL-03 handset which includes a H4EJ cord
- P1B ringer
- 4228B network.

**2.17** The overall dimensions of the 20A coinless set are the same as those of the 2-type coin sets. See Fig. 8.

**2.18** Security studs may be used with this set.

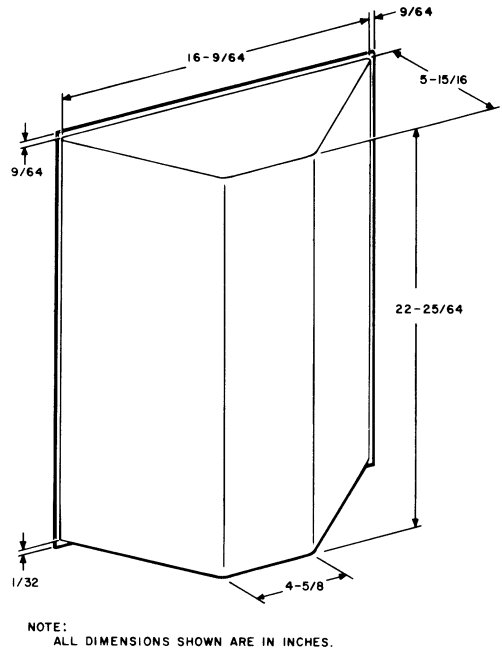
**2.19** The set has no coin handling features.

### C. KS-22284 Backboard (Fig. 3 and 9)

**2.20** The KS-22284 backboard is intended as a mounting apparatus to mount a black, nonmodular 2554-type telephone set indoors for "Charge-a-Call" public telephone service in lieu of the 10A coinless telephone set.

**2.21** The backboard is a two-piece assembly which consists of a rear panel support and a front mounting panel. The two pieces are made of Bell System blue colored plastic. Mounting hardware is furnished.

**2.22** Any closure that will accept a 1-type coin telephone set will accept this backboard, however, when a recessed enclosure is encountered, such as the SENTRY mounting or wedge shelf, a KS-22171, List 1 adapter (Fig. 10) is required.



**Fig. 8—Rear View of 20A Coinless Set Showing Dimensions**

**2.23** The rear panel has four holes compatible with the coin set mounting holes on the 178A backboard to facilitate installation when the 178A is present; however, the rear panel can be mounted directly to a wall.

**2.24** The instruction card (Fig. 3 and 11) must be fabricated and procured locally.

## 3. INSTALLATION

### A. 10A Coinless Telephone Set

**3.01** Install the rear pan assembly on a 178A backboard or on any enclosure that will accept a 1-type coin telephone set. Use four 1/4-20 by 5/8 RHM screws.

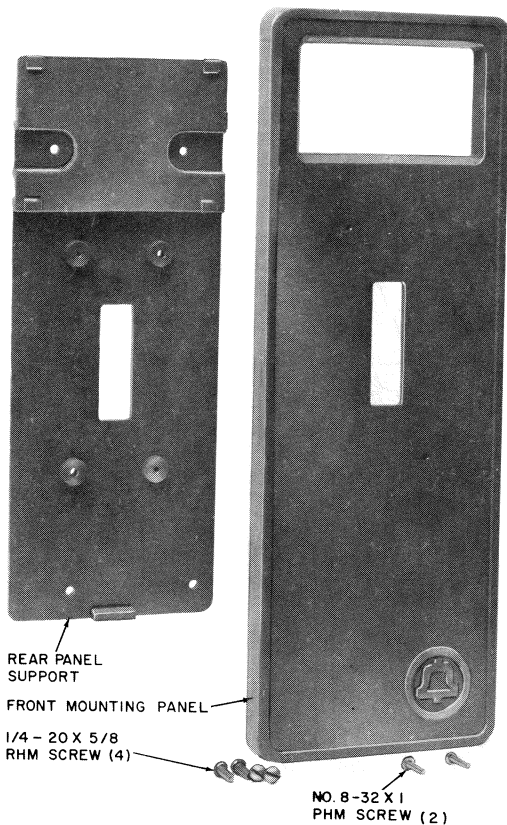


Fig. 9—KS-22284 Backboard

**Note:** On the KS-21571 deluxe wedge shelf and KS-20842 SENTRY mounting, a KS-22171, List 1 adapter is required (Fig. 6).

- 3.02** Run inside wire through grommet (Fig. 4) and terminate on TB1 per Fig. 17. Be sure that bonding and grounding practices are followed as described in Sections 460-100-400, 506-100-100, and 508-100-100.
- 3.03** Install instruction card in front cover assembly as follows.
- (1) Remove four No. 8-32 hex nuts and remove plate from instruction card opening (Fig. 4).

- (2) Insert instruction card (procured locally) into the opening and secure with the plate and four No. 8-32 hex units removed in Step (1).

**3.04** Install number card (procured locally) as follows.

- (1) Remove two No. 8-32 hex nut and 840994453 plate clamp that secures number card window 812169480 (P-21F948) in faceplate.

- (2) Insert number card in window from rear.

- (3) Secure window and number card using the plate clamp and two hex nuts removed in Step (1).

**3.05** Using a KS-19192, List 1 tool, back the security screw (located in the center of the front cover) out to where it is flush with the threaded nut.

**3.06** Hold the front cover assembly close to the rear pan assembly and connect P1 of the D4CD-49 line cord to J1 located on rear of front cover.

**Note:** Do not release the front cover and allow the D4CD cord to support its weight.

**3.07** Carefully dress cord in rear pan assembly so as not to interfere with switchhook or latching tabs and install front cover assembly by pushing back and down.

**3.08** Secure cover to pan by tightening the security screw securely.

#### B. 20A Coinless Telephone Set

**3.09** Install the set in the enclosure or other mounting, using the thirteen 1/4-20 by 5/8 RHM screws which are shipped with the set. The hole locations in the housing are identical to those in the 2-type coin telephone sets.

**3.10** Run inside wire through one of the large holes in the rear of the housing and terminate on TB1 per Fig. 5 and 17.

**3.11** Install instruction card in front panel assembly as described in paragraph 3.03.

**3.12** Install number card as described in paragraph 3.04.

**3.13** Install 29A lock in front panel.

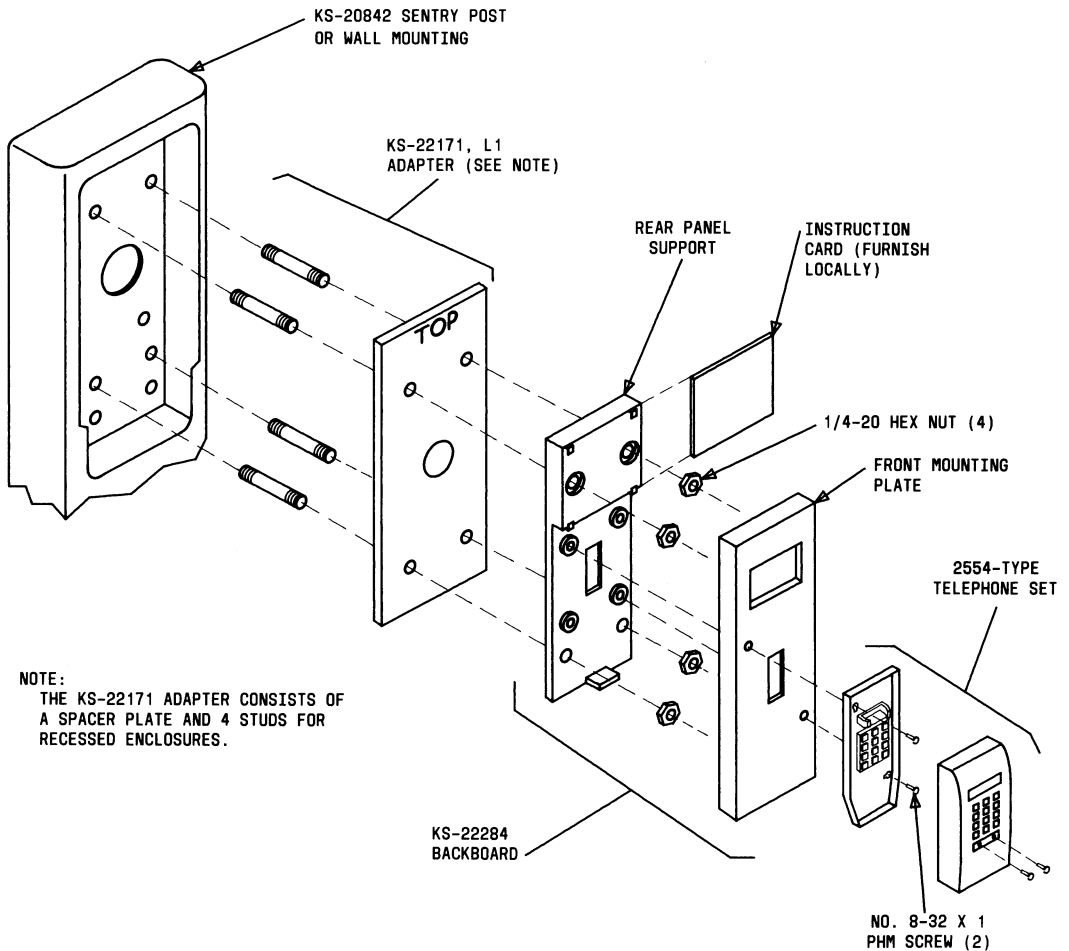


Fig. 10—KS-22284 Backboard and 2554-Type Telephone Set Used With Adapter

C. KS-22284 Backboard (Fig. 9)

3.14 Install the rear panel support on a 178A backboard or on any enclosure that will accept a 1-type coin telephone set. Use four 1/4-20 by 5/8 RHM screws furnished.

**Note:** For a recessed enclosure (SENTRY Mounting and Wedge Shelf) use a KS-22171, List 1 adapter (Fig. 10).

3.15 The backboard can be installed on a wall without the aid of a 178A backboard. This is accomplished as follows.

(1) Mark the location for the rear panel support using the following guidelines.

- Distance from top of rear panel support to floor will be 55 inches.

(2) Refer to Division 080 for method of installing fasteners.

(3) Secure support to wall using fasteners described in Table A.

3.16 Install the locally procured instruction card as follows.

NOTES:

1. INSTRUCTION CARD FORMAT IS FOR EXAMPLE ONLY.
2. MATERIAL MAY BE A RIGID LAMINATED PLASTIC OR OTHER MATERIAL WITH PROTECTED OR DURABLE SURFACE. THICKNESS MUST BE .045" TO .050".
3. ALL DIMENSIONS SHOWN ARE IN INCHES.
4. THE OPENING IN FRONT OF SET IS 3 X 5-1/4. ENSURE THAT INSTRUCTIONS ARE NOT PRINTED BEYOND THIS VISIBLE AREA.

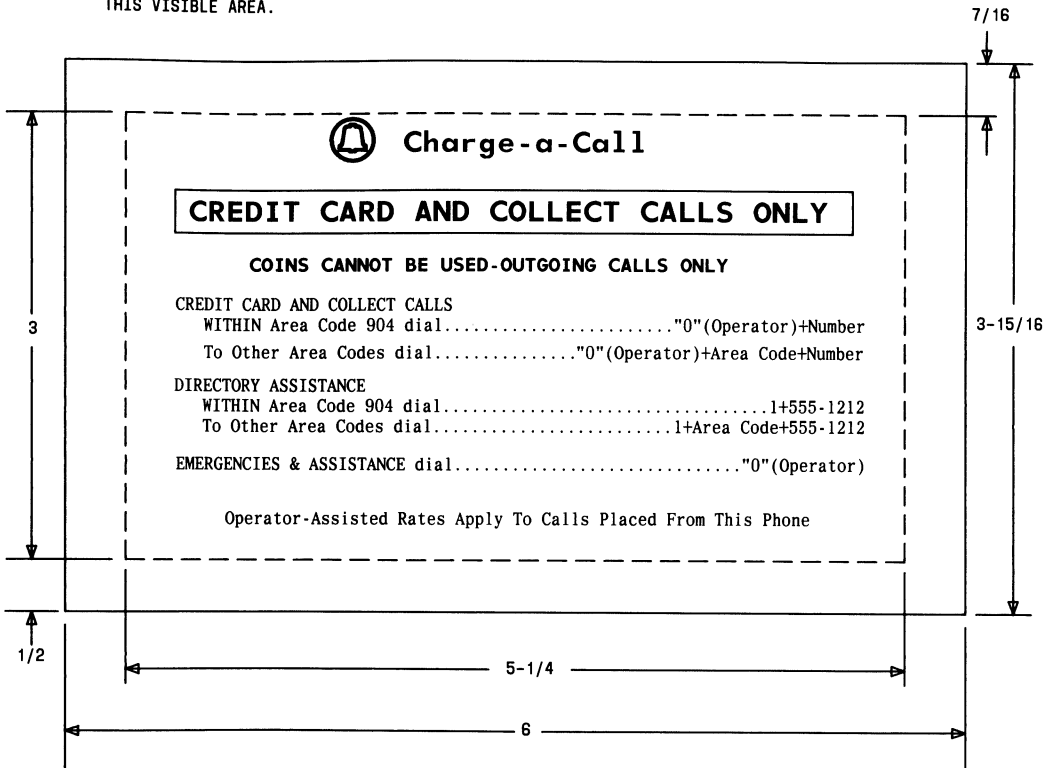


Fig. 11—Instruction Card for KS-22284 Backboard (Typical)

- (1) Place top of card under tabs on panel (Fig.12).
- (2) Push back and down under bottom tabs.
- (3) Ensure that card is seated properly.

**D. 2554B-03 (MD), Modified 2554B-03 (MD), or Modified 2554BMP-03 Telephone Set**

*Note:* The nonmodular 2554B-03 (MD) set is desired for "Charge-a-Call" service when using the KS-22284 backboard; however, a 2554BM-03 (MD) or 2554BMP-03 wall set can be modified and used for this purpose.

**3.17** Place the front mounting panel over the rear panel support and install two No. 8-32 by 1 PHM screws furnished (Fig. 10). Do not tighten the two screws; they are also used to mount the base of the wall set.

**3.18** Modify a 2554BM-03 (MD) or 2554BMP-03 set as follows.

TABLE A  
FASTENERS USED TO SECURE KS-22284 BACKBOARD TO WALL

MOUNTING SURFACES					HOLE SIZE REQUIRED	FASTENERS	
SOFT- WOOD	HARD- WOOD	MASONRY (CONCRETE, BRICK) (NOTE 1)	PLASTER BOARD AND PLASTER ON LATH (NOTE 2)	PLASTER ON CINDER BLOCK, HOLLOW TILE, METAL LATH		SIZE AND TYPE	QUANTITY
•					1/8 or No. 30	1-3/4 inch No. 14 RH tapping screw	4
	•					1-1/4 inch No. 14 RH tapping screw	
		•			1/2	1/4-20 by 1-1/2 inch RH machine screw in 1/4 by 1-1/4-inch expansion shield	
			•		1/8 or No. 30	1-3/4 inch No. 14 RH tapping screw, secure in stud a minimum of 1 inch	
				•	3/4	1/4-by 4-inch RH toggle bolt (Note 3)	

Note 1. When mounting on plastered masonry, install expansion shield below plastered surface by amount equal to thickness of plaster and use 1/2-inch longer machine screw than specified in table.

Note 2. When mounting on plasterboard, plaster on lath, etc, fasteners must be embedded in stud at least 1 inch.

Note 3. When using toggle bolts, cut off excess length.

- (a) Disconnect the H4DU handset cord, if present, from the base and handset.
- (b) Remove the set housing.
- (c) Disconnect and remove the 616B handset cord jack from base.
- (d) If a set is equipped with a 229-type adapter (refer to Section 503-100-100) remove the adapter.

**Note:** The nonmodular G3A6-03 handset is desired for this modification; however, a G15A-03 handset can be modified and used for this purpose.

- (e) Modify a G15A-03 handset as follows.
  - (1) Remove the 616W jack from handset.
  - (2) Install a H4CJ-03 cord in the handset, making sure the cotton ball is replaced.
- (f) Connect the handset cord of a G3A6-03 or modified G15A-03 handset to the set base per Table B.
- (g) Install a 124A apparatus blank on the base to secure the cord.

TABLE B

HANDSET CORD CONNECTIONS FOR 2554-TYPE TELEPHONE SET

TYPE NETWORK	HANDSET CORD WIRE COLOR	CONNECT TO
4010-Type	BK	B on Network
	R	11 on Term. Strip
	W	R on Network
	W	10 on Term. Strip
4228-Type	BK	B on Network
	R	T on Network
	W	R on Network
	W	S on Network

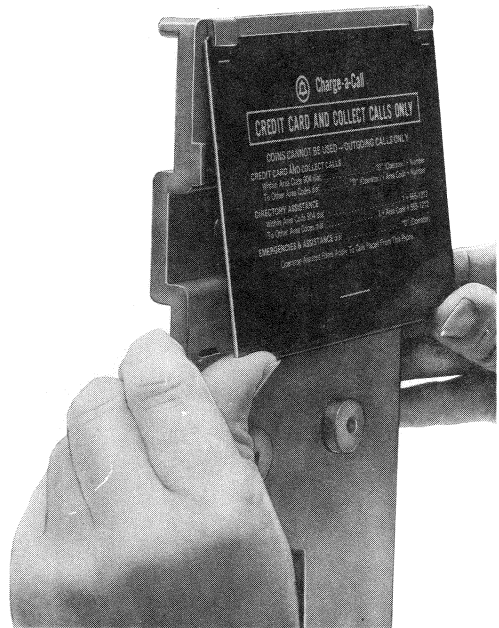


Fig. 12—Installing Instruction Card On Rear Panel Support of KS-22284 Backboard

3.19 Install a 2554B-03 (MD), modified 2554BM-03 (MD), or modified 2554BMP-03 set on a KS-22284 backboard (Fig. 13) as follows.

- (a) Run station wire through opening in backboard and through opening in base of set. If set is a 2554BMP-03, run wire through opening past the 523A3 plug.
- (b) Hang the base on the two PHM screws installed in paragraph 3.17 and tighten the two screws.
- (c) Connect station wire per Table C.
- (d) Install set housing.

4. TESTS (For all Coinless Public Telephone Sets)

**Note:** Refer to test desk if any of the following tests fail.

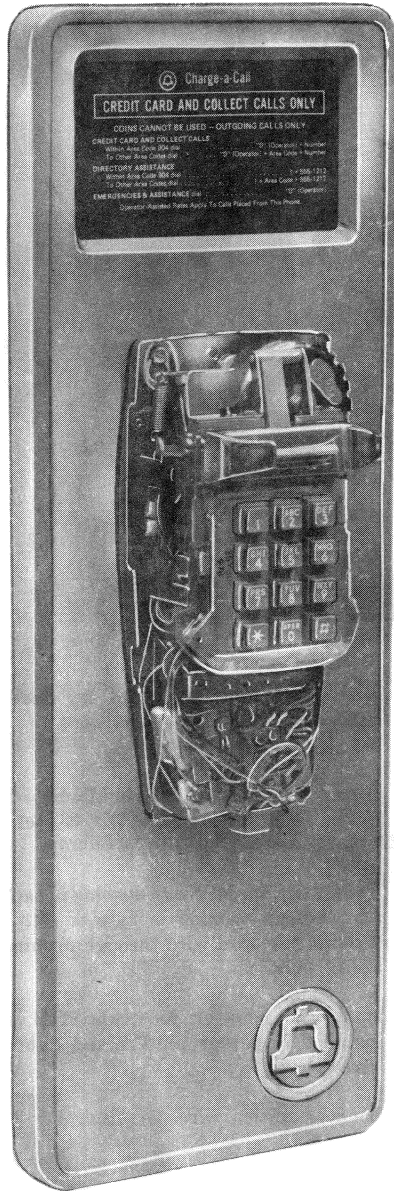


Fig. 13—Installing 2554-Type Telephone Set On Backboard

TABLE C

STATION WIRE CONNECTIONS FOR 2554-TYPE TELEPHONE SET

TYPE NETWORK	STATION WIRE	CONNECT TO
4010-Type	Tip	1 on Term. Strip
	Ring	2 on Term. Strip
	Ground	3 on Term. Strip
4228-Type	Tip	L1 on Network
	Ring	L2 on Network
	Ground	G on Network

#### 4.01 Without dialing "0".

- (1) Dial a local charge number and verify that call is blocked.
- (2) Initiate a station-to-station toll call and verify that call is blocked.
- (3) If central office is equipped with unrestricted-ring-back on noncoin lines verify that operator can ring back, using ring-back key after hang-up.

#### 4.03 Denied termination of service check.

- (1) Go to adjacent coin station and attempt to call "Charge-a-Call" station.
- (2) Charge-a-Call station should not ring. Proper announcement should be heard and money should be returned.

#### 4.02 Dial "0".

- (1) Have operator verify coinless class of service.
- (2) Have operator verify correct number assignment.

### 5. MAINTENANCE

- 5.01 Maintenance will consist of replacing components shown in Fig. 1 through 17.

**A. 10A Coinless Telephone Set****5.02** To replace switchhook.

- (a) Remove handset from switchhook.
- (b) Disconnect switchhook leads from network and polarity guard (Fig. 17).
- (c) Pull cable out from cable ties.
- (d) Remove four 841067283 PH thread forming screws that secure bracket to front panel.
- (e) Lift switchhook out.
- (f) To install, use reverse procedure.

**Note:** Mounting screws for the switchhook assembly are thread forming. Exercise care to avoid cross threading.

**5.03** To replace switch assembly on switchhook.

- (a) Disconnect switchhook leads from network and polarity guard (Fig. 17).
- (b) Pull cable out from cable ties.
- (c) Remove one No. 4-40 by 3/8 hex head screw from the switch assembly (Fig. 4).
- (d) Carefully lift switch off being careful to keep the slide in place.
- (e) Transfer slide to the new switch.
- (f) Mount new switch with slide attached while inserting switchhook actuator in slide.
- (g) Secure switch with the No. 4-40 by 3/8 hex head screw removed in Step (c).
- (h) Run cable through cable ties and connect wires per Fig. 17.

**5.04** To replace G3AL-03 handset.

- (a) Disconnect handset leads (Fig. 17) and loosen screw to remove stayband (hook) which anchors leads to upper part of housing.
- (b) Remove the "E" ring from around armored cord retainer on inside of cover (Fig. 4).

- (c) Pull cord retainer from cover and remove from cord.

- (d) Install using reverse procedure and dress the cable down the channel in corner of cover. Stayband should be fastened to housing as shown in Fig. 4. To insure proper dressing of cord.

**5.05** To replace 842621930 chassis assembly.

**Note:** This assembly contains the ringer, network, and polarity guard.

- (a) Loosen two No. 8-32 hex nuts at bottom of chassis.
- (b) Remove two No. 8-32 hex nuts from top of chassis.
- (c) Disconnect all wiring from the network and polarity guard.
- (d) Pull chassis up and out.
- (e) To install, use reverse procedure.

**5.06** To replace 70-type dial.

- (a) Remove 842621930 chassis assembly per paragraph 5.05, except only the dial leads need be removed from network.
- (b) Remove two additional hex nuts that secure dial brackets.
- (c) Pull dial and dial brackets away from cover.
- (d) Loosen the two dial mounting screws and transfer the dial mounting brackets to the new dial.
- (e) Install using reverse procedure and make connections per Fig. 17.

**5.07** To replace polarity guard (842621955 printed wiring board assembly).

- (a) Disconnect the two wiring board leads from the network.
- (b) Remove one No. 8-32 by 3/8 thread forming screw (Fig. 4) and remove dust cover.



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- (c) Disconnect two switchhook leads from printed wiring board.
- (d) Lift printed wiring board off chassis.
- (e) Install using reverse procedure and connect leads per Fig. 17.
- (f) The same printed wiring board assembly is used in D-180893 Kit of Parts. In that kit, however, the leads are attached to different terminals on the polarity guard, and must be changed to agree with Fig. 17. The kit also contains a bracket which is not used in the coinless set and should be discarded.

**5.08** To modify the nonilluminated instruction card to an illuminated instruction card in the 10A coinless telephone set, using D-180941 Kit of Parts, (Fig. 14) proceed as follows.

- (1) Remove the cover and panel assembly from the rear pan assembly.
- (2) On the cover and panel assembly remove the four nuts which retain the metal instruction card stiffener. Remove the stiffener and the instruction card.
- (3) Install the 1/16 inch clear plastic shield over the four studs. Then install the translucent information card (furnished by the operating company) over the clear plastic shield. Next install the 1/8-inch clear plastic stiffener over the instruction card. The plastic stiffener is retained by the four nuts (Fig. 15) which retained the metal stiffener.
- (4) Next the rear pan assembly is modified. The printed circuit board, which has two metal brackets riveted to it, is mounted over the four studs protruding from the pan. The circuit board assembly is fastened in place by using the four 8-32 nuts supplied in the kit. The circuit board must be mounted with the screw terminals at the bottom as shown in Fig. 16. The 24 light emitting diodes are powered by the 2012A (MD) or 2012C transformer supplied in the kit. Two 27 gauge wires (furnished by the operating company) are connected between the transformer and the two screw terminals on the printed circuit board. The transformer will

require a 115 volt ac outlet, to be supplied by the operating company.

**Note:** Upon completion of the modification the craftsman should be sure the LEDs are lit before replacing the cover.

- (5) Connect the cover to the rear pan electrically, using the modular cord. Mount the cover to the rear panel and secure with retaining screw.

**Note:** The modified instruction card should exhibit a greenish-yellow glow when the power is turned on. When the power is off the translucent instruction card will produce adequate visibility of the printed information.

### B. 20A Coinless Telephone Set

**5.09** Maintenance of the 20A set is the same as for the 10A set described in paragraphs 5.01 through 5.07, except for handset replacement, paragraph 5.04.

**5.10** To replace the G3AL-03 handset.

- (a) Disconnect handset leads and loosen screw to remove stayband (hook).
- (b) Remove the two nuts which retain the coverplate (with key-hole slot) and remove coverplate from cord.
- (c) Install new handset, using reverse procedure.

### C. 2554-Type Telephone Set

**5.11** Refer to Section 502-503-101.

## 6. CLEANING

**6.01** Clean sets and backboard in accordance with Section 508-100-101.

## 7. CONNECTIONS

**7.01** Refer to Fig. 17 for connections on the 10A or 20A coinless telephone set.

**7.02** Refer to Section 502-523-402 for connections on the 2554-type telephone set.

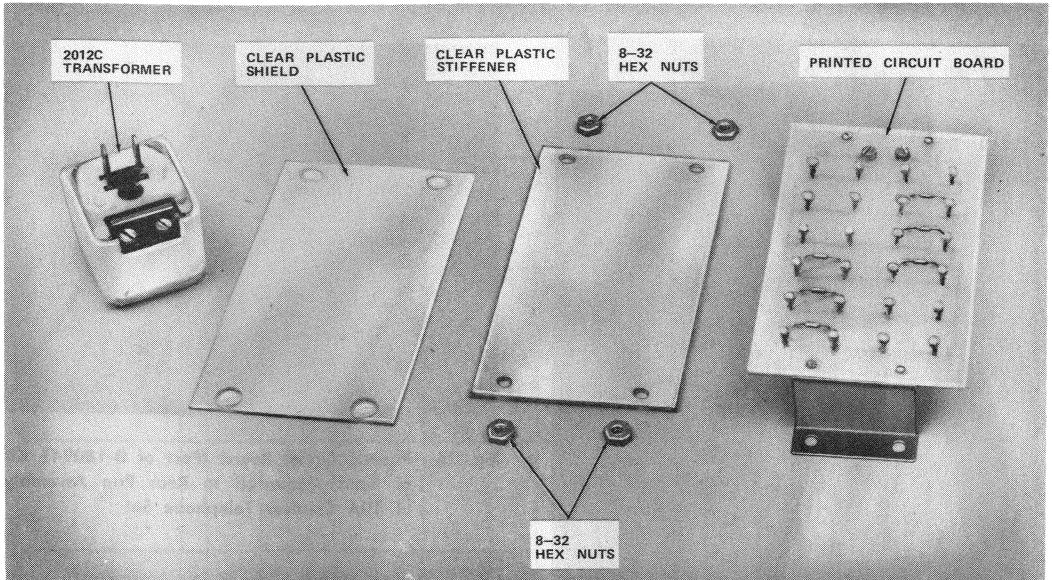
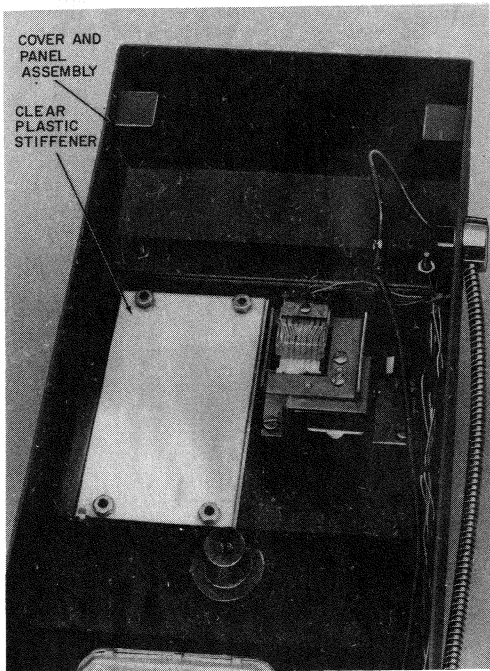
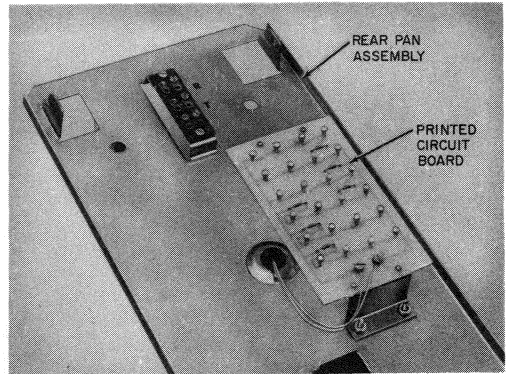


Fig. 14—D-180941 Kit of Parts



**Fig. 15—Stiffener (Part of D-180941 Kit of Parts) Installed Over Shield and Information Card on Cover and Panel Assembly of 10A Coinless Telephone Set**



**Fig. 16—Printed Circuit Board (Part of D-180941 Kit of Parts) Mounted to Rear Pan Assembly of 10A Coinless Telephone Set**

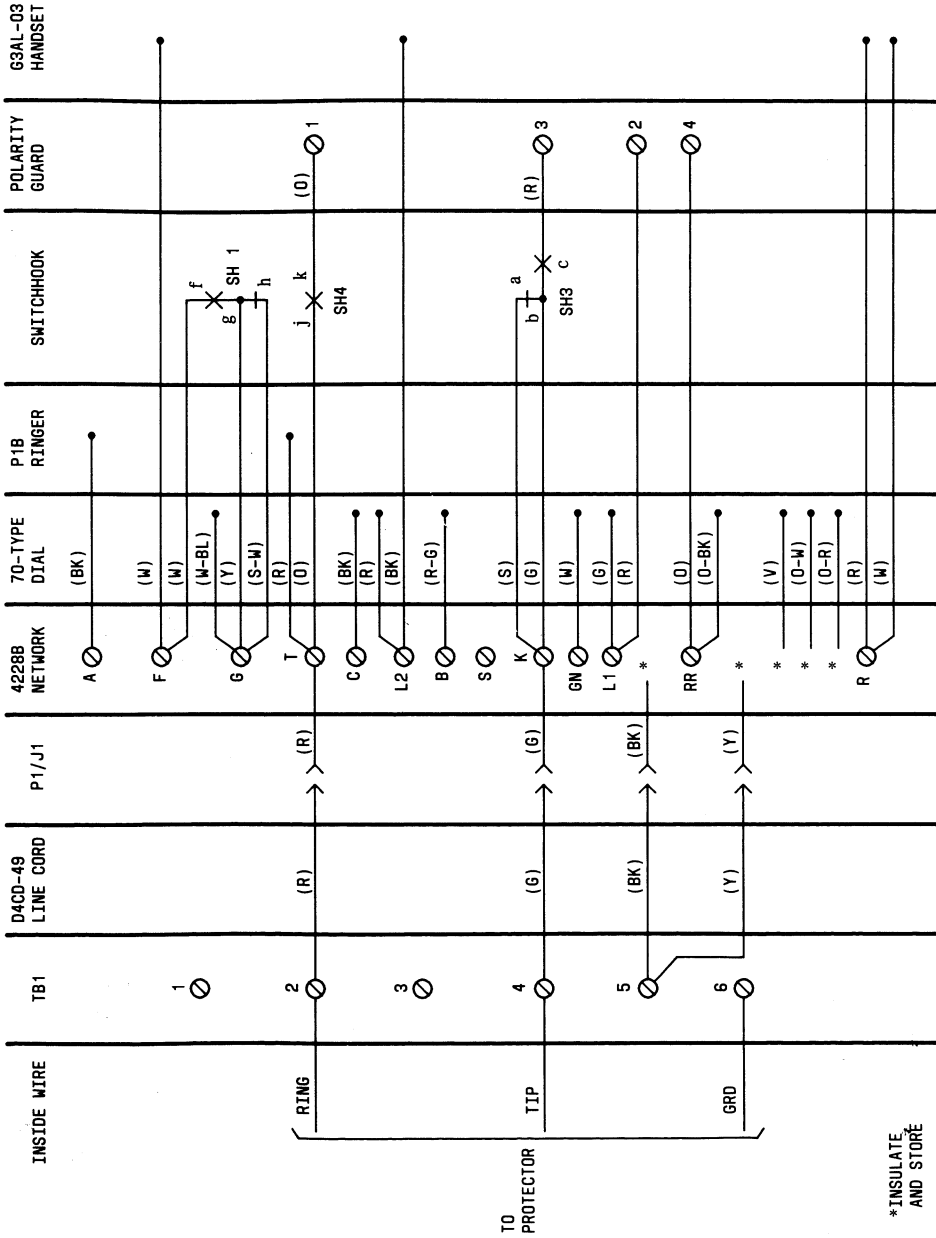


Fig. 17—10A and 20A Coinless Telephone Set, Connections