COIN TELEPHONE MAINTENANCE CHECK

SINGLE SLOT

CONTENTS

FIGURES

1. GENERAL

1.01 This booklet supplements Section 506-326-200 entitled Coin Telephones — 1A-Type — Installation and Maintenance, and Section 506-328-200 entitled Coin Telephones — 2A-Type — Installation and Maintenance. The latter section will be available during the third quarter of 1968.

1.02 It is intended that this booklet be used as an on-the-job reference for performing routines and clearing trouble in dial, prepay, single slot coin telephones. For detailed maintenance procedures see section referenced for the particular work operation.

1.03 *Dial Prepay Service:* When a coin telephone is in an idle state, the central office line circuit furnishes battery on the ring side of the line with the tip side open. When a coin or coins amounting to the initial rate are deposited, and the handset is off-hook, a coin ground causes the central office line circuit to operate over the ring side of the line (ground start). Operation of the line circuit connects ground to the tip and prepares the line for dialing over tip and ring. When the call is completed and handset is on-hook, collect (+) or return (−) current is applied to both sides of the line at the central office. The primary circuit in the coin telephone being open, causes the current to flow over the tip side of the line, through the coin relay to ground. The coin relay operates to refund or collect the deposit.

1.04 *Telephone Circuit:* The talking circuit in a single slot coin telephone is generally the same as used in conventional telephone sets, except for the addition of a chute noise transmitter in the primary circuit.

1.05 When trouble cannot be cleared, report it to to the test desk and place an E-4914 sticker over coin slot. Sticker shall be removed when service is restored.

2. TOOLS, GAUGES, CORDS, AND MATERIAL

2.01 The following tools, gauges, cords, and material may be required, in addition to those normally carried, to perform work operations outlined in this booklet:

Item	Use
139B Tool	Leveling coins
265C Tool	Burnishing contacts
376A Tool	Dental mirror for viewing contacts
528A Tool	Removing foreign material from locks

Item	Use
719A Tool	Removing cover unit assembly (1A1, 1A2), opening door (2A1, 2A2)
Level, Spirit	Vertical alignment of coin telephone
KS-14995 Tool	Trap and vane release test
KS-6320 (orange stick)	Removing objects from chute
No. 6 Sash brush	General cleaning
146B Gauge	Coin relay bias margin test
P11C Cord	Connecting cover to housing (1A1, 1A2), connecting door to housing (2A1, 2A2)
Form E-4914	Out-of-service sticker
KS-2423 Cotton twill cloth	Cleaning
KS-6824 Sealing compound	Sealing bias adjustment screw on coin relay
KS-7860, petroleum spirits	Cleaning
KS-16601, L1 paper	Cleaning
KS-16750, L2 releaser	Removing dial fingerwheels, setting totalizer (2 req'd)
Lead pencil (2B or softer)	Lubricating coin release mechanism
Paper clip	Dial shorting test

3. EIGHT-STEP COIN STATION ROUTINE

3.01 The eight-step routine outlined in the following pages is provided as a reference check list for the inspection of single slot coin telephones during installation and repair visits.

3.02 The question of when to perform the routine is of concern to those whose efforts are directed to improving coin service by reducing repeated reports. The following guidelines are in keeping with this objective.

When to Perform the Complete Eight-Step Routine

(a) Upon installation of a coin telephone

(b) On repeated reports for which trouble cannot be found by the usual maintenance procedures.

(c) Before closing out the following type reports as "FOUND OK OUT":

"COINS DON'T RETURN"

"NO DIAL TONE—COINS DON'T RETURN"

When to Perform Specific Steps of the Routine

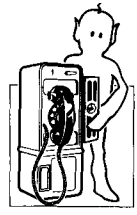
(a) Steps 1, 2, 3, 7, and 8 are required as part of each repair visit for all trouble reports.

(b) Steps 4 and 6 are required, in addition to (a) as part of the investigation of "Coins Don't Return" and "No Dial Tone" reports.

(c) Step 5 is required to update the measurement records on the test center line card and on repeated "Coins Don't Return" reports.

3.03 When trouble reports continue after repeated routine visits have been made, additional assistance and/or central office investigation may be in order rather than continued routines of the station.

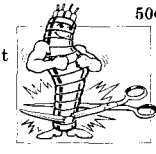
3.04 Single-slot coin telephones must be mounted on a vertical surface. A tilt greater than 1-1/2 degrees in any direction will cause a malfunction of the telephone. (See 506-326-200.)

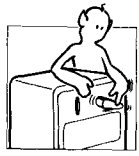


3.05 The eight-step coin station routine is as follows:

Step 1. Inspection Before Removing Cover Assembly or Opening Door.

Inspect:	*BSP Reference*
(a) Dial Operation	
• Operates smoothly without slipping or skipping	
• Does not bind on return to normal	
• Finger wheel not cracked	
• 8-type dials (rotary)	501-162-100
• 35-type dials (TOUCH-TONE®)	501-164-115
(b) Handset	
• Locked caps	501-210-101
• Cracked caps or handle	
• Antifraud transmitter unit	501-230-100
• Antifrost transmitter cover	506-110-200
• G-type handsets	501-210-102
(c) Armored Cord	506-110-103
• Secure at handset and instrument	
• Armor intact	
(d) Housing, Cover, or Door	
• Appearance	506-326-200 506-328-200
• 1A1 or 1A2 tilted vertically	506-326-200
(e) Number Cards	501-150-100
• Correct telephone number	
(f) Instruction Cards	506-326-200 506-328-200
• Correct information	
• Securely in place	
(g) Coin Return Chute	506-326-200 506-328-200
• Door swings freely	
• Not blocked	



Inspect:		*BSP Reference*
(h) Coin Release Lever • Not broken • Operates freely		506-326-200 506-328-200

Step 2. Operation Tests Before Removing Cover or Opening Door

Note: Refer to Trouble Analysis (Table A) when operation tests fail. Normally, when using Table A, it will be necessary to remove cover or open door and connect to housing with P11C cord to evaluate trouble.

- Coins required: 1 quarter, 1 dime, 2 nickels, 1 penny
- BSP reference: Sections: 506-326-200, 506-326-500, and 506-328-200

(a) With handset on-hook:
  (1) Deposit quarter
    • Quarter should be refunded
  (2) Repeat, using a dime and than a nickel
    • Each coin should be refunded

Note: If coin is not refunded after installing a new totalizer, repeat test with second coin before assuming failure. Cam shaft could be in such position initially that no response would be obtained from Cenral Office.

(b) With handset on-hook:
  (1) Deposit penny
  (2) Depress coin release lever
    • Penny should be returned

(c) With handset off-hook:
  (1) Deposit nickel
    • Check for no dial tone
  (2) Deposit second nickel
    • Check for dial tone
  (3) Dial any digit but "0" or "1"
    • Dial tone breaks
  (4) Hang up handset
    • Nickels should be returned

(d) Check for receiving and breaking dial tone with each of the following:
  • 1 quarter, 1 dime

TABLE A

TROUBLE ANALYSIS

(INITIAL RATE SET FOR 10 CENTS)

TELEPHONE SET CONDITION	FAILURE	STEP NO.*	COIN TELEPHONE 1A1, 2A1	COIN TELEPHONE 1A2, 2A2	POSSIBLE CAUSE	REMEDIAL ACTION
Handset On-Hook (Inverted) Deposit Quarter	No Readout †	1	•	•	Tip and ring reversed	Reconnect as required
		2	•	•	Plugs P1 & P2 reversed	
		3	•	•	Central office overload	Wait, then repeat test
		4	•	•	Switch hook transfer contacts SH1(NC) and SH3(NC) not making	Clean contacts Replace dial and housing assembly
		5	•	•	Coin relay contact HT1 not making	Clean contacts Replace coin relay

TABLE A (Cont)

TELEPHONE SET CONDITION	FAILURE	STEP NO.*	COIN TELEPHONE 1A1, 2A1	COIN TELEPHONE 1A2, 2A2	POSSIBLE CAUSE	REMEDIAL ACTION
Handset On-Hook (Inverted) Deposit Quarter (Cont)	No Readout † (Cont)	6	•	•	Defective totalizer	Replace defective apparatus
		7	•	•	Defective coin relay	
		8	•	•	Defective chassis wiring	
		9	•	•	Defective wiring in dial and housing assembly	
		10	•	•	Defective A relay	
		11	•	•	Defective handset	
		12		•	Defective dial	
Handset On-Hook (Inverted), Deposit Nickel	No Readout †	13	•	•	Switch hook transfer contacts SH3(NC) not making	Clean contacts Replace dial and housing assembly
		14	•	•	Defective wiring in dial and housing assembly	Replace dial and housing assembly
		15	•	•	Central Office overload	Wait, then repeat test
Handset On-Hook (Inverted) Nickel Deposited Readout OK	No Refund	16	•	•	Switch hook contacts SH2 or SH4 not breaking	Replace dial and housing assembly
		17	•	•	Defective totalizer	Replace totalizer
		18	•	•	Central Office overload	Wait, then repeat test
		19	•	•	Defective CO coin trunk	Refer to Test Center
Handset Off-Hook Deposit Nickel	Readout Obtained, Dial Tone is Heard	20	•	•	T1 contacts remain latched after refund	Replace totalizer
		21	•	•	Initial rate set for 5 cents	Reset totalizer rate
Handset Off-Hook Deposit Nickel (Cont)	Readout Obtained Dial Tone is Heard (Cont)	22	•	•	Switch hook transfer contacts SH3(NC) not breaking	Replace dial and housing assembly
		23	•	•	Defective chassis wiring	Replace chassis assembly
		24	•	•	Defective wiring in dial and housing assembly	Replace dial and housing assembly
Handset Off-Hook Initial Rate (10 Cents) Deposited	No Readout †	25	•	•	Switch hook transfer contacts SH3(NO) or SH2(NO) not making	Clean contacts Replace dial and housing assembly
		26	•	•	Totalizer set for more than initial rate	Reset totalizer rate
		27	•	•	Defective wiring in dial and housing assembly	Replace dial and housing assembly

TABLE A (Cont)

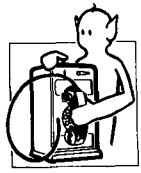
TELEPHONE SET CONDITION	FAILURE	STEP NO.*	COIN TELEPHONE 1A1, 2A1	COIN TELEPHONE 1A2, 2A2	POSSIBLE CAUSE	REMEDIAL ACTION
Handset Off Hook, Initial Rate Deposited, Readout OK	No Dial Tone (or Reduced Dial Tone Level in 1A2 or 2A2)	28	•	•	Switch hook transfer contacts SH1(NO) not making	Clean contacts Replace dial and housing assembly
		29	•		Rotary dial off — normal contacts not breaking	
		30	•	•	Defective totalizer	Replace defective apparatus
		31	•	•	Defective chassis wiring	
		32	•	•	Defective wiring in dial and housing assembly	
		33	•	•	Defective handset	
		34		•	Defective dial	
Handset Off-Hook, Initial Rate Deposited, Readout OK (Cont)	Coins Return After Readout With No Dial Tone	35	•	•	Switch hook contacts SH2 and SH4 not making	Clean contacts Replace dial and housing assembly
		36	•		Open dial	
		37	•	•	Defective chassis wiring	Replace defective apparatus
		38	•	•	Defective wiring in dial and housing assembly	
	Totalizer Steps Continuously (May Give Short Bursts of Dial Tone)	39	•	•	Totalizer transfer contacts T2(NC) not making	
		40	•	•	Defective chassis wiring	
		41	•	•	Defective wiring in dial and housing assembly	
Handset Off Hook Dial Tone OK	Cannot Break Dial Tone	42	•	•	Totalizer contacts T1 not latching	Replace totalizer
		43	•	•	Defective dial	Replace defective apparatus
		44	•	•	Defective chassis wiring	
		45	•	•	Defective wiring in dial and housing assembly	
		46		•	Defective handset	
	Coins Return When Dial is Operated	47	•	•	Defective dial	

TABLE A (Cont)

TELEPHONE SET CONDITION	FAILURE	STEP NO.*	COIN TELEPHONE 1A1, 2A1	COIN TELEPHONE 1A2, 2A2	POSSIBLE CAUSE	REMEDIAL ACTION
Handset Off-Hook, Hopper Trigger tripped by hand, Dial Tone OK, Dial One Digit Other Than "0" or "1"	Dial Tone is Broken	48	•	•	Totalizer transfer contacts T1(NO) not making	Replace totalizer
Handset Off-Hook, Initial Rate Deposited Readout OK	No Dial Tone and No Refund	49	•	•	Totalizer transfer contacts T2(NC) not making	Replace totalizer
		50	•	•	Totalizer steps through zero rate position	
Handset Off-Hook, Readout OK, Dial Tone OK, Refund OK	No Sidetone	51	•	•	Open transmitter	Replace handset
Operator on Line, Deposit Nickel	No Readout, Operator Cannot Hear Coin Tones	52	•	•	Defective A relay	Replace A relay
		53	•	•	Defective chassis wiring	Replace chassis assembly
Operator On Line, Deposit Additional Coins	Hear Coin Tones in Handset ‡	54	•	•	Defective chassis wiring	Replace chassis assembly
	No Coin Tones Heard by Operator	55	•	•	Totalizer transfer contacts S1(NC) not making	Replace totalizer
		56	•	•	Defective oscillator	Replace chassis
Operator on Line, Deposit Additional Coins (Cont)	Dime Tones Too Fast	57	•	•	Totalizer contacts CS(NC) not making	Replace totalizer
		58	•	•	CS cam not resetting	
	Too Many Coin Tones	59	•	•	Totalizer not stepping properly — T2(NC) not making	
	Quarter Tones Too Slow	60	•	•	Totalizer contacts CS(NC) not breaking	

* Steps should be taken in sequence. Possible cause assumes that preceding tests have been met.
† Readout refers to operation of totalizer and generation of beeps by coin signal oscillator.
‡ A slight tone may be heard on long loops but may not necessarily be a failure.

Step 3. Inspection After Removing Cover or Opening Door



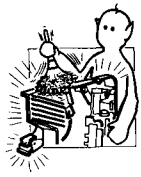
Note: Before removing cover on 1A1 and 1A2 coin telephones, invert handset on switch hook to prevent armored cord from pushing handset off switch hook when cover is set down.

Inspect:	*BSP Reference*

(a) Station and coin relay wiring for tight connections.

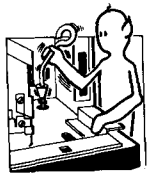
(b) Coin chute assembly for foreign matter and dirt.

- Make certain chute locking lever and spring are properly engaged. — 560-326-200, 506-328-200
- Make certain station wiring is properly dressed and not binding against totalizer cover causing coin chute to be out of alignment.



(c) Level of coins using 139B Tool.

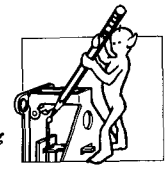
(d) For evidence of station tampering indicating fraudulent use.



Step 4. Coin Relay and Hopper Operation

Inspect:	*BSP Reference*
(a) Ground contact and dial shorting contact spring	506-110-301, 506-326-200, 506-328-200
• Clean	
• Proper operation	

Inspect:	*BSP Reference*



- Lubricate surface between trigger and contact spring with 2B, or softer, lead pencil

(b) Selector card magnets and pole piece extensions — 506-110-301, 506-326-200, 506-328-200

- Remove foreign magnetic particles and dirt.

(c) Operation of trigger, trap, and vane — 506-110-301, 506-326-200, 506-328-200

- Perform trap and vane release test with KS-14995 tool.

(d) Coin relay bias margin test:

(1) Call testdesk and request a bias margin test of the coin relay (use Central Office test circuit where available).

Note: Do not operate coin relay armature without first depressing selector card.

(2) Slip 146B bias margin gauge (Fig. 1) over left pole piece extension arm from left side of coin relay (Fig. 2).

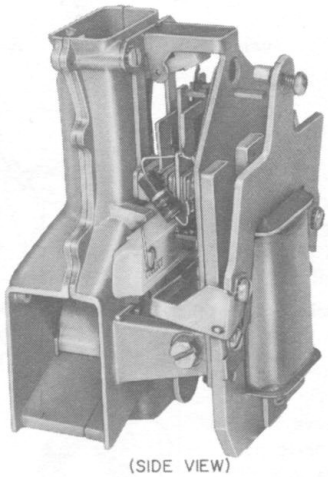
Fig. 1 — 146B Bias Margin Gauge

(3) Request deskman to perform operation (collect or return) appearing in lower left corner of gauge.

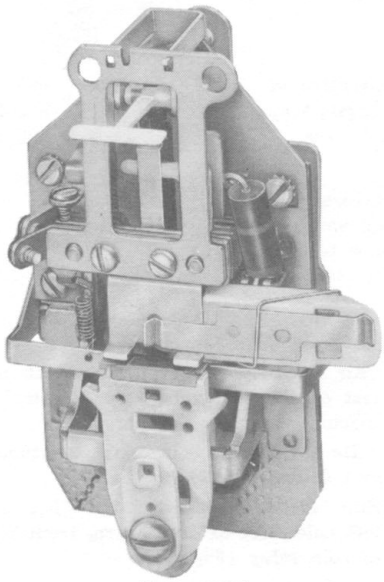
(4) After checking for the correct relay operation, reverse the gauge by turning it around *on the same pole piece extension arm* and request operation appearing in the lower left corner of gauge.

(5) Check for the correct relay operation. Replace relay if either test fails.

Note: Make certain coin relay cover is in place before replacing cover assembly or closing door. If cover is missing, replace it before closing out the report.



(SIDE VIEW)



(REAR VIEW)

Fig. 2. — 146B Bias Margin Gauge in Position for Collect Test

Step 5. Tests to be Performed With Testdesk

Note: The following tests should be performed on initial installations, and on maintenance visits when repeated coin-handling trouble reports are evidenced, or the line card record in test center is not posted.

(a) Request deskman to test for foreign potential.

(b) Loop and ground resistance measurements.

- Connection for loop and ground resistance measurements for a typical single slot coin station are shown in Fig. 3 and 4, respectively. See Table B for use of Dial Long Line equipment, and Table C for maximum allowable loop ranges.

  Note: The difference between the ground measurement and 1/2 the loop measurement is considered to be the ground resistance. This difference should be less than 50 ohms.

- Test measurements should be recorded on the line card in the test center.

(c) Coin relay current flow test (Fig. 5).

(1) Preparation by type of station:

a. 1A1 and 1A2 coin telephones:

- Remove cover assembly and connect it to housing with P11C cord.

b. 2A1 and 2A2 coin telephones:

- Open and connect door to housing assembly with P11C cord.

(2) With handset off-hook deposit initial rate.

(3) Call testdesk and request a current flow test of the coin relay.

- Observe relay operation.

- If either operate (48 ma) or nonoperate (40 ma) tests fail, replace coin relay.

Note: The operate and release time for the single coin relay is 625 milliseconds with a minimum of 550 msec and a maximum of 700 msec. If any appreciable delay can be detected by eye, this requirement has not been met and the relay should be replaced. The timing interval may be compared with the time it takes for a rotary dial to return to normal after dialing digit 6.

Note: Coin lines equipped with long line circuits may appear to work satisfactorily even though the tip and ring are reversed. Check for 48 volts on ring and ground on tip.

(4) Coin relay current flow test date should be posted on line card in test center.

Step 6. Inspection of Wiring

Inspect:	*BSP Reference*
(a) Inside and ground wire for:	
• Continuity and tight connections at ground clamp and terminal.	
• Proper selection of route and support	461-200-200
• Proper gauge (ground wire)	638-210-100

TABLE B
REQUIREMENTS FOR DIAL LONG LINE CIRCUITS ON COIN LINES

Type of Office	Requirements
Step-by-Step	DLL CKT required on loops over 885 ohms
Panel	
No. 1 Crossbar	DLL CKT required on loops over 1200 ohms
No. 5 Crossbar	

TABLE C
MAXIMUM ALLOWABLE LOOP RANGES FOR CENTRAL OFFICE COIN SUPPLY VOLTAGES
(Maximum Ground Resistance — 50 Ohms)

Type of Central Office	Minimum Coin Voltage	Loop Range
Step-By-Step	100 volts (100-120V)	1100 ohms
Panel and No. 1 Crossbar	115 volts (115-120V)	1600 ohms
No. 5 Crossbar	125 volts (125-135V)	2000 ohms

Inspect:	*BSP Reference*
(b) Station protector for:	
• Proper type	638-215-200
• Operated blocks and units	638-215-100
• Ground wire caution tag (E-3013B)	638-210-100

Note: Post location of coin station signaling ground inside set according to local regulations.

Step 7. Final Tests and Inspection After Replacing Cover Assembly or Closing Door

Note: Perform uncompleted operation tests shown in Step 2. Refer to Trouble Analysis (Table A) when tests fail.

- Coins required: 1 nickel, 1 dime, 1 quarter.
- BSP reference: 506-326-200, 506-326-500, and 506-328-200

(a) Call operator:

(1) Request that coins be identified as nickel, dime, and quarter as they are deposited.

(2) Request coins be refunded.

(3) Verify returned coins.

(4) Request ring-back.

- Observe ringer volume

(b) Inspect for noisy or cutout handset cord.

Step 8. Visual Inspection of Associated Items

Inspect condition of:

- Booth, shelf, or mounting (properly anchored and grounded)
- Glass
- Door operation
- Light fixtures
- Blower
- Directories
- Signs
- General area for public safety and appearance

4. COIN TELEPHONE FUNCTIONAL SCHEMATICS

4.01 As an aid in understanding the various circuit operations of single slot coin telephones, the following functional schematics are provided:

- Fig. 6 — Call Abandoned With Less Than Initial Rate Deposited (Deposit Refunded)
- Fig. 7 — Initial Rate Deposited — Origination State
- Fig. 8 — Dialing, Talking, and Listening Circuits
- Fig. 9 — Coin Signal Tone Circuit

4.02 The following figures are provided as an aid in clearing electrical troubles:

- Fig. 10 — 1A1 and 2A1 Coin Telephone Schematic
- Fig. 11 — 1A2 and 2A2 Coin Telephone Schematic

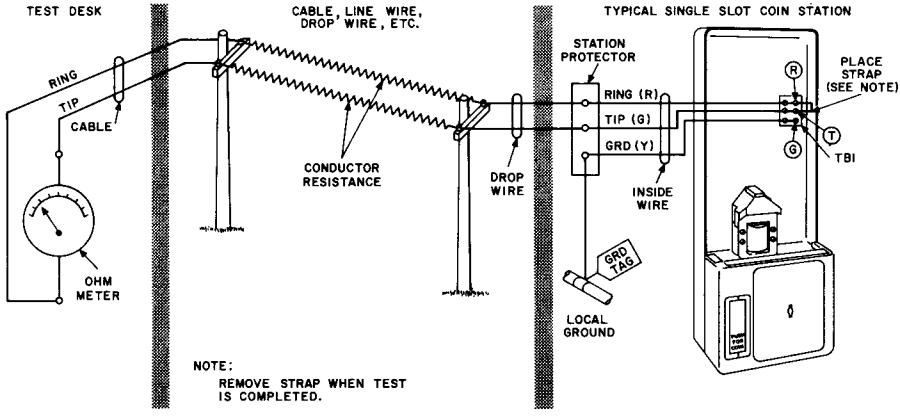


Fig.3 — Loop Resistance Measurement

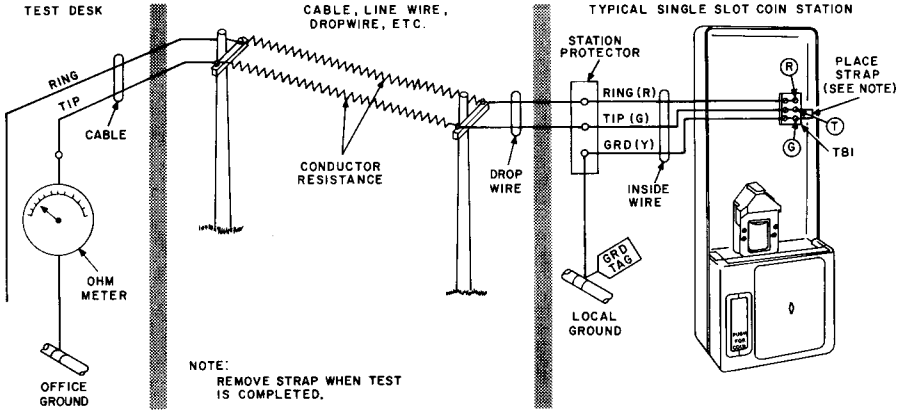


Fig. 4 — Ground Resistance Measurement

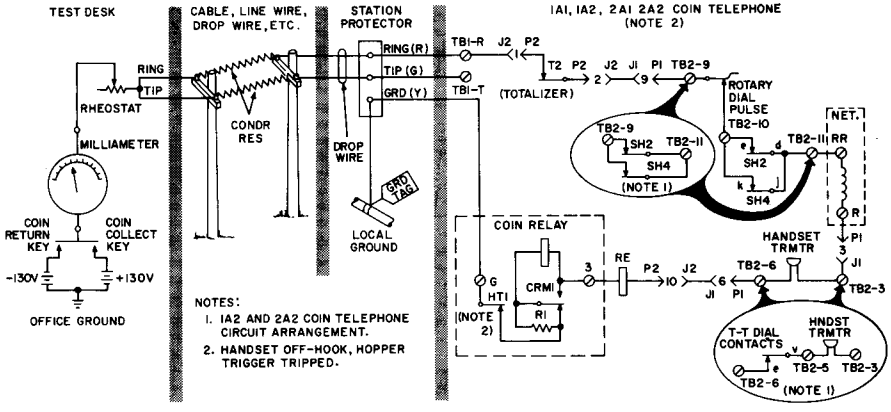
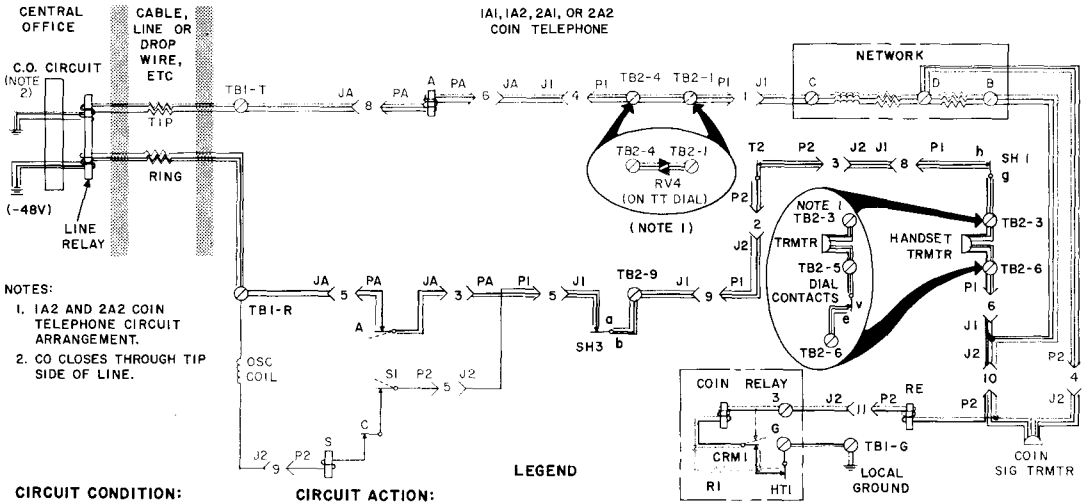


Fig. 5 — Coin Relay Current Flow Test



NOTES:

1. 1A2 AND 2A2 COIN TELEPHONE CIRCUIT ARRANGEMENT.
2. CO CLOSES THROUGH TIP SIDE OF LINE.

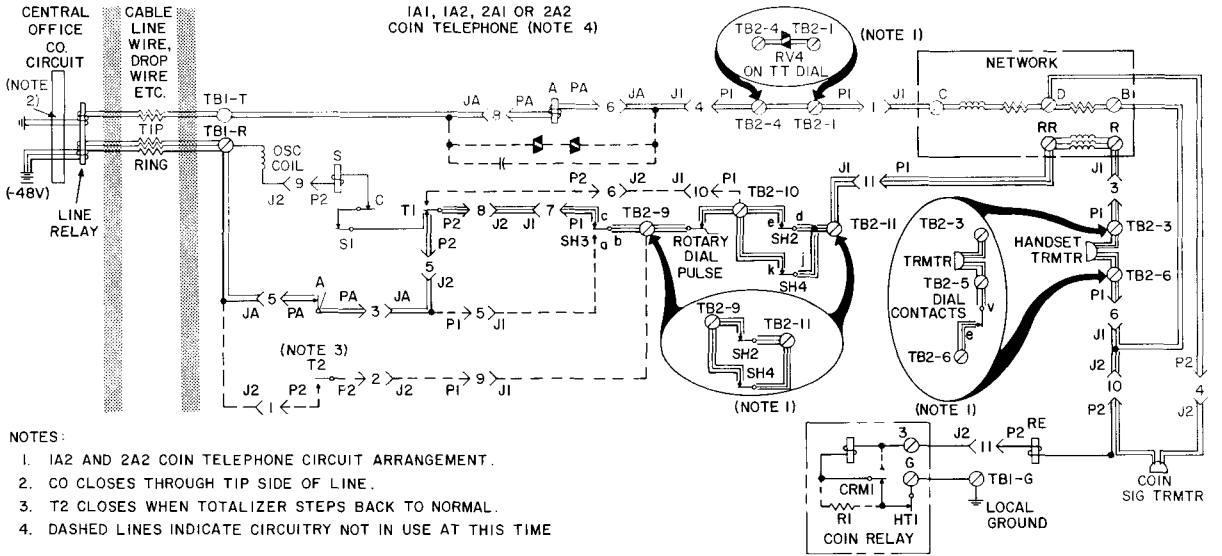
CIRCUIT CONDITION:

- *HANDSET ON SWITCH HOOK*
- T2 OPERATED (COIN DEPOSITED)
- HT1 (HOPPER TRIGGER) OPERATED

CIRCUIT ACTION:

1. **BLACK-** *THIS CIRCUIT CAUSES THE TIP SIDE OF LINE TO BE CLOSED THROUGH TO GROUND IN THE* **CO.** DIAL TONE IS PLACED ON LINE BUT IS INEFFECTIVE. CURRENT IN THIS CIRCUIT (48V) IS NOT SUFFICIENT TO OPERATE **RE** OR COIN RELAY.
2. **RED—** **A** RELAY OPERATES, CAUSING ITS NORMAL CONTACT TO OPEN REMOVING THE SHORT ACROSS THE **S** (STEPPER) RELAY.
3. **GREEN-** (A) OPERATION OF **S** RELAY CAUSES ITS NORMALLY CLOSED **S1** CONTACT TO OPEN. THE **S1** CONTACT IN OPENING CAUSES THE **S** RELAY TO RELEASE, THUS CLOSING THE **S1** CONTACT. THIS OPERATING AND RELEASING ACTION OF THE **S** RELAY STEPS THE TOTALIZER 10 DEGREES BACK TO NORMAL EACH TIME IT OPERATES. (EACH $.05 AMOUNT DEPOSITED CAUSES THE TOTALIZER TO ROTATE 10 DEGREES OFF NORMAL).
   (B) WHEN THE TOTALIZER HAS BEEN STEPPED BACK TO NORMAL, **T2** CONTACT RESTORES, (OPENS ITS MAKE CONTACT) WHICH IN TURN, OPENS THE TELEPHONE CIRCUIT.
4. **BLUE—** (A) THE **CO.** DETECTING THE OPEN TELEPHONE CIRCUIT, SENDS OUT NEGATIVE 100 TO 130 VOLTS RETURN BATTERY TO RETURN THE DEPOSIT.
   (B) THE **RE** RELAY IN OPERATING WOULD NORMALLY RESTORE THE **T1** CONTACT. SINCE THE INITIAL RATE WAS NOT DEPOSITED, THE **T1** WAS NORMAL AND THE OPERATED **RE** RELAY HAS NO EFFECT.
   (C) *THE OPERATED COIN RELAY, CLOSES ITS MAKE CONTACT CAUSING THE CURRENT TO BY-PASS THE RELAY AND FLOW THROUGH THE RESISTOR WHICH WAS PREVIOUSLY SHORTED. THE SHORT ACROSS THE RELAY WINDING CAUSES THE RELAY TO BE SLOW RELEASE. THE RESISTOR, HAVING APPROXIMATELY THE SAME RESISTANCE AS THE COIN RELAY WINDING, IS PLACED IN THE CIRCUIT TO PROTECT CONTACT* **HT1** *WHEN IT RESTORES, AND TO PROTECT THE RESISTANCE LAMP IN THE CENTRAL OFFICE CIRCUIT.*
   (D) AS THE COIN RELAY RELEASES, THE **HT1** *CONTACT OPENS, PLACING THE TELEPHONE IN ITS IDLE STATE.*

Fig. 6 — Call Abandoned With Less Than Initial Rate Deposited (Deposit Refunded)



NOTES:

1. 1A2 AND 2A2 COIN TELEPHONE CIRCUIT ARRANGEMENT.
2. CO CLOSES THROUGH TIP SIDE OF LINE.
3. T2 CLOSES WHEN TOTALIZER STEPS BACK TO NORMAL.
4. DASHED LINES INDICATE CIRCUITRY NOT IN USE AT THIS TIME

LEGEND

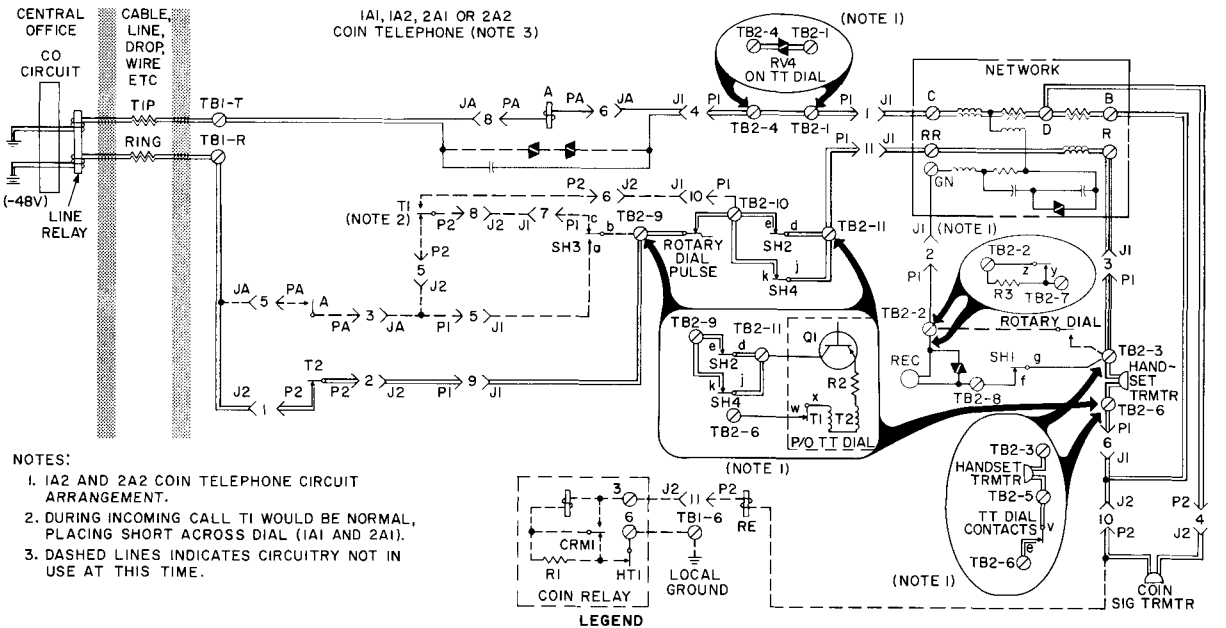
CIRCUIT CONDITION:

- OUTGOING CALL
- HANDSET OFF-HOOK (SH1, SH2, SH3, SH4 OPERATED)
- T2 OPERATED (COIN DEPOSITED)
- T1 OPERATED (INITIAL RATE DEPOSITED)
- *HTI (HOPPER TRIGGER) OPERATED*

CIRCUIT ACTION:

1. **BLACK**—THIS CIRCUIT CAUSES THE TIP SIDE OF LINE TO BE CLOSED THROUGH TO GROUND IN THE **CO.** DIAL TONE IS PLACED ON LINE. CURRENT IN THIS CIRCUIT (48V) IS NOT SUFFICIENT TO OPERATE **RE** OR COIN RELAY.
2. **RED**—**A** RELAY OPERATES CAUSING ITS NORMAL CONTACT TO OPEN WHICH REMOVES THE SHORT ACROSS THE **S** (STEPPER) RELAY.
3. **GREEN**—(A) OPERATION OF **S** RELAY CAUSES ITS NORMALLY CLOSED **SI** CONTACT TO OPEN. THE **SI** CONTACT IN OPENING CAUSES THE **S** RELAY TO RELEASE THUS CLOSING THE **SI** CONTACT. THIS OPERATING AND RELEASING ACTION OF THE **S** RELAY STEPS THE TOTALIZER 10 DEGREES BACK TO NORMAL EACH TIME IT OPERATES.
   (B) WHEN THE TOTALIZER HAS BEEN STEPPED BACK TO NORMAL THE **T2** CONTACT RESETS AND PLACES THE TELEPHONE CIRCUIT IN ITS DIALING AND TALKING STATE.

Fig. 7 — Initial Rate Deposited — Origination State



NOTES:

1. 1A2 AND 2A2 COIN TELEPHONE CIRCUIT ARRANGEMENT.
2. DURING INCOMING CALL T1 WOULD BE NORMAL, PLACING SHORT ACROSS DIAL (1A1 AND 2A1).
3. DASHED LINES INDICATES CIRCUITRY NOT IN USE AT THIS TIME.

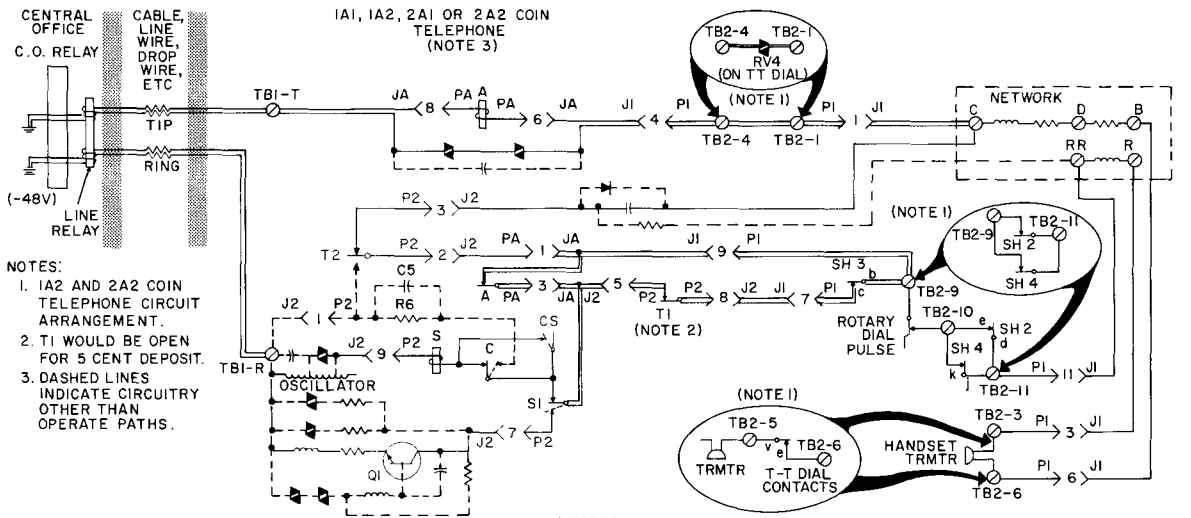
CIRCUIT CONDITION:

- OUTGOING CALL
- HANDSET OFF HOOK
- DIAL TONE PRESENT
- T1 OPERATED
- T2 RETURNED TO NORMAL

CIRCUIT ACTION:

1. **BLACK—DIALING—**
   DIALING PATH OF ROTARY DIAL COIN TELEPHONE DIFFERS FROM **TOUCH-TONE** SET (SEE NOTE 1 AND INSETS). **TOUCH-TONE** DIAL CONTACTS **V, E** OPEN AND DISCONNECT TRANSMITTER FROM NETWORK DURING DIALING; CONTACTS **W, X** CLOSE AND CONNECT THE DIAL OSCILLATOR TO THE NETWORK IN PLACE OF THE TRANSMITTER.
2. **RED—TALKING—**
   TOUCH-TONE DIAL CONTACTS **V, E** CLOSE, AND **W, X** OPEN DURING THE TALKING STATE (SEE INSETS). THE COIN SIGNAL TRANSMITTER DETECTS THE SOUND OF COINS DROPPING THROUGH THE CHUTE.
3. **GREEN—LISTENING—**
   (A) THE LISTENING (SECONDARY) CIRCUIT RECEIVES ITS ENERGY THROUGH INDUCTIVE COUPLING FROM THE PRIMARY INDUCTION COIL WINDINGS.
   (B) ROTARY DIAL OFF-NORMAL CONTACTS SHORT OUT THE RECEIVER DURING DIALING.
   (C) **TOUCH-TONE** DIAL CONTACTS **Y, Z** REMOVE THE SHUNT ACROSS LEVEL LIMITING RESISTOR **R3** TO REDUCE OSCILLATOR SIDETONE DURING DIALING.

Fig. 8 — Dialing, Talking, and Listening Circuits



CIRCUIT CONDITION:

- NICKEL, DIME, OR QUARTER DEPOSIT REQUESTED BY OPERATOR
- T2 OPERATED AS RESULT OF DEPOSITED COIN
- **C** AND **CS** CONTACTS NORMAL FOR NICKEL OR DIME DEPOSIT
- **C** AND **CS** CONTACTS OPERATED FOR QUARTER DEPOSIT

1. **BLACK**—OSCILLATOR CHARGING CIRCUIT AND **S** RELAY OPERATING PATH FOR NICKEL OR DIME DEPOSIT. THE CIRCUIT IS SHOWN FOR DIME DEPOSIT. NICKEL DEPOSIT CIRCUIT WOULD BE THE SAME, EXCEPT **T1** CONTACT WOULD BE NORMAL (OPEN) INSTEAD OF CLOSED AS SHOWN.
2. **BLACK AND GREEN**—OSCILLATOR CHARGING CIRCUIT AND **S** RELAY OPERATING PATH FOR QUARTER DEPOSIT. **CS** CONTACT OPERATES WHEN TOTALIZER ROTATES 45°, ENABLING CHARGING OF THE OSCILLATOR AND OPERATION OF **S** RELAY AFTER **C** CONTACT OPENS. THIS ENABLES A FASTER READOUT OF THE OSCILLATOR CIRCUIT.
3. **RED**——OSCILLATOR READOUT (TONE SIGNAL) PATH. CONTACT **SI** TRANSFERS THE CURRENT FLOW FROM THE TOTALIZER TO THE TRANSISTOR. CURRENT FLOW IS INCREASED AND DECREASED DUE TO THE CHANGING POLARITY ON THE EMITTER AND BASE OF THE TRANSISTOR CAUSED BY THE TRANSFORMER ACTION OF THE TANK CIRCUIT. THIS PRODUCES TONE SIGNAL HEARD BY OPERATOR.

Fig. 9 — Coin Signal Tone Circuit

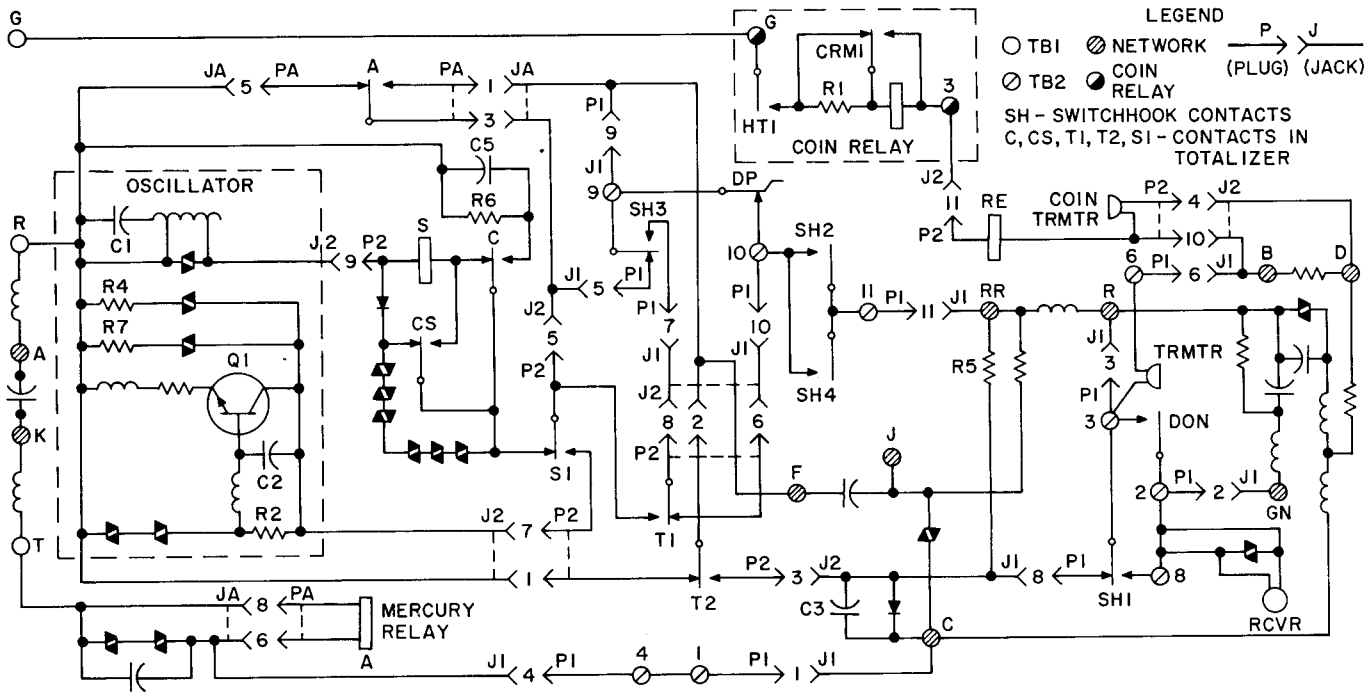


Fig. 10 — 1A1 and 2A1 Coin Telephone Schematic

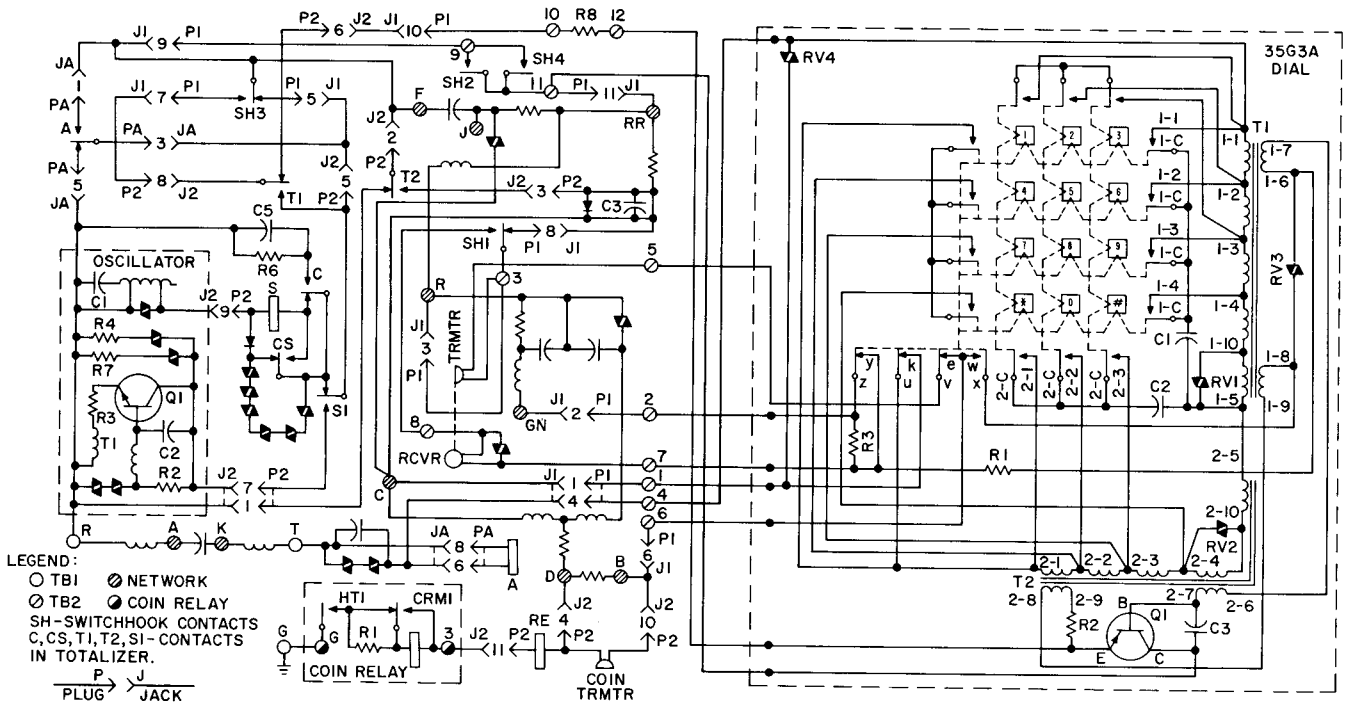


Fig. 11 — 1A2 and 2A2 Coin Telephone Schematic