COIN TELEPHONE MAINTENANCE CHECK

MULTISLOT

CONTENTS

FIGURES

1. GENERAL

1.01 This section supplements Section 506-110-301 entitled COIN COLLECTORS/COIN TELEPHONES — (PREPAY-MULTISLOT) — MAINTENANCE.

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, multislot coin stations. For detailed maintenance procedures see section referenced for the particular work operation.

1.03 *A Coin Collector* requires a subscriber set to provide talking and ringing components whereas a *Coin Telephone* has all components within one housing.

1.04 When trouble cannot be cleared, report it to the test desk and place a KS-7991 out-of-service sign or an E-4914 tag over coin gauge. Sign or tag shall be removed when service is restored. Return sign to agent.

1.05 *Dial Prepay Service:* When a coin collector 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 collector 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.

1.06 *Telephone Circuit:* The talking circuit in a multislot coin instrument is generally the same as used in conventional telephone sets, except for the addition of two signal transmitters and an electromagnet in series in the primary circuit.

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
466A Tool	Adjusting housing contacts
528A Tool	Removing foreign material from locks

Item	Use
641A Tool (2 req'd)	To facilitate mounting dials
710A Tool	Removing Switch Hooks (corner mounts)
719A Tool	Open door — 235-, 1235-type coin telephones
KS-14995 Tool	Trap and vane release test
KS-6320 (orange stick)	Removing stuck coins
KS-14164 brush	Cleaning washer reject mechanism
KS-13786 nylon brush	Cleaning coin return
No. 6 sash brush	General cleaning
146B gauge	Coin relay bias margin test
178A gauge	Gate operating arm adjustment (shaft type)
178B gauge	Gate operating arm adjustment (yoke type)
P10B cord	Connecting lower to upper housing (236-, 1234-type)
P11C cord	Connecting door to housing assembly (235-, 1235-type)
Form E-4914 or KS-7991	Out-of-Service tag or sign
KS-2423 cotton twill cloth	Cleaning
KS-7860 petroleum spirits	Cleaning
KS-14774, L1 grease	Lubricating
KS-16601, L1 paper	Cleaning
KS-16750, L2 releaser	Removing dial finger wheels
KS-19094, L1 or L2 antiseize compound	Security locks
No. 320 aluminum oxide cloth	Cleaning housing contacts
P-12A745 spacer	Reduce upper housing vertical play
Tinnerman clips (C-29313-012-445) (C-3412-020-38)	Upper to lower housing ground clips
Pipe cleaners	Cleaning coin gauges
Lead pencil (2B or softer)	Lubricating switch hook and coin release mechanism
Paper clip	Dial shorting

3. TEN-STEP COIN STATION ROUTINE

3.01 The ten-step routine outlined on the following pages is designed as a reference check list for the inspection of coin stations on 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 Ten-Step Routine

(a) Upon installation of a coin station

(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, 4, 5, 9, and 10 are required as part of each repair visit for all trouble reports.

(b) Steps 6 and 8 are required, in addition to (a) above, as part of the investigation of "Coins Don't Return" and "No Dial Tone" reports.

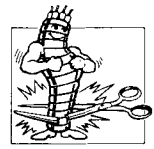
(c) Step 7 is required to update the measurement records on the test center line card and on repeated "Coins Don't Return" reports.

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.

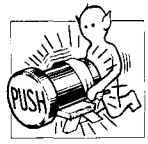
3.04 The ten-step coin station routine is as follows:

1. Inspection Before Removing Upper Housing 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	
• 6- and 8-type dials (rotary)	501-162-100
• 25-type dials (TOUCH-TONE®)	501-164-105
(b) Coin deflector	506-110-301
• Securely in place	
(c) Handset	
• Locked caps	501-210-101
• Cracked caps or handle	
• Antifraud transmitter unit	501-230-100
• Antifrost transmitter cover	506-110-301
• F-type handsets	501-210-101
• G-type handsets	501-210-102
(d) Armored Cord	506-110-103
• Secure at handset and instrument	
• Armor intact	



Inspect:	*BSP Reference*
(e) Housing	
• Appearance	506-110-301
(f) Number cards	501-150-100
• Correct telephone number	
(g) Instruction cards and holders	506-110-101
• Securely in place	
• Instruction card present	
(h) Pull bucket	506-110-301
• Properly secured	
• Operates freely	
(i) Coin release button	506-110-301
• Operates freely	



2. Operation Tests Before Removing Upper Housing or Opening Door

Note: Refer to Trouble Analysis (Table A) when operation tests fail.

- Coins required: 3 nickels, 1 dime, 1 quarter
- BSP reference: Sections 506-110-100 and 506-110-301

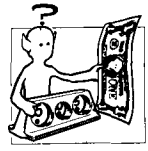


	Table A Trouble Nos.
(a) With handset off-hook:	
(1) Deposit nickel	1, 2
• Nickel should be held at holding latch	3, 4
(2) Depress switch hook	
• Nickel should be returned	5
(b) With handset off-hook:	
(1) Deposit nickel	
(2) Depress coin release button	
• Nickel should be returned	6
(c) With handset off-hook:	
(1) Deposit nickel	
• Check for no dial tone	7
(2) Deposit second nickel	
• Check for dial tone	8
(3) After dial tone, deposit third nickel	
• Nickel should strike coin signal gong	9, 12
(4) Hang-up	
• Three nickels should be returned	10
(d) Check for receiving and breaking dial tone with each of the following:	11
• 2 nickels, 1 dime, 1 quarter	

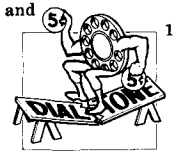


TABLE A

TROUBLE ANALYSIS

200 AND 1200 SERIES COIN COLLECTORS/TELEPHONES

No.	Trouble	Possible Cause	Remedial Action
1	Coin gauge will not accept coins	Stuffed coin gauge or twister	Clear coin gauge or twister (do not use metal tool)
2	Dial tone without deposit	Full coin receptacle	Level coins and notify coin collection department
		Defective coin relay	Replace
		Foreign ground	Check relay, protector, and wiring
3	Nickel returns or sticks at reject mechanism	Loose star wheel shaft	Replace upper housing
		Loose or defective reject frame	
		Blocked switch hook	Clear

TABLE A (Cont)

No.	Trouble	Possible Cause	Remedial Action
4	Nickel returns or sticking at latches or gate	Sticking latches or bent gate lever	Replace coin chute.
		Gate operating arm or support bracket out of adjustment	Adjust, using 178-type gauge
5	Nickel does not return when switch hook is depressed	Gate operating arm out of adjustment	Adjust
		Coin return path blocked	Clear coin return path
6	Nickel does not return when coin return button is depressed	P12A666 stop bracket loose or missing	Tighten or replace
		Stuffed coin chute	Clear or replace coin chute
7	Dial tone with nickel deposit	Latching or holding latches sticky or out of adjustment	Replace coin chute
8	No dial tone for ten cent deposit	Blocked or dirty coin chute	Replace coin chute
		Handset transmitter or receiver unit removed or defective	Replace handset
		Dial pulsing contacts open	Replace dial
		Switch hook contacts not making	Adjust or clean contacts
		Hopper trigger contacts not making	Clean and adjust or replace coin relay
		Dial off-normal contacts not making	Replace dial
		No local ground	Check for tight connection to proper ground
		Defective internal wiring or loose connections	Check continuity of wiring and transfer contacts
		Central office overload or trouble	
9	Third nickel does not reach coin relay trap	Defective electromagnet or sticky armature arm	Replace coin chute
10	Coins not returned by coin relay when handset is placed on-hook *	Coin relay not functioning properly.	Check selector card for foreign particles, clean contacts, or replace coin relay
		Poor ground and/or connections	Correct
11	Can't break dial tone	Coin relay dial-shorting contacts not breaking	Adjust or replace coin relay
		Dial pulsing contacts not functioning properly	Replace dial
		Short caused by defective wiring	Check wiring in set
12	Improper coin signal tones	Defective coin signal transmitter	Replace
		Signal gongs improperly positioned	Adjust

TABLE A (Cont)

No.	Trouble	Possible Cause	Remedial Action
12 (Cont)	Improper coin signal tones	Broken or shorted signal transmitter leads	Repair leads or replace signal transmitter
		Dial off — normal contacts not restoring	Replace dial
		Wiring improperly dressed against gongs	Dress wires properly
		Coin chute capacitor (452B) open	Replace
13	No ring back or low volume	Defective ringer or leads	Replace ringer
		Ringer out of adjustment	Adjust ringer
		Open ringer capacitor in network	Replace network

*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.

3. Inspection After Removing Upper Housing

Note: Remove handset from switch hook before removing upper housing. Careful removal of upper housing may facilitate locating coin troubles.

Inspect: — *BSP Reference*

(a) All wiring for tight connections

(b) Dressing of wiring and cords

- Free of spring contacts
- Not touching coin signal gongs

(c) Bolt or stud fasteners — 506-110-103

- Insulator in place — 506-110-103
- Antiseize compound on threads — 506-110-301

(d) Ground clip on upper housing — 506-110-200

(e) Ground wire from coin relay to lower housing (except 235- and 1235-type coin telephones) — 506-110-200

(f) Coin gauge — 506-110-301

- Dirty, sticky
- Blocked
- Corroded

(g) Washer reject mechanism — 506-110-100

- Free operation of starwheels

(h) Housing contacts — 506-110-301

- Dirty
- Out of adjustment

4. Coin Chute Assembly

Inspect: — *BSP Reference*

(a) For dirt, sticky or greasy substances, foreign matter — 506-110-301

- *DO NOT CLEAN CHUTE*
- Replace chute, not housing

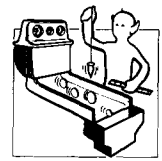
Note: Use only an orange stick or nonmetallic tool to remove stuck coins and foreign matter.

(b) For damaged or corroded holding and locking latches, electromagnet, and gate — 506-110-301

- Replace chute, not housing

(c) Chute and coin twister alignment — 506-321-100, 506-110-301

- Suspect chute alignment if coins are found beside relay or stuck between bottom of chute and hopper.



5. Switch Hook Operation

Note: (a), (b), (c), and (e) do not apply to 235- and 1235-type coin telephones.

Inspect: — *BSP Reference*

(a) Vertical and lateral movement — 506-110-301

- Loose sleeve

Inspect:	*BSP Reference*
(b) Spring pileups • Alignment • Tension • Tightness	506-110-301
(c) Contacts • Dirty • Pitted	506-110-301
(d) Gate operating arm adjustment • Check adjustment with 178-type gauge	506-110-301
(e) Unblockable switch hook (D-180009 switch hook conversion kit) • Bushing not binding • Shaft not bent	506-110-103

6. Coin Relay and Hopper Operation

Inspect:	*BSP Reference*
(a) Ground contact and dial shorting contact springs • Clean • Properly adjusted • Lubricate surface between trigger and contact spring with 2B, or softer, lead pencil	506-110-301
(b) Selector card magnets and pole piece extensions • Remove foreign magnetic particles and dirt.	506-110-301
(c) Operation of trigger, trap, and vane • Perform trap and vane release test with KS-14995 tool.	506-110-301

(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).

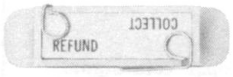
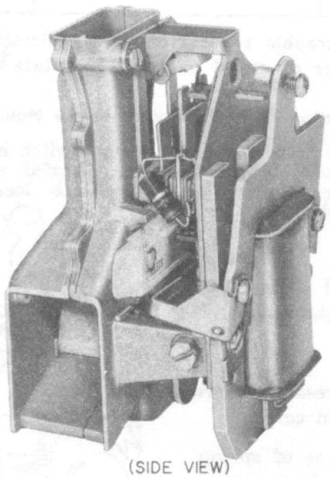


Fig. 1 — 146B Bias Margin Gauge

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



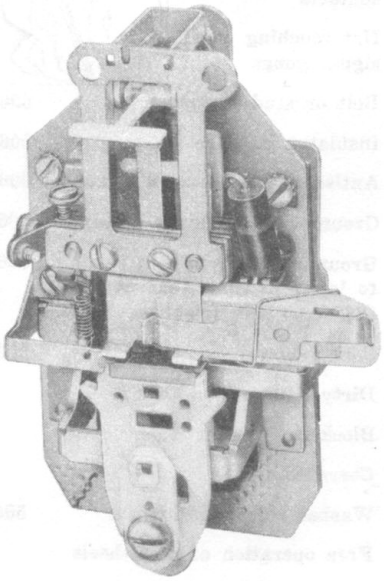


Fig. 2 — 146B Bias Margin Gauge in Position for Collect Test

(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 upper housing. If cover is missing, replace it before closing out the report.

Note: On 235- and 1235-type coin telephones make certain P-208E453 clip is properly positioned to avoid damaging clip when door is closed.

7. 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

- Connections for loop and ground resistance measurements for a typical coin station are shown in Fig. 3 and 4, respectively. See Table B for use of dial long line equipment.

Note: The difference between the ground measurement and ½ 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.

- Installations with excessive loop resistance may require the use of a 685B subscriber set (S-36 relay). When required a 233- or 234-type coin collector must be used. Refer to Table C for use of 685B subscriber set and Fig. 5 for connections and operate path of the S-36 relay. For complete connection information see Section 506-215-404.

(c) Coin relay current flow test

(1) Preparation by type of station:

a. 233- and 234-type coin collectors:

- Remove upper housing and connect 1011B test set to (Y) and (L) terminals as shown in Fig. 6.

b. 235- and 1235-type coin telephones:

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

c. 236- and 1234-type coin telephones:

- Remove and connect upper housing to lower housing with P10B cord.

(2) With the handset off-hook operate the hopper trigger.

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

- Observe relay operation.

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

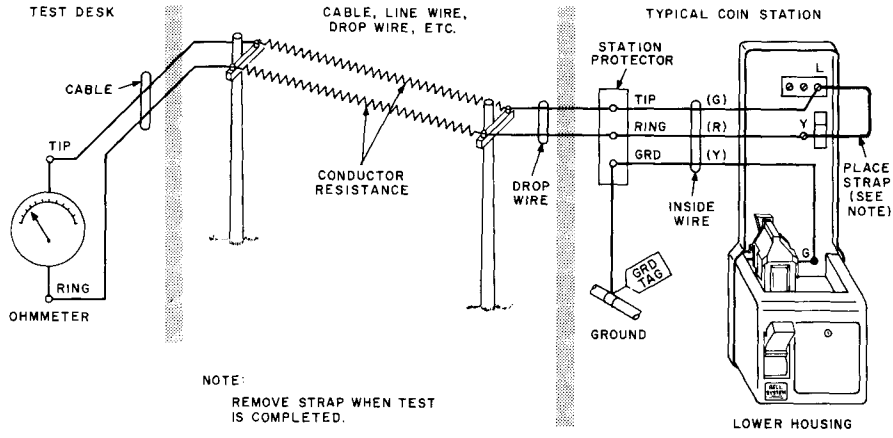


Fig. 3 — Loop Resistance Measurement

Note: The operate and release time for the single coil 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: Circuits equipped with long line relays may appear to work satisfactorily even though the tip and ring are reversed. Check for 48V on ring and ground on tip.

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

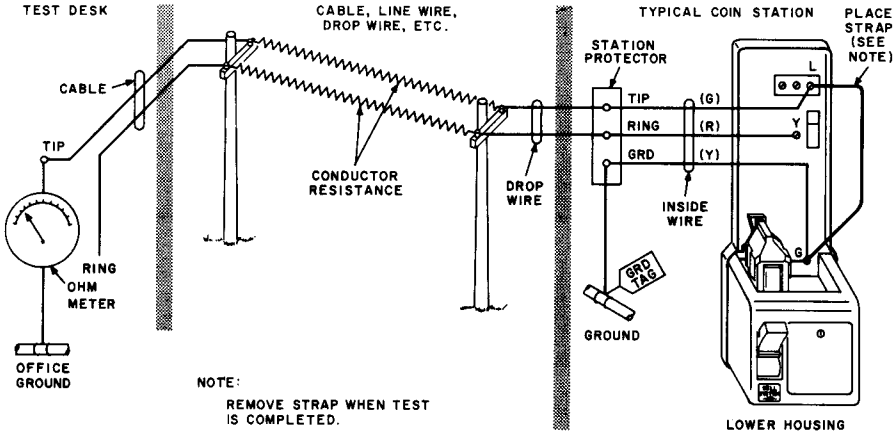


Fig. 4 — Ground Resistance Measurement

TABLE B

REQUIREMENTS FOR DIAL LONG LINE CIRCUITS ON COIN LINES

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

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 Without S-36 Relay	Loop Range With S-36 Relay
Step-By-Step	100 volts (100-120V)	1100 ohms	1400 ohms
Panel and No. 1 Crossbar	115 volts (115-120V)	1600 ohms	1960 ohms
No. 5 Crossbar	125 volts (125-135V)	2000 ohms	2460 ohms

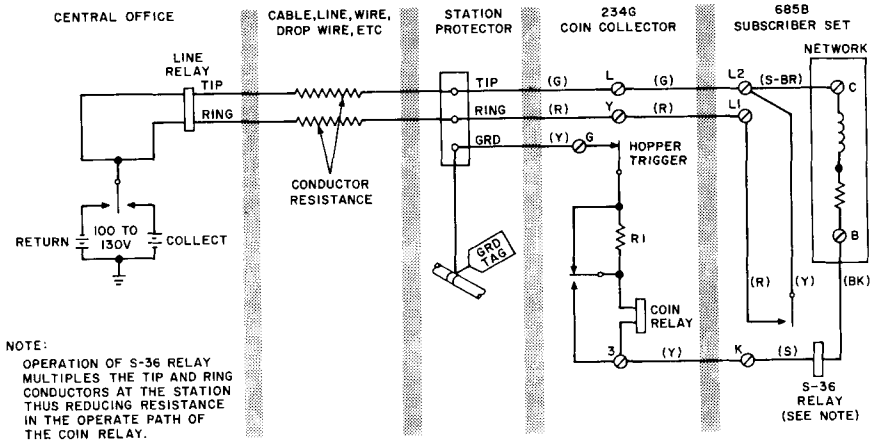


Fig. 5 — Connections and Operate Path of S-36 Relay (685B Subscriber Set)

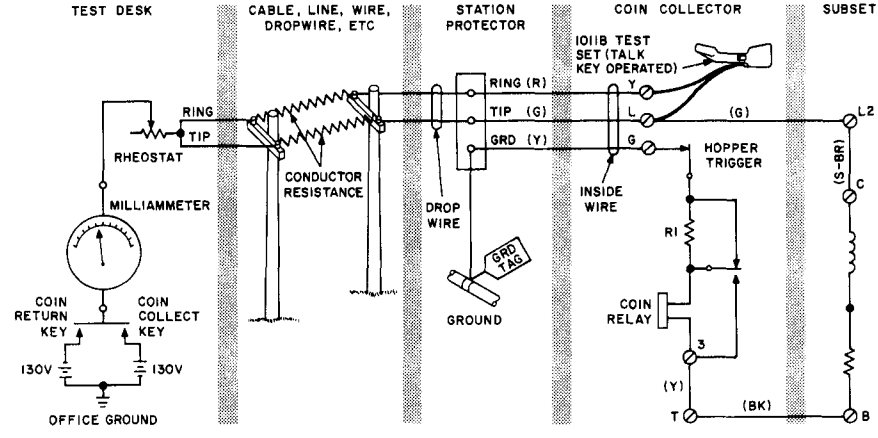


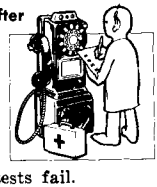
Fig. 6 — Coin Relay Current Flow Test

8. 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
(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.

9. Final Tests and Inspection After Replacing Upper Housing 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: Sections 506-110-100 and 506-110-301

	Table A Trouble Nos.
(a) Call operator using two nickels:	

(1) Request that coins be identified as nickel, dime and quarter as they are deposited.	12
(2) Request coins be refunded	
(3) Verify returned coins	10
(4) Request ring-back	13
• Observe ringer volume	

(b) Inspect for noise or cutout caused by upper housing vertical play (P-12A745 spacers).

(c) Inspect for noisy or cutout handset cord.

10. 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 COLLECTOR/TELEPHONE FUNCTIONAL SCHEMATICS

4.01 As an aid in clearing electrical troubles, Fig. 7 through 11 provide functional schematics for coin collectors/telephones as follows:

- Fig. 7 — 234G Coin Collector With 685A Subscriber Set
- Fig. 8 — 235G Coin Telephone
- Fig. 9 — 236G Coin Telephone
- Fig. 10 — 1234G Coin Collector With 685A Subscriber Set
- Fig. 11 — 1235G Coin Telephone

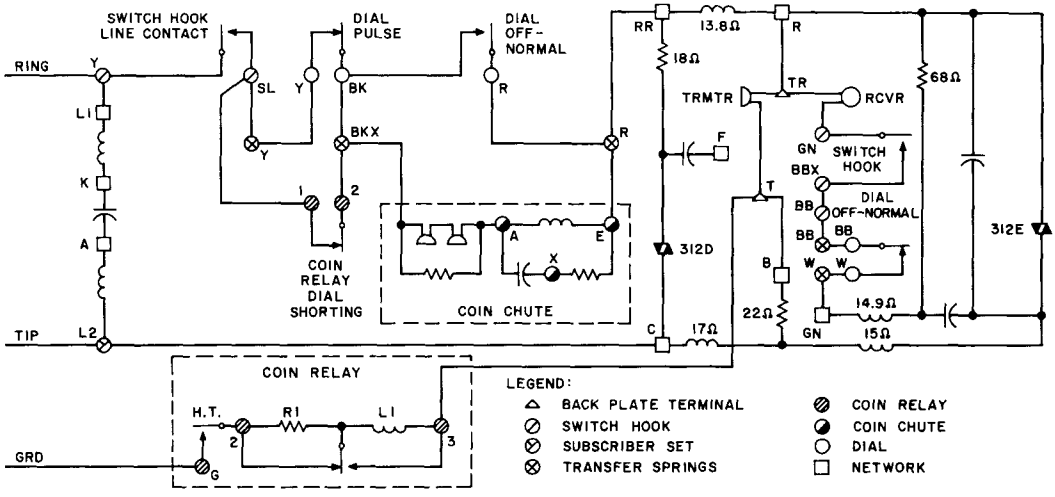


Fig. 7 — 234G Coin Collector With 685A Subscriber Set

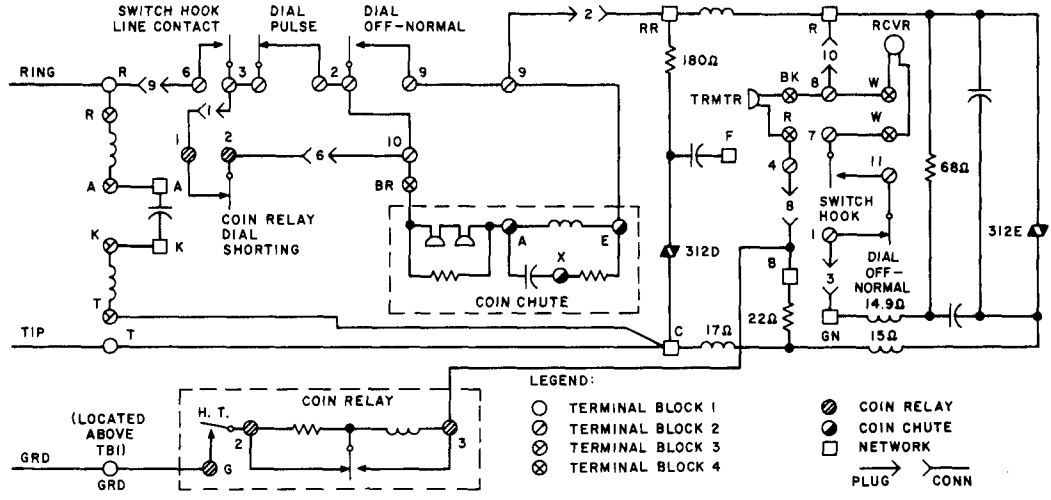


Fig. 8 — 235G Coin Telephone

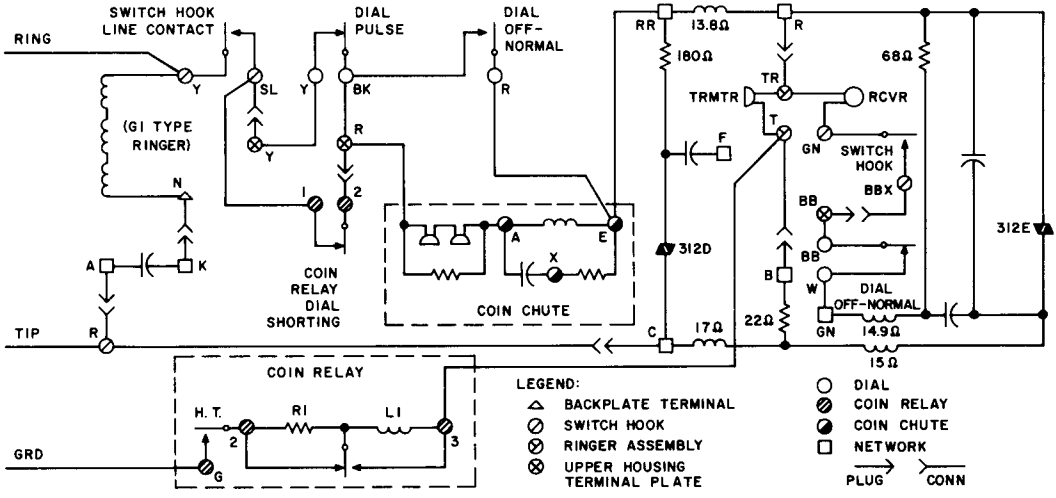


Fig. 9 — 236G Coin Telephone

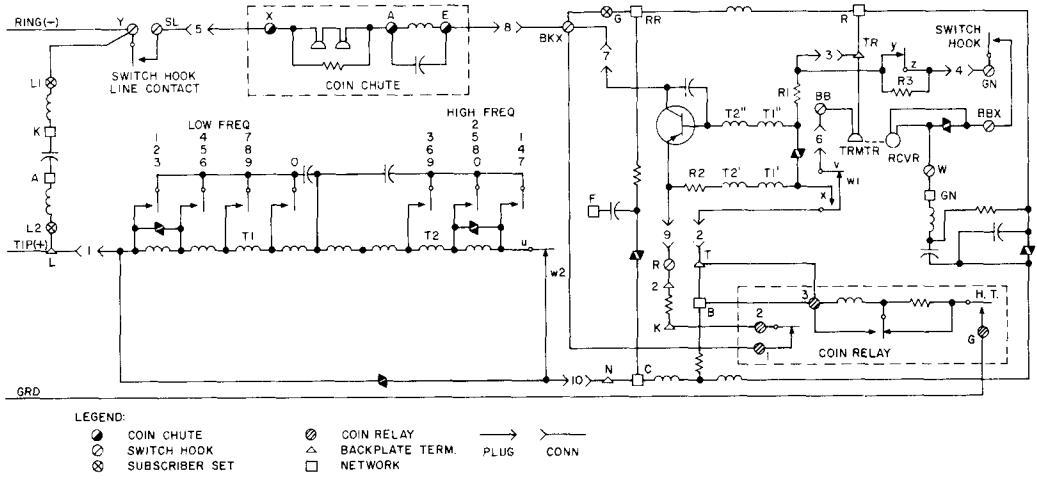


Fig. 10 — 1234G Coin Collector With 685A Subscriber Set

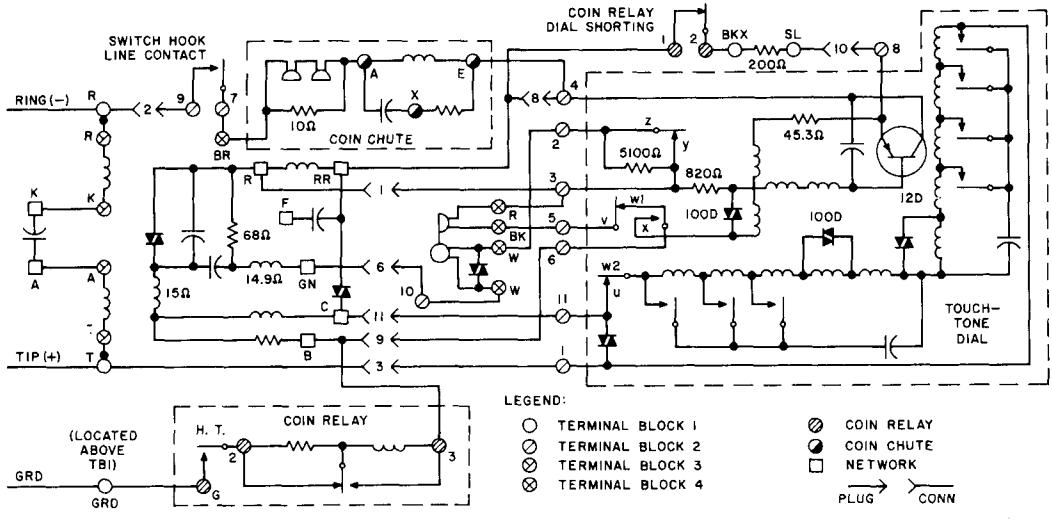


Fig. 11 — 1235G Coin Telephone