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 506-900-508. 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
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 IC- 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

CF
Go off-hook
Deposit nickel less than initial rate
OK  Failure
No dial tone
Totalizer does not home
Hang up
OK  Failure
Deposit returned
Deposit does not return
Totalizer does not home
(Standard)

DTF
Go off-hook
Deposit nickel less than initial rate
OK  Failure
Dial tone heard
Totalizer homes
Dial tone heard
No dial tone (B-4)

Totalizer does not home
Totalizer homes
Deposits
Dial number of station under test
OK  Failure
Insufficient deposit
Recording heard
Recording not heard (B-7)
Hang up

OK  Failure
Deposit is returned
Deposit does not return
(B-8)

Connect lineman's test set across tip and ring and verify that "TALK-MONITOR" switch is in "MONITOR" position
Go off-hook
Deposit initial rate
Dial any digit except "0" or "1" to break dial tone
Deposit nickel, dime, and quarter

OK

Coins properly identified in lineman's test set

Failure

Improper coin signal tones (A-37 for CF) (B-12 for DTF)

Hang up—coins returned
Disconnect lineman's test set
Go off-hook
Deposit initial rate
Dial coin test line number

NOTE: If test line is in use, busy signal will be heard. If busy for long period, call central office.

Test line seized, makes COIN DETECTION AND GROUND REMOVAL test

CF

OK

Failure

$2$ beeps (3 times)

Tone C (A-8)

DTF

OK

Failure

$2$ beeps (3 times) (B-9)

NOTE: Loop leakage may be too high. Perform the loop leakage test, if it checks OK, A relay is probably bad.

$1$ beep, OK when 8A range extender (REG) is used in CO.

$2$ beeps, OK when 8A range extender (REG) is used in CO.

NOTE: This is the ZK option and cannot be performed in all systems. If dial tone not broken with CF station deposit a single coin equal to or greater than initial rate and dial. If coin tone heard after dialing a DTF station, deposit initial rate or greater.

Test line makes Ground Path
FEMF test and returns coin(s)

GROUND CIRCUIT
AND LOOP
FOREIGN EMF

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

$1$ beep, OK when 8A range extender (REG) is used in CO.

$2$ beeps, OK when 8A range extender (REG) is used in CO.
GROUND CHECK, LOOP RESISTANCE, AND LOOP LEAKAGE TESTS

OK | Failure
---|---
3 beeps (3 times) | (1) Coin(s) does not return (A-5 for CF)
                      | (B-6 for DTF)
                      | (2) 1 beep (3 times)–ground path dc FEMF excessive (may affect other tests)

High tone, hang up

Test line makes loop (T-Grd) FEMF test and then loop (R-Grd) FEMF test

OK | Failure
---|---
3 rings or beeps (3 times) | 2 rings or beeps (3 times)–loop dc FEMF excessive (>3.0 volts)–test with test desk (may affect other tests)

Note: Go off hook before the third group of rings is completed to prevent disconnect (ring changes to beep)

Interrupted dial tone

Deposit coin equal to or greater than initial rate

Dial 2

Test line makes GROUND CHECK test, returns coin(s), then makes LOOP RESISTANCE test

OK | Failure
---|---
3 beeps (3 times) | Marginal
4 beeps (3 times)† | (1) Coin(s) does not return (A-5 for CF)
ZX option not in all test lines | (B-6 for DTF)

High tone, hang up

Test line makes LOOP LEAKAGE test

*Notes 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.

NOTE: Loop resistance may pass during cold weather and fail when warm. This indicates marginal conditions and coin REG should be added.
**COLLECT TEST**

**OK**
- 1 ring (3 times)

**Failure**
- 2 rings/beeps (3 times) - loop resistance less than 100,000 ohms across pair or to ground. (Test with test desk.)

**Note:** Go off-hook before 3rd ring to prevent disconnect (ring changes to beep).

**Interrupted dial tone**

**Install 146B Gauge in COLLECT position**

**CF**
- Insert thin end of KS-14995, L3 tool between chute and hopper to block coin drop
- Deposit a single coin equal to or greater than initial rate

**DTF**
- No action required

**Trip trigger**
- Dial 3
- High tone, hang up
- Test line makes COLLECT test (Verify that vane moves to collect position)

**OK**
- 1 ring (3 times) - collects on lst attempt.

**Failure**
- 2 rings (3 times) - collects on 2nd attempt. (marginal, see note).
- 3 rings (3 times) - collects on 3rd attempt or not at all. (Replace coin relay).

**Note:** If all other tests are OK, replace coin relay or test coin relay with testboard current flow method.

**Interrupted dial tone**

**Tones time out in 60 sec., test line disconnects**
RETURN TEST
(AND AUTOMATIC
NICKEL LOCAL
OVERTIME TEST
DTF only)

Install 146B Gauge in RETURN position

CF

- Remove KS-14895, L3 tool (Coin(s) fall into coin return chute after coin relay is manually operated)
- Deposit a single coin equal to or greater than initial rate
- Dial 4
- High tone
- OK
- Failure

- Deposit nickel (Nickel drops into hopper)
- Dial 4
- High tone
- Tone C - Replace chassis or Totalizer does not restore (1A/1C/2A/2C sets only)
- (B-12)

OK

- Hang up

Failure

1 ring (3 times) - coin returns on 1st attempt.

Note: Go off-hook before 3rd ring or group of rings to prevent disconnect (ring changes to beep).

Interrupted dial tone*

CF

- Remove 146B gauge

High tone

OK

Failure

2 rings (3 times) - coin returns on 2nd attempt, (marginal).

3 rings (3 times) - coin returns on 3rd attempt or not at all (A-5 for CF) (B-6 for DTF)

Deposit a single coin equal to or greater than initial rate

Deposit a coin
d

*Tones time out in 60 sec., test line disconnects
COIN RELAY TIMING TEST

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

Dial 5

Test line makes COIN RELAY TIME test

<table>
<thead>
<tr>
<th>SIGNAL (Coin relay operate time)</th>
<th>TEMPERATURE of Coin Relay</th>
<th>Adjusting Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Beeps (Above 500 milliseconds)</td>
<td>Below 20°</td>
<td>Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>20-60°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>60-100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>Above 100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td>3 Beeps (475-500 milliseconds)</td>
<td>Below 20°</td>
<td>Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>20-60°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>60-100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>Above 100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td>STEADY TONE (425-475 milliseconds)</td>
<td>Below 20°</td>
<td>Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>20-60°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>60-100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>Above 100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td>2 Beeps (400-425 milliseconds)</td>
<td>Below 20°</td>
<td>Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>20-60°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>60-100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>Above 100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td>1 Beep (Below 400 milliseconds)</td>
<td>Below 20°</td>
<td>Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>20-60°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>60-100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
<tr>
<td></td>
<td>Above 100°</td>
<td>TBD - Refer to Adjust Chart</td>
</tr>
</tbody>
</table>

Adjust to steady tone and turn armature screw clockwise until first indication of 2 beeps is acquired
Adjust to 3 beeps and turn armature screw clockwise until first indication of steady tone is acquired
Adjust to 4 beeps and turn armature screw clockwise until first indication of 3 beeps is acquired
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

Test line seized

Interrupted dial tone heard

Deposit coin ≥ IR

Dial digit 8

Coin returns

Calibration OK

3 beeps (3 times)
4 beeps (3 times)
for (ZX option)

Failure/Refer to CO

Calibration required

1 beep (3 times) – ground resistance calibration
adjust R3 on CPA962 counterclockwise
2 beeps (3 times) – loop resistance calibration
adjust R5 on CPA962 counterclockwise

Hang up tone

Hang up

Failure/Refer to CO

Calibration required

Double rings (3 times) leakage resistance
adjust R5 on CPA963 or CPA963B counterclockwise

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

Interrupted dial tone

Deposit coin ≥ IR

Dial digit 9
(Dial digit 9, cont)

Coin returns

- Calibration OK
  - 2 beeps (3 times)
  - *In CO both ANSI and ANS2 relays operate
    - Hang up tone
    - 3 beeps (3 times) adjust R5 on CPA962 clockwise

- Failure/Refer to CO
  - Calibration adjustment required
    - 1 or 4 beeps (3 times) adjust R5 on CPA962 clockwise
    - 3 beeps (3 times) adjust both R3 and R5 on CPA962 clockwise

Hang up tone

- Hang up

- Calibration OK
  - 2 rings (3 times)
    - 3 beeps (3 times) adjust both R3 and R5 on CPA962 clockwise

- Failure/Refer to CO
  - Calibration adjustment required
    - Single ring (3 times) adjust R5 on CPA963 or CPA963B clockwise

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

Interrupted dial tone

- Deposit coin ≥IR
  - Dial new test or hang up if no further tests are to be made
  - After several seconds check for disconnect

CF

No tones heard

DTF

Steady dial tone heard