COIN STATION TEST LINE SD-1C297-01

TESTS

1. GENERAL

1.01 This section describes a method of testing and adjusting the coin station test line circuit SD-1C297-01. The test line will operate with any coin station that does not require dial long line circuits.

1.02 This issue affects the Equipment Test List.

1.03 The tests covered are:

PAGE

A. Coin Present and Ground Removal: This test checks the ability of the test line to detect the presence of the proper coin or coins at the coin station and to determine if the ground removal relay operates. 3

B. Digit Reception: This test checks the ability of the test line to reject an invalid digit and request a valid digit. 4

C. Loop Resistance and Leakage: This test checks the ability of the test line to make a loop resistance and line leakage test of the coin station loop, returning signals to indicate results of the tests. 5

D. Coin Return: This test checks the ability of the test line to test the ability of the coin station to return coins. 6

E. Coin Collect: This test checks the ability of the test line to check the diode which shunts the totalizer contacts and to apply collect current to the coin station. 8

PAGE

F. Coin Relay Line Test: This test checks the ability of the test line to determine the operating time of the coin relay in the coin station. 8

G. 4-Volt Power Supply Test and Adjustment: This test checks the 4-volt power supply and outlines procedures to be followed if the voltage is out of limits. 9

H. Ground and Loop Resistance Test Adjustments: This test checks circuit pack A962 and outlines procedures to check the answers to the loop resistance tests of Test C. 10

I. Leakage Adjustment: This test checks circuit pack A963. Procedures are outlined to check the answers to the leakage tests of Test C. . . . . .

1.04 In order to test all features of the test line, a 1C type coin station equipped with a 3W9A cord is used in the step-by-step, panel, or crossbar offices where the test line is located. The spade terminals of the 3W9A cord are connected to the T, R, and G terminals of the coin chassis as follows: tip (white) to T, ring (black) to R, sleeve (brown) to G. The coin station should be modified for dial tone first features and have the bank removed.

1.05 Various signaling tones and test answers are generated by the test line and are described as follows:

- *C Tone:* C (coin) tone is supplied whenever a coin is desired in the coin hopper. Coin tone consists of alternate application of high tone and dial tone at a rate of 120 ipm.

- ***Interrupted Dial Tone:*** This tone is supplied when the test line awaits a digit requesting a new test. This tone consists of dial tone interrupted at 120 ipm. This tone is used so that if the test line gets disconnected and central office dial tone is applied to the coin station, a difference will be noted.

- ***HU Tone:*** HU (hang up) tone consists of steady high tone and is applied whenever it is desired to have the coin station receiver placed on-hook.

- ***Beep Tone:*** Beep tones are supplied as test answers to various tests. The number of beep tones constitute a code which indicates the test result of the test being performed. Each code is heard three times. Beep tone is produced by interrupting high tone at 120 ipm.

- ***Coded Ringing:*** Coded ringing is supplied as test answers to certain tests. With the coin station receiver on-hook, the number of rings constitute a code which indicates the test result of the test being performed. The ringing current is interrupted at a rate of 60 ipm. The receiver may be lifted during ringing and coded tones will replace coded ringing at the same 60 ipm rate.

1.06 The test line is designed to accept rotary dialed digits. When required, TOUCH-TONE® digits may be received by optional TOUCH-TONE receiver and interface circuits. An illegal digit will be rejected and the circuit reset to await a legal digit. Legal digits (those which initiate a valid test) will be held in the counter and are as follows:

- 2 Resistance tests
- 3 Collect tests
- 4 Return tests
- 5 Coin relay time test

1.07 For troubles on the test line which cannot be cleared using this section, consult TLM 1C-297.

1.08 The tests should preferably be made out of hours since the test line will be out of service during the test procedures.

1.09 ***Lettered Steps:*** A letter, a, b, c, etc, added to a step number in Part 3 or 4 of this section, indicates an action which may or may not be required depending on local conditions. The condition under which a letter step or a series of lettered steps should be made is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

2. APPARATUS

All Tests

2.01 1C type coin station equipped with 3W9A cord. See 1.04.

2.02 5 cent and 10 cent coins as required.

2.03 3P6D patching cord.

2.04 Wire strap.

2.05 Coin station test line calibration set J93025B.

Test A

2.06 Wire strap

Tests D and E

2.07 KS-6320 orange stick

Test F

2.08 Size 1B screwdriver

Test G

2.09 14510-1 L1 voltmeter or equivalent

Tests G, H, and I

2.10 723A extractor

2.11 Card extender, as required.

2.12 3-inch C screwdriver

Tests H and I

2.13 Blocking tools, as required. Use as specified in Section 069-020-801.

3. PREPARATION

STEP	ACTION	VERIFICATION
All Tests		
1	Check that test line circuit is not busy.	OH and DISC relays normal.
2a	If test line circuit is in a No. 5 crossbar office— Operate MB switch.	
3	Insert plug of 3W9A cord connected to 1C type coin station into COIN PHONE jack of calibration set.	
4	Patch TJA jack of calibration set to TJ jack of test line under test.	
5	Set calibration set switches as follows: LEAKAGE—NONE GRD RES—SHORT LOOP RES—NONE	
6	Add wire strap (to short circuit transmitter) between terminals on dial housing terminal board as follows: For 1C1 or 2C1 coin station, terminals 3 and 6. For 1C2 or 2C2 coin station, terminals 3 and 5.	

4. METHOD

STEP	ACTION	VERIFICATION
A. Coin Present and Ground Removal		
7	Lift receiver off hook.	C tone heard.
8	Hang up receiver.	In 60 seconds— OH relay releases.
9	Lift receiver off hook.	C tone heard.
10	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
11	Hang up receiver.	Coin returned.
12	Strap terminals 4 and 8 at terminal board 3 of chassis assembly.	

STEP	ACTION	VERIFICATION
13	Deposit ten cents and lift receiver.	2 beeps heard, repeated twice. 120 ipm dial tone heard.
14	Hang up receiver.	Coin returned.
15	Remove strap placed in Step 12.	
16b	If no further tests are to be performed— Disconnect plugs from TJ, TJA and COIN PHONE jacks.	
17b	Restore MB switch (No. 5 crossbar office only).	
18b	Remove strap placed in Step 6.	
B. Digit Reception Test		
7	Lift receiver off hook.	C tone heard.
8	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
9	Dial an illegal digit. See 1.06.	120 ipm dial tone heard. In 60 seconds— 120 ipm dial tone silenced.
10	Hang up receiver.	Coin returned.
11	Perform Test C, D, E, or F to check reception of legal digit.	
C. Loop Resistance and Leakage		
7	Lift receiver off hook.	C tone heard.
8	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
9	Dial digit 2.	Coin returned. 3 beeps heard. (Loop and ground OK) HU tone heard.
10	Hang up receiver.	Coin station bell rings once, indicating non leaky line.
11	At calibration set, set switches as follows: LEAKAGE—100K (T-R) GRD RES—100Ω	
12	Repeat Steps 7 through 10.	3 beeps heard at Step 9. 2 rings heard at Step 10.

STEP	ACTION	VERIFICATION
13	At calibration unit, set switches as follows: LEAKAGE—110K (T-R) GRD RES—150Ω	
14	Repeat Steps 7 through 10.	1 beep heard at Step 9. 1 ring heard at Step 10.
15	At calibration unit, set switches as follows: LEAKAGE—100K (R-G) GRD RES—SHORT LOOP RES—950 or 1300 ***Note:*** Use 950 in panel office, 1300 in any other type.	
16	Repeat Steps 7 through 10.	3 beeps heard at Step 9. 2 rings heard at Step 10.
17	At calibration unit, set switches as follows: LEAKAGE—110K (R-G) LOOP RES—1000 or 1350 ***Note:*** Use 1000 in panel offices, 1350 in any other type.	
18	Repeat Steps 7 through 10.	2 beeps heard at Step 9. 1 ring heard at Step 10.
19	At calibration unit, turn all switches counterclockwise as far as possible.	
20b	If no futher tests are to be performed— Disconnect plugs from COIN PHONE, TJA, and TJ jacks.	
21b	Restore MB switch (No. 5 crossbar office only).	
22b	Remove strap placed in Step 6.	
D. Coin Return		
7	Deposit a nickel.	
8	Lift receiver off hook.	1 beep heard. 120 ipm dial tone heard.
9	Dial digit 4.	HU tone heard.

STEP	ACTION	VERIFICATION
10	Hang up receiver.	Coin returned on first attempt. Coin station bell rings once.
11	Lift receiver off hook after bell rings once.	Answer completed as coded tone (1 beep). 120 ipm dial tone heard.
12	Repeat Steps 7 and 9.	HU tone heard.
13	With index finger holding coin relay armature in nonoperated position, hang up receiver. When first attempt is completed, (indicated by pressure on index finger) remove finger from armature.	Coin returned on second attempt. Coin station bell rings twice.
14	Lift receiver off hook after bell rings twice.	Answer completed as coded tones (2 beeps). 120 ipm dial tone heard.
15	Repeat Steps 7 and 9.	HU tone heard.
16	With index finger holding coin relay armature in nonoperated position, hang up receiver. When second attempt is completed, (indicated by pressure on index finger) remove finger from armature.	Coin returned on third attempt. Coin station bell rings three times.
17	Lift receiver off hook after bell rings three times.	Answer completed as coded tones (3 beeps) 120 ipm dial tone heard.
18	Block coin relay armature nonoperated with orange stick.	
19	Repeat Steps 7 and 9.	HU tone heard.
20	Hang up receiver.	Coin not returned. Coin station bell rings three times, repeated twice.
21	Remove coin and orange stick from coin station.	
22b	If no further tests are to be performed— Disconnect plugs from TJ, TJA, and COIN PHONE jacks.	
23b	Restore MB switch (No. 5 crossbar offices only).	
24b	Remove strap placed in Step 6.	

E. Coin Collect

1	Deposit a nickel.	

STEP	ACTION	VERIFICATION
8	Lift receiver off hook.	1 beep heard. 120 ipm dial tone heard.
9	Dial digit 3.	HU tone heard.
10	Hang up receiver.	Coin collected on first attempt. Coin station bell rings once.
11	Lift receiver off hook after bell rings once.	Answer completed as coded tone. 120 ipm dial tone heard.
12	Repeat Steps 7 and 9.	HU tone heard.
13	With index finger holding coin relay armature in nonoperated position, hang up receiver. When first attempt is completed, (indicated by pressure on index finger) remove finger from armature.	Coin collected on second attempt. Coin station bell rings twice.
14	Lift receiver off hook after bell rings twice.	Answer completed as coded tones (2 beeps). 120 ipm dial tone heard.
15	Repeat Steps 7 and 9.	HU tone heard.
16	With index finger holding coin relay armature in nonoperated position, hang up receiver. When second attempt is completed, (indicated by pressure on index finger) remove finger from armature.	Coin collected on third attempt. Coin station bell rings three times.
17	Lift receiver off hook after bell rings three times.	Answer completed as coded tones (3 beeps). 120 ipm dial tone heard.
18	Block coin relay armature nonoperated with orange stick.	
19	Repeat Steps 7 and 9.	HU tone heard.
20	Hang up receiver.	Coin not collected. Coin station bell rings three times, repeated twice.
21	Remove coin and orange stick from coin station.	
22b	If no futher tests are to be performed— Disconnect plugs from TJ, TJA, and COIN PHONE jacks.	
23b	Restore MB switch (No. 5 crossbar offices only).	

STEP	ACTION	VERIFICATION
24b	Remove strap placed in Step 6.	

F. Coin Relay Time Test

7	Lift receiver off hook.	C tone heard.
8	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
9	Dial digit 5.	Deposit returned. Coded beep tones indicate coin relay operate time as shown in Table A. C tone heard.
10	Adjust phillips head screw on coin relay and repeat Steps 8 and 9 until entire range of answers is returned as shown on Table A.	

TABLE A

OPERATE TIME OF COIN RELAY

OPERATE TIME	ANSWER
400 ms	1 Beep*
400-425 ms	2 Beeps*
425-475 ms (ideal)	Steady Tone
475-500 ms	3 Beeps*
500 ms	4 Beeps*

* Repeated twice.

11	Hang up receiver.	
12b	If no further tests are to be performed—Disconnect plugs from COIN PHONE, TJA, and TJ jacks.	
13b	Restore MB switch (No. 5 crossbar offices only).	
14b	Remove strap placed in Step 6.	

G. 4-Volt Power Supply Test and Adjustment

7	Place CP A966 on card extender.	
8	Measure voltage between pin 13 (negative) and pin 26 (positive).	Meter reads 4.0 to 4.25 volts dc.

STEP	ACTION	VERIFICATION
9b	If voltage is beyond limits— Adjust R2 potentiometer until required voltage is obtained.	
10c	If required voltage cannot be obtained in preceding step, replace circuit pack and repeat Steps 7, 8, and 9b.	
11	Remove card extender and place CP A966 in position.	
12	Perform Tests A through F.	

H. Ground and Loop Resistance Test Adjustments

7	Place CP A962 on card extender.	
8	Turn R3 and R5 potentiometers counterclockwise as far as possible.	
9	At calibration unit— Set GRD RES switch to 120.	
10	Set LOOP RES switch to 1000 or 1350 according to local requirement. ***Note:*** Use 1000 in panel office, 1350 in any other type.	
11	At coin station— Lift receiver off hook.	C tone heard.
12	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
13	At test line circuit— Block AUX1 relay operated.	
14	At coin station— Dial digit 2.	120 ipm dial tone silenced. At test line circuit— CPT relay releases.
15	Block TMR1 and TMR3 relays nonoperated.	
16	Remove blocking tool from AUX1 relay.	
17	Adjust R3 potentiometer until ANS1 relay just operates.	
18	Remove blocking tool from TMR1 relay.	Coin returned.

STEP	ACTION	VERIFICATION
19	Adjust R5 potentiometer until ANS2 relay just operates.	
20	Remove blocking tool from TMR3 relay.	HU tone heard.
21	Replace receiver on hook.	One ring heard.
22	Lift receiver off hook after one ring.	Two beeps heard.
23	Perform Test C. *Note:* If Test C should fail, repeat preceding steps, taking particular care when adjusting potentiometers.	
24	Remove card extender and place CP A962 in proper location.	

I. Leakage Adjustment

7	Place CP A963 on card extender.	
8	At calibration unit— Set switches as follows: LEAKAGE—110K (T-G) GRD RES—SHORT LOOP RES—NONE	
9	Set R5 potentiometer to full counterclockwise position.	
10	Lift coin station receiver.	C tone heard.
11	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
12	Dial digit 2.	Coin returned. 3 beeps heard. HU tone heard.
13	Block TMR2 relay nonoperated.	
14	Hang up receiver.	
15	Adjust R5 potentiometer until neon lamp DS2 is just extinguished and then turn the potentiometer 1 turn counterclockwise.	

STEP	ACTION	VERIFICATION
16	At calibration unit, set switches as follows: LEAKAGE—100K (T-G) GRD RES—SHORT	
17	Remove blocking tool from TMR2 relay.	
18	Lift receiver off hook.	C tone heard.
19	Deposit 10 cents.	1 beep heard. 120 ipm dial tone heard.
20	Dial digit 2.	Coin returned. 3 beeps heard. HU tone heard.
21	Hang up receiver.	Coin station bell rings twice.
22b	If verification is not obtained— Repeat Steps 8 through 21, using extreme care in Step 15. If verification is still unobtained, replace CP A963 and repeat Steps 7 through 21.	
23	Remove card extender and place CP A963 in proper position.	