COIN STATION TEST LINE FEATURE

NO. 2 ELECTRONIC SWITCHING SYSTEM

FIGURES   **TABLES**

FEATURE DEFINITION AND DESCRIPTION

1. DEFINITION

1.01 The coin station test line is a facility which enables a craftsperson to test the operation of a coin station from the coin station without aid of central office personnel.

1.02 No. 2 Electronic Switching System (ESS) provides for coin station test line service with generic programs LO-1, Issue 4, or EF-1. It is also necessary to specify two additional circuits; a 9-mounting plate SD-1C297 on coin station test line common systems circuit, and a one-mounting plate SD-2H159-01 No. 2 ESS test line coupler circuit for the office. An office data administration (ODA) run is also necessary before the service can be instituted.

2. DESCRIPTION

A. Customer (User) Perspective

2.01 The user of the coin station test line can test the operation of a coin station from the coin station. To access the test line the user deposits a coin and dials the number assigned to the test line coupler circuit. When the connection is established, a coin present and a ground removal test is made. The user receives the results of the ground removal via audible coded tones. Ground removal occurs when the presence of a coin is detected. Upon receipt of interrupted dial tone, the user selects one of four tests by dialing the appropriate digit. The results of the tests are returned via coded tones and signals. Interrupted dial tone is returned at the end of each test sequence if the user is still off-hook. If no other testing is desired, an on-hook by the user will terminate the tests. The coin is not collected when testing via the coin station test line.

B. System Implementation

2.02 When the user dials the number assigned to the coin station test line, the system translates the digits into the terminal equipment number of the test line and sets up the connection.

2.03 The system then performs a coin present and a ground removal test. If no coin is present, alternating high and low tone ("C" tone) will be returned requesting the user to deposit a

coin. When a coin is detected, a test is then made to determine if the ground removal relay (if it exists) will operate. In dial tone first systems, there are no ground removal relays. The system then returns the results of the ground removal test in coded tones as follows:

- one beep—relay operated and ground is removed

- two beeps—ground not removed (relay not present or it has malfunctioned).

2.04 Following the coded result, interrupted dial tone is connected to the coin station requesting that one of four test sequences be selected. The desired test sequence is selected when the user dials the digit assigned to that test. If no further testing is desired, an on-hook by the user while the interrupted dial tone is present will disconnect the test line.

2.05 The following tests may be requested by the user:

- Resistance tests—digit 2

- Collect tests—digit 3

- Return test—digit 4

- Coin relay time test—digit 5.

For a more detailed description of these tests refer to CD-1C297-01.

Resistance Test

2.06 When the user dials the digit 2 the coin station test line recognizes a request for a resistance test. First, a coin present test is made to determine if the user has deposited a coin. When a coin is detected, an attempt will be made to return the coin. If the coin does not return, disconnect will occur after 60 seconds.

2.07 If the coin returns, the loop resistance is measured. The results of this measurement are returned to the user via coded tones as follows:

- three beeps—indicates loop and ground is within limits

• two beeps—indicates loop resistance is too high

• one beep—indicates ground resistance is too high.

2.08 The answer is repeated three times. Upon completion, steady high tone is returned requesting the user to go on-hook. If the user does not go on-hook within 60 seconds, disconnect will occur. When the user goes on-hook, the leakage measurements are made. The leakage test detects resistance of less than 100 kilohms to allow early detection of leaky loops before any circuit failures occur. Upon completion of the measurements, the results are returned to the user via coded ringing as follows:

• one ring—loop OK

• two rings—loop leaky or grounded.

These results are repeated three times. If the user goes off-hook before completion of the coded ringing, the answer will be completed as coded tone.

2.09 The user must go off-hook before completion of coded ringing to continue testing. If the receiver is not lifted before coded ringing is ended, disconnect will occur. Following the leakage test results, interrupted dial tone is returned indicating that a new test digit can now be dialed.

Collect Test

2.10 To perform the collect test, the user must block collection of the coin, since it is not desirable to collect a coin during this test. Refer to the appropriate 506 Division BSP section to determine how to do this for different types of pay stations.

2.11 After steps have been taken to block collection of the coin, dialing the digit 3 and going on-hook will initiate the collect test. Three attempts will be made to operate the coin relay. Coded ringing will then return the results of the collect attempts as follows:

• one ring—one attempt

• two rings—two attempts

• three rings—three attempts or not collected.

These results are repeated three times.

2.12 If the receiver is lifted before completion of coded ringing, the remainder of the answer will be supplied by coded tone. The receiver must be lifted before the end of the coded ringing, otherwise, disconnect will occur. Interrupted dial tone is returned if the user is off-hook indicating that a new test digit can now be dialed.

Return Test

2.13 The return test is selected by dialing the digit 4. This sequence tests the ability of a coin station to return coins. In this test the user deposits a nickel and waits for confirmation that a nickel is detected. A continuous high tone is received if the coin is detected; a "C" tone if the coin is not detected. After the coin is detected, the user must go on-hook. Up to three attempts are then made to return the coin. Upon completion, coded ringing is returned to the user to indicate the results as follows:

• one ring—coin returned after one attempt

• two rings—coin returned after two attempts

• three rings—three attempts or not returned.

The answer is repeated three times. If testing is to be continued, the user must go off-hook before the coded ringing is completed. Interrupted dial tone is then returned indicating that a new test digit may be dialed.

2.14 The return test may also be used to perform a bias test. This is done by inserting a bias gauge and operating the hopper trip switch before dialing the digit 3. The test sequence provides return signals for the bias test. The bias test determines if the 130-volt collect and return signals can overcome the bias on the coin relay enough that a coin can be collected or returned.

Coin Relay Time Test

2.15 The coin relay time test is selected by dialing the digit 5. This test determines the operating time of the coin relay in the coin station. The sequence first checks to determine if a coin is present. If it is not, "C" tone is sent requesting

a coin. If the coin is not deposited within 60 seconds, disconnect will occur. Once a coin is detected, a return will be attempted and the operating time of the coin relay is measured. The operating time should be 450±25 ms. The results of the measurement are returned as follows:

- one beep—operating time less than 400 ms

- two beeps—operating time between 400 and 425 ms

- steady tone—operating time ideal (425-475 ms)

- three beeps—operating time between 475 and 500 ms

- four beeps—operating time greater than 500 ms.

2.16 The answer is repeated three times. Upon completion of the coded tone, "C" tone is returned requesting a coin to repeat the measurement if the limits are incorrect. If the relay is within limits and additional testing is required, the switchhook must be flashed for one second to receive interrupted dial tone. When the interrupted dial tone is received, a new test digit may now be dialed.

Disconnect

2.17 Disconnect occurs when the user goes on-hook while the interrupted dial tone is present or when a 60-second time-out takes place during certain portions of the test sequences. Disconnect will also occur if the coin fails to return during the resistance tests, or if a 60 Hz power failure prevents completion of the time test.

3. FEATURE FLOW DIAGRAM

3.01 The flow diagram illustrated in Figure 1 is a graphical representation of use of the coin station test line in a No. 2 ESS.

4. INTERACTIONS

4.01 The procedures for dialing up the coin station test line from different types of coin stations may vary slightly. Refer to the appropriate coin station handbook (506 Division BSPs) and CD-1C297 for the correct procedure. No other interactions exist for this feature.

ATTRIBUTES

5. STATION/SYSTEM

5.01 The coin station test line is provided on a system basis. This feature requires that the coin station test line (SD-1C297) and a test line coupler circuit (SD-2H159) be installed. The coupler circuit is needed to protect the network, since the coin station test line circuit always has a voltage applied across the tip and ring. The number of coin station test lines needed must be determined by the operating company. This test line is assigned to a trunk group and is given a service circuit status. The appropriate translation changes to accompany these circuits must also be made (refer to SOFTWARE ENGINEERING).

6. LIMITATIONS

6.01 The coin station test line coupler is assigned to a trunk group and is subject to the same limitations as any trunk group. The common system coin station test line circuit requires a +48 volt supply. Refer to HARDWARE ENGINEERING for power limitations.

7. RESTRICTION CAPABILITY

7.01 The coin station test line coupler circuit may be restricted in the same manner as any trunk or service circuit.

8. COST DATA

Program Store

8.01 The test line coupler circuit appears as a service circuit on the No. 2 ESS network. This requires that the coupler be translated in the same manner as other service circuits. The coin station test line feature requires the following program store translator words:

(a) one word in the master table index to address the trunk and service circuit group translator

(b) four words in the trunk group translator for each service circuit group defined for coin station test line

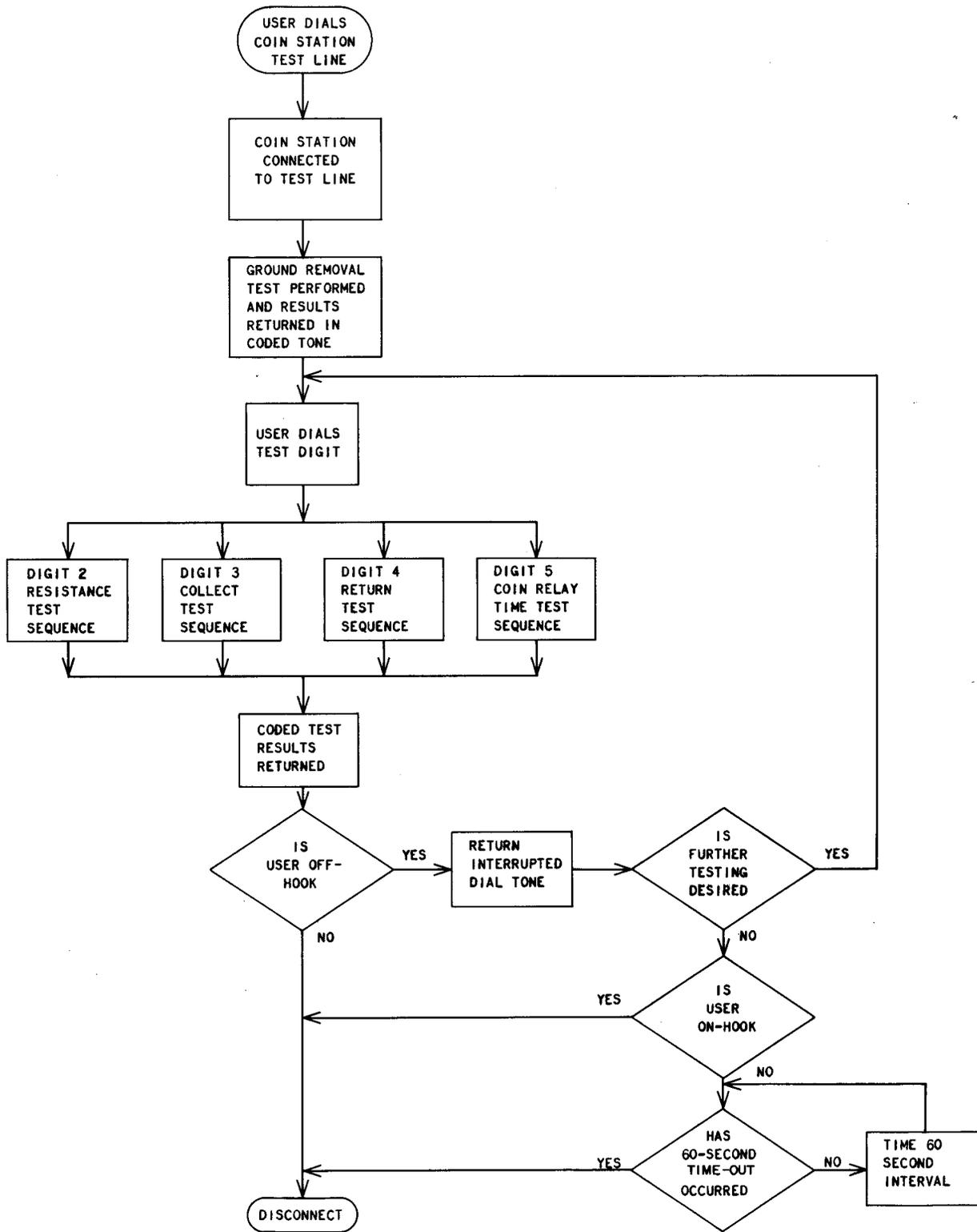(c) ten bits for each test line coupler circuit in the service circuit list

Fig. 1—Feature Flow Diagram—Coin Station Test Line

(d) one circuit state table for each service circuit group assigned for coin station test line use. Each test line coupler circuit requires one word in its respective group state table.

(e) The scan point translator requires four words in the service circuit subtranslator and one word in the auxiliary subtranslator for each test line coupler circuit.

Call Store

8.02 Each service circuit group assigned to coin station test line requires four words in the group status block of call store to indicate the status of circuits in the group.

Hardware

8.03 In addition to the SD-2H159 and SD-1C297 circuits, the following hardware is required for the coin station test line feature.

(a) Each SD-2H159 circuit requires a 2-inch mounting plate in the miscellaneous trunk frame.

(b) The SD-1C297 circuit requires nine mounting plates arranged into two subunits. The first subunit requires six 2-inch mounting plates; the second subunit requires two 2-inch mounting plates and one 4-inch mounting plate. The two subunits are fastened to unit mounting bars to form a 20-inch unit that mounts in the "toll" area of the office.

(c) An additional cost consideration is the J93025B test line calibration set used to calibrate the coin station test line.

8.04 Refer to Section 801-205-154 for details concerning other options that may affect the cost of this feature.

INCORPORATION INTO SYSTEM

9. PLANNING

9.01 Normal schedules for ordering equipment and office data administration changes must be observed. Particular attention should be given to power requirements for coin station test line. Refer to HARDWARE ENGINEERING and Section 801-205-154 for power options.

10. HARDWARE ENGINEERING

10.01 To incorporate this feature into a No. 2 ESS the following two circuits must be installed:

- An SD-2H159-01 Test Line Coupler Circuit (J2H018FP). The trunk order code for this circuit is 76700.

- An SD-1C297-01 Coin Station Test Line Circuit (J93025A).

The coupler circuit mounts in the miscellaneous trunk frame, and the coin station test line circuit mounts in the toll area with other common system circuits.

10.02 The coin station test line requires a +48 volt supply. This power may be supplied by office battery or by optional power equipment. Refer to Section 801-205-154 for power options.

10.03 Figure 2 illustrates the interface of the coin station test line circuit with the No. 2 ESS switching network through the test line coupler circuit.
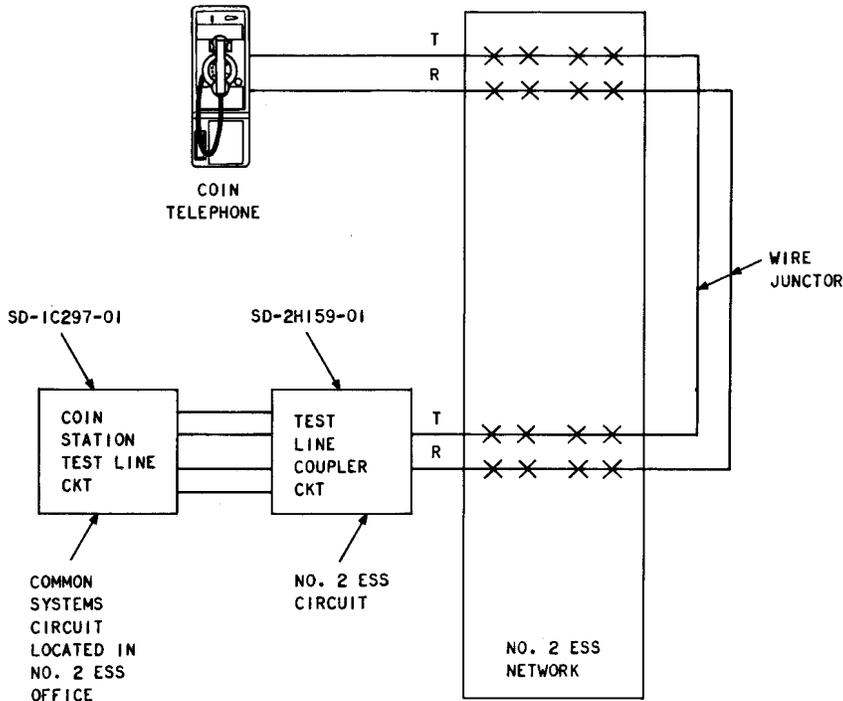
Fig. 2—No. 2 ESS Access to Common Systems Coin Station Test Line

10.04 The test line must be connected to the No. 2 ESS ringing and tone plant (SD-81870-01) on a balance-pair basis. The correspondence between lead designations of the two circuits is shown in Table A.

TABLE A

NO. 2 ESS RINGING AND TONE PLANT TO COIN STATION TEST LINE INTERCONNECTIONS

Common Systems Coin Station Test Line Ckt SD-1C297-01	No. 2 ESS Ringing and Tone Circuit SD-81870-01
Lead Designation	Lead Designation
DT	T(TT) R(TT)
BT	T(HT) R(HT)
SUP R	AC-DC RING G or SUP-RING G
120 IPM	120A 120B
60 IPM	60A 60B

10.05 Refer to Section 801-205-154 for information concerning the appropriate list numbers for various options available.

11. SOFTWARE ENGINEERING

11.01 The coin station test line circuit has no network appearances, thus requiring no translation data. It is connected to the network through the SD-2H159 test line coupler circuit.

11.02 To incorporate the SD-2H159 circuit into the No. 2 ESS, an ODA run is required. The following ESS input forms must be prepared and submitted to the WECo Regional Center.

- *ESS 2100—Directory Number Table*—An entry must be made on this form to indicate the directory number to be dialed to access the coin station test line.

- *ESS 2303—Route Index Expansion*—A route index must be specified for each test line coupler circuit to be equipped.

- *ESS 2201—Trunk Assignment Table*—Specify one peripheral decoder point per test line coupler circuit and associated central pulse distributor point.

- *ESS 2202-2 Trunk Group Table*—Specify a trunk group number for each service circuit group to be assigned to the coin station test line feature. Also specify the highest member number in the group and a trunk order code of 76700.

12. COMPATIBILITY

12.01 The coin station test line can be used to test all existing coin stations; however, some variations may be encountered in the "dialing up" procedures. Refer to the applicable coin station handbook (506 Division BSPs) and CD-1C297 for the correct procedure.

13. OFFICE DATA

13.01 All of the ODA output forms which result from incorporating the coin station test line feature into the No. 2 ESS must be retained as part of the office records.

13.02 After the ODA run to activate this feature is completed, the translation data associated with it becomes a part of the office data base stored in the translation area of program store.

13.03 The translators used by the coin station test line feature are shown in Figure 3. This figure illustrates the translation of the coin station test line directory number when it is dialed from a coin station.

14. GROWTH/RETROFIT PROCEDURES

14.01 To incorporate this feature into an existing system, an ODA run is necessary. After the input forms have been submitted and the update is ready to be incorporated, insert the new information in accordance with Section 232-124-301—*Office Update Procedures Using Regional ODA Program.* If the administrative data link is to be used for the update refer to Section 232-008-301—*Administrative Data Link Procedures.*

15. TESTING

15.01 The SD-1C297 circuit should be tested according to Section 201-833-501 at the intervals specified in Section 201-001-011—*Equipment Test List.*

15.02 No operational test is specified for the SD-2H159 circuit in an operational system. Installation testing should be done according to WECo Handbook 266, Section 216.59.

ADMINISTRATION

16. MEASUREMENTS

16.01 Traffic peg counts, usage, and overflow counts are kept on each service circuit group assigned to coin station test line.

17. RECORD KEEPING

17.01 No special record keeping is required for this feature. The ODA output forms should be retained as part of the office records.

18. CHARGING

18.01 This part is not applicable to the coin station test line feature.

AVAILABILITY

19. NEW INSTALLATIONS

19.01 The coin station test line feature is available for application with Issue 4 of the LO-1 generic program or with the EF-1 generic program.

20. GROWTH/RETROFIT

20.01 The coin station test line may be retrofitted into any office with the EF-1 generic program or Issue 4 of the LO-1 generic program.

SUPPLEMENTARY INFORMATION

21. GLOSSARY

21.01 The following list identifies terms used in this section that may be unfamiliar to the reader.

- *Audible Coded Tone*—Coded tones returned to the user through the handset receiver to indicate the results of a test sequence.

- *Coded Ringing*—Special ringing returned to the coin station to indicate the results of a test sequence.

- *"C" Tone*—Alternating high and low tones with interruptions.

- *Interrupted Dial Tone*—Regular dial tone with interruptions to indicate the system is waiting for a test digit.

- *Office Data Administration (ODA) Run*— Mechanism by which software is changed in the No. 2 ESS. Information from the ODA input forms are inputted into the regional ODA computer; reassembled, then sent back to the No. 2 ESS.

- *Test Line Coupler Circuit*—A cut-through circuit that provides the test line access to the No. 2 ESS switching network.

22. REASONS FOR REISSUE

22.01 This is the initial issue of this section.

23. REFERENCES

23.01 The following documents may be referred to for supplementary information concerning the coin station test line:

- CD and SD-1C297-*Coin Station Test Line*

- CD and SD-2H159-*Test Line Coupler Circuit*

- Section 201-833-501-*Coin Station Test Line Tests*

- 506 Division Coin Station Handbooks

- Section 801-205-154 *Coin Station Test Line and Test Line Calibration Set Equipment Design Requirements*
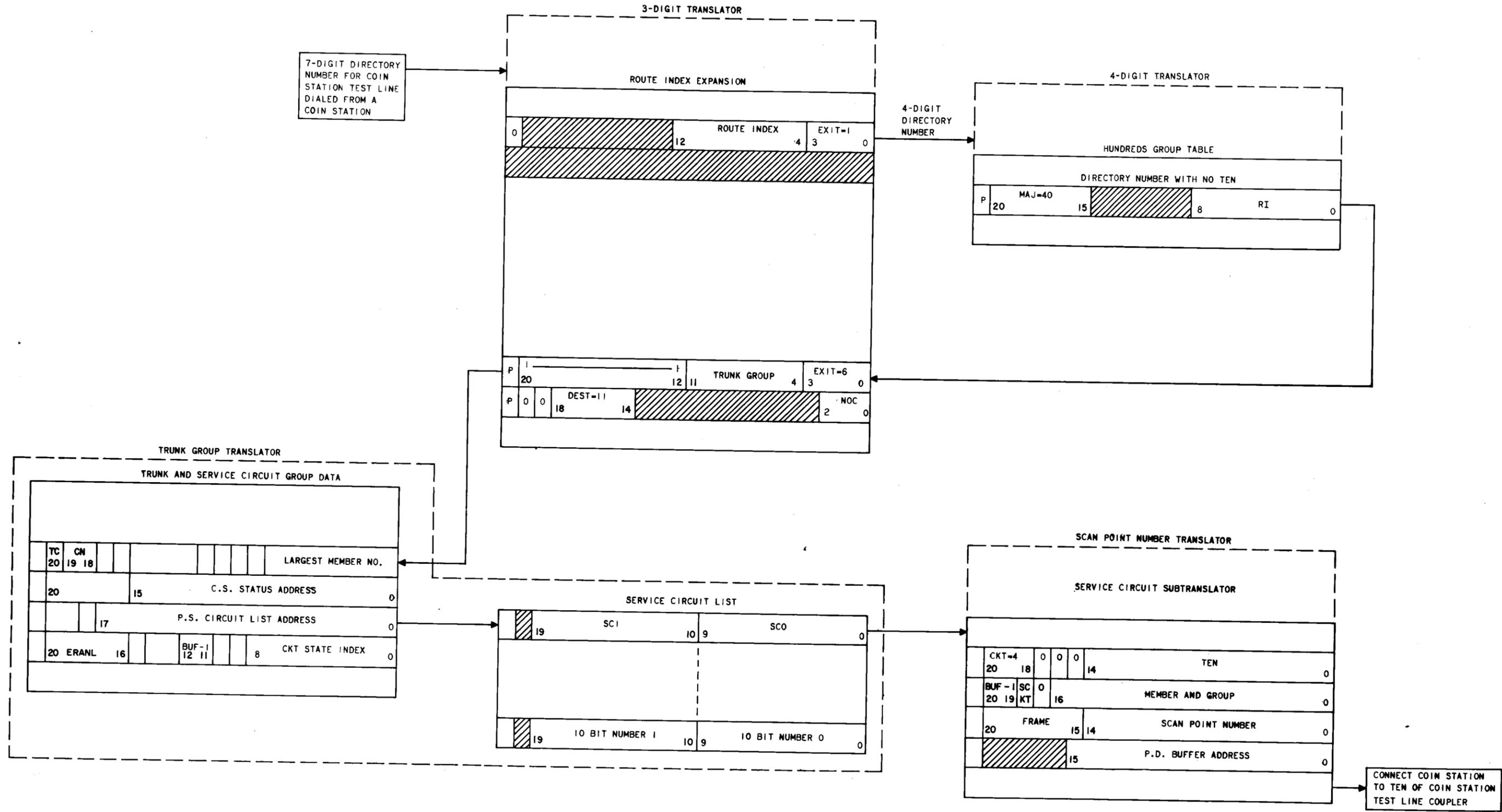
- Translation Guide, TG-2H

Fig. 3—Translation of Coin Station Test Line Directory Number