

TRUNK TRANSMISSION TESTS
STEP-BY-STEP OFFICES
NOT PROVIDED WITH
MANUAL TRUNK TEST FRAME

1. GENERAL

1.01 This appendix covers the implementation of the Directory Charge Recording (DCR) feature into the Traffic Service Position System (TSPS) No. 1.

1.02 (Reserved for future use.)

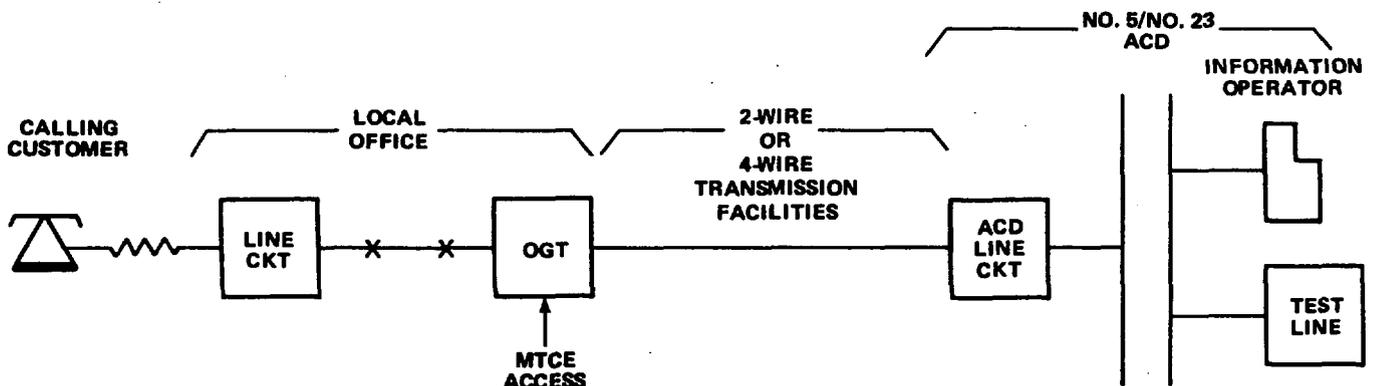
1.03 It is issued to cancel Flash No. 524, dated 10-19-76. All information contained in Flash 524 has been transferred to this appendix.

1.04 The introduction of the new DCR feature into TSPS No. 1 enables Automatic Message Accounting (AMA) records to be made for directory assistance calls originating at local offices not equipped with AMA facilities. The TSPS receives these calls via dedicated DCR trunk circuits interconnected between the local office and a central information bureau. This arrangement eliminates the need to route such traffic through the toll office.

2. MAINTENANCE OF DCR TRUNKS

Present Practice

2.01 The present maintenance plan shown in Fig. 1 (designed for the No. 5 Automatic Call Distributor [ACD]) is essentially manual. A craftsman at the local office or concentrator accesses an outgoing trunk and seizes forward towards the ACD. Simultaneously with the seizure, a TOUCHTONE® signal (digit 16) is applied. A TOUCH-TONE detector at the ACD recognizes the TOUCH-TONE frequency as a special test tone and a connection is made from the ACD line circuit to special transmission testing equipment. When the test complex has been accessed, dial tone is returned to the local office. The craftsman can then perform maintenance tests on the facilities by selecting a particular test termination at the ACD by the application of an additional TOUCH-TONE digit.



ACD Maintenance
Fig. 1

NOTICE
Not for use or disclosure outside the
Bell System except under written agreement

**SECTION 226-588-500PT
APPENDIX 1**

2.02 When dedicated DCR incoming trunk circuits are used in TSPS, two problems are imposed onto the connection:

- The TSPS DCR trunk will be seized instead of the ACD line circuit when maintenance is performed.
- TSPS does not have TOUCH-TONE detectors or generators to receive or forward these special codes.

New Practices

2.03 To circumvent the above problems the maintenance procedures are modified (see Fig. 2). The craftsperson at the local office will access an outgoing trunk and seize forward towards the TSPS DCR trunk. Upon recognition of the DCR trunk seizure, TSPS will attach a multifrequency (MF) receiver or operator to the connection depending upon whether the trunk group is Automatic Number Identification (ANI) or Operator Number Identification (ONI), respectively.

ANI Local Offices

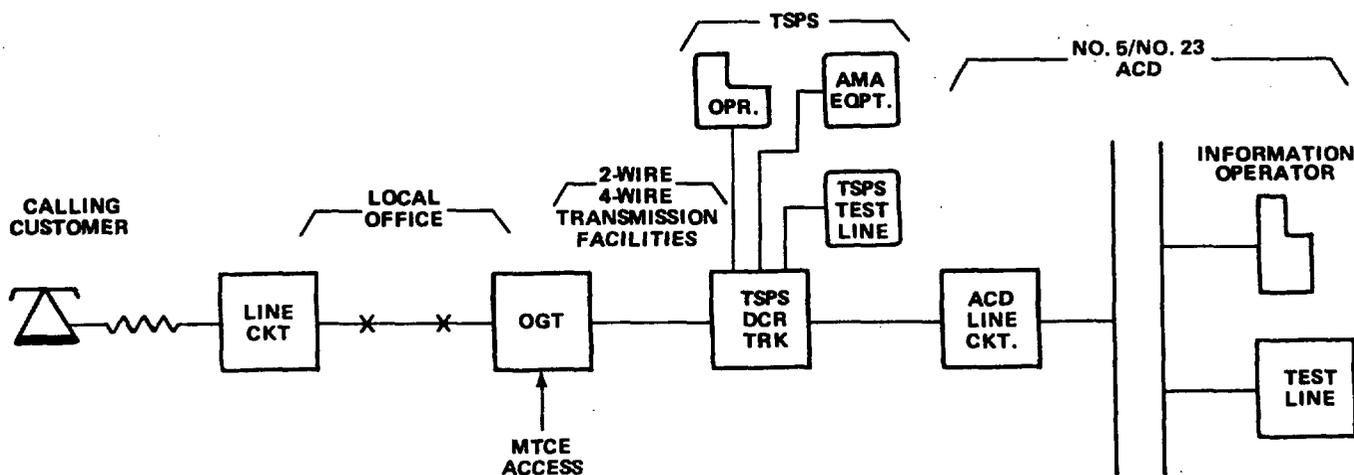
2.04 In the case of ANI, MF pulses followed by a continuous test signal of TOUCH-TONE frequency 16 are forwarded to TSPS. These tests are accomplished through special testing equipment at the local office test frame in conjunction with a portable auxiliary test set (SD-99391-01) used by the local office craftsperson.

Note: If Single Frequency (SF) signaling is involved between the local office and TSPS, the seizure signal is applied approximately 200 ms before the application of TOUCH-TONE to permit the SF units to function properly.

2.05 The TOUCH-TONE signal is applied after the ANI ST (start) pulse. This arrangement involves special timing considerations since the ACD detector may time-out and consequently be removed from the connection as fast as 150 ms after seizure.

Note: The presence of TOUCH-TONE at the time of seizure is necessary because the TOUCH-TONE detector at the ACD is sometimes removed from the connection 150 ms after seizure. For the cases in which the craftsperson controls the application of these signals, the delay is necessary to ensure the presence of TOUCH-TONE at seizure. This also presumes that SF units will not be used between TSPS and the ACD.

2.06 Approximately 140-170 ms are required for TSPS to cut-through the DCR trunk from the start of the ANI ST pulse from the local office. Since the ST pulse is 100 ms long, there is 40-70 ms from the end of the ST pulse to the seizure of the ACD line circuit. Allowing 150 ms from seizure to detector time-out, local offices must have the capability of providing TOUCH-TONE within 190 ms after the ST pulse. For local offices not meeting this constraint the associated ACD line circuits may be equipped with a marker seizure delay feature which



**ACD/DCR Sectionalized Maintenance
Fig. 2**

delays marker seizure 300-360 ms from trunk seizure. This timing requirement may involve modification in present local office maintenance routines. Once the ACD recognizes the maintenance call, dial tone is returned to the craftsperson who can then select special transmission testing equipment at the ACD through the application of other TOUCH-TONE frequencies in the normal manner.

ONI Local Offices, ANI Failures, and Concentrator Connections

2.07 In cases involving ANI failures, ONI local offices, and connections involving a No. 23 concentrator, a TSPS operator is attached to the connection upon seizure from the local office. The craftsperson then advises the TSPS operator that this is a maintenance call and TOUCH-TONE is about to be applied. The TSPS operator can then key in the special test number (959-XXXX, where XXXX is any number except 0010, 0011, 0012, 0013), or the special test codes noted below and inform the craftsperson that the last digit is about to be activated. The craftsperson waits momentarily to ensure that the TSPS operator is released and applies TOUCH-TONE frequency 16. In a later generic when processing the special test number, TSPS will delay 3 seconds before cutting through the DCR trunk to ensure the presence of TOUCH-TONE upon seizure towards the No. 5 Crossbar ACD.

2.08 The portable auxiliary test set (SD-99391-01) is designed to apply TOUCH-TONE frequency 16 automatically after seizure through the control of a special timing circuit. This test set should be modified to give the local office craftsperson the ability to inhibit the automatic application of TOUCH-TONE when necessary.

No. 23 Desk

2.09 For maintenance tests directed towards the No. 23 desk, all tests should be completed on a person-to-person basis. Selection of a particular trunk under test is prearranged by the two craftspersons who then meet on the circuit under test.

Operational Tests

2.10 Operational tests for both the No. 5 Crossbar ACD and No. 23 desk should consist of an attempt, initiated at the local office and

established through the TSPS DCR trunk, to reach a directory assistance operator. If the operator is reached and communication is established, the test should be accepted as successful.

2.11 Verification of answer supervision should be included as part of the operational test. A TSPS craftsperson can access a test trunk through the Communication Display Terminal (CDT), operate the Scan Display key and monitor the supervisory ferrod associated with the information bureau side of the DCR trunk. When the TSPS craftsperson releases CDT control of the test trunk with the Scan Display key operated, the local office craftsperson can seize the DCR trunk and perform the normal operational test with the TSPS craftsperson monitoring the state of the ferrod to verify that answer supervision was received from the information bureau.

Sectionalization

2.12 Future plans for TSPS include a generic change that enables the local office craftsperson to perform sectionalization. In the event of a maintenance test failure it may be required to test specific sections of the Directory Assistance (DA) connection between the local office and ACD information bureau. If sectionalization is required, the local office craftsperson will have the capability of accessing special transmission equipment at TSPS by having the TSPS operator key in a special test code (See 2.13) in place of the calling number. To cause the connection of a TSPS operator, an ANI failure should be forced on the ANI DCR trunk tested. On all test calls from DCR trunks, the operator should key the test code as the back number. If the number is a test code, TSPS will connect the appropriate test equipment. Thus, sectionalization can be accomplished.

Test Codes and Testing Sequences

2.13 When the TSPS implements the changes required to enable the local office craftsperson to sectionalize the connection between the local office and the ACD, one of several test codes may be keyed to select a terminating test line at the TSPS, as shown in Table A.

TABLE A
TSPS TEST CODES — SECTIONALIZED FACILITIES

TEST CODE	ACTION
959-122X	<p>First, a minimum of 300 ms of quiet off-hook supervisory signal is returned to stabilize an off-hook state in the single frequency signaling unit in the incoming trunk. TSPS will then connect the trunk to a milliwatt test terminal (MWTT). The output of the test terminal will alternate between the following conditions:</p> <ul style="list-style-type: none"> (a) 1000 Hz (± 10 Hz) of test tone (1 mw) for 10 sec. (± 1 sec.). (b) 1 sec. (± 0.25 sec.) of quiet termination. <p>The above conditions will be repeated until the trunk goes on-hook.</p>
959-120X	<p>After returning a minimum of 300 ms of quiet off-hook supervisory signal, TSPS will connect the trunk to a balance test terminal. This terminal provides a single cycle (5 to 6 sec.) of 1000 Hz (± 10 Hz) test tone (1 mw), followed by continuous quiet termination until the toll connecting trunk goes on-hook.</p>
959-121X	<p>TSPS will connect the test-originating trunk to the master test line associated with the TSPS unit. Two-man tests can then be made through the facilities at the CDT or Test and Display Circuit at a Remote Trunk Arrangement. These tests will verify noise, loss measurements and the ability of the trunk circuit to carry speech.</p>

Note: If the TSPS test-line is *traffic* busy, a re-order signal will be returned to the local office for 10 to 20 seconds, then placed on high and dry status. If the test-line is *maintenance* busy, the local office will receive a recorded announcement.

2.14 A delay of 3 seconds is planned to be imposed after operator position release, before the trunk is cut through to the serving equipment. This feature will be included in a later generic.

Test Circuit Release

2.15 If a test connection to TSPS is held for 30 to 40 minutes, the connection will be released. A message will be sent to the Master Control Center Teletype (MCC TTY) indicating the test circuit holding time has been exceeded. The message will include the trunk group number (TGN) and member number (MEMN) involved.

Through Testing

2.16 On through testing to the ACD office, a TOUCH-TONE digit 16 must be transmitted from the local office within 150 ms after the trunk is cut through to the ACD equipment. If a TOUCH-TONE digit 16 is not received at the ACD within that time, the call will not be connected to the ACD trunk test arrangement. On ANI calls where no operator intervention occurs, the delays in TSPS should be sufficient for the originating office craftsman to send a TOUCH-TONE digit 16. However, on test calls where the operator is connected, a 3-second delay is planned to be inserted after position release. Thus, on through tests to the ACD on DCR trunks, a 3-second delay occurs via general purpose timing between position release by the operator and cut-through to the serving equipment.