TERMINATING SENDER TEST FRAME TEST

CONTENTS

1. GENERAL INFORMATION

1.1 This section describes a method of verifying features of the Terminating Sender Test Frame, SD-25159-01, for trouble conditions not readily detected in the normal use of the frame.

1.2 The major operating features of the test frame are tested in conjunction with these tests of the various Terminating and "B" switchboard type senders as described in Sections 222, 223, 227, 228, and 229 of this Handbook.

2. RECORDS AND REQUIREMENTS

2.1 Forms SD-4-1313 and SD-4-1315 are required for recording the results of the tests of this section.

3. TEST EQUIPMENT

3.1 Test Sets

Amt	ITE	Description
1	1883	Wheatstone Bridge
*1	4029	Pulse Checking Set
*1	4089	Transmission Measuring Set

* Not required if equivalent Telephone Company equipment is available.

3.2 Cords

Amt	ITE	Lgth	Cdrs	One End	Other End	With ITE
2	9601	12'	3	310 Plug	310 Plug	4023
1	9627	12'	3	310 Plug	508A Key	4023

3.3 Accessories

Amt	Code	Description	With ITE
1	R-9572	Test Receiver	4023
As Req'd.	322A	Make Busy Plug	4023
"	349A	Make Busy Plug	4023
1	ITE-4208	Hand Telephone Set	4023
1	R-3314	Stop Watch	4023

4. RESISTANCE MEASUREMENTS

NOTE: Resistance measurements should be made with fuses removed.

4.1 Using the Wheatstone Bridge as described in Handbook 100, TMO 1883 or Handbook 61, Section 0.2, verify the resistance paths shown in Section 221.1, Figures 1 thru 3.

5. FUSE VERIFICATION

5.1 Test Procedure - General

CAUTION: To eliminate a fire hazard, verify that direct ground is not present on the alarm bar or stud on a fuse panel before installing its feeder fuse.

NOTE: Use ITE-4442 Volt-ohmmeter. To avoid damaging the meter, first verify that battery is not present on the alarm bar by using the voltmeter portion of ITE-4442. If clear, switch to the ohmmeter portion for the resistance reading which should be either infinity or approximately 600 ohms.

5.11 Fuse verification is, ordinarily, only required on fuse panels wired by the installer.

5.12 On shop wired and fused fuse panels, inspect the panel for missing or operated fuses. If a fuse is missing or operated, test the fuse terminal for the absence of low resistance ground. Clear any grounded condition and install the proper fuse. At the completion of this test all fuse panels should be fully equipped with proper fuses. These may be either the proper specified type or a dummy.

5.13 The operation of relays in circuits when fuses or potentials are applied is normal in some circuits. Oscillation, chatter, and signs of overheating should be analyzed and cleared immediately.

5.14 ITE-4442 Volt-ohmmeter should be used to verify all potentials at fused terminals to insure that polarity and voltages are correct. Many errors are caused by the use of the R-9572 Test Receiver on potentials other than -48 Volts. Handbook 100, TMO 4442, provides full instructions for the use of the volt-ohmmeter.

5.15 When the R-9572 Test Receiver is used, avoid placing it directly on the ear.

6. CONTACT PROTECTION

6.1 Contact protection network tests shall be made only on job wired equipment in accordance with the method prescribed in Handbook 61, Section 0.2.

7 KEY AND LAMP DESCRIPTION

7.1 Test Circuit Keys

7.11 Test Circuit keys are associated with test circuit functions as follows:

KEY	PURPOSE
ACO	Alarm Cutoff: To prevent or silence the audible alarm.
APB	Automatic Pass Busy: To automatically pass by senders if they remain busy for 29 seconds minimum to 59 seconds maximum.
AV	Advance: To manually advance the test circuit on a step-by-step basis when the SS key is operated, or to advance the test frame to the next sender during timeout tests.
BAL	Balance: To provide a maximum loop test condition for senders equipped for balanced revertive pulse circuits.
BS	"B" Sender: To test only "B" Senders
CA	Control Advance: To manually advance the test circuit to the next sender or to restart a repeat test of the same sender, depending upon the position of the REP key.
CBT	Connects the T, R, FT, and FR leads between the terminating part and the switchboard part of the Central B Sender together under control of the test circuit.
CL (0-9)	Class: To provide for setting up various classes of test. CL0 - Regular Call All SDRS CL1 - Special Call All SDRS CL2 - Telltale Test FS and B SDRS CL3 - Trouble Release (LINK) All SDRS CL4 - Trouble Release (MKR) All SDRS CL5 - Trunk Disconnect (D LEAD) B, DP and FS SDRS CL5 - " " (T & R LEADS) MF SDR CL6 - Time Out CL7 - L Relay Non-Operate and Time Out (All SDR's) CL8 - Reorder B & MF SDRS CL9 - Trunk Disconnect (D LEAD) MF SDRS

KEY	PURPOSE
DD	Grounds lead NS1 to the FS Sender to test dedicated DID trunk group indications.
DPR	Double Pulse Registered: This key causes pulses with a minimum open period to be transmitted for all digits.
DPS	Dial Pulse Senders: To test only DP senders.
DSD	Disconnect Before Dialing: To prepare the test circuit when making a test of the senders ability to restore to normal in case the call is abandoned before registration is completed.
DSR	Dial Pulse Sender Release: To simulate the release of a trunk before all digits have been dialed.
DT	Dial Tone: To apply dial tone to the trunk as a start pulse signal when the senders are arranged for this feature.
EG (1-4)	End of Group: To stop the test circuit after it has tested the last sender in a group for which the test circuit was prepared.
F (0-9)	Frame: To transmit the units digit of the incoming frame indication to the sender.
FA-	Frame Auxiliary: To transmit the tens digit of the incoming frame indication to the sender.
FKP	False Keypulse: To cause two KP signals to be transmitted to test that the sender will block in case a false preliminary KP signal is received.
FTO	Fast Timeout: Tests the ability of the sender to release before calling in a marker when a trunk has been abandoned after all digits have been dialed but no ground is available to lock the trunk D relay.
G (0-1)	Group: To select the associated sender connector switch, when the test frame has access to more than 10 sender subgroups.
H (0-9)	Hundreds: To set up the hundreds registration.
IDT	Interdigital Time: To check that the interdigital timeout interval of the FS Sender is not too short.
IDT1	Interdigital Time: To check that the interdigital timeout interval of the FS Sender is not too long.
IG5	Incoming Group Selection: Causes five additional pulses to be transmitted for incoming group selection.
IL	Increase Limiter: To cause an increase in the power from the volume limiter of the MF receiver circuit, making the receiver more sensitive to transients
L	Loop Resistance: Normal = Minimum Fundamental Loop. Operated = Maximum Fundamental Loop.
LL	Low Loss: To remove a high loss pad (HL) from the MF pulsing circuit to provide a high input to the receiver.
LLR	Cuts resistance into the FT and FR leads between the terminating and switch - board parts of the "B" sender to test the selection relays on the working limits of the circuit.

KEY	PURPOSE
LOA LOB LOC	Local Office Indication: To set up the desired office unit information.
LRB	For checking long reverse battery period.
LST	Long selections interval.
LT	Light Traffic: To check, during periods of light traffic, the TT (regular test) leads of the terminating sender link sender subgroup circuit. Also to check for a premature advance of the P (preference) leads of that circuit. With this key normal, only the RT (reserve test) leads are checked.
LTK	Loop Resistance, Trunk: With key operated, to test with maximum trunk loop resistance; with key normal, to test with minimum trunk loop resistance.
MFS	Multifrequency Sender: To test only MF senders.
MGB	Make Group Busy: To make busy the sender subgroup to which the test frame is connected, thereby giving preference to the test frame for this subgroup of senders.
NS (0-9)	Number Series: To check the number series leads grounded to the marker on a DID call.
OAB	Office A or B: To check that the sender gives the proper office unit indication to the marker when an office unit B indication has been transmitted to the sender.
OA-OB	This key when operated to the OB position causes ground to be connected to the T & R leads to "B" senders, in OA position battery is connected to T & R.
OI (0-9)	Office Indication: Where the senders are equipped with office indication register, the OI keys are used to transmit an office indication digit in advance of the thousands digit. When this key is used, LOC key must be operated.
PBS	Pass B Senders.
PCR	Particular Circuit Run: To cause the test circuit sender connector switch to advance automatically as long as this key is operated.
PCS	Particular Circuit Step: To cause the test circuit sender connector switch to advance one step for each operation of this key.
PD	Position Disconnect: To eliminate the test of the position disconnect feature.
PG (1-4)	Pass Group: Operate the proper key (1-4) when provided, to pass by the associated subgroup of senders when it contains senders having different operating conditions than those for which the test frame is set up.
PP	Position Selection: Permits the position selector switch to be advanced by means of the dial.
PR	Position Release: To release the position and test circuit at end of position test.
PT	Position Test: Arranges the test circuit for testing position circuits.

KEY	PURPOSE
PTS	Pass Terminating Senders: To cause all full selector senders to be passed without testing.
RBT	Reverse Battery Test: Tests that the reverse battery from the FS sender is not falsely delayed.
REP	Repeat: To test the same sender repeatedly. Also to extend the control-advance feature to the C (remote control) jacks at the sender frames.
REP2	Repeat 2: To cause two successive tests to be made of the same sender, thereby checking the ability of the sender to restore to normal.
RN	Return to Normal: To restore the test circuit to normal.
RO	Reorder: To check the signal on the RO lead from the sender to the marker.
SF	Single Frequency: To cause a single frequency to be transmitted following the "KP" signal to test that the MF receiver and sender will not register on a single frequency.
SKP	Slow Keypulse: To generate slow pulses (Approximately .250 sec make and .250 sec break.) This test checks the locking circuit of the sender TO relay.
SP	Start Pulse: To cause the sender to transmit a reverse battery start-pulse signal.
SS	Step-By-Step: To transmit the pulses for each digit on a step-by-step basis under control of the AV key. (See RC jack.)
SST	Secondary Start: To permit dialing at 10 pps, with either minimum or maximum trunk loop resistance, using a handset connected to B jack of sender test frame.
ST	Start: To start the test circuit.
STP-OPR	To test the sender L and STP relays for operate. (Unbalanced revertive pulse circuits only.)
T (0-9)	Tens: To set up the tens registration.
TA	Time Alarm: To prevent or silence the test circuit alarms.
TF	Third Frequency: To check that the receiver will not respond to three frequencies as an initial "KP" signal.
TFD	Third Frequency Digit: To check that the receiver will block on three frequencies transmitted for a digit. This key adds one frequency to the two normally transmitted in the hundreds digit.
TFT	Test FT Relay Release: To check for immediate release of sender on the trunk disconnect test.
TH	Thousands: To set up the thousands registration.
TO	Disconnects the T and R leads from the tone coil and connects them to the TEL SET at the test frame.
TOS	Permits the tester to talk through the terminating part of the sender to the position at the switchboard part, simulating service conditions.

KEY	PURPOSE
TP	Before a position is tested the sender to be used for this test is routined. Operation of key TP stops the routine test at the end of the test in progress and causes the position test to start.
TS	To test terminating senders only.
TT	To make tone tests (Order Tone "B" senders")
TTSC	To test for short circuits on front contacts of the IB register.
TWT	Twist Test: To check that the receiver will operate satisfactorily when frequency twist is present. This key reduces the power of the 1500-hertz frequency 6.25 db below that of the 700-hertz frequency.
U (0-9)	Units: To set up the units registration.
V10	Connects 700 cycles to VI jack.
V17	Connects 1500 cycles to VI jack.

7.2 Test Circuit Lamps

7.21 The test circuit lamps are provided to indicate the progress of a test call and, should the test circuit block, identify the sender circuit involved and the reason for its circuit failure. The significance of these lamps as follows:

LAMP	PURPOSE
0-9	Numerical: To indicate what number was transmitted to the marker for the particular digit being checked by the register check circuit at that time.
BY	Busy: Indicates that the sender, to which the test circuit is connected, is busy.
CH	Chain: Indicates the operation of the S-relay failed to remove ground from the TCH lead.
CH1	Chain-1: Indicates that the operation of S- relay failed to remove battery from the TCH1 lead.
CO	CO Lead: Indicates that the test circuit is awaiting ground on the S and CO leads from the sender.
CT	Check Transfer: Lights while waiting for the sender to reverse the battery on the T and R leads.
D	D Lead: Indicates that the test circuit is waiting for the sender to (1) remove battery from the CO lead (2) connect battery to the T and R leads or (3) connect ground to the D lead.
DG	D Lead Ground: Indicates that the D lead was grounded prematurely or, that the sender failed to remove ground from the D lead.
EC	End of Cycle: Indicates that the last sender, to which the test frame has access, has been tested satisfactorily.
EF	Even Frame: Indicates the EF relay has failed to operate on a call using an even numbered frame indication.

KEY	PURPOSE
EG(1-4)	End of Group: Indicates, when provided, that the last sender of a sender subgroup associated with the operated EG-key, has been tested satisfactorily.
G(0-1)	Group: Indicates the particular sender test connector switch in use when more than one sender test connector switch is provided.
GB	Group Busy: Indicates the group busy test is being made.
IDT	Interdigital Timing: Indicates that interdigital timing test of FS sender is in progress.
IB IG FB FT FU OB1 OG	Office Selection Check: Indicates which selection is next to be registered in the sender.
KP OF OI TH H T U ST	Keypulse Progress: Indicates which digit the test circuit is ready to send.
LSP	Long Start Pulse: Indicates start pulse is too long.
MGB	Make Group Busy: Indicates the sender subgroup is being held busy by the test circuit. If the lamp remains lighted for an interval longer than 5 to 12 seconds, the major alarm will sound.
NS	Number Series: Number series check is being made on a DID call. This check is made of the grounded NS leads to the marker agai st the operated NS key.
OA	Indicates battery is connected to the T and R leads from the "B" position.
OB	Indicates ground is connected to the T and R leads from the "B" position.
PB	Indicates busy test of position is in progress.
PD1	Lighted while waiting for the position disconnect signal over the K1 lead.
PD2	Lighted while waiting for the position disconnect signal over the T and R leads.
RB	Lighted while waiting for reverse battery from sender.
RC	Registration Completion: Indicates that the test circuit is waiting for the sender to recognize that registration is completed.

LAMP	PURPOSE
TH H T U F FIO RO OAB	Register Check Progress: Indicate which digit is being checked with the setting of the associated keys.
RL	RL Lead: Indicates that the test circuit is waiting for the sender to connect ground to the RL lead.
RR	Lighted while waiting for reset signal to be send to sender.
S	S Lead: Indicates that the test circuit is waiting for the sender to connect ground to the S lead.
SEL	Selection: Indicates that the test circuit is waiting for the S-relay to operate and connect ground to the S-lead.
SPF	Sender Preference: Indicates that the test circuit is waiting for the operation of the SB- relay to advance the P lead to the next sender in the subgroup chain.
SSP	Short Start Pulse: Indicates start pulse is too short.
TA	Time Alarm: Indicates that the test was not completed within the allowable interval.
TC	Trunk Closure: Indicates that the test circuit is waiting for the sender to be connected to a marker.
TENS (0-9)	Tens: With units lamp, indicates location of sender being tested.
TR	Lighted while waiting closure of FT and FR leads to the pulsing circuits.
TRL	Trouble Release: Indicates whether or not a second marker is seized on trouble release tests.
UNITS (0-9)	Units: With tens lamp, indicates location of senders being tested.
X	Indicates premature advance of preference lead or crossed SC relay contacts.

8. MISCELLANEOUS CIRCUIT TESTS (SD-25176-01)

8.1 Fuse Alarm

8.11 Using a test receiver short the fuse alarm bar with the feeder bus bar. Lamp FA lights and the floor alarm functions. Check that the alarm will function with lamp FA removed.

8.2 Frame Line

8.21 This circuit is tested in accordance with Section 309 of Handbook 63.

8.3 Frame Test Battery and A Jack

8.31 Check the 48V test battery terminals and tip of the A jack for presence of -48 volts.

8.32 Check the G test terminals for direct ground.

8.33 Check the HRG test terminals for high resistance ground.

8.34 Check for direct ground on the A jack sleeve.

8.4 Spare B Jack

8.41 Make a continuity test of the B jack to the sender test connector frame.

8.5 Frame Line D Jack

8.51 Make a continuity test of the tip and ring leads of the D jack to all associated D jack appearances and to the HMDF.

9. MULTIFREQUENCY CURRENT SUPPLY

NOTE: See Handbook 50, Section 30 for information on MF Current Supply and Distribution Circuit.

9.1 Signal Frequency Measurement

9.11 At the MFCS Frame, using a transmission measuring set, measure the multifrequency current supply at the distributing resistors assigned to the Terminating Sender Test Frame. Record this level.

9.12 At the Test Frame, install a 12.75 db pad into pad socket HL. Operate keys PCS and PCR until the sender selected for test is indicated on the sender selection lamps.

9.13 Operate keys TA, LL and VIO. Momentarily operate and release key ST.

9.14 Patch the transmission measuring set into jack IN of the associated MF Receiver. Change pad IN in the test frame until the meter reads 12 db less than the reading at the distributing resistors.

9.15 Disconnect transmission measuring set and restore all keys to normal.

9.2 Twist Test Shunt Adjustment

9.21 Verify that resistors EJ-EO, SD-25159-0116, Figure 7, are not strapped..

9.22 Make adjustments in accordance with Note 108 or 113 on SD-25159-0117. Transmission Measuring Set, ITE-4089 may be used if the 753B Volume Indicator is not available.

10. KP2, KP3, AND KP4 RELAY PULSING

NOTE: Handbook 50, Section 5 describes the use of the ITE-4029, Pulse Checking Test Set, for checking condenser timed relay interrupters.

10.1 With the ITE-4029 or equivalent located at the Terminating Sender Test Frame, patch test set jack A to frame jack A using cord ITE-9601.

10.2 Using an ITE-9601 cord, patch the test set jack P to the test jack associated with the KP-relay under test.

10.3 Verify that the pulses per second and per cent break readings are within the limits specified in the circuit requirements on SD-25159-117, Pages 8 and 9 or -119 Page 5.

10.4 Repeat tests of Paragraph 10.2 and 10.3 to other KP-relays.

11. REGISTER TESTS

NOTE: The register tests may be made during the routine and supplementary tests of the senders. (See Paragraph 1.2)

11.1 Verify that register CT scores once for each circuit tested (Key REP normal, key REP-2 operated or normal).

11.2 Verify that register RST scores once for each repeat single test made (Key REP operated).

11.3 Verify that register PB scores once for each busy sender passed without testing (Keys REP and REP-2 normal and key APB operated).

12 MISCELLANEOUS FEATURE TESTS

12.01 TT-SC Key Check

12.011 Short the No. 3 contact and 1T of IB register (crossbar registration switch) of the first FS sender.

12.012 Originate a tell-tale class of test call (class key No. 2) with key TT-SC operated. The test frame blocks with lamps IB and D lighted. Restore all equipment to normal.

12.02 Sender Subgroup Busy Test

12.021 Make the first sender subgroup busy and set up the test frame for an automatic test with key APB normal. Operate key ST. The BY and GB lamps light and the test blocks.

12.022 Release the sender subgroup. The test frame advances with the test. Restore the test frame and repeat the test on each sender subgroup.

12.03 Group Make Busy

12.031 Make one sender busy at the TTI frame and direct the test circuit to this sender. Originate a test call and note that the BY lamp lights.

12.032 Momentarily operate the MGB key and observe that the major alarm is brought in after 5 to 12 seconds and lamps MGB and GB light.

12.033 Operate the TA key to silence the alarm. Observe that the TMB or BMB relay (both or only one depending on type of test FS or B) associated with the group held busy on all sender link frames on which the subgroup appears is operated.

12.034 Restore the ST key and observe that relay MGB does not release. Restore the equipment to normal and repeat this test from each sender group.

12.035 From one sender group, set up the test as above but remove the busy condition from the sender before 5 seconds have elapsed and observe that the sender is seized for test.

12.04 Pass Busy and Time Alarm

12.041 At the Terminating Trouble Indicator (TTI) make busy a terminating sender.

12.042 Set the test frame to select the make busy sender. Operate keys APB and ST. Lamp BY is lighted. After 29 to 59 seconds the test circuit advances to the next sender.

12.043 Restore keys APB and ST and momentarily operate key RN. The test circuit restores to normal.

12.044 Operate key ST. Lamp BY is lighted. After 60 to 90 seconds lamp TA is lighted and the minor alarm sounds.

12.045 Operate key ACO. The minor alarm is silenced.

12.046 Operate key TA and restore key ACO. Lamp TA is extinguished.

12.047 At the TTI, release the sender made busy for test. The test circuit proceeds to test the sender and blocks on completion of test.

12.048 Restore key TA. The test circuit advances to the next sender.

12.049 Restore key ST. Momentarily operate key RN. The test circuit restores to normal.

12.05 Particular Circuit Feature:

12.051 In order to select a particular sender circuit for test, operate the corresponding G key (when provided). The particular crosspoint associated with the sender is selected by means of the PCR and PCS keys. Key PCR operated causes the crossbar switch to advance automatically until the desired crosspoint is approached. The PCR key is then released and the PCS key is operated and released until the desired crosspoint is reached. The advance of the switch is indicated by the locating lamps. The numerical keys are operated as on a regular test. Operate the REP key and then the ST key. Complete one test and then restore the equipment to normal by operating key RN.

12.052 Operate and hold key PCR until the test frame has advanced past all senders.

12.053 Operate and release key PCS to advance the test frame past all senders. Observe that when spare terminals are reached they are automatically passed up.

12.06 Control Advance Feature

12.061 Set up the test frame for an automatic test. Make the second sender busy.

12.062 Operate key ST. When second sender is seized, operate key CA. Test frame relays CA and CA1 operate.

12.063 Restore key CA. Test frame advances to the third sender.

12.064 While the test call is in progress on third sender, operate key REP.

12.065 Operate and release key CA. The test circuit restores and a new test call is started on the same sender.

12.066 Restore key ST. Momentarily operate key RN. The test circuit restores to normal.

12.07 Remote Control Feature

12.071 Set up the test frame for an automatic test. Operate keys REP and ST. The test circuit proceeds to test the sender.

12.072 At the sender frame, insert the plug of the ITE-9627, Remote Control Cord, into the remote control jack and momentarily depress the red button. The test in progress is abandoned and another test of the sender is started.

12.073 Repeat test of Paragraph 12.072 at all sender frame remote control jacks.

12.074 Momentary insertion of a 349A make busy plug into the remote control jack performs the same function as the momentary depression of the red button on ITE-9627.

12.08 End of Group Test - Fig. AM With ZM Option

12.081 Originate a call to the last sender in the group. Operate the EG- key and note that the Test Frame completes the call and then stops with the EG lamp lighted.

12.09 Pass Sender Groups - Fig. AM With AN Option

NOTE: This test made only when there is an intermediate group of senders having different operating conditions from its preceding or succeeding group and it is desirable to test all senders of one operating condition before giving an end of cycle indication.

12.091 Originate a call to the last sender in the preceding group. Operate the PG- key and note that the call is completed, that the test frame passes up the intermediate group and proceeds to make a test on the succeeding group of senders.

12.10 Step-By-Step Registration

12.101 Operate key SS and originate a test call to a FS Term. Sender. Operate and release key AV to record each selection.

12.102 Repeat the test using the remote control cord to advance the test circuit. Momentary depression of the white button on ITE-9627 performs the same function as key AV.

12.103 Originate a call to a "B" Swbd. Term. Sender and repeat the test in Paragraphs 12.101 and 12.102.

12.11 Dialing from Sender Frame - DP Senders

12.111 At the test frame, operate keys CL-0, SST, REP, DS, and F-. Operate an office indication key and numerical keys 9999. Verify that key ST is normal.

12.112 At the sender frame, insert the plug of an ITE-4208, Hand Telephone Set into jack MN-D. Verify the receipt of low or high dial tone.

12.113 Dial the office code and numerical digits in accordance with the operated office and numerical keys on the test frame. Observe that the test call is completed.

12.114 Move the plug of ITE-4208 from jack MN-D to jack MX-D and repeat test of preceding paragraphs.

12.115 Repeat test from each multiple appearance of jacks MN-D and MX-D. Restore the test circuit to normal.

12.12 Interdigital Time-Out Figure AZ

12.121 Operate keys FS, REP, IDT, CLO, FO, and numerical keys 0000.

12.122 Operate key ST. With the stop watch verify that lamp IDT is lighted for 2 to 2 1/2 seconds minimum. Lamp FB is lighted and the test frame completes this selection and advances for other selections. The test should complete and the test circuit will recycle to retest the same sender.

12.123 Restore key ST. Momentarily operate key RN. The test circuit restores to normal.

12.124 Restore key IDT and operate key IDT1.

12.125 Operate key ST. The call proceeds as far as "TH" registration. After approximately 7 seconds, lamp IDT is lighted and the test completes.

12.126 Restore all keys to normal. Momentarily operate key RN. The test circuit restores to normal.

No changes indicated due to extensive revision.

Manager, Crossbar Product Engineering
Control Center

Reason for Reissue:
1) Add information required for No. 1 Crossbar Direct for Dialing.
2) Make a general revision to update to current engineering standards.