

**“SLC*-96 SUBSCRIBER LOOP CARRIER SYSTEM
PAIR GAIN TEST CONTROLLER
DESCRIPTION AND INSTALLATION**

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1. GENERAL

1.01 This section contains the general description and the installation procedures for the pair gain test controller (PGTC).

1.02 This section is reissued to include the use of the SM87B, SM88B, SM91B, SM92B, and the SM94B series of plug-in circuit packs. The B series of circuit packs *must* be used if the testing is to be performed using the mechanized loop testing (MLT) system.

1.03 The PGTC provides the means to connect test trunks from the repair service bureau (RSB) to the subscriber channel unit in the central office SLC-96 channel bank and also to the subscriber line beyond the SLC-96 remote terminal (RT).

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1.04 Section 662-505-507 provides information on testing procedures from the local test desk (LTD) or test cabinet served by test trunks connected to a PGTC. The PGTC may also serve test trunks serving an automated testing system (mechanized loop testing).

2. DESCRIPTION

A. Control Shelf and Expansion Shelf

2.01 The equipment arrangement for the PGTC consists of one J1C142A(-), L1 Control Shelf (Fig. 1), which is always required, plus up to four J1C142A(-), L2 Expansion Shelves (Fig. 2), depending on the number of test trunks to be served. The two types of shelves are similar in that they are intended to be miscellaneous mounted in 23-inch wide framework. Each shelf is 8 inches high (four, 2-inch mounting plates). If expansion shelves are required, they should be mounted in the same framework as the control shelf.

2.02 All intrashelf wiring is done via printed wiring board (PWB) backplanes. Wire wrap and screw terminals are provided for terminating installation wiring. Cabling, wiring, and connections required during the installation are:

- Test control circuits from the PGTC to the first SLC-96 system. The test control circuits are electrically connected between the PGTC and the SLC-96 system through a 16-pair cable which is connectorized at the end that connects to the SLC-96 system.
- Test trunks to a distributing frame (DF).
- Power and ringing voltage leads to a miscellaneous fuse panel.
- Intershelf wiring if multiple shelves are used.
- Connections required to tie the PGTC into the central office alarm system.

2.03 The *control shelf* requires -48 Vdc (signal grade) at 2.5 amperes (maximum) and *uninterrupted* ringing voltages at 0.5 amperes (maximum). The ringing voltages supplied to the control shelf must correspond to the ringing voltages applied to the SLC-96 system (ac-dc, negative superimposed, positive superimposed, or ac-only).

Each *expansion shelf* requires only -48 Vdc (signal grade) at 1.2 amperes (maximum).

2.04 The J1C142A(-), L1 control shelf may be equipped with coded circuit packs to accommodate all the common control functions, and up to 12 test trunks. Each J1C142A(-), L2 Expansion Shelf (maximum of four) can be equipped to accommodate up to 20 additional test trunks. Table A provides a list of the circuit packs associated with the control shelf and the shelf position where these circuit packs are to be installed. Table B provides a list of circuit packs associated with the expansion shelf and the shelf position where these circuit packs are to be installed.

Optional trunk unit circuit packs may be used in the control shelf. Part 2C provides additional information on the three types of trunk unit circuit packs.

B. Capabilities and Limitations

2.05 The PGTC will interface between the test trunks serving a repair service bureau (RSB) or a local test desk (LTD) equipped for manual or automated testing. The PGTC is compatible with all testing features of the local test desk, test cabinet, and automated testing arrangements. Most LTDs and test cabinets are equipped with all testing keys required for testing through the PGTC. Locations which do not have a functional +STA key on the LTDs or test cabinets must have the +STA key and associated circuitry installed for testing through the PGTC.

2.06 The PGTC is compatible with direct dc test trunks and test trunks derived from remote testing systems. When a RSB serves subscribers being served by a SLC-96 pair gain system, all test trunks should be connected to the PGTC.

2.07 When the PGTC interfaces with a SLC-96 system, it provides test capabilities for the subscriber lines as follows:

- Permits standard telephone number access via central office incoming test trunk circuits.
- Accommodates standard test procedures for testing through the central office switching system up to the channel unit of the SLC-96 system.

TABLE A
CIRCUIT PACKS USED WITH
J1C142A- (), L1 CONTROL SHELF

SHELF POSITION	EQUIPPED WITH CIRCUIT PACK
01	SM86 Control Shelf Power Unit
02	SM87/87B Tester Unit
03	Vacant or SM87/87B Tester Unit
04	Vacant or SM87/87B Tester Unit
05	Vacant or SM87/87B Tester Unit
06	SM88/88B Control Unit
07	SM91B Trunk Unit (Dedicated) or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)
08	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)
09	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)
10	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)
11	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)
12	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)

- Allows recognition that a channel unit in a SLC-96 system is being tested.
- Identifies the specific test trunk over which the test is being applied.
- Applies a distinctive termination to the test trunk when set-up checks are complete (1K ohms leak from tip to ground, full scale deflection on test desk meter).
- Switches the test trunk from the central office switching system to the appropriate channel test unit (CTU) in the central office SLC-96 channel bank which in turn establishes a connection, via the dc test pair, through the associated remote terminal CTU to the subscribers loop. (Figure 3 provides a block diagram of a typical test connection made through a PGTC).
- Provides a lock-up of the circuit established through the dc test pair to permit standard testing (manual or automated) from the RSB without a time restriction.
- Automatically verifies supervision, signaling, end-to-end loss, and noise of the pair gain channel while tests are being made on the subscriber loop.
- Outputs the test results of the automatic channel test when initiated from the RSB. The test results are outputted as audible tone burst(s), and as measurable dc voltages.
- Accommodates from one to 92 test trunks with simultaneous testing possible on four, separate SLC-96 systems.
- Applies 120 interruptions-per-minute (IPM) reorder indication on the test trunk in the event access to a SLC-96 system is blocked due to other testing on the same SLC-96 system or due to exceeding the number of separate systems which can be tested simultaneously.
- Applies a 60 IPM busy indication on the test trunk in the event test access has been attempted to a line served by a SLC-96 system experiencing a major alarm condition.

TABLE B

**CIRCUIT PACKS USED WITH
J1C142A-(), L2 EXPANSION SHELF**

SHELF POSITION	EQUIPPED WITH CIRCUIT PACK
01	SM89 Expansion Shelf Power Unit
02	SM90 Fanout Extender Unit
03 Through 12 As Required	Vacant or SM92/92B Trunk Unit (2x2) or SM94/94B Trunk Unit (2x4)

- Monitors its own performance and activates the central office alarm system if a trouble condition is detected, and displays status information to aid in trouble locating.

C. Circuit Packs Used in Control Shelf

2.08 The SM86 POWER UNIT provides power for other circuit packs and control signals within the control shelf. The SM86 power unit requires a -48 Vdc signal grade battery input to generate outputs of +5, +12, -12, +48, -48, +130, and -130 Vdc. The -48 Vdc output is a filtered talk grade battery supply. The SM86 is equipped with two sets of normally closed contacts which serve to interface with an external alarm system. The relay is operated (contacts open) by the -48 Vdc input and will release and activate an alarm when the -48 Vdc input is interrupted or some other trouble condition causes the contacts to close. Test jacks are provided on the face of the SM86 circuit pack for the measurement of the input and output voltages.

2.09 The SM87 or SM87B TESTER UNIT provides most of the circuitry associated with the automatic testing of the SLC-96 channel and also the circuitry which permits the test trunk to be switched from the central office switching system to the subscriber loop.

2.10 The SM88 or SM88B CONTROL UNIT contains common control circuitry for the PGTC. The common control circuitry is in the form of a single device microcontroller package

and the associated interface circuitry. Input controls to the SM88/88B control unit are:

- Tone detect lead common to all trunk units.
- Sleeve leads associated with the four test control circuits which interconnect the PGTC and SLC-96 system.
- Seize, seize-busy and major alarm leads from the central office SLC-96 channel test units (CTU).
- Status information (busy or idle) on the four tester units.
- Inputs test responses from the individual tester units.

Output signals from the SM88/88B control units are:

- Select controls to associate a tester unit with a test trunk.
- Signals (proceed and lock) to establish test connections.
- Sweep frequency oscillator (1000- to 2000-Hz at a 125-Hz rate) to tester unit.
- Alarm control (to power unit).
- Reorder and busy control (to trunk unit).

- Separate alarm contact (to **optional** external central office alarm scanning system).
- Outputs test control signals to the individual tester units.

2.11 The program stored in the microcontroller directs the operation of the SM88/88B control unit as follows:

- Scans the inputs for task requests.
- Consults its memory for applicable instructions and status information.
- Outputs signals to other units of the PGTC to control their functions.
- Continuously checks its own performance and the performance of connecting circuits.
- Attempts to assign alternate tester units when a trouble condition is detected.
- Operates an alphanumerically coded error display (Fig. 4) on the control unit according to Chart 11. The corresponding alarm condition is relayed to a connected alarm system when a trouble condition exists. Connected alarms may be retired by operating the ACO (alarm cut off) pushbutton on the control unit. The ACO indicator will be lighted if an active alarm has been retired.

2.12 The SM88 or SM88B control unit has an option requirement for multiparty service which must be set at the time of installation. The option is set by means of an option plug (Fig. 4). Option **4P** must be provided to serve multiparty lines with full selective ringing and option **2P** is required when multiparty lines are served with ringing arrangements other than full selective ringing.

2.13 The SM91B TRUNK UNIT is used in the control shelf to provide dedicated access to the test control circuits between the PGTC and a selected SLC-96 system. The SM91B trunk unit is **only** required when the PGTC serves dedicated test trunks required for special testing arrangements, any one of the automated testing systems, or a mechanized loop testing (MLT) system. Associated with the SM91B trunk unit is one or two SM87B test units. One SM87B test unit will be required

for each test control circuit which is to be dedicated. A maximum of two control circuits may be arranged for dedicated access. The SM91B trunk unit must be installed in position 07 of the control shelf and an SM87B tester unit **must** be installed in position 04 and/or 05 (04 for trunk 1 and 05 for trunk 2).

D. Circuit Packs Used in Expansion Shelf

2.14 The SM89 POWER UNIT in position 01 generates the +5, +12, and -12 Vdc necessary to power all associated circuit packs. The SM89 power unit requires a -48 Vdc signal grade input. Test jacks are provided on the face of the power unit so all input and output voltages may be measured.

2.15 The SM90 FANOUT EXTENDER UNIT is used in position 02 of the expansion shelf. The fanout extender provides buffering (amplification) and additional fanout capability for the common control signals between the control shelf and the expansion shelf. One SM90 fanout extender unit is required in position 02 of **each** expansion shelf.

E. Circuit Packs Common to Control Shelf and Expansion Shelf

2.16 The SM92 or SM92B TRUNK UNIT provides a means to connect any **two** test trunks to **two** test-control circuits. The SM92/92B trunk unit may be used in any trunk unit position in either the control or expansion shelves. The SM92/92B trunk units should be used in a control shelf which has an SM91B trunk unit serving dedicated test trunks. When one or two nondedicated tests trunks are connected, the SM92/92B trunk unit should be used. If an SM92/92B trunk unit is installed in any position on the control or expansion shelves, the tester units in positions 04 and 05 can only be accessed by an SM91B trunk unit.

2.17 The SM94 or SM94B TRUNK UNIT provides a means to connect any **two** test trunks to any **four** of the test control circuits. The SM94/94B trunk unit may be used in any trunk unit position in either the control or expansion shelves.

F. System Operation

2.18 The PGTC may be equipped to provide various arrangements for interconnecting test trunks between the RSB or local test cabinet

and subscriber line beyond the remote terminal (RT). Typical arrangements are as follows:

- A maximum of 92 test trunks may access a single test control circuit between the PGTC and the channel test unit (CTU) of a selected SLC-96 system. With this arrangement, one SLC-96 system may be seized for testing at a time.
- Each of two dedicated test trunks has access to a dedicated test control circuit between the PGTC and the CTU of a selected SLC-96 system. With this arrangement two SLC-96 systems may be seized for testing at one time as long as each system has access to a different dc test pair between the central office and the RT.
- A maximum of 92 test trunks may have access to any one of two test control circuits between the PGTC and the CTU of a selected SLC-96 system. This arrangement is usually provided when only two test control circuits are required or when two test control circuits are dedicated and additional test control circuits are provided for nondedicated test trunks. Two SLC-96 systems may be seized for testing at one time over the nondedicated test control circuits, as long as each system has access to different dc test pairs.
- A maximum of 92 test trunks may have access to any one of four test control circuits between the PGTC and the channel test unit (CTU) of a selected SLC-96 system. With this arrangement four SLC-96 systems may be seized for testing at the same time as long as each SLC-96 system has access to a different dc test pair.

2.19 Even though all test trunks associated with a repair service bureau (RSB) may be connected to the PGTC, these test trunks may be used to test subscriber lines not served by a SLC-96 system. The three leads (tip, ring, and sleeve) of the test trunk pass through normally made contacts of a relay in the PGTC and are connected through a test trunk circuit to the central office switching system. The circuitry of the PGTC in an idle state does not affect the test procedures or test results when testing subscriber lines which are not derived from a SLC-96 system.

2.20 When initiating a test from the repair service bureau (RSB) on a subscriber line derived from a SLC-96 system, the initial connection is established by dialing the telephone number of the line to be tested. After the connection has been established and before the automated tests are initiated, any testing of circuits up to the channel unit in the central office may be made in the normal manner. These tests will be used to verify that the line is good up to the channel unit in the channel bank of the central office SLC-96 system.

2.21 After establishing the initial connection to the subscriber line (paragraph 2.20), action may be taken to initiate an automated test of the channel serving that subscriber and to switch the test trunk to a dc test pair for testing the far end of the subscriber line. The action required from the RSB to initiate the channel test and to switch the test trunk to a test pair is to apply **+116 Vdc** to the **tip** side of the line to be tested. The +116 Vdc is applied from the LTD or test cabinet by operating the REV and +STA keys. When testing coin channels, the G key must also be operated.

2.22 After the +116 Vdc is applied to the test trunk, the test connection to the selected SLC-96 system is established as a result of the following sequence of actions and responses. (See Fig. 3):

1. A 333.3-Hz signal is transmitted from the channel unit to identify the test trunk to be used for testing the subscriber line.
2. A unique signaling code is sent to the channel unit at the RT to indicate a test request has been initiated. The channel unit then signals the channel test unit (CTU) that a test request has been initiated.
3. A confirmation signal is sent from the remote CTU to the associated central office CTU which generates a seize request on the test-control circuit to the PGTC. The identification signal (Step 1) and the seize signal in this step provide a means for the PGTC to associate a selected test trunk with the SLC-96 system being tested.
4. After it has been determined that a tester unit is available and pretests of the unit

- have been completed, the PGTC will send a proceed signal to the central office CTU.
5. The proceed signal is transmitted to the remote terminal (RT) CTU. This proceed signal causes the test relay in the remote channel unit and the associated cut-through relay in the CTU to operate, connecting the subscriber line to be tested to the dc test pair at the remote SLC-96 terminal.
 6. The RT channel test unit (CTU) checks for the talk battery supplied by the associated channel unit.
 7. If the talk battery is present, the proceed signal (Steps 4 and 5) is returned to the central office CTU which causes the CTU cut-through relay to operate. When the cut-through relay operates, the dc test pair is cut through to a selected test control circuit and a ground is applied to the sleeve lead of that test control circuit. The ground on the sleeve lead signals the PGTC that the testing circuit between the central office SLC-96 terminal and the associated RT has been completed.
 8. The PGTC outputs a lock signal and removes the proceed signal (Step 4 and 5). The PGTC also applies a 1K-ohm (K = thousand) resistance leak from *tip* to ground on the test trunk. The resistance leakage measured at the RSB serves as an indication that a test connection has been completed. An interrupted (120 times per minute) meter deflection on the test desk meter indicates a testing circuit has not been connected, and an interrupted (60 times per minute) deflection indicates a major alarm condition is present on the selected SLC-96 system.
 9. Identifying tone generated by the channel unit is removed and the seize request is released.
 10. After the 1K-ohm resistance leakage is detected at the RSB, the +STA, REV, and G (if operated) keys are released.
 11. When these keys are released, a metallic test circuit is connected, allowing normal testing procedures to be used to test the loop between the RT and the subscriber station.
 12. The PGTC monitors the sleeve lead of the test trunk from the RSB for any change of status.
 13. The PGTC automatically performs end-to-end tests of the channel associated with the subscriber line while the test trunk is connected to the dc test pair. The automated tests on the channel include testing for supervision, signaling, noise, and loss. The test results are stored until action is taken by the RSB to recall this information.
 14. The automated test results are obtained by operating the 3WO key at the test desk position. The test trunk may be switched back and forth between the subscriber loop and the output of the PGTC, by operation and release of the 3WO key, to allow dc tests on the loop or to recall automated channel test results.

Each time the 3WO key is operated only the *initial* test results on the subscriber channel are repeated and a new automated test is *not* initiated. To initiate a new automated test of the subscriber channel a disconnect must be performed and the test arrangement reestablished. Results from the automated test will be recalled as shown in Table C.

3. INSTALLATION

3.01 The following paragraphs and associated charts provide installation and testing procedures for the PGTC when used with a compatible pair gain system.



The charts are intended to be used only as specified by the master flow diagram of Chart 1. DO NOT ATTEMPT to use the charts otherwise.

3.02 Fusing for the -48 Vdc signal grade battery feed(s) and for the office ringing supply feed(s) must be provided by a miscellaneous fuse panel. Operation of the fuse panel and its associated alarm circuitry, if any, must be verified in accordance

TABLE C
AUTOMATED TEST RESULTS

CHANNEL CONDITION	AC SIGNAL OUTPUT	DC SIGNAL OUTPUT
Channel no good	None	T: Ground R: +48V
Channel good—Single party Channel Unit	Single Tone Burst	T: Ground R: -48V
Channel good—Multiparty Channel Unit	Double Tone Burst	T: -48V R: Open
Channel good—Coin Channel Unit	Triple Tone Burst	T: +48V R: Open

with standard procedures as part of the initial acceptance test.

3.03 To aid in the installation and trouble procedures, Chart 10 is provided, listing the steps in

Charts 2 through 9 with test requirements and suggestions or references on what to do if the requirement has not been met. A listing of 2-6 corresponds to a requirement associated with Chart 2, Step 6, for example.

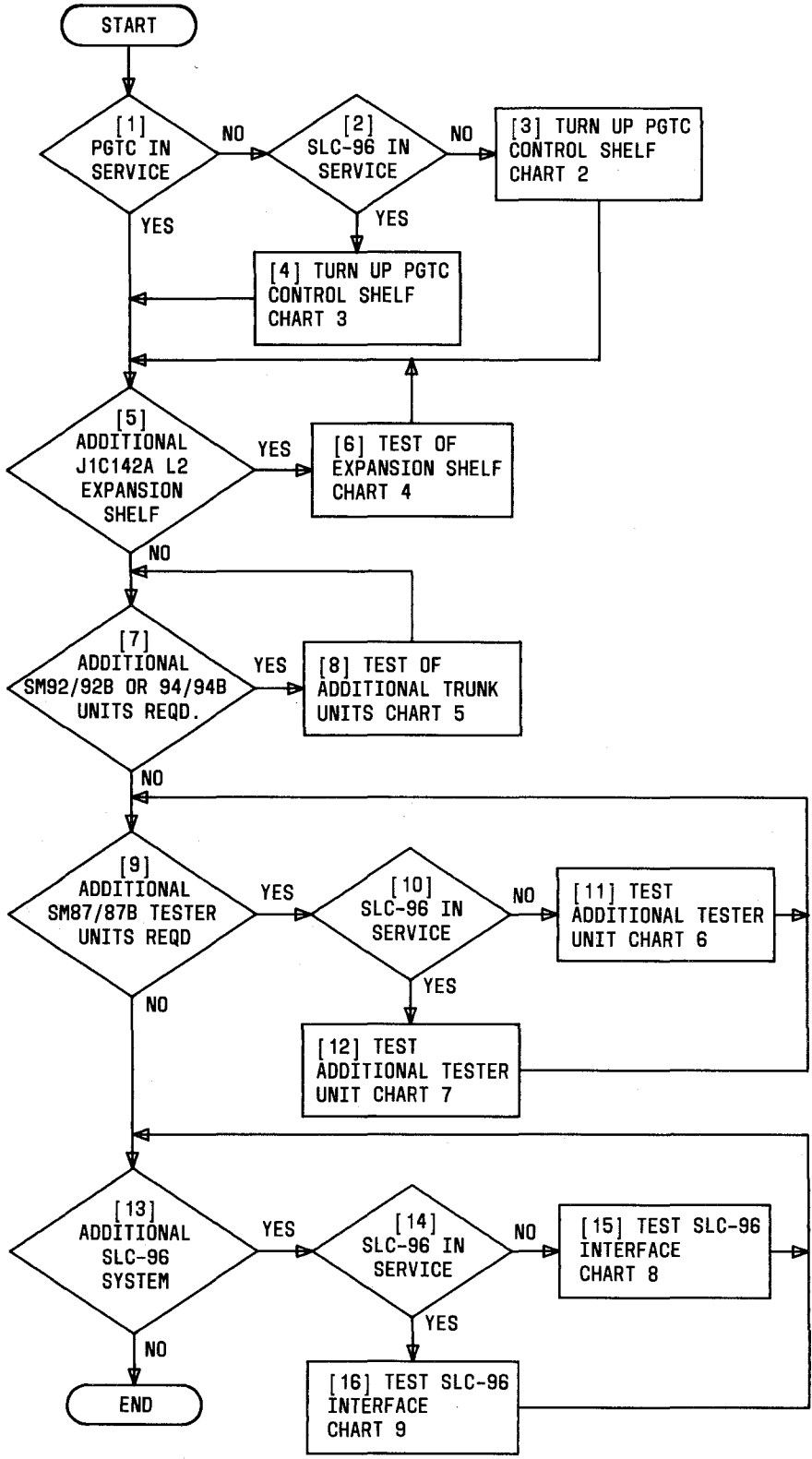


Chart 1—PGTC Test Procedures Flowchart

CHART 2

**PGTC CONTROL SHELF TURN UP
(SLC-96 SYSTEM NOT CUTOVER TO SERVICE)**

APPARATUS:

- 1—KS-14510 Volt-Ohm-Milliammeter (VOM) or equivalent
- 1—35D (5.A) fuse
- 2—35A (1.33A) fuses
- 1—500-Type Telephone Set, wired for bridged ringing.

STEP**PROCEDURE**

Prerequisite: A SLC-96 system is available, having been verified in accordance with Task Oriented Practice (TOP) 363-202-400 (COT) and 363-202-401 (RT), however, the system should **not** be cutover to customer service. If customers have been cutover to service, use the procedures of Chart 3.

The dc test pair between the central office distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs.

Verify the TT(), TR(), and TS() leads from the PGTC have been brought to the MDF and are ready for jumpering to the test trunks toward the RSB or local test cabinet. The T(), R(), and S() leads from the PGTC have been brought to the MDF and are ready for jumpering to the incoming test trunk circuits of the office.

Note: If the CO is equipped with an SD-96474-01 test trunk ringing circuit, the ringing circuit **must** be between the PGTC and the test trunks toward the RSB or LTD (Fig. 5).

A test line at the central office, consisting of a temporary telephone number and a subscriber line circuit.

- 1 Verify that the J1C142A, L1 control shelf (Fig. 1) and associated power and connecting cables have been properly installed and terminated.
- 2 Verify that fuses A1, A2, and A3 (if provided) are removed from the miscellaneous fuse panel.
- 3 Verify test desk is equipped with an operational +STA key.
- 4 Alert central office personnel that alarm tests are being made.
- 5 Plug an SM86 circuit pack (control shelf power unit) into position 01 of the control shelf.

CHART 2 (Contd)

STEP

PROCEDURE

Requirement 1: The office alarm (if provided) is activated.

Requirement 2: The proper aisle and frame indicator lamps light (if provided).

- 6 Insert the 35D (5A) fuse in the A1 position of the miscellaneous fuse panel.

Requirement: The fuse does not operate (blow).

- 7 Using the VOM and noting the polarity of the leads as well as the range setting of the VOM, measure the voltages at the SM86 test jacks as shown in Table D.

- 8 Insert the 35A (1.33A) fuse(s) in the A2 (and A3, if required) position(s) of the miscellaneous fuse panel.

Note: The A2 position is for ac or negative superimposed ringing. The A3 position is for positive superimposed ringing.

Requirement: The fuse(s) does not operate (blow).

- 9 Set the option plug on an SM88/88B circuit pack (control unit) to the appropriate position for the type of ringing supplied (see Fig. 4).

Note: If the A3 fuse position on the miscellaneous fuse panel has been provided and wired, use **4P** option position. Otherwise, use **2P** option position.

- 10 Plug the SM88/88B unit into position 06 of the control shelf.

TABLE D

SM86 VOLTAGE TEST

TEST JACK		VOM RANGE	REQUIREMENT (Vdc)
FROM (+)	TO (-)		
BG	-48S	60	45 to 53
LG	-48T	300/60	45 to 65
LG	-130	300	130 to 195
LG	-12	60/12	10.8 to 13.2
+5	LG	12	4.5 to 5.5
+12	LG	60/12	10.8 to 13.2
+48T	LG	300	60 to 85
+130	LG	300	130 to 195

CHART 2 (Contd)

STEP

PROCEDURE

Requirement 1: After a settling period (approximately 5 seconds), the status display on the SM88/88B (Fig. 4) will clear.

Requirement 2: The ACO lamp on the SM88/88B unit should be extinguished.

11 Depress ACO button.

Requirement: Office alarms (if provided) are retired and the **ACO** lamp does **not** illuminate.

12 At the distributing frame (DF), cross-connect the test line to a channel selected in the SLC-96 system.

Note: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130V (coin return)].

13 At the DF, cross-connect the dc test pair from the remote terminal (RT) to the central office terminal (COT).

Note: The dc test pair (cable pair) may be H88 loaded if required.

14 At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 12.

15 At the PGTC, plug a trunk unit (SM91B, SM92/92B, or SM94/94B circuit pack as specified) into position 07 of the control shelf.

Requirement: No fuses operate (blow).

16 At the DF, cross-connect the TT(), TR(), and TS() leads from the PGTC to the first test trunk **toward** the RSB or local test cabinet. Cross-connect the T(), R(), and S() leads from the PGTC to the first **incoming** test trunk circuit of the office. The previous direct connection between the incoming test trunk circuit and the RSB or local test cabinet test trunks **must** be removed.

17 At the RSB or local test cabinet, access the test line via the **first** test trunk in accordance with standard procedures.

Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage **tip** to ground **or** 75-volts leakage **tip** to ground and **ring** to ground for coin channel units, with approximately 50-volts ballistic deflection).

18 Operate REV and +STA keys (also G key if coin channel unit).

CHART 2 (Contd)

STEP

PROCEDURE

Requirement: The VMA meter indicates deflections at a 120 interruptions-per-minute (IPM) rate.

Note 1: Busy light will illuminate on the trunk unit and the minor and near end alarm light on the ACU of the SLC-96 system under test will briefly flash.

Note 2: The alarm light on the CTU may or may not flash.

19 Release all keys.

20 Release test trunk.

21 Repeat Steps 16 through 20 using the **second** test trunk (if provided) before continuing to Step 22.

22 If the PGTC has been equipped with an SM91B unit in Step 15, plug an SM87/87B circuit pack (tester unit) into position 04 of the control shelf. Otherwise, plug the SM87/87B unit into position 02 of the control shelf.

Requirement 1: No fuses operate (blow).

Requirement 2: The status indicator on the SM88/88B control unit remains clear.

Note: If a status indication appears on the SM88/88B, remove and reseal the SM88/88B control card. The microcontroller is now reset and the status indicator is clear (no display).

23 At the RSB or local test cabinet, access the test line again via the **first** test trunk.

24 Operate the REV and +STA key (also G key if coin unit).

Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater.

Requirement 2: At the PGTC, the busy indicator lamp on the trunk unit lights simultaneously with Requirement 1.

25 Release the +STA key (and G key if operated).

Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).

26 By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.

CHART 2 (Contd)

STEP	PROCEDURE
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Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer.

27 Release all keys.

28 Operate MONITOR key, then the 3WO key and monitor the tone burst(s) in the headset.

Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 12 as follows:

CHANNEL TYPE	TONE BURST(S)
Single-party	One burst
Multiparty	Double burst
Coin	Triple burst

Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.

29 With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.

Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(S) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO	approx. 100 volts
	(b) FEMF, 3WO	approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts
Coin	(a) FEMF, REV, VM REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts

30 Release all keys.

31 Release test trunk.

Requirement: At the PGTC, the busy indicator lamp on the trunk unit in position 07 should extinguish.

CHART 2 (Contd)

STEP	PROCEDURE
32	At the DF, ground the INHIBIT lead coming from the SLC-96 system.
33	At the RSB or local test cabinet, access the test line again.
34	Operate the REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 120 IPM rate.
35	Release all keys.
36	Release test trunk.
37	At the DF, remove the ground on the INHIBIT lead (placed in Step 32).
38	At the COT for the SLC-96 system, cause a major alarm by removing the TRU unit on a shelf other than the one containing the channel unit under test.
39	At the RSB or local test cabinet, access the test line again.
40	Operate the REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 60 IPM rate.
41	Release all keys.
42	Release test trunk.
43	At the COT, restore the TRU unit to clear the major alarm condition.
44	If the PGTC has been equipped with an SM91B trunk unit in Step 15 and a second dedicated test trunk is required, plug in an SM87/87B tester unit into position 05 of the control shelf.
45	Repeat Steps 23 through 43 for the second test trunk.
46	Remove the test line connected in Step 12 and the 500-type telephone set connected in Step 14.
47	Return to Step 1 in Chart 1.

CHART 3

**PGTC CONTROL SHELF TURN UP
(SLC-96 SYSTEM CUTOVER TO SERVICE)**

APPARATUS:

- 1—KS-14510 Volt-Ohm-Milliammeter (VOM) or equivalent
- 1—35D (5.A) fuse
- 2—35A (1.33A) fuses
- 1—500-Type Telephone Set, wired for bridged ringing.

STEP**PROCEDURE**

Prerequisite: A SLC-96 system is available, having been verified in accordance with Task Oriented Practice (TOP) 363-202-400 (COT) and 363-202-401 (RT), and the system *is* cutover to customer service. If customers have *not* been cutover to service, use the procedures of Chart 2.

The dc test pair between the central office distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs.

Verify the TT(), TR(), and TS() leads from the PGTC have been brought to the MDF and are ready for jumpering to the test trunks toward the RSB or local test cabinet. The T(), R(), and S() leads from the PGTC have been brought to the MDF and are ready for jumpering to the incoming test trunk circuits of the office.

Note: If the CO is equipped with an SD-96474-01 test trunk ringing circuit, the ringing circuit *must* be between the PGTC and the test trunks toward the RSB or LTD (Fig. 5).

A test line at the central office, consisting of a temporary telephone number and a subscriber line circuit.

- 1 Verify that the J1C142A, L1 control shelf (Fig. 1) and associated power and connecting cables have been properly installed and terminated.
- 2 Verify that fuses A1, A2, and A3 (if provided) are removed from the miscellaneous fuse panel.
- 3 Verify test desk is equipped with an operational +STA key.
- 4 Alert central office personnel that alarm tests are being made.
- 5 Plug an SM86 circuit pack (control shelf power unit) into position 01 of the control shelf.

CHART 3 (Contd)

STEP

PROCEDURE

Requirement 1: The office alarm (if provided) is activated.

Requirement 2: The proper aisle and frame indicator lamps light (if provided).

6 Insert the 35D (5A) fuse in the A1 position of the miscellaneous fuse panel.

Requirement: The fuse does not operate (blow).

7 Using the VOM and noting the polarity of the leads as well as the range setting of the VOM, measure the voltages at the SM86 test jacks as shown in Table E.

8 Insert the 35A (1.33A) fuse(s) in the A2 (and A3, if required) position(s) of the miscellaneous fuse panel.

Note: The A2 position is for ac or negative superimposed ringing. The A3 position is for positive superimposed ringing.

Requirement: The fuse(s) does not operate (blow).

9 Set the option plug on an SM88/88B circuit pack (control unit) to the appropriate position for the type of ringing supplied (see Fig. 4).

Note: If the A3 fuse position on the miscellaneous fuse panel has been provided and wired, use **4P** option position. Otherwise, use **2P** option position.

10 Plug the SM88/88B unit into position 06 of the control shelf.

TABLE E

SM86 VOLTAGE TEST

TEST JACK		VOM RANGE	REQUIREMENT (Vdc)
FROM (+)	TO (-)		
BG	-48S	60	45 to 53
LG	-48T	300/60	45 to 65
LG	-130	300	130 to 195
LG	-12	60/12	10.8 to 13.2
+5	LG	12	4.5 to 5.5
+12	LG	60/12	10.8 to 13.2
+48T	LG	300	60 to 85
+130	LG	300	130 to 195

CHART 3 (Contd)

STEP

PROCEDURE

Requirement 1: After a settling period (approximately 5 seconds), the status display on the SM88/88B (Fig. 4) will clear.

Requirement 2: The ACO lamp on the SM88/88B unit should be extinguished.

11 Depress ACO button.

Requirement: Office alarms (if provided) are retired and the ACO lamp does **not** illuminate.

12 At the distributing frame (DF), cross-connect the test line to an unassigned channel selected in the SLC-96 system.

Note 1: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130V (coin return)].

Note 2: An assigned channel may be used, however, service will be denied to the assigned subscriber during test access. In this case proceed to Step 14.

13 At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 12.

14 At the DF, cross-connect the dc test pair from the remote terminal (RT) to the central office terminal (COT).

Note: The dc test pair (cable pair) may be H88 loaded if required.

15 At the PGTC, plug a trunk unit (SM91B, SM92/92B, or SM94/94B circuit pack as specified) into position 07 of the control shelf.

Requirement: No fuses operate (blow).

16 At the DF, cross-connect the TT(), TR(), and TS() leads from the PGTC to the first test trunk **toward** the RSB or local test cabinet. Cross-connect the T(), R(), and S() leads from the PGTC to the first **incoming** test trunk circuit of the office. The previous direct connection between the incoming test trunk circuit and the RSB or local test cabinet test trunks **must** be removed.

17 At the RSB or local test cabinet, access the test line via the **first** test trunk in accordance with standard procedures.

Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage **tip** to ground **or** 75-volts leakage **tip** to ground and **ring** to ground for coin channel units, with approximately 50-volts ballistic deflection).

CHART 3 (Contd)

STEP	PROCEDURE
18	Operate REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 120 interruptions-per-minute (IPM) rate. Note 1: Busy light will illuminate on the trunk unit and the minor and the near end alarm light on the ACU of the SLC-96 system under test will briefly flash. Note 2: The alarm light on the CTU may or may not flash.
19	Release all keys.
20	Release test trunk.
21	Repeat Steps 16 through 20 using the second test trunk (if provided) before continuing to Step 22.
22	If the PGTC has been equipped with an SM91B unit in Step 15, plug an SM87/87B circuit pack (tester unit) into position 04 of the control shelf. Otherwise, plug the SM87/87B unit into position 02 of the control shelf. Requirement 1: No fuses operate (blow). Requirement 2: The status indicator on the SM88/88B control unit remains clear. Note: If a status indication appears on the SM88/88B, remove and reseal the SM88/88B control card. The microcontroller is now reset and the status indicator is clear (no display).
23	At the RSB or local test cabinet, access the test line again via the first test trunk.
24	Operate the REV and +STA key (also G key if coin unit). Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater. Requirement 2: At the PGTC, the busy indicator lamp on the trunk unit lights simultaneously with Requirement 1.
25	Release the +STA key (and G key if operated). Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).
26	By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.

CHART 3 (Contd)

STEP	PROCEDURE
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Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer. If an assigned channel has been used, the test connection will have the characteristics of the assigned subscriber station.

27 Release all keys.

28 Operate MONITOR key, then the 3WO key and monitor the tone burst(s) in the headset.

Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 12 as follows:

CHANNEL TYPE	STONE BURST(S)
Single-party	One burst
Multiparty	Double burst
Coin	Triple burst

Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.

29 With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.

Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(S) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO	approx. 100 volts
	(b) FEMF, 3WO	approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts
Coin	(a) FEMF, REV, VM REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts

CHART 3 (Contd)

STEP	PROCEDURE
30	Release all keys.
31	Release test trunk. Requirement: At the PGTC, the busy indicator lamp on the trunk unit in position 07 should extinguish.
32	At the DF, ground the INHIBIT lead coming from the SLC-96 system.
33	At the RSB or local test cabinet, access the test line again.
34	Operate the REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 120 IPM rate.
35	Release all keys.
36	Release test trunk.
37	At the DF, remove the ground on the INHIBIT lead (placed in Step 32).
38	At the COT for the SLC-96 system, cause a major alarm by removing the TRU unit on a shelf other than the one containing the channel unit under test. Note: Removing the TRU unit will interrupt service to all subscribers assigned to that shelf. Ensure that no channel busy lights are illuminated before removing this unit. It may be necessary to perform this test during low traffic hours.
39	At the RSB or local test cabinet, access the test line again.
40	Operate the REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 60 IPM rate.
41	Release all keys.
42	Release test trunk.
43	At the COT, restore the TRU unit to clear the major alarm condition.
44	If the PGTC has been equipped with an SM91B trunk unit in Step 15 and a second dedicated test trunk is required, plug in an SM87/87B tester unit into position 05 of the control shelf.
45	Repeat Steps 23 through 43 for the second test trunk.

CHART 3 (Contd)

STEP	PROCEDURE
46	Remove the test line connected in Step 12 and the 500-type telephone set connected in Step 13.
47	Return to Step 1 in Chart 1.

CHART 4
TEST OF EXPANSION SHELF

APPARATUS:

- 1—KS-14510 Volt-Ohm-Milliammeter (VOM) or equivalent
- 1—35C (3.A) fuse

STEP**PROCEDURE**

Prerequisite: Chart 1 has directed reference to this chart.

Verify the TT(), TR(), and TS() leads from the PGTC have been brought to the MDF and are ready for jumpering to the test trunks toward the RSB or local test cabinet. The T(), R(), and S() leads from the PGTC have been brought to the MDF and are ready for jumpering to the incoming test trunk circuits of the office.

- 1 Verify that the J1C142A, L2 Expansion Shelf (Fig. 2) as well as associated power and connecting cables have been properly installed and terminated.
- 2 Insert the 35C (3.A) fuse into position B() of the miscellaneous fuse panel as follows:

ADDITIONAL EXPANSION SHELF	FUSE
First J1C142A,L2	B1
Second J1C142A,L2	B2
Third J1C142A,L2	B3
Fourth J1C142A,L2	B4

Requirement: The fuse does not operate (blow).

- 3 Plug an SM89 circuit pack (expansion shelf power unit) into position 01 of the expansion shelf.

Requirement: The B() fuse does not operate (blow).

- 4 Using the VOM and noting the polarity of the leads as well as the range setting of the VOM, measure the voltages at the SM89 test jacks as shown in Table F.
- 5 Plug an SM90 circuit pack (fanout extender unit) into position 02 of the shelf.

Requirement 1: The status display on the SM88/88B unit (Fig. 4) in the control shelf is clear.

CHART 4 (Contd)

STEP

PROCEDURE

TABLE F

SM89 VOLTAGE TEST

TEST JACK		VOM RANGE	REQUIREMENT (Vdc)
FROM (+)	TO (-)		
BG	-48S	60	45 to 53
LG	-12	60/12	10.8 to 13.2
+5	LG	12	4.5 to 5.5
+12	LG	60/12	10.8 to 13.2

Requirement 2: The office alarm (if provided) is not activated.

6 Return to Step 5 in Chart 1.

CHART 5

TEST OF ADDITIONAL TRUNK UNITS

APPARATUS:

1—1000-ohm resistor (1/4-watt or greater)

STEP

PROCEDURE

Prerequisite: Chart 1 has directed reference to this chart.

A functional SLC-96 system is available for these tests.

An equipped (but unassigned) channel is available at both the COT and RT.

Note: An assigned channel may be used, however, service will be denied to the assigned subscriber during test access. In this case proceed to Step 2.

A test line at the CO, consisting of a temporary telephone number and a subscriber line circuit is available.

- 1 At the DF, cross-connect the test line to the channel selected for test.
- 2 Also at the DF, remove the cross-connection to the dc test pair for the RT of the system selected for test, and a 1000-ohm resistor **must** be connected from ring to tip on the COT side of the DF.
- 3 Depending on the type of trunk unit to be added and the type of trunk unit already in position 07 of the control shelf proceed as follows:

TRUNK UNIT TO BE ADDED	TRUNK UNIT IN POS. 07	TESTER POSITIONS INVOLVED
SM92 SM92B	N/A	02, 03
SM94 SM94B	SM91B	02, 03
SM94 SM94B	SM94/94B	02, 03, 04, 05

Note: If an SM92/92B trunk unit is installed in any position on the control or expansion shelves, the tester units in positions 04 and 05 can only be accessed by an SM91B trunk unit.

CHART 5 (Contd)

STEP	PROCEDURE
4	Unplug all SM87/87B tester units in positions (02, 03, etc) involved according to Step 3.
5	Plug the trunk unit (SM92/92B or 94/94B circuit pack) into the trunk position to be equipped. Requirement: No fuse operates (blows).
6	At the DF, cross-connect the TT(), TR(), and TS() leads from the PGTC to the first test trunk served by this trunk unit toward the RSB or local test cabinet. Cross-connect the T(), R(), and S() leads from the PGTC to the first incoming test trunk circuit of the office served by this trunk unit.
7	At the RSB or local test cabinet, access the test line via the first of the two test trunks accommodated by the trunk unit in accordance with standard procedures. Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage tip to ground or 75-volts leakage tip to ground and ring to ground for coin channel units, with approximately 50-volts ballistic deflection).
8	Operate REV and +STA keys (also G key if coin channel unit). Requirement: The VMA meter indicates deflections at a 120 interruptions-per-minute (IPM) rate.
9	Release all keys.
10	Release test trunk.
11	Plug an SM87/87B tester unit back into its position (02) in the shelf.
12	At the RSB or local test cabinet, access the test line again.
13	Operate the REV and +STA key (also G key if coin unit). Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater. Requirement 2: At the PGTC, the busy indicator lamp on the trunk unit lights simultaneously with Requirement 1.
14	Release all keys. Requirement: The VMA meter indicates 0 volts.

CHART 5 (Contd)

STEP	PROCEDURE
15	Operate G key. Requirement: The VMA meter indicates 98 volts.
16	Release G key.
17	Release test trunk. Requirement: The busy indicator lamp on the trunk unit extinguishes.
18	Unplug the tester unit inserted in Step 11.
19	Repeat Steps 7 through 18 for each of the other tester positions involved, equipped one at a time (see Step 3).
20	Disconnect from the first test trunk.
21	Repeat Steps 7 through 19 via the second of the two test trunks accommodated by the trunk unit.
22	Disconnect from the second test trunk.
23	Remove the 1000-ohm resistor placed in Step 2 and restore the cross-connection to the dc test pair.
24	Disconnect the test line placed in Step 1.
25	Plug all tester units back into their positions.
26	Return to Step 7 in Chart 1.

CHART 6

**TEST OF ADDITIONAL TESTER UNITS
(SLC-96 SYSTEM NOT CUTOVER TO SERVICE)**

APPARATUS:

1—500-Type Telephone Set, wired for bridged ringing.

STEP**PROCEDURE**

Prerequisite: Chart 1 has directed reference to this chart.

A functional SLC-96 system is available for these tests (not cutover to customer service).

The dc test pair between the central office (CO) distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs prior to cross-connecting to the central office terminal (COT).

A test line at the CO, consisting of a temporary telephone number and a subscriber line circuit.

- 1 At the distributing frame (DF), cross-connect the test line to a channel selected in the SLC-96 system.

Note: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130 volts (coin return)].

- 2 At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 1.
- 3 If the additional tester unit (SM87/87B) is to be added in position 02 of the control shelf, proceed to Step 7. Otherwise, continue to Step 4.
- 4 If the additional SM87/87B unit is to be added in position 03 of the control shelf, unplug the SM87/87B unit in position 02 **before** proceeding to Step 7. Otherwise, continue to Step 5.
- 5 If the additional tester unit (SM87/87B) is to be added in position 04 of the control shelf, unplug the SM87/87B units in positions 02 and 03 **before** proceeding to Step 7. Otherwise, continue to Step 6.
- 6 If the additional SM87/87B unit is to be added in position 05 of the control shelf, proceed to Step 7 **if** position 07 is equipped with an SM91B trunk unit. Otherwise, unplug the SM87/87B units in positions 02, 03, and 04 **before** proceeding to Step 7.
- 7 Plug an SM87/87B circuit pack (tester unit) into the additional position to be equipped.

CHART 6 (Contd)

STEP	PROCEDURE
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Requirement 1: No fuses operate (blow).

Requirement 2: The status indicator on the SM88/88B control unit remains clear.

Note: If a status indication appears on the SM88/88B, remove and reseal the SM88/88B control card. The microcontroller is now reset and the status indicator is clear (no display).

- 8 At the RSB or local test cabinet, access the test line in accordance with standard procedures via the appropriate test trunk as follows:

SM87/87B ADDED POSITION NO.	SM91B IN POSITION 07	ACCESS VIA
02	Yes	Any trunk but 1 or 2
02	No	N/A
03	Yes	Any trunk but 1 or 2
03	No	Any trunk
04	Yes	N/A
04	No	Any trunk
05	Yes	2 Only
05	No	Any trunk

Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage *tip* to ground **or** 75-volts leakage *tip* to ground and *ring* to ground for coin channel units with approximately 50-volts ballistic deflection).

- 9 Operate the REV and +STA key (also G key if coin unit).

Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater.

Requirement 2: At the PGTC, the busy indicator lamp on the appropriate trunk unit lights simultaneously with Requirement 1.

CHART 6 (Contd)

STEP	PROCEDURE								
	<p>Note: If the VMA meter indicates deflections at a 120 IPM rate, the PGTC may be in use via another test trunk. Release test trunk and repeat Steps 8 and 9 to retry.</p>								
10	<p>Release the +STA key (and G key if operated).</p> <p>Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).</p>								
11	<p>By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.</p> <p>Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer.</p>								
12	<p>Release all keys.</p>								
13	<p>Operate MONITOR key, then the 3WO key and monitor the tone burst(s) in the headset.</p> <p>Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 1 as follows:</p> <table border="1" data-bbox="591 1091 982 1310"> <thead> <tr> <th data-bbox="591 1091 740 1117">CHANNEL TYPE</th> <th data-bbox="830 1091 982 1117">TONE BURST(S)</th> </tr> </thead> <tbody> <tr> <td data-bbox="591 1155 745 1181">Single-party</td> <td data-bbox="816 1155 943 1181">One burst</td> </tr> <tr> <td data-bbox="591 1219 728 1244">Multiparty</td> <td data-bbox="816 1219 982 1244">Double burst</td> </tr> <tr> <td data-bbox="591 1283 650 1308">Coin</td> <td data-bbox="816 1283 971 1308">Triple burst</td> </tr> </tbody> </table> <p>Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.</p>	CHANNEL TYPE	TONE BURST(S)	Single-party	One burst	Multiparty	Double burst	Coin	Triple burst
CHANNEL TYPE	TONE BURST(S)								
Single-party	One burst								
Multiparty	Double burst								
Coin	Triple burst								
14	<p>With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.</p>								

CHART 6 (Contd)

STEP	PROCEDURE
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Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(s) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO (b) FEMF, 3WO	approx. 100 volts approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts
Coin Unit	(a) FEMF, REV, VM REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts

15 Release all keys.

16 Release test trunk.

Requirement: At the PGTC, the busy indicator lamp on the appropriate trunk unit should extinguish.

17 At the COT for the SLC-96 system, cause a major alarm by **removing** the TRU unit on a shelf other than the one containing the channel unit under test.

18 At the RSB or local test cabinet, access the test line again.

19 Operate the REV and +STA keys (also G key if coin channel unit).

Requirement: The VMA meter indicates deflections at a 60 IPM rate.

20 Release the +STA key (and G key if operated).

21 Release all keys.

22 Release test trunk.

23 At the COT, **restore** the TRU unit to clear the major alarm condition.

24 Plug any SM87/87B tester unit(s) removed as part of Step 4, 5, or 6 back into their position(s).

25 Remove the test line connected in Step 1 and the 500-type telephone set connected in Step 2.

26 Return to Step 9 in Chart 1.

CHART 7

TEST OF ADDITIONAL TESTER UNITS
(SLC-96 SYSTEM CUTOVER TO SERVICE)

APPARATUS:

1—500-Type Telephone Set, wired for bridged ringing

STEP

PROCEDURE

Prerequisite: Chart 1 has directed reference to this chart.

A functional SLC-96 system is available for these tests.

The dc test pair between the central office (CO) distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs prior to cross-connecting to the central office terminal (COT).

A test line at the CO, consisting of a temporary telephone number and a subscriber line circuit.

- 1 At the distributing frame (DF), cross-connect the test line to an unassigned channel selected in the SLC-96 system.

Note 1: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130V (coin return)].

Note 2: An assigned channel may be used, however, service will be denied to the assigned subscriber during test access. In this case proceed to Step 3.

- 2 At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 1.

- 3 If the additional tester unit (SM87/87B) is to be added in position 02 of the control shelf, proceed to Step 7. Otherwise, continue to Step 4.

- 4 If the additional SM87/87B unit is to be added in position 03 of the control shelf, unplug the SM87/87B unit in position 02 **before** proceeding to Step 7. Otherwise, continue to Step 5.

- 5 If the additional tester unit (SM87/87B) is to be added in position 04 of the control shelf, unplug the SM87/87B units in positions 02 and 03 **before** proceeding to Step 7. Otherwise, continue to Step 6.

CHART 7 (Contd)

STEP	PROCEDURE
6	If the additional SM87/87B unit is to be added in position 05 of the control shelf, proceed to Step 7 if position 07 is equipped with an SM91B trunk unit. Otherwise, unplug the SM87/87B units in positions 02, 03, and 04 before proceeding to Step 7.
7	Plug an SM87/87B circuit pack (tester unit) into the additional position to be equipped. Requirement 1: No fuses operate (blow). Requirement 2: The status indicator on the SM88/88B control unit remains clear. Note: If a status indication appears on the SM88/88B, remove and reseal the SM88/88B control card. The microcontroller is now reset and the status indicator is clear (no display).
8	At the RSB or local test cabinet, access the test line in accordance with standard procedures via the appropriate test trunk as follows:

SM87/87B ADDED POSITION NO.	SM91B IN POSITION 07	ACCESS VIA
02	Yes	Any trunk but 1 or 2
02	No	N/A
03	Yes	Any trunk but 1 or 2
03	No	Any trunk
04	Yes	N/A
04	No	Any trunk
05	Yes	2 Only
05	No	Any trunk

Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage **tip** to ground **or** 75-volts leakage **tip** to ground and **ring** to ground for coin channel units, with approximately 50-volts ballistic deflection).

9 Operate the REV and +STA key (also G key if coin unit).

CHART 7 (Contd)

STEP

PROCEDURE

Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater.

Requirement 2: At the PGTC, the busy indicator lamp on the appropriate trunk unit lights simultaneously with Requirement 1.

Note: If the VMA meter indicates deflections at a 120 IPM rate, the PGTC may be in use via another test trunk. Release test trunk and repeat Steps 8 and 9 to retry.

10 Release the +STA key (and G key if operated).

Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).

11 By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.

Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer.

12 Release all keys.

13 Operate MONITOR key, then the 3WO key and monitor the tone burst(s) in the headset.

Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 1 as follows:

CHANNEL TYPE	tone burst(s)
Single-party	One burst
Multiparty	Double burst
Coin	Triple burst

Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.

14 With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.

CHART 7 (Contd)

STEP

PROCEDURE

Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(s) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO	approx. 100 volts
	(b) FEMF, 3WO	approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts
Coin	(a) FEMF, REV, VM REV, 3WO	approx. 48 volts
	(b) 3WO	approx. 0 volts

15 Release all keys.

16 Release test trunk.

Requirement: At the PGTC, the busy indicator lamp on the appropriate trunk unit should extinguish.

17 At the COT for the SLC-96 system, cause a major alarm by **removing** the TRU unit on a shelf other than the one containing the channel unit under test.

18 At the RSB or local test cabinet, access the test line again.

19 Operate the REV and +STA keys (also G key if coin channel unit).

Requirement: The VMA meter indicates deflections at a 60 IPM rate.

20 Release the +STA key (and G key if operated).

21 Release all keys.

22 Release test trunk.

23 At the COT, **restore** the TRU unit to clear the major alarm condition.

24 Plug any SM87/87B tester unit(s) removed as part of Step 4, 5, or 6 back into their position(s).

25 Remove the test line connected in Step 1 and the 500-type telephone set connected in Step 2 if an unassigned SLC-96 channel was used for test.

26 Return to Step 9 in Chart 1.

CHART 8

TEST OF ADDITIONAL SLC-96 SYSTEM INTERFACE
(SLC-96 SYSTEM NOT CUTOVER TO SERVICE)

APPARATUS:

1—500-Type Telephone Set, wired for bridged ringing

STEP

PROCEDURE

Prerequisite: Chart 1 has directed reference to this chart.

A SLC-96 system is available, having been verified in accordance with Task Oriented Practice (TOP) 363-202-400 (COT) and 363-202-401 (RT), however, the system should **not** be cutover to customer service. If customers have been cutover to service, use the procedures of Chart 9.

The dc test pair between the central office (CO) distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs prior to cross-connecting to the central office terminal (COT).

A test line at the CO, consisting of a temporary telephone number and a subscriber line circuit.

- 1 At the distributing frame (DF), cross-connect the test line to a channel selected in the SLC-96 system.

Note: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130V (coin return)].

- 2 At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 1.
- 3 At the RSB or local test cabinet, access the test line via an available test trunk in accordance with standard procedures.

Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage **tip** to ground **or** 75-volts leakage **tip** to ground and **ring** to ground for coin channel units, with approximately 50-volts ballistic deflection).

- 4 Operate the REV and +STA key (also G key if coin unit).

Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater.

CHART 8 (Contd)

STEP

PROCEDURE

Requirement 2: At the PGTC, the busy indicator lamp on the trunk unit lights simultaneously with Requirement 1.

- 5 Release the +STA key (and G key if operated).

Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).

- 6 By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.

Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer.

- 7 Release all keys.

- 8 Operate MONITOR key, then the 3WO key and monitor the tone burst(s) in the headset.

Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 1 as follows:

CHANNEL TYPE	STONE BURST(S)
Single-party	One burst
Multiparty	Double burst
Coin	Triple burst

Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.

- 9 With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.

CHART 8 (Contd)

STEP	PROCEDURE
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Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(s) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO (b) FEMF, 3WO	approx. 100 volts approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts
Coin	(a) FEMF, REV, VM REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts

10 Release all keys.

11 Release test trunk.

Requirement: At the PGTC, the busy indicator lamp on the trunk unit identified in Step 4 (Requirement 2) should extinguish.

12 At the DF, ground the INHIBIT lead coming from the SLC-96 system.

13 At the RSB or local test cabinet, access the test line again.

14 Operate the REV and +STA keys (also G key if coin channel unit).

Requirement: The VMA meter indicates deflections at a 120 IPM rate.

15 Release all keys.

16 Release test trunk.

17 At the DF, remove the ground on the INHIBIT lead (placed in Step 12).

18 At the COT for the SLC-96 system, cause a major system alarm by **removing** the TRU unit on a shelf other than the one containing the channel unit under test.

19 At the RSB or local test cabinet, access the test line again.

20 Operate the REV and +STA keys (also G key if coin channel unit).

Requirement: The VMA meter indicates deflections at a 60 IPM rate.

21 Release all keys.

CHART 8 (Contd)

STEP	PROCEDURE
22	Release test trunk.
23	At the COT, restore the TRU unit to clear the major alarm condition.
24	Remove the test line connected in Step 1 and the 500-type telephone set connected in Step 2.
25	Return to Step 13 of Chart 1.

CHART 9

**TEST OF ADDITIONAL SLC-96 SYSTEM INTERFACE
(SLC-96 SYSTEM CUTOVER TO SERVICE)**

APPARATUS:

1—500-Type Telephone Set, wired for bridged ringing

STEP	PROCEDURE
	<p>Prerequisite: Chart 1 has directed reference to this chart.</p> <p>A SLC-96 system is available, having been verified in accordance with Task Oriented Practice (TOP) 363-202-400 (COT) and 363-202-401 (RT), and the system is cutover to customer service. If customers have not been cutover to service, use the procedures of Chart 8.</p> <p>The dc test pair between the central office (CO) distributing frame (DF) and the RT has been verified in accordance with standard procedures for voice frequency pairs prior to cross-connecting to the central office terminal (COT).</p> <p>A test line at the CO, consisting of a temporary telephone number and a subscriber line circuit.</p>
1	<p>At the distributing frame (DF), cross-connect the test line to an unassigned channel selected in the SLC-96 system.</p> <p>Note 1: The tests are most effective if the channel selected is equipped with coin service capability units; however, multiparty or single-party service units may be used with less complete test verification [no +130V (coin collect) or -130V (coin return)].</p> <p>Note 2: An assigned channel may be used, however, service will be denied to the assigned subscriber during test access. In this case proceed to Step 3.</p>
2	<p>At the RT, connect the 500-type telephone set to the subscriber side (drop side) of the corresponding channel unit as selected in Step 1.</p>
3	<p>At the RSB or local test cabinet, access the test line via an available test trunk in accordance with standard procedures.</p> <p>Requirement: The signature (seizure) of the central office channel unit should be evident from standard test (approximately 40-volts leakage tip to ground or 75-volts leakage tip to ground and ring to ground for coin channel units, with approximately 50-volts ballistic deflection).</p>
4	<p>Operate the REV and +STA key (also G key if coin unit).</p>

CHART 9 (Contd)

STEP**PROCEDURE**

Requirement 1: The VMA meter indicates a steady deflection of approximately 85 volts or greater.

Requirement 2: At the PGTC, the busy indicator lamp on the trunk unit lights simultaneously with Requirement 1.

- 5 Release the +STA key (and G key if operated).

Requirement: The VMA meter should indicate approximately 0 volts (except for any dc test pair leakage observed in the prerequisite).

- 6 By operating (and releasing) the REV key, with and without the G key operated, verify the test connection.

Requirement: The test connection should have approximately 0-volts leakage (except as observed in the prerequisite) with a ballistic indication corresponding to one bridged ringer. If an assigned channel has been used, the test connection will have the characteristics of the assigned subscriber station.

- 7 Release all keys.

- 8 Operate MONITOR key then the 3WO key and monitor the tone burst(s) in the headset.

Requirement: The tone burst(s) heard should correspond to the type of channel unit selected in Step 1 as follows:

CHANNEL TYPE	tone burst(s)
Single-party	One burst
Multiparty	Double burst
Coin	Triple burst

Note: If necessary to reverify the number of tone burst(s), release the 3WO key and then reoperate it.

- 9 With the MONITOR key released and the 3WO key operated, operate the REV, FEMF, and VM REV keys as required to obtain dc response.

CHART 9 (Contd)

STEP

PROCEDURE

Requirement: The VMA meter indications should be as shown for the type of channel unit selected and the keys operated as listed:

CHANNEL TYPE	KEY(s) OPERATED	VMA INDICATION
Single-party	(a) REV, 3WO (b) FEMF, 3WO	approx. 100 volts approx. 48 volts
Multiparty	(a) FEMF, REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts
Coin	(a) FEMF, REV, VM REV, 3WO (b) 3WO	approx. 48 volts approx. 0 volts

10 Release all keys.

11 Release test trunk.

Requirement: At the PGTC, the busy indicator lamp on the trunk unit identified in Step 4 (Requirement 2) should extinguish.

12 At the DF, ground the INHIBIT lead coming from the SLC-96 system.

13 At the RSB or local test cabinet, access the test line again.

14 Operate the REV and +STA keys (also G key if coin channel unit).

Requirement: The VMA meter indicates deflections at a 120 IPM rate.

15 Release all keys.

16 Release test trunk.

17 At the DF, remove the ground on the INHIBIT lead (placed in Step 12).

18 At the COT for the SLC-96 system, cause a major system alarm by removing the TRU unit on a shelf other than the one containing the channel unit under test.

Note: Removing the TRU unit will interrupt service to all subscribers assigned to that shelf. Ensure that no channel busy lights are illuminated before removing this unit. It may be necessary to perform this test during low traffic hours.

19 At the RSB or local test cabinet, access the test line again.

20 Operate the REV and +STA keys (also G key if coin channel unit).

CHART 9 (Contd)

STEP**PROCEDURE**

Requirement: The VMA meter indicates deflections at a 60 IPM rate.

- | | |
|----|--|
| 21 | Release all keys. |
| 22 | Release test trunk. |
| 23 | At the COT, restore the TRU unit to clear the major alarm condition. |
| 24 | Remove the test line connected in Step 1 and the 500-type telephone set connected in Step 2. |
| 25 | Return to Step 13 of Chart 1. |
-

CHART 10
INSTALLATION
TROUBLE-LOCATING GUIDE

CHART	STEP	REQT. (SEE NOTE)	MOST LIKELY CAUSE OF TROUBLE
2	5	1	Office alarm wiring; SM86
2	5	2	Office alarm wiring
2	6		Fuse panel wiring to PGTC; SM86; shelf wiring
2	7		SM86; fuse panel wiring to PGTC; shelf wiring
2	8		Fuse panel wiring to PGTC; shelf wiring
2	10	1, 2	SM88/88B; shelf wiring
2	11		SM88/88B; SM86
2	15		SM91B, SM92/92B or SM94/94B; shelf wiring; wiring to PGTC
2	17		SM91B, SM92/92B or SM94/94B; DF wiring; wiring to PGTC; SM88/88B, shelf wiring; SLC-96 channel unit; wiring from DF to SLC-96
2	18		SM91B, SM92/92B or SM94/94B; SM88/88B, shelf wiring
2	22	1, 2	SM87/87B; wiring to PGTC; shelf wiring
2	24	1	SM88/88B; SM87/87B; SM91B; SM92/92B; or SM94/94B; SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT); wiring from SLC-96 to PGTC; shelf wiring
2	24	2	SM91B; SM92/92B or SM94/94B
2	25		SM87/87B; SM88/88B; wiring from SLC-96 to PGTC; SLC-96 CTU (COT or RT); shelf wiring
2	26		DF wiring; wiring from SLC-96 to PGTC; test pair connections at RT.
2	28		SM88/88B; SM87/87B; SM86; shelf wiring; SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT); incorrect ringing voltage (SD-97760)
2	29		SM87/87B; SM88/88B; SM86; shelf wiring
2	31		SM87/87B; SM88/88B; SM91B; SM92/92B or SM94/94B
2	34		DF wiring; wiring from SLC-96 to PGTC; SLC-96 CTU (COT); SM88/88B; SM91B, SM92/92B or SM94/94B; shelf wiring
2	40		SM88/88B; SM87/87B; wiring from SLC-96 to PGTC; SLC-96 CTU (COT); shelf wiring
3	5	1	Office alarm wiring; SM86
3	5	2	Office alarm wiring
3	6		Fuse panel wiring to PGTC; SM86; shelf wiring
3	7		SM86; fuse panel wiring to PGTC; shelf wiring
3	8		Fuse panel wiring to PGTC; shelf wiring
3	10	1, 2	SM88/88B; shelf wiring
3	11		SM88/88B; SM86
3	15		SM91B, SM92/92B or SM94/94B; shelf wiring; wiring to PGTC
3	17		SM91B, SM92/92B or SM94/94B; DF wiring; wiring to PGTC; SM88/88B; shelf wiring; SLC-96 channel unit; wiring from DF to SLC-96
3	18		SM91B; SM92/92B or SM94/94B; SM88/88B; shelf wiring
3	22	1, 2	SM87/87B; wiring to PGTC; shelf wiring
3	24	1	SM88/88B; SM87/87B; SM91B; SM92/92B or SM94/94B; SLC-96 channel unit (COT or RT); wiring from SLC-96 to PGTC; shelf wiring

Note: Requirement number.

CHART 10 (Contd)

CHART	STEP	REQT. (SEE NOTE)	MOST LIKELY CAUSE OF TROUBLE
3	24	2	SM91B, SM92/92B or SM94/94B
3	25		SM87/87B; SM88/88B; wiring from SLC-96 to PGTC; SLC-96 CTU (COT or RT); shelf wiring
3	26		DF wiring; wiring from SLC-96 to PGTC; test pair connections at RT
3	28		SM88/88B; SM87/87B; SM86; shelf wiring; SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT); incorrect ringing voltage (SD-97760)
3	29		SM87/87B; SM88/88B; SM96; shelf wiring
3	31		SM87/87B; SM88/88B; SM91B; SM92/92B or SM94/94B
3	34		DF wiring; wiring from SLC-96 to PGTC; SLC-96 CTU (COT); SM88/88B; SM91B; SM92/92B or SM94/94B; shelf wiring
3	40		SM88/88B; SM87/87B; wiring from SLC-96 to PGTC; SLC-96 CTU (COT); shelf wiring
4	2		Fuse panel wiring to shelf; shelf wiring; wiring from expansion shelf to control shelf
4	3		SM89; fuse panel wiring to shelf; shelf wiring
4	4		SM89; fuse panel wiring to shelf; shelf wiring
4	5	1, 2	SM90; shelf wiring; wiring from expansion shelf to control shelf
5	5		SM92/92B, SM94/94B; DF wiring; wiring to PGTC
5	7		SM92/92B, SM94/94B; DF wiring; wiring to PGTC; shelf wiring; SLC-96 channel unit; wiring from DF to SLC-96
5	8		SM92/92B; SM94/94B; shelf wiring; SM88/88B; wiring to PGTC
5	13	1, 2	SM92/92B, SM94/94B; shelf wiring; wiring to PGTC; SM87/87B
5	14		SM92/92B, SM94/94B; wiring to PGTC; shelf wiring; SM87/87B
5	15		SM92/92B, SM94/94B; shelf wiring; DF wiring
5	17		SM92/92B, SM94/94B; shelf wiring; SM88/88B; SM87/87B
6	7	1, 2	SM87/87B; wiring to PGTC; shelf wiring
6	8		Wrong test trunk; DF wiring; SLC-96 channel unit; wiring from DF to SLC-96
6	9	1, 2	SM87/87B; SM88/88B; wiring to PGTC; SM91B, SM92/92B, SM94/94B; shelf wiring
6	10		SM87/87B; SM88/88B; SM91B, SM92/92B, SM94/94B; shelf wiring; wiring from SLC-96 to PGTC; wiring from SLC-96 to DF; DF wiring
6	11		SM91B, SM92/92B, SM94/94B; SM87/87B; shelf wiring; DF wiring; SLC-96 CTU (COT or RT)
6	13		SM87/87B; SM88/88B; shelf wiring; SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT)
6	14		SM87/87B; SM88/88B; SM86
6	16		SM87/87B; SM88/88B; SM91B; SM92/92B; SM94/94B
6	19		SM87/87B; SM88/88B; shelf wiring; wiring from SLC-96 to PGTC; SLC-96 CTU (COT)
7	7	1, 2	SM87/87B; wiring to PGTC; shelf wiring
7	8		Wrong test trunk; DF wiring; SLC-96 channel unit; wiring from DF to SLC-96
7	9	1, 2	SM87/87B; SM88/88B; wiring to PGTC; SM91B, SM92/92B, SM94/94B; shelf wiring
7	10		SM87/87B; SM88/88B; SM91B, SM92/92B, SM94/94B; shelf wiring; wiring from SLC-96 to PGTC; wiring from SLC-96 to DF; DF wiring

Note: Requirement number.

CHART 10 (Contd)

CHART	STEP	REQT. (SEE NOTE)	MOST LIKELY CAUSE OF TROUBLE
7	11		SM91B, SM92/92B, SM94/94B, SM87/87B; shelf wiring; DF wiring, SLC-96 CTU (COT or RT)
7	13		SM87/87B; SM88/88B; shelf wiring, SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT)
7	14		SM87/87B; SM88/88B; SM86
7	16		SM87/87B; SM88/88B; SM91B; SM92/92B; SM94/94B
7	19		SM87/87B; SM88/88B, shelf wiring, wiring from SLC-96 to PGTC; SLC-96 CTU (COT)
8	3		DF wiring; SLC-96 channel unit; wiring from DF to SLC-96
8	4	1, 2	SLC-96 channel unit (COT or RT), SLC-96 CTU (COT or RT) wiring to PGTC
8	5		Wiring to PGTC; SLC-96 CTU at the COT
8	6		DF wiring; test pair connections at RT, RT channel unit; CTU at both (COT or RT)
8	8		SLC-96 channel unit (COT or RT); wiring SLC-96 to PGTC; SLC-96 CTU (COT or RT)
8	14		DF wiring; wiring from SLC-96 to PGTC; SLC-96 CTU (COT); SM88/88B
8	20		Wiring from SLC-96 to PGTC; SLC-96 CTU (COT)
9	3		DF wiring; SLC-96 channel unit; wiring from DF to SLC-96
9	4	1, 2	SLC-96 channel unit (COT or RT); SLC-96 CTU (COT or RT); wiring to PGTC
9	5		Wiring to PGTC; SLC-96 CTU at the COT
9	6		DF wiring; test pair connections at RT; RT channel unit; CTU at both (COT or RT)
9	8		SLC-96 channel unit (COT or RT); wiring SLC-96 to PGTC; SLC-96 CTU (COT or RT)
9	14		DF wiring; wiring from SLC-96 to PGTC; SLC-96 CTU (COT), SM88/88B
9	20		Wiring from SLC-96 to PGTC; SLC-96 CTU (COT)

Note: Requirement number.

CHART 11

SM88 OR SM88B MAINTENANCE CODES AND CLEARING PROCEDURES

DIGIT DISPLAYED	MEANING	CLEARING PROCEDURE STEP NUMBER
0	Controller Not Operating Properly	1
1	Permanent Seize	2
2	Permanent Seize Busy	2
3	Permanent Maj Alarm (TMAJ)	2
4	Permanent Tone Detect	3
5	Permanent Dedicated Tone Detect	4
6	Permanent SLV A	5
7	Permanent SLV B	5
8	Permanent SLV C	5
9	Permanent SLV D	5
A	Tester "A" Failed Self-Test	6
B	Tester "B" Failed Self-Test	6
C	Tester "C" Failed Self-Test	6
D	Tester "D" Failed Self-Test	6
E	Tester "C" Failed Self-Test Dedicated	7
F	Tester "D" Failed Self-Test Dedicated	7

STEP

PROCEDURE

- 1 If the maintenance display indicates a zero (0), the controller is not operating properly. Remove and reinsert the SM88/88B control card. If this does not clear the display, replace the SM88/SM88B control card.
- 2 A maintenance display of one (1), two (2), or three (3) indicates a stuck seize, seize busy, or T Maj respectively in the interface between the PGTC and the SLC-96 system. To clear, successively remove the CTU units (WN10) from the SLC-96 systems until the alarm retires. Replace the CTU (WN10) that causes the alarm to retire. If removing all CTUs fails to retire the alarm, replace the SM88/88B control card in the PGTC. If the alarm

CHART 11 (Contd)

STEP

PROCEDURE

persists, the indicated wire is grounded in the interface cable and appropriate dc troubleshooting methods must be used.

- 3 A maintenance display of four (4) indicates a permanent tone detect condition. Remove the SM92/92B or SM94/94B trunk cards one at a time until the alarm clears. Replace the SM92/92B or SM94/94B that causes the alarm to clear. If removing all SM92/92B or SM94/94B units fails to clear the alarm, replace the SM88/SM88B control card.
 - 4 A maintenance display of five (5) indicates a permanent tone detect condition from the SM91B trunk card. To clear replace the SM91B. If this fails to clear the alarm or if no SM91B is used in the system, replace the SM88/88B control card.
 - 5 A maintenance display of six (6), seven (7), eight (8), or nine (9) indicates that SLVA, SLVB, SLVC, or SLVD, respectively, is stuck in the interface between the PGTC and the SLC-96 system. To clear, successively remove the CTU units (WN10) from the SLC-96 systems until the alarm clears. Replace the WN10 that causes the alarm to retire. If removing all CTUs fails to retire the alarm, replace the SM88/88B control card in the PGTC. If the alarm persists, the indicated wire is grounded in the interface cable between the PGTC and the SLC-96 system and appropriate dc troubleshooting methods must be used.
 - 6 A maintenance display of A, B, C, or D indicates that the SM87/87B tester card in locations P02, P03, P04, or P05 respectively, has failed. To clear the alarm, replace the indicated SM87/87B tester card.
 - 7 A maintenance display of E or F indicates that the SM87/87B tester card in locations P04 or P05 respectively has failed when dedicated to an SM91B trunk card. Replace the indicated SM87/87B and clear the alarm by removing and reinserting the SM91B trunk card.
-

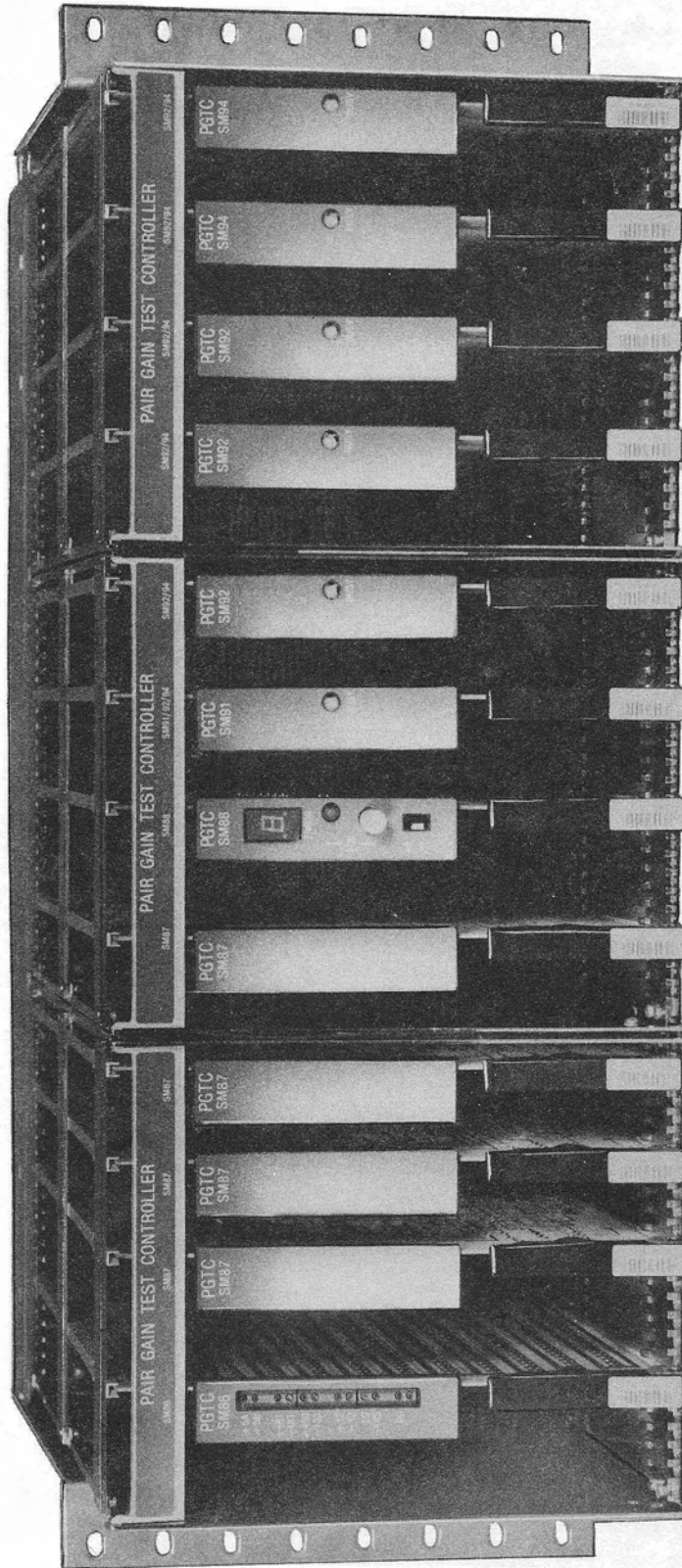


Fig. 1—J1C142A-(), LI PGTC Control Shelf

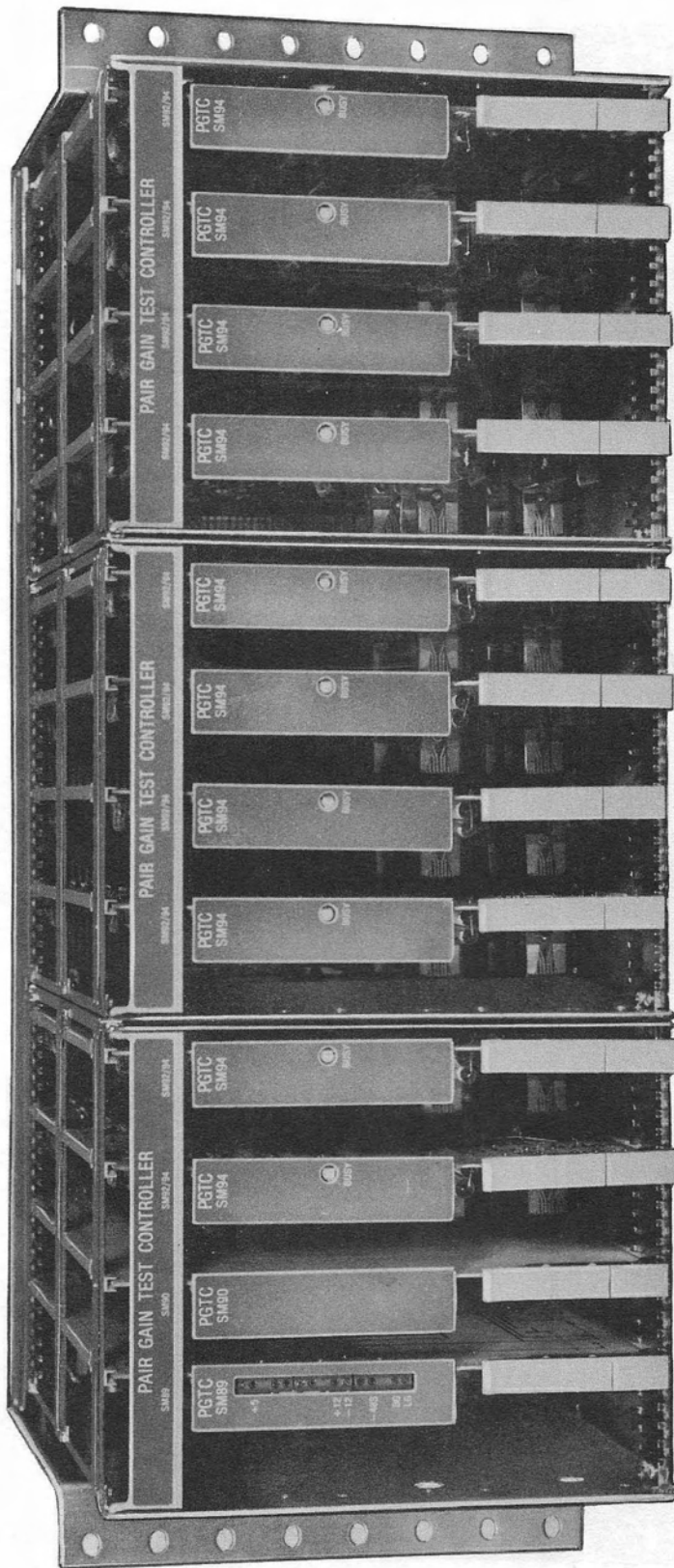


Fig. 2—JIC142A-(), L2 PGTC Expansion Shelf

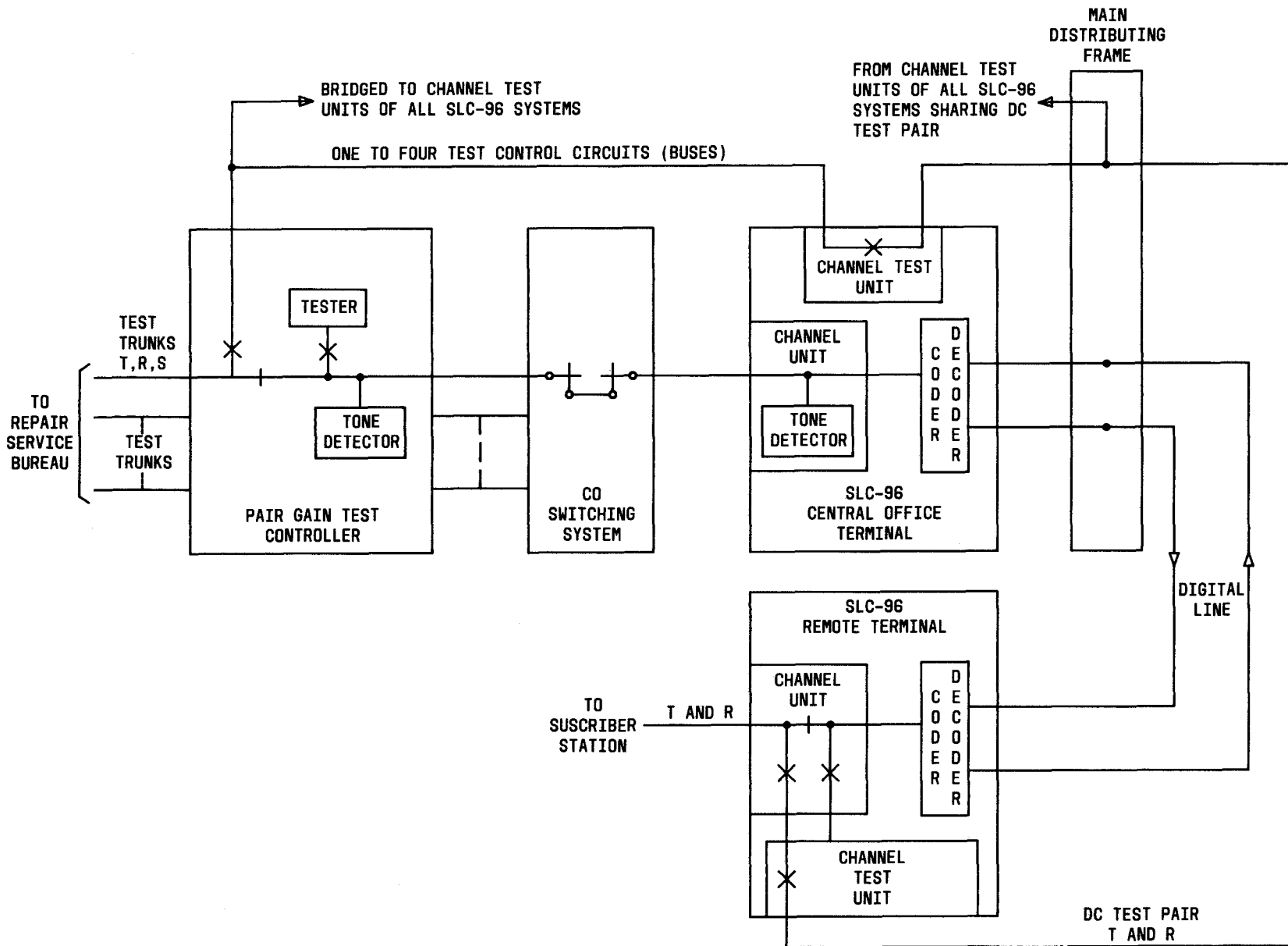


Fig. 3—Typical Test Connection Through PGTC

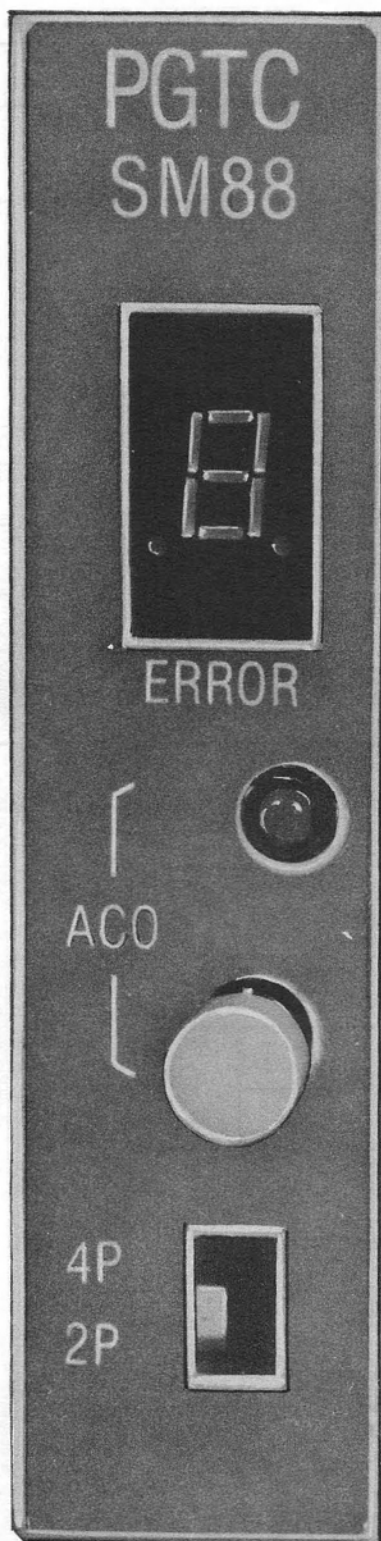


Fig. 4—PGTC-Error (Trouble) Display

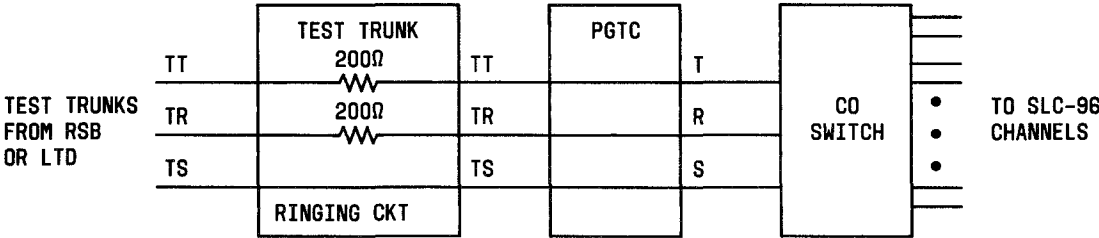


Fig. 5—CO Equipped With SD-96474-01 Ringing Circuit