STUCK SENDER TRUNK IDENTIFICATION (SSTI) FEATURE DESCRIPTION, OPERATION, AND TROUBLE LOCATING NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section covers the description, operation, and trouble locating procedures for the Stuck Sender Trunk Identification (SSTI) feature for No. 1 crossbar offices.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The SSTI feature provides the circuitry for automatic tracing and recording of stuck originating senders and their associated trunks.

2. DESCRIPTION

2.01 The SSTI feature uses four new circuits and shares usage of two existing frames, the originating sender test (OST) and automatic test circuit for incoming trunks (ITT) to control the SSTI functions. Fig. 1 displays how the SSTI feature connects to the existing office equipment.

2.02 The SSTI feature provides for controlled sharing of central office test facilities. During the SSTI process, the OST and ITT test frame usage is limited to SSTI functions. If the OST and ITT frames have other tests in progress, the SSTI circuits will wait until the tests are complete before seizing the test frames.

Sender Test Connector Control (STCC) Circuit (SD-28102-01)

2.03 The STCC circuit detects stuck senders by monitoring the J leads of the sender make-busy (SMB) frame. It also monitors the state of the OST to gain control and set up to the stuck sender for application of tracing tone to the sender transmission path.

2.04 The STCC provides SG keys that can be operated to deny access of subgroups of ten senders to SSTI when maintenance is to be performed on them. The operation of the SG key will light the SG lamp.

Trunk Scan Control Circuit (TSCC) (SD-28101-01)

2.05 The TSCC monitors the ITT to gain control of the Incoming Trunk Connector (ITC) crossbar switches, to bridge all outgoing trunk transmission paths, ten at a time, with tone detectors for locating and identifying the trunk connected to the stuck sender being traced.

2.06 The TSCC also provides means for automatic and/or manual testing of tone detectors.

2.07 Various controls are provided for operation and maintenance of the TSCC. The controls and their definitions are listed in Table A.

Printer and Printer Control (PPC) Circuit (SD-28103-01)

2.08 The PPC circuit provides for printing trunk and sender identification data, prefaced with time and date, at the conclusion of a stuck sender trace. Test records may also be printed.

2.09 The printer is a commercial impact type printer used to print parallel binary coded decimal SSTI data in nine numeric columns and three columns of special characters. (See Fig. 2 for example of stuck sender printout.)

2.10 If the office is equipped with Automatic Trouble Analysis (ATA), the TSCC circuit provides controls, when operated, that allow collected data to be printed on the printer, or sent to

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Maintenance Data Transmitter (MDT) of ATA, or both.

2.11 Various controls and indicators are provided for operation, maintenance, monitoring, or testing of the PPC. The controls and their definitions are listed in Table B, and the indicators are listed in Table C.

Trap Circuit (SD-28120-01)

2.12 The trap circuit is used to set a three-digit sender identification number or a two-digit subgroup number that will be compared with all senders initiating SSTI traces.

2.13 It is also used to set a five-digit trunk identification number or a three-digit trunk level number that will be compared with all trunks involved in completed SSTI traces.

2.14 The circuit traps and prevents the release of the trapped equipment, which locks out the associated sender subgroup, and indicates that the trap has been activated.

2.15 It prevents reuse of that portion of the trap circuit on which a trap has been set, until it is manually reset.

2.16 Controls and indicators for the operation, maintenance, and monitoring of the trap circuit are described in Tables D and E.

Associated Equipment

2.17 The originating sender test (OST) frame has been modified to add keys and lamps to provide control and trouble indications for the SSTI. The controls and their definitions are listed in Table F, and the lamps are listed in Table G.

2.18 The automatic test circuit for incoming trunk (ITTs) has been modified with the addition of one key and lamp. They are as follows:

- The automatic override stuck sender (AOSS) key is provided to cancel ITT busy and trouble timing and permit control advance of test frame for SSTI use .
- The stuck sender tracing (SST) lamp is provided to indicate that the TSCC has seized the test frame.

3. METHOD OF OPERATION

3.01 With the SSTI feature, the procedure to locate and identify a stuck sender is as follows (Fig. 3):

(a) A sender becomes stuck.

(b) After a 2-second validation delay, STCC proceeds with stuck sender tracing.

(c) The STCC circuit bids for and gains control of OST to set up to stuck sender for application of tracing tone.

(d) The STCC circuit signals the TSCC to initiate a scan of all outgoing trunks.

(e) The TSCC bids for and gains control of ITT and ITC.

(f) Trunk transmission paths are switched to TSCC tone detectors until tracing tone is detected.

(g) The TSCC signals the PPC circuit that trace is completed, and a record of trace is required.

(h) The PPC circuit prints a record of time and date of trace, sender identification number, originating marker group number, and trunk identification number.

(i) If office is equipped with ATA, the TSCC initiates transfer of stuck sender data to the MDT.

(j) Selection of means of recording SSTI identification data is made with the MTO/PO switch (see Table A).

4. TROUBLE LOCATING PROCEDURE

A. Alarms

4.01 When a failure occurs in the SSTI feature, a minor alarm will sound with appropriate lamp indication provided at OST to aid in trouble locating. These lamps and their definitions are listed in Table G.

4.02 Audible alarms are retired by the operation of OST SSAR key.

4.03 See Fig. 4 for trouble-locating procedures for troubles indicated by an alarm.

B. PPC Circuit Alarms

4.04 The OST PF lamp lights and a minor alarm sounds when a failure occurs in the PPC circuit or operation with MDT fails. Indicator lamps light at the PPC circuit to display the cause of the alarm condition. These lamps and their definitions are listed in Table C.

4.05 Alarm and indicator conditions are reset by operation of PPC ALM RLS switch.

C. PPC Circuit Pack Replacement

4.06 If a circuit pack is suspected of causing troubles and must be replaced, power module (A1130) must be removed prior to removing circuit pack and replaced after replacing circuit pack.

TABLE A

TRUNK SCAN CONTROL CIRCUIT CONTROLS

CONTROL	MEANING	DEFINITION
MB	Make Busy	Removes circuit from service.
LT	Lamp Test	Provides a lamp test for all detector indicators.
MDC	Manual Detector Check	Performs a test to verify ability of selected detectors to respond to system tracing tone.
AR	Alarm Release	Releases DF alarm and restores circuit to normal operation.
MTO (See Note)	Maintenance Data Transmitter Only	Provides for transmission to maintenance data transmitter (MDT) only without printer operation.
PO (See Note)	Printer Only	Provides for printer operation only without transmission to maintenance data transmitter (MDT).
DS	Detector Selection	Provides for selecting a detector for test purposes.

Note: If neither MTO or PO selected (switch at center position), then SSTI records will be made at both the printer and the MDT.

TABLE B

PRINTER CONTROL UNIT CONTROLS

CONTROL	DEFINITION
MAKE BUSY	Makes printer and printer control busy.
ALM RLS	Resets alarm condition.
ADV PAPER	When operated momentarily, advances paper one line; when held operated, continuously advances paper.
TIME SET	Advances selected time and date column to set current time and date.
DATA PWR	Turns +5V on and off to data conversion circuits.
PRINT TEST	Provides a line test of printer to show it is functional.
LAMP TEST	Tests BUSY, ALM, PRINT TEST, PRINT and NO PRINT indicators.
CLK/CAL UPDATE	Selects proper columns to set current time and date.

TABLE C

PRINTER CONTROL UNIT STATUS INDICATORS

INDICATOR	DEFINITION
BUSY	Indicates that the PPC was made busy automatically if the ALM indicator is also on or that PPC was made busy with the MAKE BUSY switch if the ALM indicator is not on.
ALM	Indicates that a printer failure has caused an alarm condition.
PWR INT	Indicates that an interruption of primary power had occurred with power now restored. (The time and date circuit must be checked and updated if required.)
DATA PWR	Indicates +5V is present to the data conversion circuit boards.
PRINT TEST	Indicates a print test print cycle is in progress.
PRINTER PWR	Indicates that the printer power supply (+30V) is present.
PAPER OUT	Indicates that the alarm condition was caused by the printer running out of paper.
NO PRINT	Indicates that the printer failed a print test and caused an alarm condition.
READY	Indicates that the printer is functional with paper loaded and that the DATA PWR switch is not turned off.
PRINT	Indicates a print cycle is in progress.

TABLE D

TRAP CIRCUIT LAMPS

LAMP	MEANING	DEFINITION
SDR TRAP	Sender Trap	Indicates a match has occurred on a sender or sender sub-group corresponding to trap circuit switch settings.
TRK TRAP	Trunk Trap	Indicates a match has occurred on a trunk or trunk level corresponding to trap circuit switch settings.

TABLE E

TRAP CIRCUIT KEYS AND SWITCHES

KEY/SWITCH	MEANING	DEFINITION
SSG	Stuck Sender Group	Selects the originating sender test frame connector switch group number corresponding to the sender on which trap is desired.
SSS	Stuck Sender Select	Selects the originating sender test frame connector switch select number corresponding to the sender on which trap is desired.
SSH	Stuck Sender Hold	Selects the originating sender test frame connector switch hold number corresponding to the sender on which trap is desired.
SG	Sub-Group	Enables the group and select portions of the trap circuit sender coincidence circuit. A trap will occur on any sender in the sub-group selected on the SSG and SSS switches.
SDR	Sender	Enables the group, select, and hold portions of the trap circuit sender coincidence circuit. A trap will occur only on the sender selected by the SSG, SSS, and SSH switches.
THT, THU	Trunk Hold Tens and Trunk Hold Units	Selects the tens and units digits of the trunk hold number corresponding to the trunk on which trap is desired.
TGT, TGU	Trunk Group Tens and Trunk Group Units	Selects the tens and units digits of the trunk group number corresponding to the trunk on which trap is desired.
TS	Trunk Select	Selects the trunk select number corresponding to the trunk on which trap is desired.
TL	Trunk Level	Enables the group and select portions of the trap circuit trunk coincidence circuit. A trap will occur on any trunk in the level selected on the TGT, TGU, and TS switches.
TRK	Trunk	Enables the group, select, and hold portions of the trap circuit trunk coincidence circuit. A trap will occur only on the trunk selected by the TGT, TGU TS, THT, and THU switches.
STR	Sender Trap Release	Releases the sender trap lockout circuit to restore circuit to normal.
TTR	Trunk Trap Release	Releases the trunk trap lockout circuit to restore circuit to normal.

TABLE F

ORIGINATING SENDER TEST (OST) FRAME KEYS

KEY	MEANING	DEFINITION
RLS	Release	Releases sender test connector control circuit.
CANCSS	Cancel Stuck Sender	Disables sender test connector control circuit and prevents SSTI from seizing OST.
SSAR	Stuck Sender Alarm Release	Retires audible alarms.
SGRLS	Sender Sub-Group Release	Restores all but manually locked out sub-groups to allow access to SSTI.

TABLE G

ORIGINATING SENDER TEST (OST) FRAME LAMPS

LAMP	MEANING	DEFINITION
PF	Peripheral Failure	Indicates peripheral failure in printer and printer control circuit or maintenance data transmitter.
TO	Time Out	Indicates an overall timeout of 120 seconds has occurred.
SS	Stuck Sender	Indicates sender test connector control circuit has seized OST.
MTR	Manual Trace Required	Indicates a trap is activated or a trunk could not be found with an associated stuck sender and that a manual trace is required to locate linkage problems.
SGPO	Subgroup Primed Out	Indicates that identification to one or more subgroups of senders has been locked out and the subgroup is primed out.
TFB	Trunk Frame Busy	Incoming trunk test frame is busy.
DF	Detector Failure	Indicates that a detector failed tone detector tests.
TRAP	Trap Activated	Indicates that equipment number selected at trap circuit has been involved in an SSTI trace and the sender sub-group has been locked out. An MTR lamp will accompany this indication.

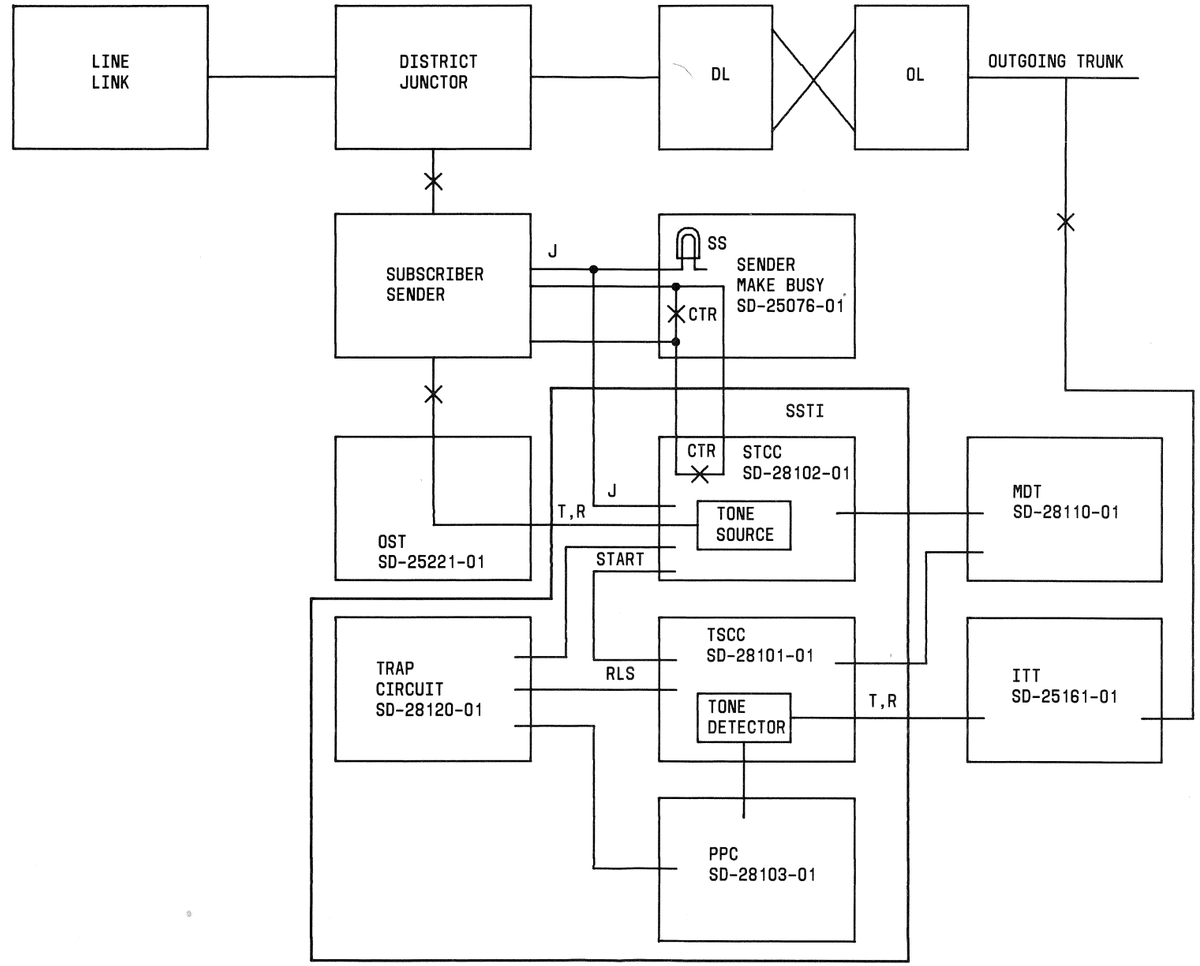
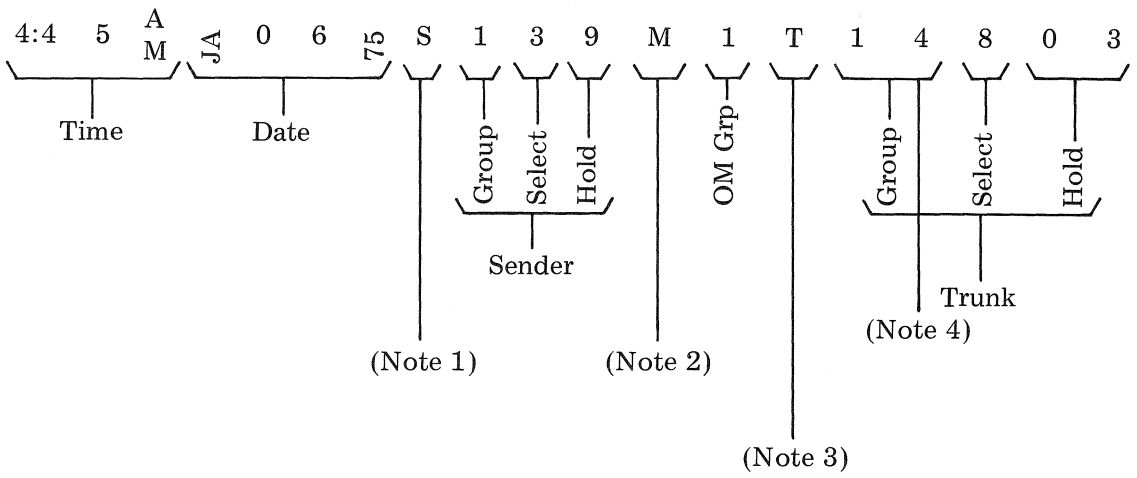


Fig. 1—Stuck Sender Trunk Identification (SSTI) Feature



Note 1: S= Stuck Sender; T= Test; U= Unexpected Loss of Stuck Sender.

Note 2: M= Originating Marker; G=Detector Test — All Tone Detectors good; B= Detector Test — At least one Tone Detector bad.

Note 3: T= Trunk; B= ITT Busy; D= Tone Detector Test.

Note 4: Detector Test — Number of Detector that failed Detector Test.

Fig. 2—Example of Stuck Sender Printout

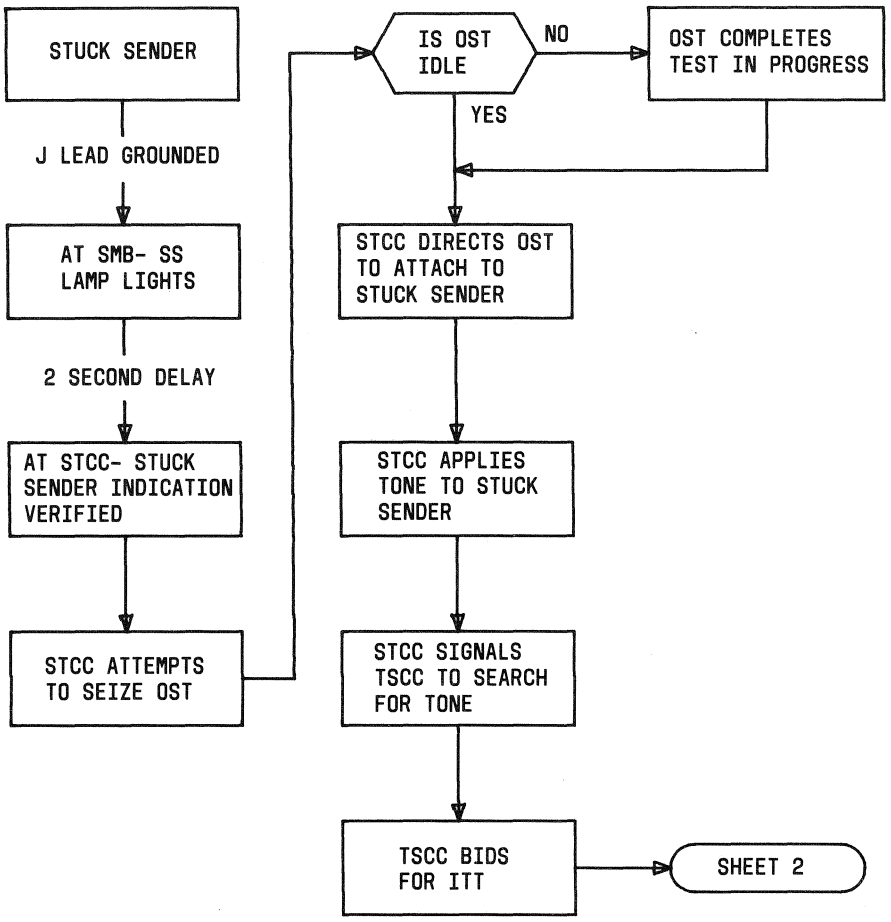


Fig. 3—SSTI Feature Method of Operation (Sheet 1 of 5)

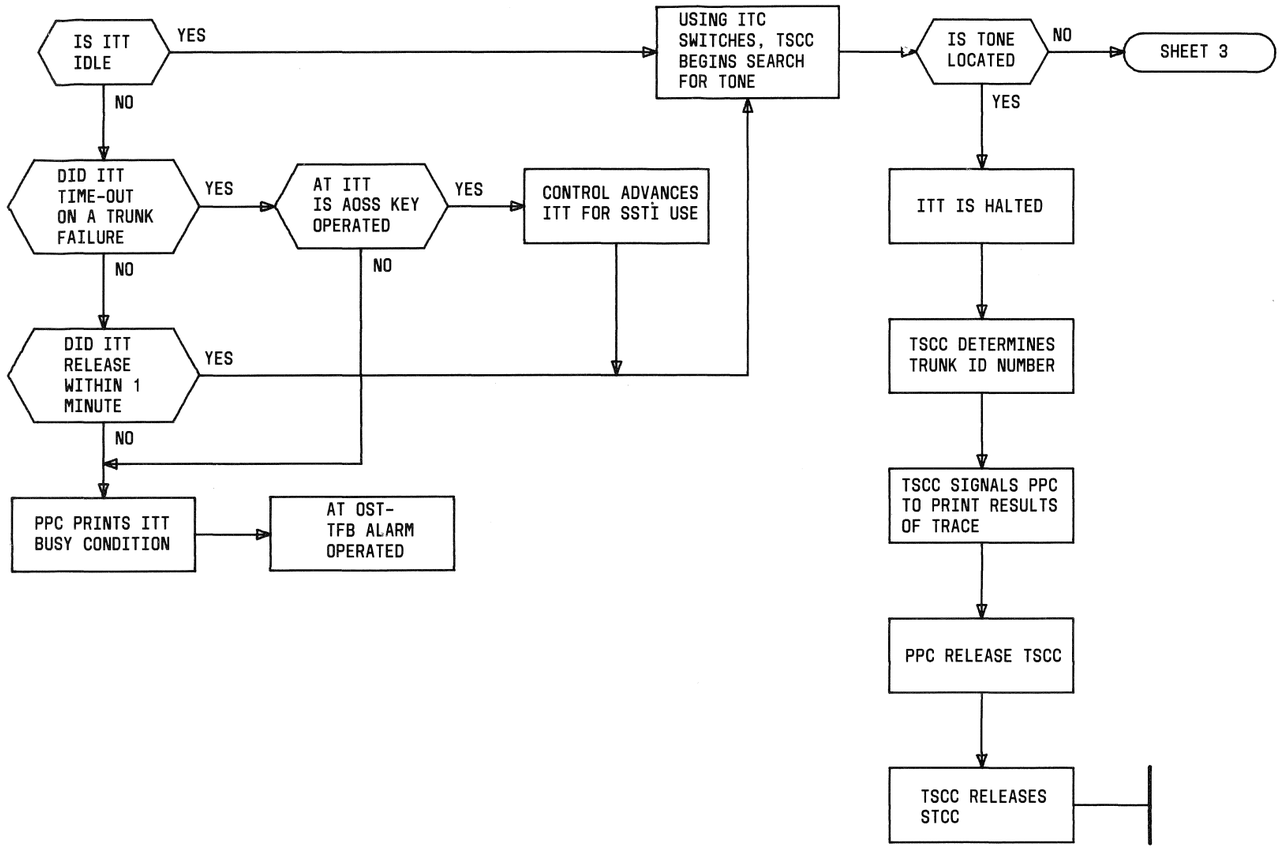


Fig. 3—SSTI Feature Method of Operation (Sheet 2 of 5)

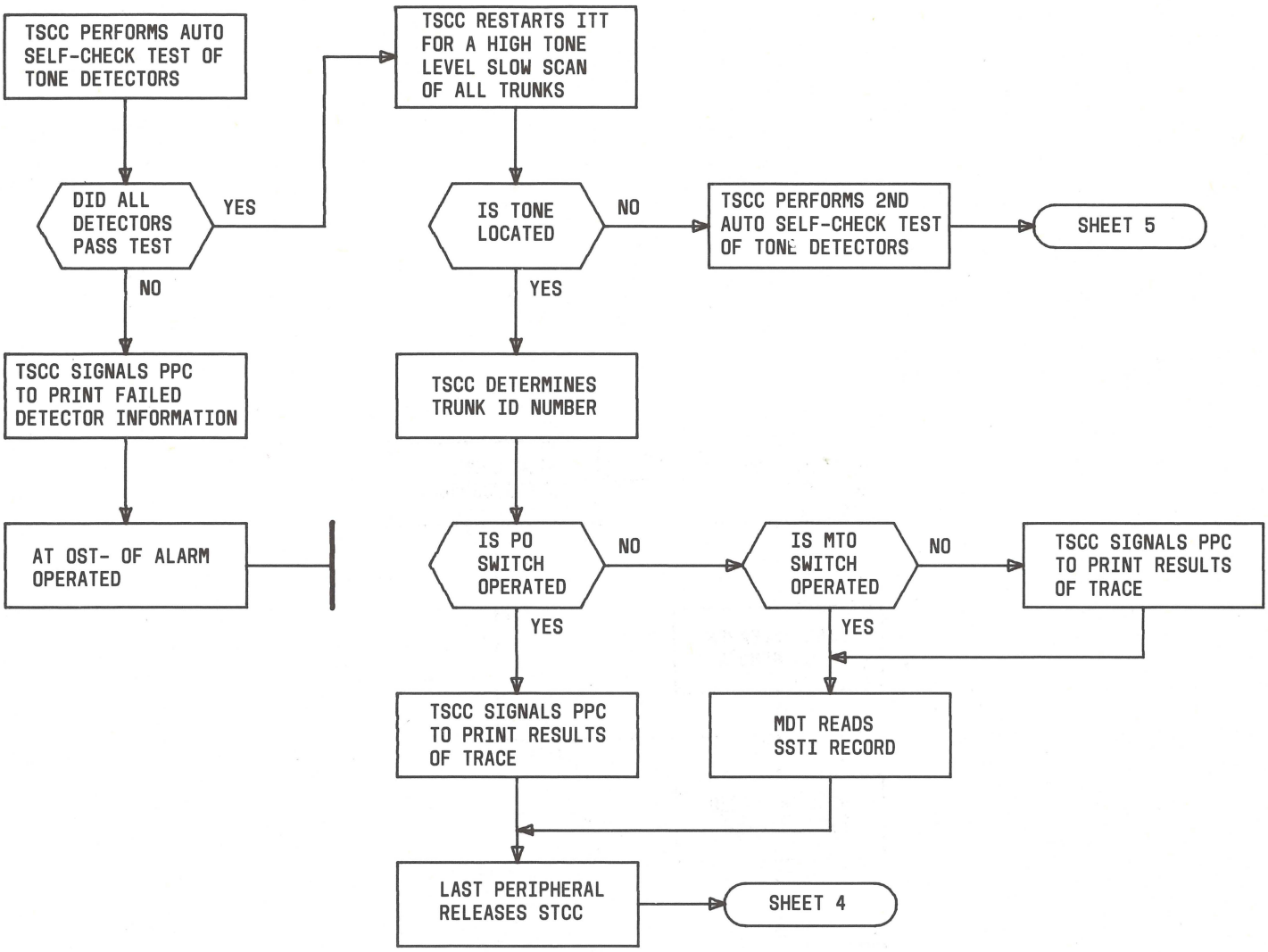


Fig. 3—SSTI Feature Method of Operation (Sheet 3 of 5)

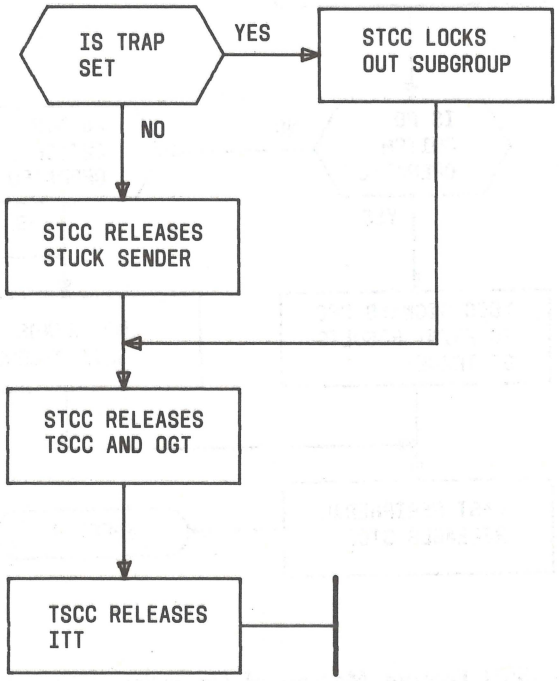


Fig. 3—SSTI Feature Method of Operation (Sheet 4 of 5)

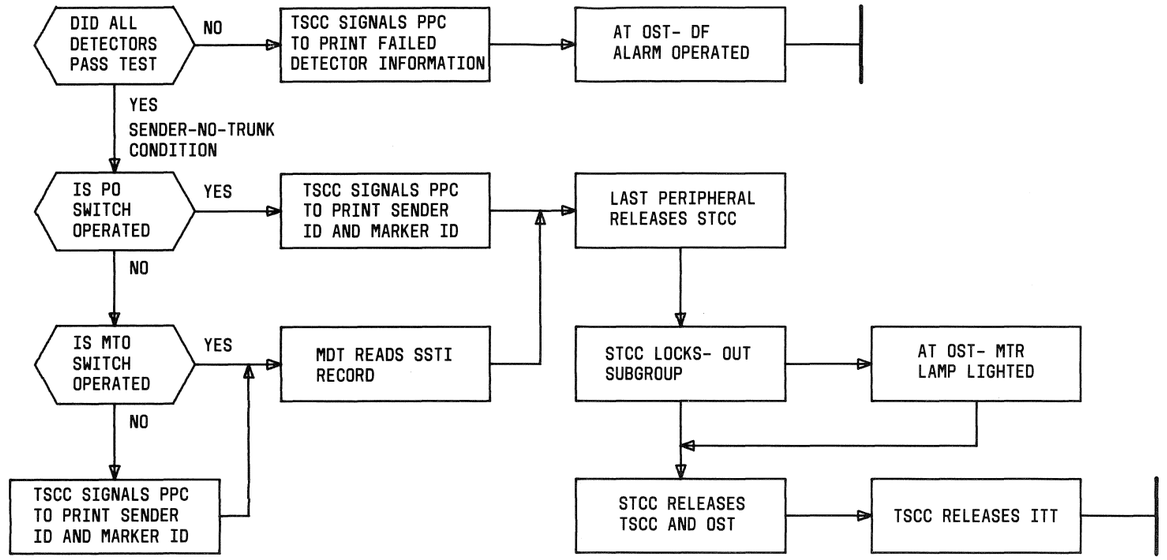


Fig. 3—SSTI Feature Method of Operation
(Sheet 5 of 5)

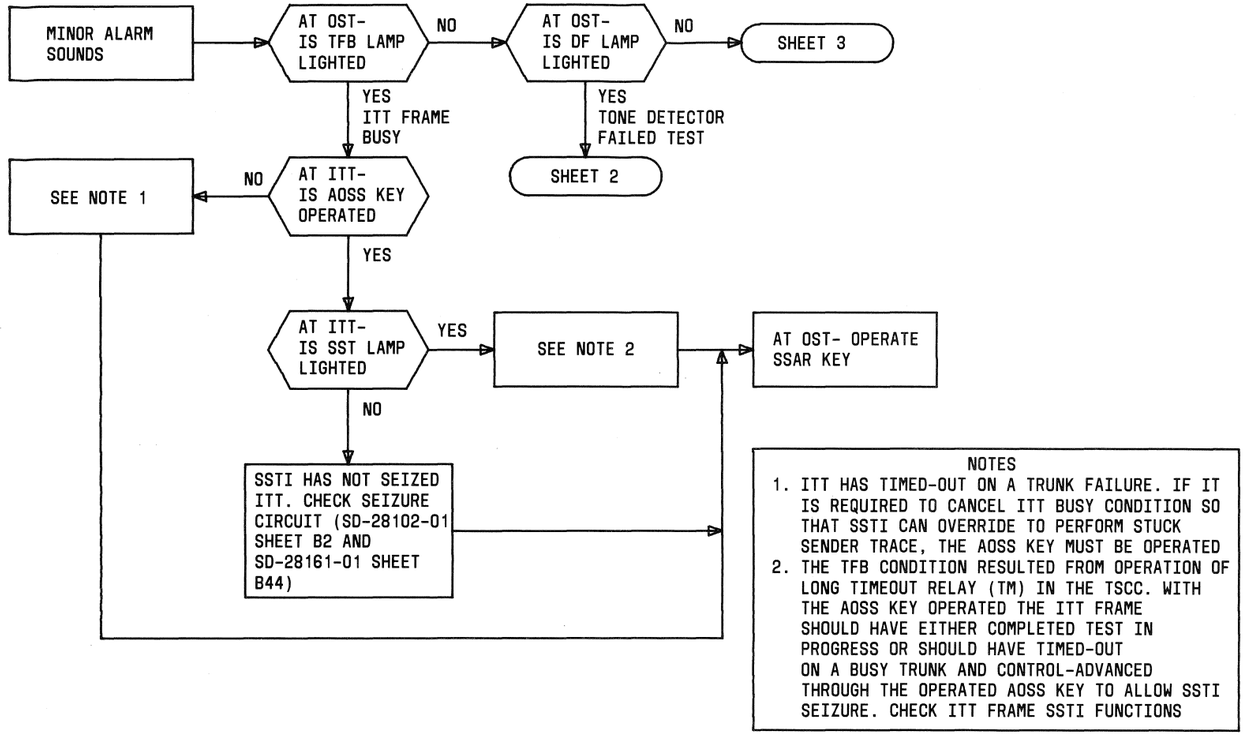


Fig. 4—Trouble Locating Procedure (Sheet 1 of 4)

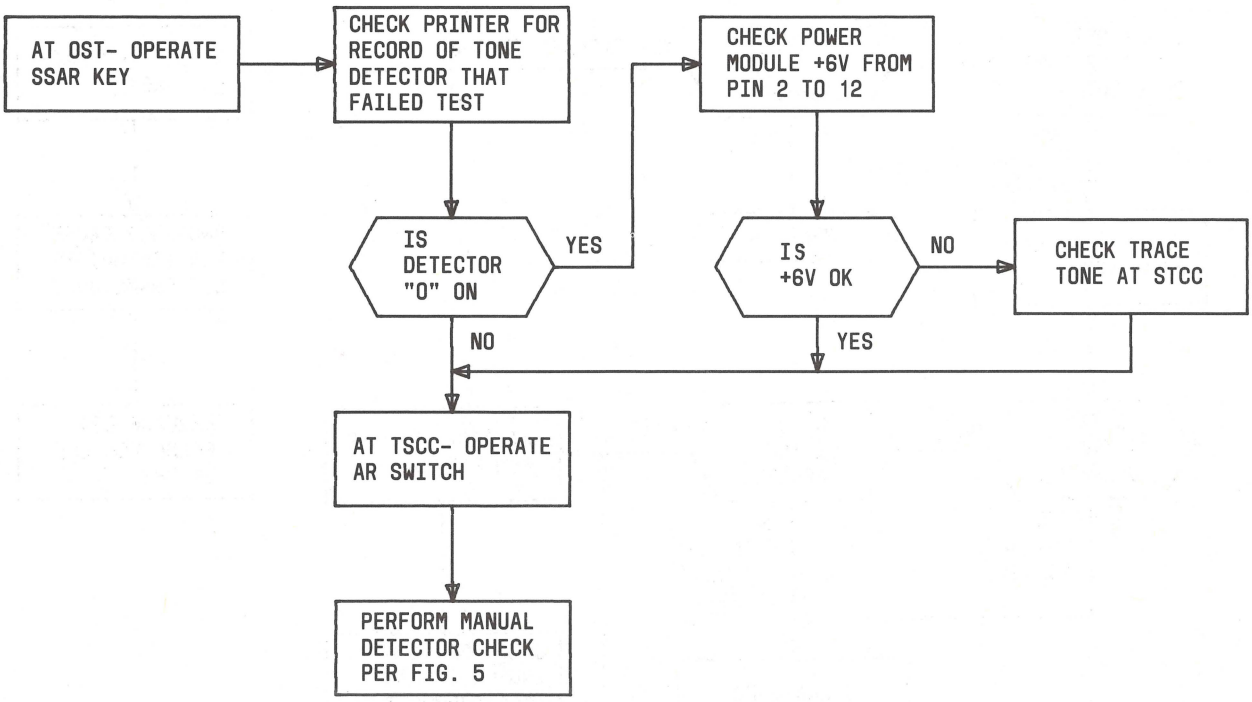


Fig. 4—Trouble Locating Procedure (Sheet 2 of 4)

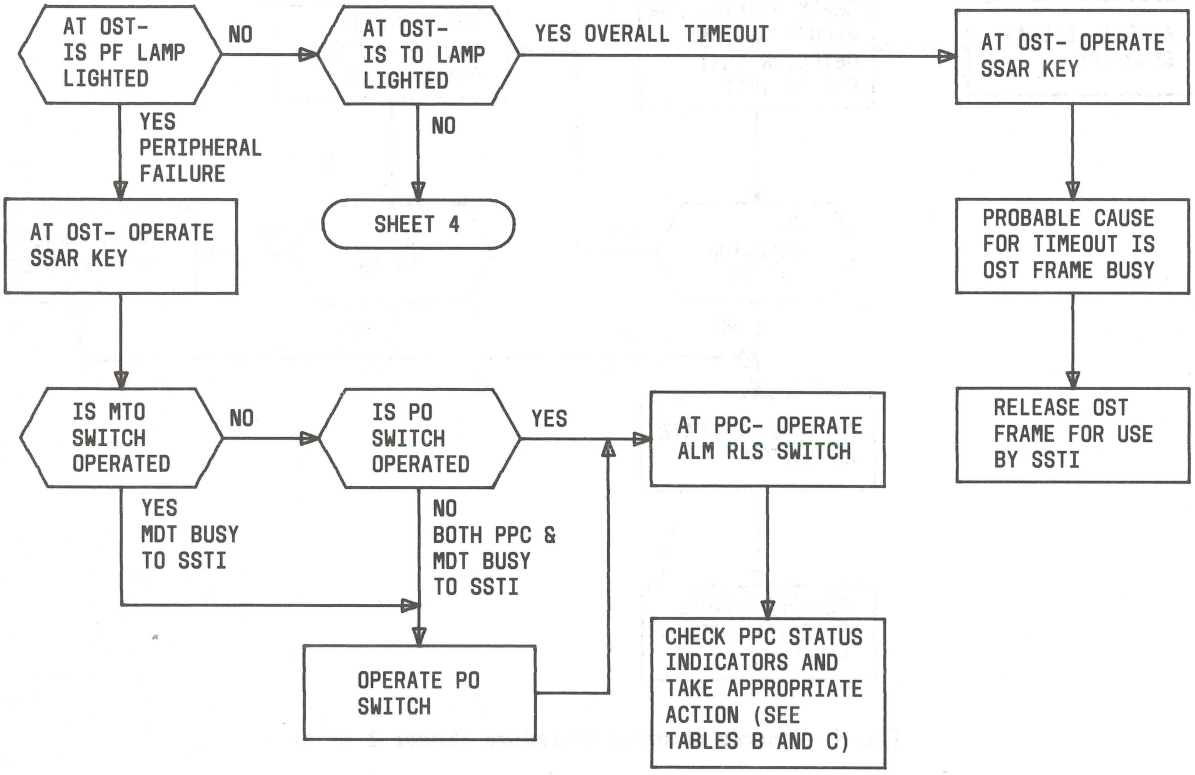


Fig. 4—Trouble Locating Procedure (Sheet 3 of 4)

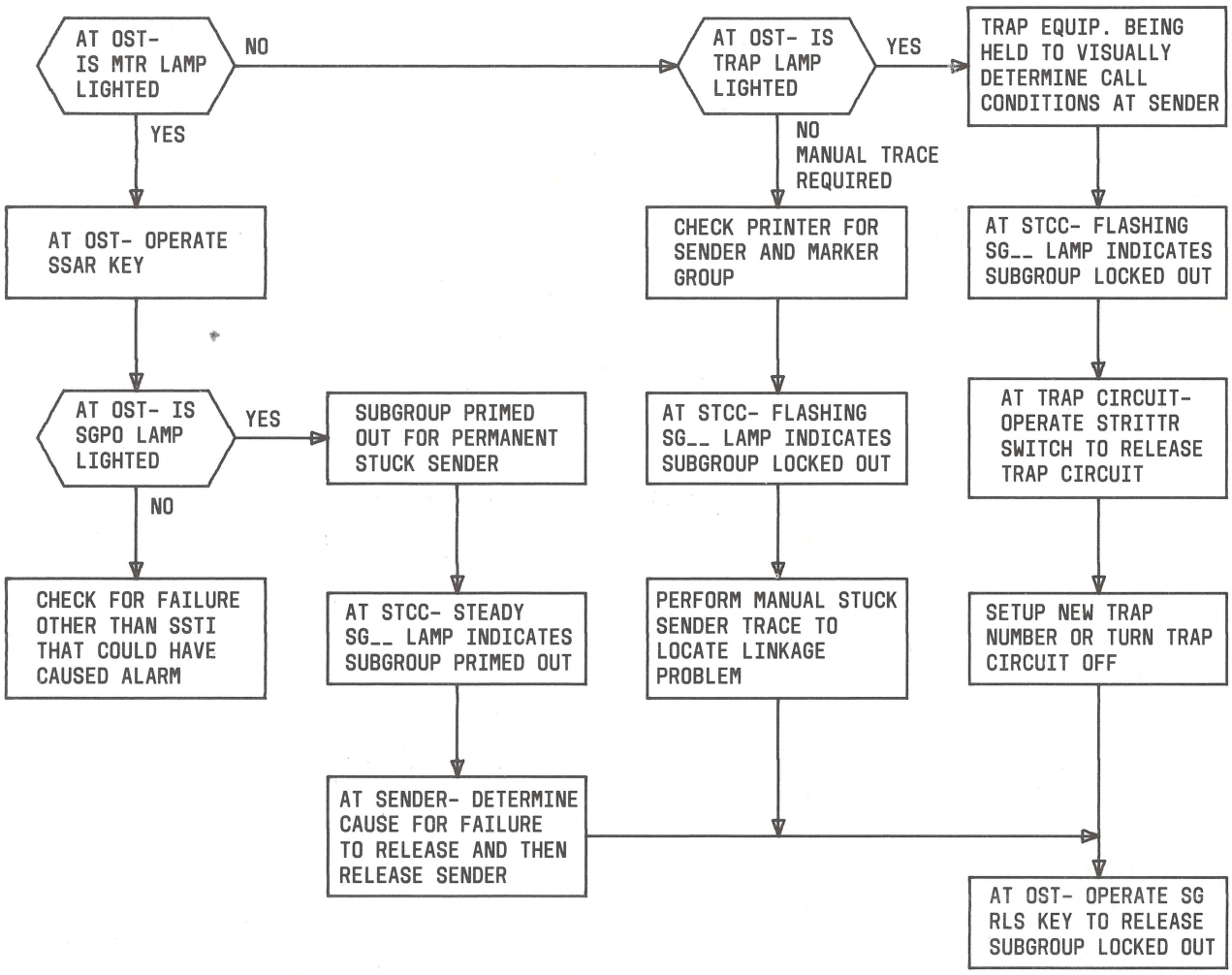


Fig. 4—Trouble Locating Procedure (Sheet 4 of 4)

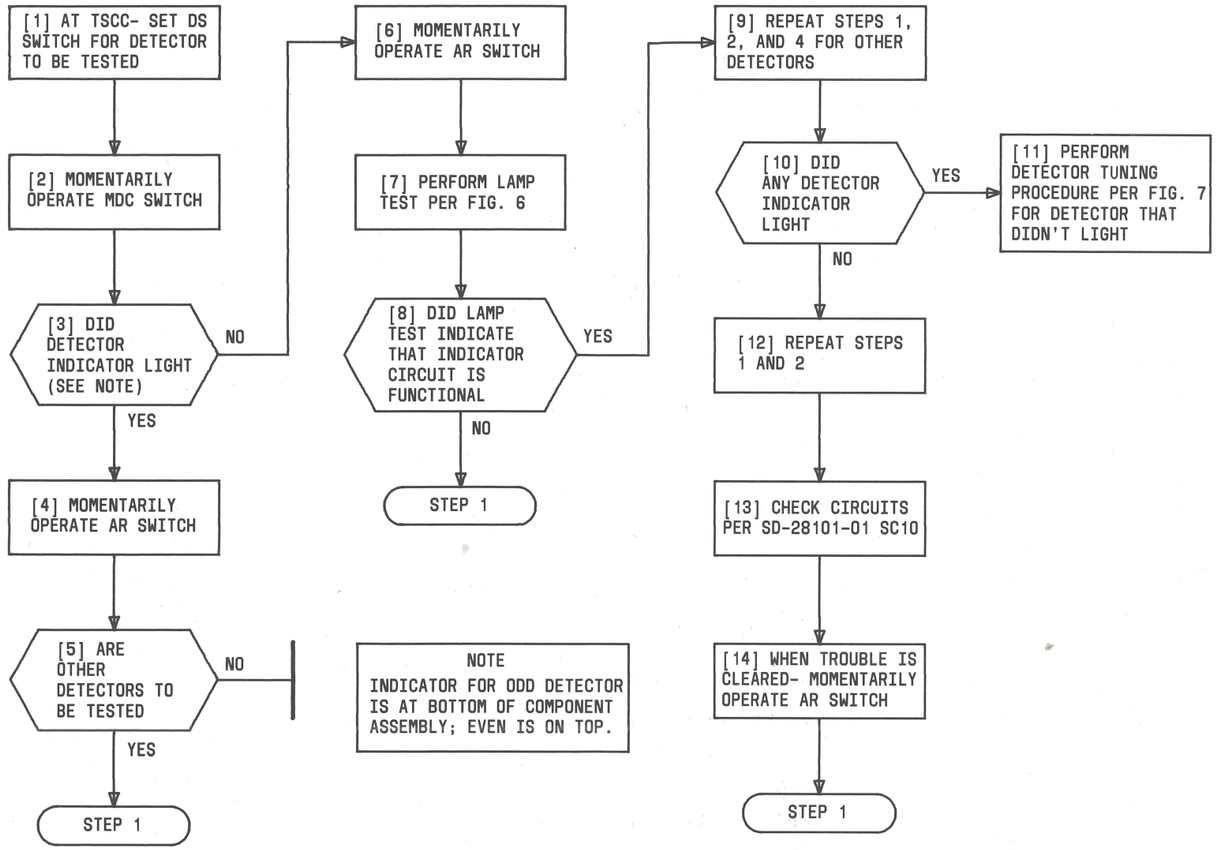


Fig. 5—Manual Detector Check When Circuit is Idle

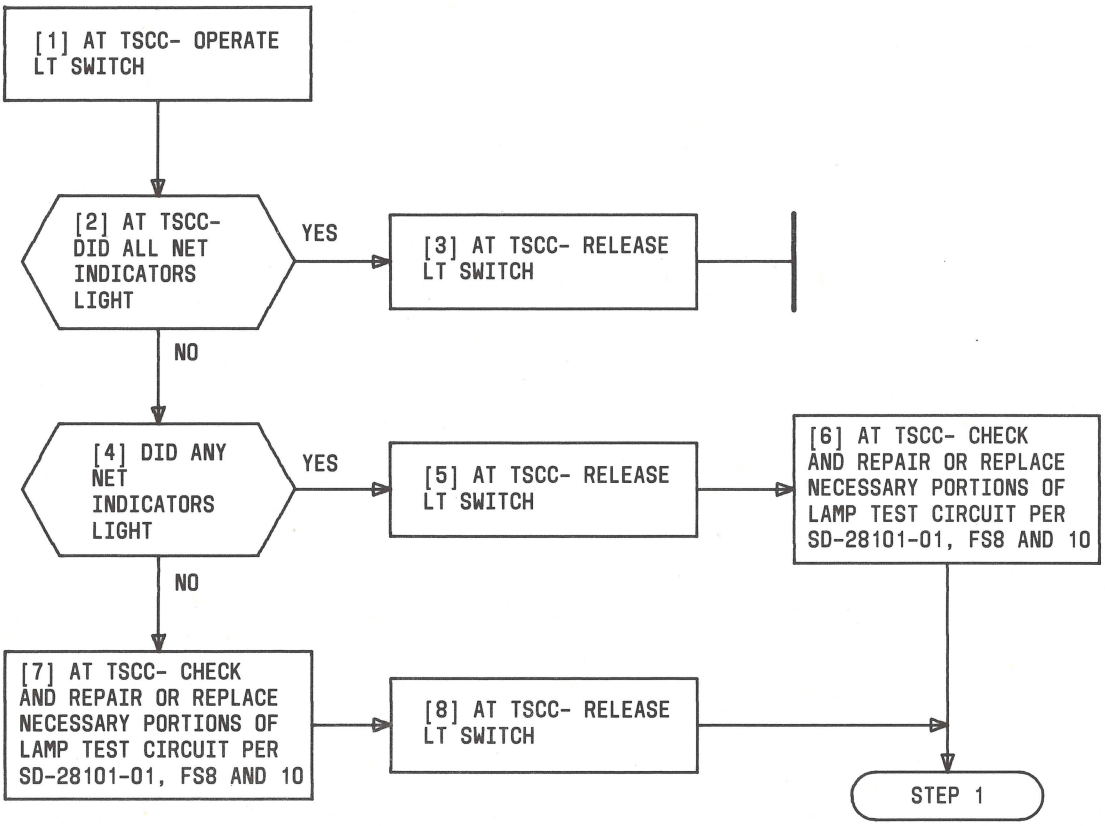


Fig. 6—Lamp Test When Circuit is Idle

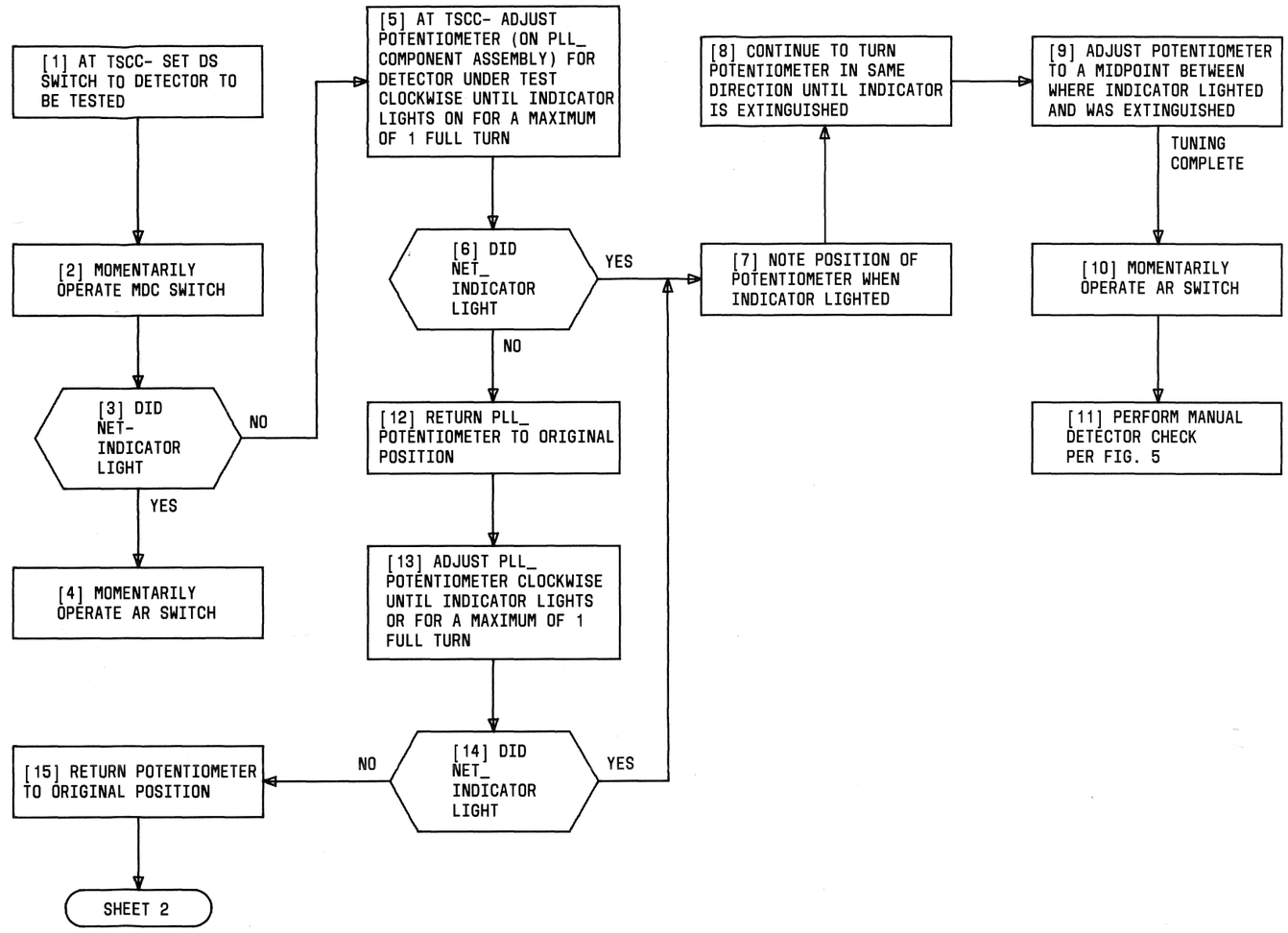


Fig. 7—Detector Tuning When Circuit is Idle (Sheet 1 of 2)

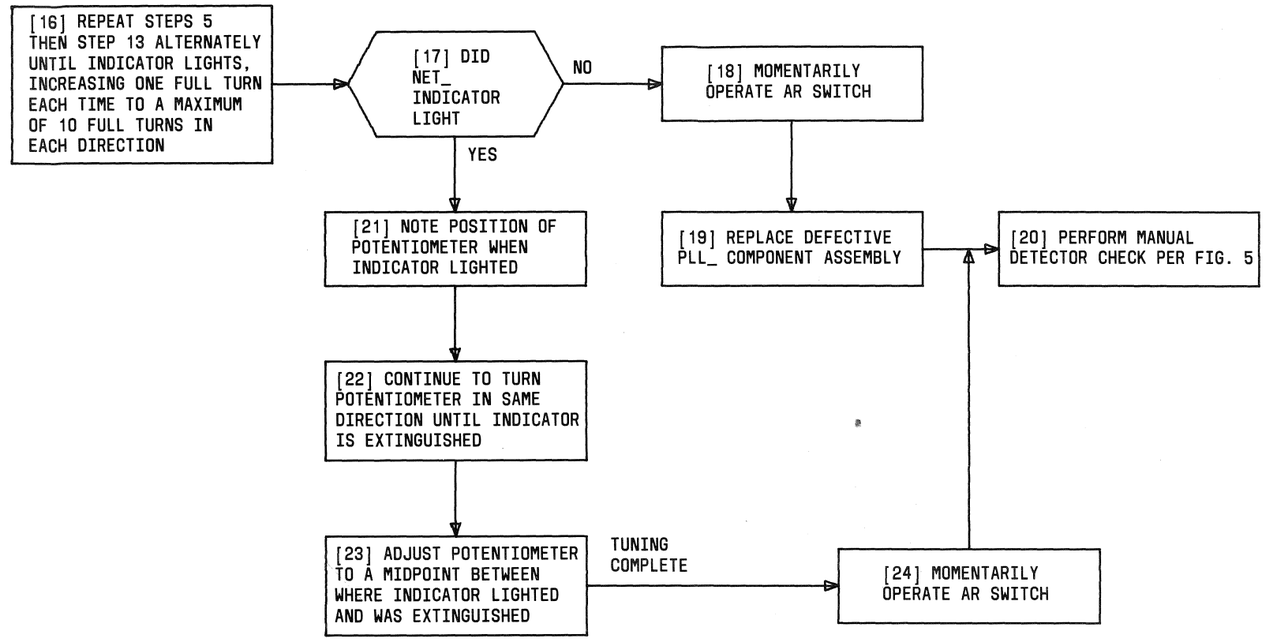


Fig. 7—Detector Tuning When Circuit is Idle (Sheet 2 of 2)