SWITCHED SERVICE NETWORKS

COMMON CONTROL SWITCHING ARRANGEMENTS (CCSA)

GENERAL PROCEDURES AND RESPONSIBILITIES

1. INTRODUCTION

A. General

1.01 This section provides a general introduction to Operating Telephone Company (OTC) procedures and responsibilities for the Common Control Switching Arrangements (CCSA) and Government Switched Networks.

1.02 The reasons for reissuing this section are listed below. Since this reissue is a general revision, no revision arrows have been used.

(a) Change title of section and incorporate information from Section 309-200-000.

(b) Provide a uniform method for Switched Service identification.

1.03 The information in this section should not be considered detailed instructions for the performance testing, service, and maintenance of the system. Specific assignments will vary depending upon the size and complexity of the service, type of facilities involved, and the testing and communications arrangements available.

1.04 The CCSA is a Bell System furnished private switched network service intended primarily for large industrial customers and government agencies with extensive internal telecommunications requirements. It provides for interconnection of

customer locations via dedicated access lines, intermachine trunks and shared common control switching. CCSA networks are terminated at the customers location by directly-homed telephone sets, data sets or key telephone systems, or by main PBXs/Centrexes.

1.05 The PBX's, PBX stations, local central office trunks and their specific vertical services are part of the customers message telecommunications system (MTS). Responsibilities for installation, repair and other activity on these services are not included in this section.

1.06 The CCSA uses voice channels that are switched at 2-wire or 4-wire No. 5 crossbar switching machines or 2-wire and 4-wire No. 1 ESS or HILO equivalent 4-wire No. 1 ESS switching machines.

1.07 Switched Service Networks (SSNs) that provide service to the US Government differ from regular SSNs in that many customer locations are dual homed, therefore, certain additional responsibilities and procedures may be necessary for the Federal Telecommunications System (FTS) and Automatic Voice Network (AUTOVON). They are covered in part in this section and in Sections 309-200-010 and 309-200-011.

B. Glossary of Terms

1.08 Several terms used in this section have been abbreviated. These are as follows:

ABBREVIATION	TERM
AUTOVON	AUTOmatic VOice Network
CAROT	Centralized Automatic Reporting on Trunks
CCSA	Common Control Switching Arrangements
CPB	Circuit Provision Bureau
MTS	Message Telecommunication System
NCO	Network Control Office
OCC	Other Common Carrier
ONAL	Off-net access line
PCO	Plant Control Office
ROTL	Remote Office Test Line
RSB	Repair Service Bureau
SSB	Switched Services Bureau
SSC	Special Service Center
STC	Serving Test Center
TRCO	Trouble Reporting Control Office
USO	Universal Service Order

2. OPERATIONS CENTERS

A. Network Control Office

2.01 The Network Control Office (NCO) is usually a toll office located in proximity to the Switched Services Bureau (SSB) serving the customer's principal office. It is assigned customer service responsibility for the customer's network communications and has primary responsibility for the network elements which centralizes that responsibility for all SSBs.

2.02 Some duties and responsibilities of the NCO are:

(a) To coordinate activities of all operating departments of the various companies involved in matters pertaining to the network

(b) To perform overall network analysis and correction of problems

(c) To coordinate and assist SSN offices in performing equipment changes, routing changes, and additions to the network

(d) To establish limits and administer releases of network circuits as may be required

(e) To advise other organizations of information relating to shortages of equipment, facility overloads, significant failures and other network affecting problems which may threaten network integrity

(f) To be informed and participate in the resolution of problems affecting more than

one switching center or faults of a chronic or intermittent nature.

2.03 The NCOs on Government Services will have responsibility for priorities of service restoration, AUTOVON and Oversea Services that are unique. The specific responsibilities are detailed in other sections in this layer.

B. Sub-Network Control Office

2.04 The Sub-Network Control Office (SNCO) may be established for part of a network at an appropriate SSB where that portion of the network can be more efficiently administered than from the NCO. In all cases the NCO remains responsible for the total service. The NCO will make this determination and advise the Circuit Layout Engineering Force of its decision so that the SNCO will be designated on the Circuit Layout Record.

2.05 Some general duties of the SNCO are:

(a) To be familiar with the overall intent of the subnetwork and its components

(b) To maintain a Circuit Layout Record (CLR) file or other appropriate record of the associated access lines, tie lines, etc

(c) To develop and coordinate testing and control methods as necessary to ensure reliable operation of the subnetwork

(d) To analyze the service conditions on the subnetwork as a unit

(e) To supply service and results data to the NCO

(f) The NCO shall arrange for Special Services System output reports to be provided to the SNCO.

C. Switched Services Bureau

2.06 The Switched Services Bureau (SSB) is a unique serving test center with primary responsibility as Plant Control Office (PCO) for all CCSA network locations homed on the switch(es) within the switching complex, and those intermachine trunks which it is assigned control.

2.07 The SSB functions should generally be performed by the forces operating the CCSA testboard at the SSN office. The functions may be performed by one or several persons as the organization may assign. It is important that close liason be maintained between the SSB and the SSN testboard. Each SSN office must have an SSB.

2.08 The SSB has service responsibility for the Universal Service Order (USO) process.

2.09 The SSB assumes maintenance responsibility for:

(a) Accepting all trouble reports:

(1) Preparation of SS Trouble Ticket Form E-6944

(2) Directing appropriate trouble clearance activities

(3) Preparation of related reports.

(b) Service Maintenance:

(1) Testing

(2) Clearing

(3) Analysis

(4) Routines

(5) CAROT Data Base

(6) Inventory

2.10 The SSB will function as the Trouble Reporting Control Office (TRCO) on those circuits in which the Other Common Carrier (OCC) provides a portion of the overall service.

2.11 When access lines terminate in the local Central Office (Local Loops Only) served by an SSB, the SSB will work directly with the Repair Service Bureau (RSB) on installation and maintenance.

2.12 Specific SSB's (AUTOVON) may be designated overseas gateway offices by the US Government Defense Communications Agency (DCA). The overseas switching machines are not provided by

the Bell System. Section 309-200-011 describes these responsibilities in greater detail.

D. Switching Control Center

2.13 The Switching Control Center (SCC) is responsible for the installation and maintenance of the Central Office switching equipment. An SCC may serve one or more Central Offices and/or CCSA networks. Personnel working in those Central Offices are dispatched and directed by the SCC. The SSB will contact the SCC on customer reported troubles that indicate switching faults. The SCC will take appropriate action on all switching machines, automatically detected troubles, and will report that action to the SSB.

2.14 When a Central Office serving a CCSA network is not part of a SCC complex the chief switchman or responsible Central Office Supervisor will have the responsibility otherwise performed by the SCC.

2.15 On CCSA networks the SCC is not involved in accepting trouble reports directly from customers.

E. Facility Office

2.16 The Facility Office is responsible for the installation and maintenance of toll terminal and carrier facilities. Its associated support systems controls the facility maintenance operations for CCSA and special services. The Facility Office in cooperation with the operation centers, initiates corrective action and reports the clearance on all facility trouble.

F. Special Service Center (SSC)/Serving Test Center (STC)

2.17 The SSC or STC (when associated with the customer end of access lines) is the operations center for administrative control which has overall responsibility for all activities associated with installation and maintenance of special services for that CCSA (PBX/CTX/STA). It directs installation and maintenance personnel through dispatch or referral to a Repair Service Bureau for work at the customers premises. The SSC/STC will not be required to accept customer trouble reports except referral or troubles from the SSB on CCSA networks.

2.18 The SSC's and STC's have identical responsibilities. However, SSC's generally have test point access at the toll type to local type facility interface and is generally the office nearest to the customer location. This may require STC interface with Repair Service Bureaus (RSBs) and Telco personnel at the carrier patch bays for sectionalization.

G. Repair Service Bureau

2.19 The Repair Service Bureau (RSB) will effect repair and perform DC type testing of the local facility and station/PBX/CTX station equipment. The RSB will work with the SSB and/or STC to initiate central office activity, direct installation and repair forces and participate in maintenance of the customers network services.

H. Other Support Centers

2.20 The following individuals or organizations input and receive information from the operations centers defined above. Their responsibilities are briefly summarized in the following paragraphs.

2.21 The **Operations Service Manager** is responsible for insuring that all the services provided perform to the customers' satisfaction and that such services meet Bell System objectives. He should have first hand knowledge of the customers' key operating centers and communications personnel, and the customers' plans for future requirements and services. The appointment and responsibilities of an Operations Service Manager are covered in Section 660-004-010.

2.22 The **Circuit Provision Bureau (CPB)** is responsible for the design and assignment of message trunks and special service circuits, maintenance facilities and equipment, and overall control of circuit orders.

2.23 **Centralized Automatic Reporting on Trunks (CAROT)** data base preparation and maintenance information is to be furnished by the SSB to the designated CAROT test center for each CCSA network, network trunk, access line and off-net circuit suitable for CAROT testing.

2.24 CAROT Test Centers will have the responsibility for testing CCSA circuits when equipped and forwarding the result printout to the appropriate SSB for analyzation.

2.25 Trunk Administration (TA) or Dial Administration (DA) is responsible for the generation of traffic, trunk, and routing orders for CCSA switching machine(s).

2.26 Plant Assignment Office (PAO) has overall responsibility for the administration of outside facility work and the facility assignment process.

2.27 Sales is responsible for negotiating a service order with the customer, generating a Universal Service Order (USO), and reporting completion of the USO to the customer. The business office in some operating companies may have this responsibility.

2.28 Accounting, or the Comptroller in some operating companies, is responsible for billing, record control, and charges to the customer for special service.

2.29 Business Services and Government Services in Long Lines or Network Services in the operating companies is the organization responsible for design of private networks, compiling design data, the network routing guide development and administration and forecasting the customer's network needs.

3. FUNCTIONAL RESPONSIBILITIES

A. Service Order Process

3.01 The CCSA service order process is the set of activities required to plan and implement a Universal Service Order for an access line, network trunk, or network feature or change. It provides authorization for Circuit Orders and Work Orders and is controlled by the Intercompany Service Coordination (ISC) plan, Section 010-520-1XX.

3.02 The center responsibilities for the service order process are summarized in Table A. Some of the functions that constitute this process are described below:

(a) Order Generation—the mechanics of obtaining customer authorization, preparing a USO, assignment of PCO (SSB on all CCSA Orders), and distributing to the appropriate centers.

(b) Order Reception—

   (1) SSB—performs activities associated with receiving, reviewing and initiating order connection.

   (2) TA—prepares routing guides and initiates cross-connection or translation order output.

(c) Design of Order—engineering the proper design of the circuit(s) to meet USO requirements.

(d) Order Control—the administration of a service order; identifying work responsibilities and coordinating the work effort.

(e) Order Tracking—monitoring of a service order to ensure proper planning and scheduling.

(f) Completion Reporting—the final step in the service order process.

TABLE A

CENTER RESPONSIBILITIES FOR SERVICE ORDER PROCESS

FUNCTION	NETWORK TRUNKS, ACCESS LINES, NETWORK FEATURES, MODIFICATIONS

Order Generation
    USO
    CPB Orders
	
	SALES
	CPB

Order Reception
    USO
    CPB Orders
	
	SSB, TA
	CPB

Order Control
    USO
    CPB Orders
	
	SSB
	CPB

Order Tracking
    USO
    CPB Orders
	
	SSB
	CPB

Design of Order	CPB*
Installation, Removal or Rearrangement	STC
Preservice Testing	STC
Completion Reporting	SSB

*TAs and PAOs would make switching assignments, as required.

3.03 The center interactions for the service order can be summarized as follows (see Fig. 1): When requested by the customer, Sales will generate a USO. The order is transmitted to the SSB and other organizations specified by the ISC Plan, including CPBs, TAs and PAOs. This results in the design of various CPB orders related to circuit design, switch assignment, and routing guides. The SSB controls and tracks the service order and reports completion.

3.04 SSBs establish liaison with the SCC, STC, SSC, RSB involved to assure that all USO and related order activity meets the critical dates, that all appropriate tests are performed, that the Plant Test Date is met, and finally that the service is provided on the service date. Automatic Message Accounting (AMA) must be in effect on the service date.

3.05 When new CCSA networks are being implemented under the Switched Service Plan for Coordination, the Project Team will establish and coordinate the USO's for that project and exercise overall coordination responsibility for schedule changes and updates necessary to effect cutover.

B. Maintenance Procedures

3.06 Maintenance procedures are the activities necessary to maintain the designed service of an existing network. The maintenance process is divided between trouble detection and maintenance. Trouble detection is the process whereby a trouble
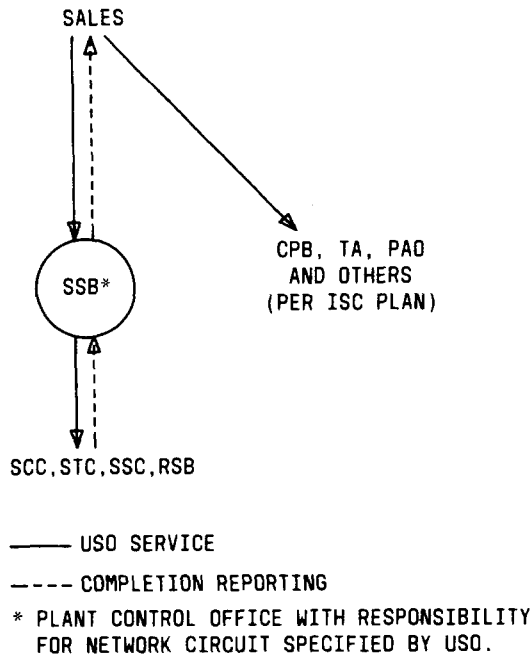
Fig. 1—Center Interactions on USO Service Orders

Fig. 2—Center Interactions For Trouble Reports

condition is found on a CCSA network. Maintenance is the process necessary to investigate possible trouble conditions, to exercise service protection, to clear a trouble condition, and to restore customer service.

3.07 The functional responsibilities for the maintenance process can be summarized as follows (see Fig. 2): The SSB will accept all network trouble reports, including those misdirected to it on telephone company provided services, and take appropriate action to resolve the reported trouble. The SSB may refer troubles to a RSB, SSC/STC, SCC or another SSB on the network. The SSB will control and track the report throughout the process and report completion.

C. Trouble Clearing

3.08 The functions required to correct trouble conditions are included in the corrective maintenance process. Center responsibilities associated with each trouble clearing function are given in Section 309-200-004, Trouble Reporting Procedures.
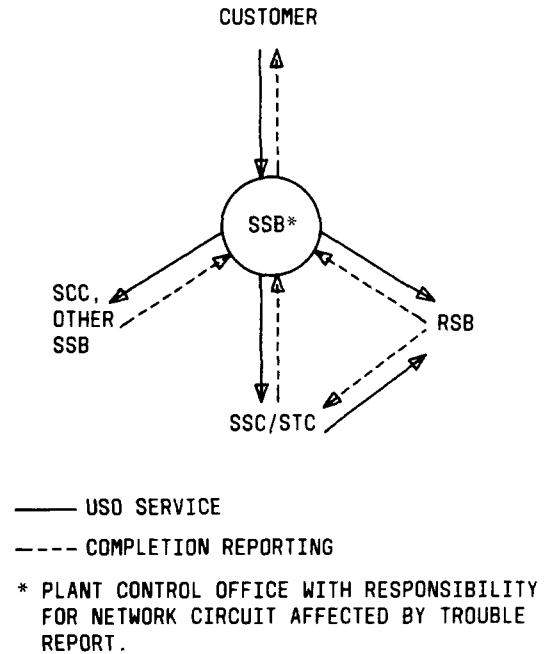
D. Installation Procedures

3.09 The installation function includes the actual hands-on activity associated with addition, removal, or rearrangement of circuits. This may involve toll facilities, local facilities, switches, and station equipment. Preservice testing is usually associated with this activity to ensure that the service meets design standards. The installation of complex Switched networks (such as CCSA) requires the performance of many tasks by many centers in the operating companies. The duties of a center when new networks are being installed closely parallel the duties defined for the day-to-day service order process. The USO is received by all centers having installation responsibilities for provision of services as specified by that particular USO.

E. Switched Service Bureau Procedures

3.10 SSBs are designated PCO on all access lines and may be designated PCO on intermachine trunks. The SSB or PCO with control responsibility will have a serving count (virtual links) for that portion of the circuit terminating on the CCSA switch.

3.11 Serving Links (SL) are provided as the base for measurement of trouble rates in CCSA. Because of its complex and special arrangement, CCSA requires special treatment when counting serving links. Whenever the SSB provides the only test access on a circuit (local access lines terminating directly off the CCSA switch), serving counts will be taken for both ends of the circuit (one virtual and one actual). See Fig. 3.

3.12 An actual link is considered to be the physical portion of the circuit from the Serving Central Office (customer side of MDF) to and including the special service equipment at the customer location. SSB's responsible for services which do not terminate at a customer location are provided a measurement base of virtual serving links. Serving link counting procedures are provided for various service types (two-point, multipoint, access service, network trunk). These four general categories are dependent on the number of points on the circuit and whether the circuit is part of a Switched Service.

3.13 The SSB is a measured entity in the Special Service System Measurement Plan per Section 660-225-105. This plan produces results based upon the ratio of troubles to Serving Links, expressed in "number of troubles per 100 Serving Links."
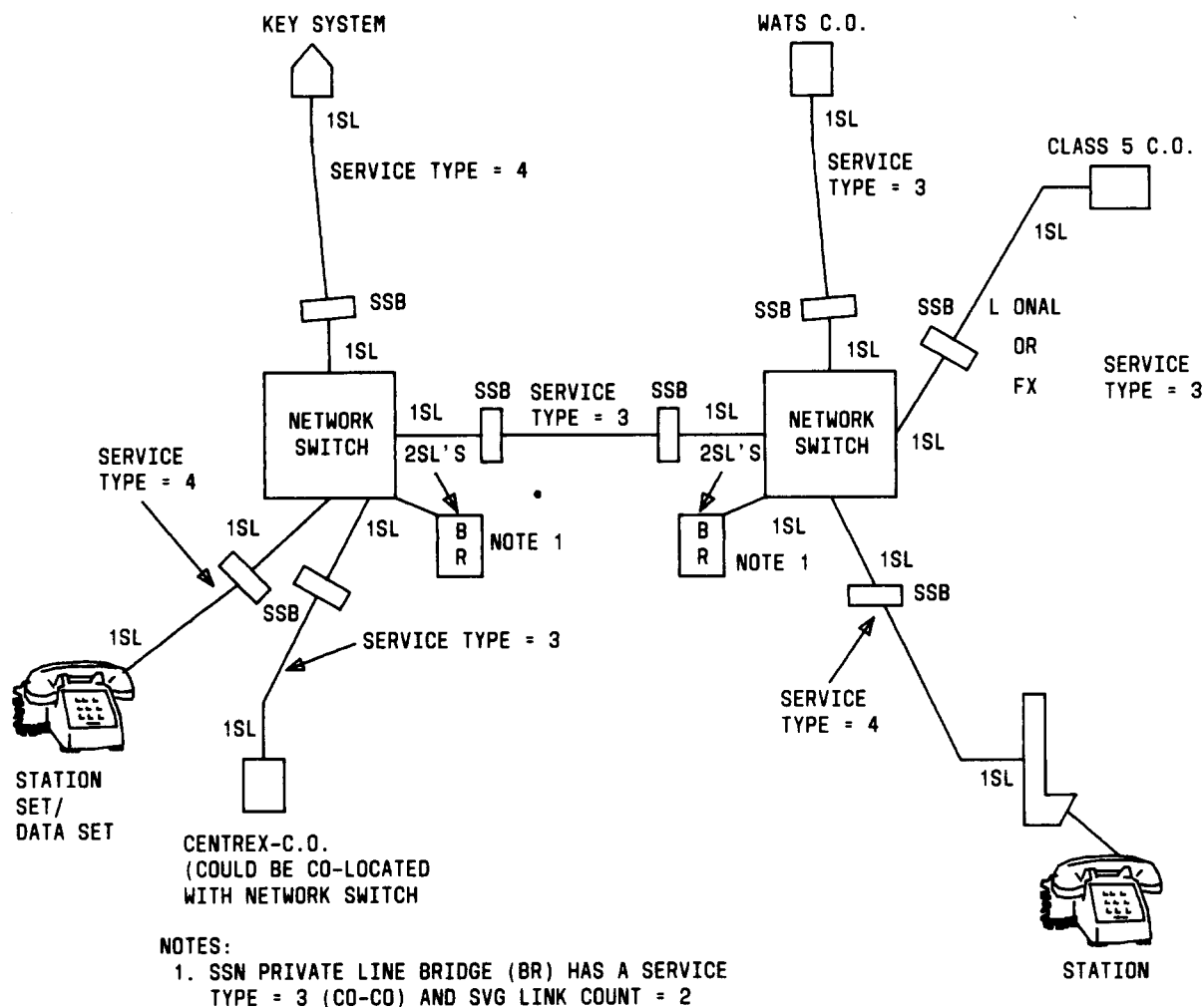

NOTES:
1. SSN PRIVATE LINE BRIDGE (BR) HAS A SERVICE TYPE = 3 (CO-CO) AND SVG LINK COUNT = 2

Fig. 3—Typical CCSA Terminations

3.14 The SSB on a CCSA access line is required to maintain circuit inventory in accordance with Section 660-225-103. The SSB will also receive Special Services System (SSS) output reports and results summaries for its area of responsibility per Section 660-225-106.

3.15 The SSB supplies the switching machine maintenance force with summaries of all trouble reports that may involve the switching machine. It also will receive switching machine results data from the SCC and transmit this information to the Data Processing Center (DPC) in accordance with Section 660-225-102.

3.16 The SSB must maintain trouble ticket, E-6944, on all troubles reported either by the customer, automatically detected reports, SSC/STC, or another SSB and input these tickets into the DPC per Section 660-225-104. The SSB is responsible for the clearance of any trouble in his area of responsibility and in addition is responsible for reporting status and clearance of all customer trouble reports.

3.17 SSB's, as PCO, are responsible for ensuring that the CAROT process works on their controlled CCSA circuit equipment for CAROT testing. This responsibility includes:

(a) CAROT Data Base preparation and maintenance for access lines, controlled intermachine trunks and ONALs. The initial data base and subsequent updates, to be forwarded to designated CAROT test center complete with ROTL, access numbers, test line equipped circuit information, and correct switch and SSB networks.

(b) Analyzation of CAROT test result printouts for network troubles, ROTL or test line failures and data base error.

3.18 The SSB will schedule and perform routine transmission maintenance tests on all controlled circuits and transmit this information to the DPC in accordance with Section 660-225-102. It must also complete all tests in accordance with Sections 309-200-300, -502, -503 for CCSA and 309-200-301, -504, -505, -506, for AUTOVON on controlled circuits.

3.19 The SSB is responsible for reporting to the NCO any of the following conditions:

(1) Twenty percent or more of any access line or trunk group interrupted simultaneously for any duration due to any cause

(2) Common switching problems that begin to impair the ability of the switching machine to process calls

(3) Any circuit outage exceeding 24 hours

(4) Any location isolated from the network

(5) Any outage on priority circuits.

> *Note:* When a SNCO has been assigned for an access line, the SSB notifies the SNCO (instead of the NCO) by telephone of every outage and restoral related to the access line. The SSB should enter the location and telephone number of the SNCO on the appropriate access line face card for convenience.

3.20 SSB's on Overseas AUTOVON Service must report any outage of any duration on individual controlled AUTOVON intermachine trunks or directly terminated subscriber or PBX access lines and any isolation of an overseas switching machine from its CONtinental United States (CONUS) gateway office.

3.21 All SSB's on Government SSN (AUTOVON and FTS) must report priority 1A, 1B, and 1C circuit outages to the Dranesville Network Management Center (DNMC) immediately, and priority 1D, 1E, 1F and 1G circuit outages after two hours outage. These procedures are outlined in Section 660-207-020. Operating telephone companies may have additional reporting requirements established.

3.22 The SSB is responsible for reporting MTS network troubles identified on off-network access lines to appropriate MTS service bureaus.

3.23 The SSB should establish a customer contact or visit program to determine the customer's attitude toward the service being provided. Unresolved problems should be referred to the Operations Service Manager for assistance.

F. Special Service Center/Serving Test Center Procedures

3.24 The SSC/STC will receive referred in troubles from the SSB. It is not responsible for accepting CCSA Network customer trouble reports. However, should the SSC/STC receive misdirected customer trouble reports, it should immediately relay them to the appropriate SSB and advise the customer of the proper trouble reporting procedures.

3.25 The SSC/STC analyzes troubles on that portion of the circuit for which it has responsibility. It must be aware of and advise the PCO (SSB) promptly of all known conditions which may affect customer service. It must also cooperate with the PCO in the sectionalization of trouble.

3.26 The SSC/STC is responsible for the sectionalization and clearance of troubles in that portion of the circuit from the SSC/STC to and including the station terminating equipment. It will also arrange for telephone company maintenance personnel at the customer location when needed.

3.27 The SSC or STC on a CCSA access line must have testing access on the circuit. Generally, this will be at the junction of the intertoll portion of the circuit and the local facility portion of the circuit.

3.28 The SSC/STC on a CCSA access line is required to maintain circuit inventory in accordance with Section 660-225-103. It will also maintain a CLR file or other appropriate records for those circuits within its responsibility.

3.29 A SSC/STC is a measured entity and participates in the Special Service System Measurement Plan as per Section 660-225-105. It will also receive SSS output reports and results summaries for its area of responsibility in accordance with Section 660-225-106.

3.30 The SSC/STC should assist the PCO (SSB/STC) in preparing schedules for and carrying out periodic routine tests and must cooperate with the SSB in performing all required tests. Results on required tests should be reported to the PCO (SSB/STC) in accordance with Sections 309-200-300, -502, -503 for CCSA and 309-200-301, -504, -505, and -506 for AUTOVON within the controlled section on circuit order and trouble correction.

3.31 The SSC/STC must maintain trouble tickets, E-6944, on all troubles referred or automatically detected and input these tickets into the DPC per Section 660-225-104. The SSC/STC is responsible for the clearance of any trouble in his area of responsibility.

G. Repair Service Bureau Procedures

3.32 The RSB may occasionally receive trouble reports from the customer that are network troubles. In these cases, the RSB should refer the troubles to the proper SSB and advise the customer of the correct trouble reporting procedures. In no case should the RSB or any other office refuse to take any customer trouble report.

3.33 The RSB is responsible for dispatching qualified repair forces upon the direction of the SSB, STC or SSC for sectionalizing and clearance of network related troubles at the customer location.

H. Other Common Carrier Procedures

3.34 When cooperative end-to-end testing with OCC's is to be performed by Bell System offices in either a control or noncontrol capacity, procedures listed in Sections 471-200-001 and 471-200-002 should be followed.

I. Direct Private Line Service Interconnection Procedures

3.35 When facilities and/or equipment are connected to direct private line circuits, procedures covered in Section 480-050-100 will apply.

4. RELATED BELL SYSTEM PRACTICES

4.01 The following Bell System Practices are related to this section.

SECTION	TITLE
010-520-1XX	Intercompany Service Coordination Plan
309-200-000	General CCSA Description
309-200-004	Trouble Reporting Procedures
309-200-005	Network Analysis
309-200-007	Network and Office Numbers