Bell System Practice
Distribution Codes: A01, A34, D01, D05, E01, E02, E09, E12, F01, F15,
                M46, M47, M48, M49, M51, M52, S96

> Review this Flash with all test center provi-
> sioning and maintenance personnel. File it in
> front of Section 309-400-001, Issue 2. Destroy
> this Flash upon receipt of a Pacific Company
> addendum or Issue 3 of the main section.

ELECTRONIC TANDEM NETWORKS (ETN)

CLARIFICATION OF ETN TRUNKS

This Flash is issued to clearly define Electronic Tandem Networks (ETN)
trunks that are controlled by the Plant Control Office (PCO) of the
ETN tandem switch indicating proper Common Language Cirucit Identification
(CLCI) for purposes of tallying work units, inventorying for class of
service 14 and for providing test access within the misroute guidelines.

CLCI	ETN DEFINITION
IT	Intertandem Tie trunks connect ETN tandem switches that may be DIMENSION® 2000 FP-8 or I/IA ESS generic IE6 or later.
TA	Tandem Access trunks connect subtending main PBXs or Centrexes to the tandem switches. This includes Bypass Access Tie Trunks from a tandem switch that connects to a main PBX or Centrex that is homed to another tandem switch.
SA	Satellite Access trunks can present a problem for ETN configurations. If there is a Main/Satellite configuration when both the Main and Satellite PBXs

are DIMENSION 2000 FP-8s and one of them is the tandem switch, the SA trunks are part of the ETN. The balance of the SA trunks, not following this definition are separate from the ETN.

OPS

Off Premise Stations can present a problem for ETN configurations. The OPS that are to be included as part of the ETN must meet the following criteria:
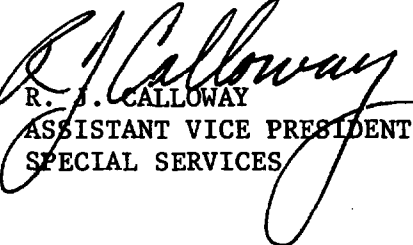(a) The OPS must be homed on the ETN tandem switch.
.(b) If the tandem switch is a DIMENSION 2000 FP-8, the OPS must terminate in an LC-361 circuit pack to qualify.

The trunks that are maintained under the ETN maintenance plan, namely IT, TA (includes Bypass Access trunks) and selected OPS and SA trunks should have test access by the PCO for the tandem switch within the misroute guidelines, inventoried in the Special Services System (SSS) under class of service 14, and tallied for ETN trunk testing work units.

When an ETN is established with these ETN trunks within the same exchange, the same ETN PCO for the tandem switch is designated PCO. The circuits should also have ETN PCO test access, be inventoried as class of service 14 and tallied with the appropriate ETN work units.

All other circuits with connectability to the ETN tandem switch are maintained separately from the ETN maintenance plan. These circuits are Wide Area Telephone Service (WATS), Foreign Exchange (FX), and Central Office trunks.

Any additional information may be obtained by calling your staff representative. My contact on this subject is Frank P. Grasso on (415) 774-9139.

R. J. CALLOWAY
ASSISTANT VICE PRESIDENT
SPECIAL SERVICES

SWITCHED SERVICE NETWORK

ELECTRONIC TANDEM NETWORK (ETN)

GENERAL PROCEDURES AND RESPONSIBILITIES

1. INTRODUCTION

A. General

1.01 This section provides a general introduction to the Bell Operating Companies (BOCs) procedures and responsibilities for Electronic Tandem Networks (ETNs).

1.02 This section is reissued to include the use of Network Control Operations Support System (NCOSS). Revision arrows are used to emphasize the more significant changes.

1.03 Specific work center 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 ETN uses voice channels that are switched by either DIMENSION® PBXs (600, 2000 or

Custom FP8) or 2-wire No. 1/1A Electronic Switching System (ESS) Centrex's (CTXs) Generic program 1E6 or later. ETN is a private switched network configuration of Electronic Tandem Switches (ETS) that provides for interconnection of customer locations (PBXs/CTXs) via dedicated access tie trunks, bypass access tie trunks, and intertandem trunks. Foreign Exchange (FX), Wide Area Telecommunication Service (WATS) and central office (CO) trunks may also terminate and be accessed by the ETN. These networks are intended primarily for large customers with extensive internal telecommunications requirements.

1.05 PBXs, PBX stations, local CO trunks, WATS and their specific vertical services are part of the customer's Message Telecommunication System (MTS). Responsibilities for installation, repair and other activity on these services are not included in this section.

B. Glossary

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

ABBREVIATION	TERM
CACS	Customer Administration Center System
CLR	Circuit Layout Record
CSAMSC	◆Customer Service Administration and Maintenance Support Center (associated with NCOSS)◆
CTX	Centrex
ETN	Electronic Tandem Network
ETS	Electronic Tandem Switching
FCO/TFMC	Facility Control Office/Trunk and Facilities Maintenance Center
ISC	Intercompany Service Coordination
LMOS	Loop Maintenance Operations System
LSV	Line Status Verifier
MLT	Mechanized Line Testing
MTS	Message Telecommunications System
NCO	Network Control Office
NCOSS	◆Network Control Operations Support System◆
OCC	Other Common Carrier
PBX	Private Branch Exchange
PCO	Plant Control Office
PSC	Plant Service Center
RSB/ARSB	Repair Service Bureau/Automated Repair Service Bureau
SCC	Switching Control Center
SM	Service Manager
SSC	Special Service Center
STC	Serving Test Center
USO	Universal Service Order

2. OPERATION CENTERS

A. ◆Customer Service Administration and Maintenance Support Center

2.01 The Customer Service Administration and Maintenance Support Center (CSAMSC) is a new work center which is responsible for scheduling, maintaining and administering the Network Control Operations Support System (NCOSS) in all of its applications.

2.02 The CSAMSC schedules NCOSS from requests for monitoring from project teams, Marketing/Business Services Organizations and NCOs or Service Managers (SMs) for a particular ETN. These requests may be for cutover support (long range) or for emergency situations (short range). All requests for NCOSS require a USO to install and disconnect the local storage unit, lines and associated equipment.

2.03 NCOSS provides message detail search and patterning algorithms. This information can be used for call tracing and trouble analysis.

2.04 Representative time frames for NCOSS usage are shown in Table A for Network Operations Support and Table B for Traffic Network Administration.◀

→TABLE A←

NETWORK OPERATIONS SUPPORT

NCOSS APPLICATION	APPLICATION TIME FRAME	APPLICATION DURATION	DATA ELEMENTS
1. Precutover Test Monitoring	Precutover	2-4 weeks	MDR
2. Post Cutover Operations Support	Postcutover	2-6 weeks	MDR FTM ACA TMBL
3. Network Operations Revisits	Every 2-4 Years	2-6 weeks	

→TABLE B←

DATA COLLECTION FOR TRAFFIC NETWORK ADMINISTRATION

NCOSS APPLICATION	APPLICATION TIME FRAME	APPLICATION DURATION	DATA ELEMENTS
1. Initial (post-cutover) Network Design	Postcutover	6-12 weeks	MDR FTM
2. Periodic Network Link Resizing	Every 6 months	1-2 weeks	FTM
3. Periodic Network Redesign	As Needed	3-6 weeks	MDR FTM

B. ETS/ETN Network Control Office

2.05 The Network Control Office (NCO) is assigned customer service responsibility for the customer's network communications (end-to-end service) according to the Control Office Plan, Section 660-005-011.

2.06 The NCO is usually collocated with the Special Service Center/Serving Test Center (SSC/STC) nearest to the customer's principal

location. This location will usually be the SSC/STC simultaneously functioning as ETS/ETN Plant Control Office (PCO).

2.07 The NCO will be informed and participate in the resolution of problems affecting more than one PBX/CTX tandem switch or faults of a chronic or intermittent nature affecting the ETN. The NCO must have circuit layout cards for all circuits under its control.

2.08 ◆When NCOSS is provided, message detail search and patterning algorithms will enable the NCO:

(a) To verify translations and localize troubles during precutover network testing and scheduled call-throughs,

(b) To respond to customer reports of troubles that are non-circuit-specific (called/calling),

(c) To determine whether a problem was caused by customer error; or, to help isolate the trouble to a specific network segment.

The NCO also has access to demand NCOSS reports that aid in the detection of network troubles (see Section 309-400-005, App. 1).◆

C. ETS/ETN Plant Control Office

2.09 The Plant Control Office (PCO) for ETN is usually the SSC/STC nearest the DIMENSION FP8 or the No. 1/1A ESS, generic 1E6 or later, PBX/CTX tandem switching locations. It has responsibility for installation and maintenance of network circuits. The PCO must have circuit layout cards for all circuits under its control.

2.10 The PCO, as operations control for ETN circuits, is responsible for service order control, preservice testing, equipment turn up/turn down, sectionalizing, repair tracking, routine testing and trouble analysis. As appropriate, the PCO will maintain all routine and trouble records for ETN circuits.

2.11 ◆When NCOSS is provided, the PCO may refer non-circuit-specific troubles (called/calling) to the NCO. The NCO may use NCOSS to determine the circuits for the call reported as having a trouble.◆

D. Serving Test Center

2.12 A Serving Test Center (STC) is the designated office responsible for the quality of service for an interexchange special service customer at a specified location. It has circuit responsibility for the portion of the circuit from the distributing frame at the STC to and including the customer station equipment. The responsibility includes circuit order work, transmission requirements, and service performance. The STC coordinates circuit activities with the ETS/ETN plant control office (PCO).

E. Special Service Center

2.13 The Special Service Center (SSC) is the operations center that has centralized administrative control and some installation and maintenance operations associated with exchange and toll special services. The SSC is customer service oriented and has overall responsibility for all activities associated with the installation and maintenance of special services within a geographical area. Depending on the amount of special services work activity in the given geographical area, the SSC will administer installation and maintenance craft through direct dispatch or referral. The directed dispatch of Installation and Repair (I&R) forces under the SSC normally occurs in metropolitan areas. The referral is to a Plant Service Center or Repair Service Bureau for station work at the customer's premises. The SSC will refer central office work to the Switching Control Center.

F. Switching Control Center

2.14 The Switching Control Center (SCC) is responsible for the No. 1/1A ESS, generic 1E6 or later, switch in ETN. It is responsible for the installation and maintenance of equipment in the Central Office. This includes, for example, installation and service order coordination, circuit work, maintenance of all central office equipment, maintenance of order tracking and control logs, and provision of CAROT data base information.

2.15 ◆The SCC assumes the responsibility for the installation and maintenance of all CO-CO circuits in an ETN configuration. This includes installation and testing for service orders providing circuits, network routing guides, and network feature orders on an end-to-end basis.

2.16 It may be responsible for the maintenance carrier equipment in the CO. The SCC serves as a focal point for all contacts between other centers and on-site forces. The SCCs are centralized within a geographical district. In ETNs the SCC is usually assigned subcontrol office (SCO) responsibilities.

G. Repair Service Bureau (RSB/ARSB)

2.17 A Repair Service Bureau (RSB) is responsible for the maintenance of customer premise equipment (PBXs, station equipment, Customer Administration Center System (CACS) and station loops (including outside plant equipment) within its geographic area. The RSB administers repair forces within its service scope for maintenance activities, works with the appropriate STC/SSC to initiate the activity required to maintain the customer service.

2.18 Automated Repair Services Bureau (ARSB) is a total RSB concept involving RSB responsibilities supported by several mechanized aids; specifically, Line Status Verifier (LSV), Loop Maintenance Operations System (LMOS), and Mechanized Line Testing (MLT).

H. Remote Maintenance Administration and Traffic System (RMATS)

2.19 Remote Maintenance Administration and Traffic System (RMATS) centers provide dial access to DIMENSION PBXs and Customer Administration Centers (CACs) for maintenance, fault and traffic data collection, and administration. The data collected by RMATS centers on DIMENSION PBX ETN tandems can be used by PCOs and NCOs for trouble verification and trouble localization. Consequently, it is expected that RMATS must interface with SSC/STCs on a request-for-data basis.

I. Plant Service Center

2.20 The Plant Service Center (PSC) is responsible for the installation of customer premise equipment (PBXs, station equipment, CACS) and station loops (including outside plant equipment) within a geographic area. The PSC administers installation forces within its service scope for installation activities and works with the appropriate STC/SSC to provide customer service.

J. Data Test Center

2.21 The Data Test Center is expected to have prime responsibility for the telephone-company-supplied data station equipment that terminates PBX loops and off-premises station lines. The DTC may be either a separate center that handles only data service, or it may be a part of a large center that handles a variety of special services (eg, SSCs). It is involved in both installation and repair of data services.

K. Facility Control Office/Trunk and Facilities Maintenance Center (FCO/TFMC)

2.22 The Facility Control Office/Trunk and Facilities Maintenance Center (FCO/TFMC) is responsible for the installation and maintenance of the toll facility section of an ETN element. The toll facility encompasses the facility (carrier or interoffice conductor) and the toll terminal equipment. It coordinates with the SSC/STC on installation and maintenance activity for this section of an ETN element. A facility section may be common to a group of circuits. In this sense, effort is directed toward groups of circuits, rather than single circuits.

L. Support Centers and Personnel

2.23 The following personnel or organizations input and receive information from the operations center defined above. Their responsibilities are briefly summarized in the following paragraphs.

2.24 A *Service Manager (SM)* is responsible for ensuring that all the services provided for specific customers perform to their satisfaction and that such services meet Bell System objectives. An SM should have knowledge of the customers' key operating centers and communications personnel, and the customers' plans for future requirements and services.

2.25 The *Circuit Provision Bureau (CPB)* is responsible for the design and assignment of both message trunks and special service circuits. It maintains facility, equipment, and circuit inventory and assignment records. It also maintains overall control and tracking of circuit orders.

2.26 *Sales* is responsible for negotiating an order with the customer, generating a service order, and reporting completion of the order to the contracting customer. In some operating

companies, this is the responsibility of the business office.

2.27 *Accounting,* or Comptroller in some operating companies, is responsible for billing activities on special services. This includes record control of all special service equipment and circuits chargeable to a customer, and issuing the appropriate monthly bill for the customer's special service.

2.28 *Business Services* is the organization responsible for the design of private networks. This includes compiling the data for network design studies, providing the Network Routing Guide (NRG) and deriving forecasts of the customer's communication needs based on the network design.

3. FUNCTIONAL RESPONSIBILITIES

A. General

3.01 The following paragraphs give the functional assignment of tasks and responsibilities of centers found in ETN. The activities of a center may involve the service order process, installation, maintenance and trouble clearance. Work center assignments for ETN elements are shown in Table C. Appendix 1 gives a more detailed assignment of the responsibilities when more specific information is required.

TABLE C

WORK CENTER ASSIGNMENTS FOR ETN

ETN ELEMENT	WORK CENTER
CP-CP CIRCUIT CO-CP CIRCUITS	SSC/STC (PCO)
CO-CO CIRCUITS	SSC/STC (PCO) SCC/CO (SCO)

OVERALL SERVICE	SSC/STC (NCO)

DIMENSION PBX	PSC — INSTALLATION RSB — MAINTENANCE RMATS — INSTALLATION AND MAINTENANCE
NO. 1 ESS CTX	SCC/CO

SUPPORTING CENTERS: FCO, DTC

3.02 The ETN *Service Order Process* is the set of activities required to plan and implement a Universal Service Order for an access tie trunk, bypass access tie trunk, intertandem tie trunk, or network feature or change. It provides authorization for Circuit Orders and Work Orders.

3.03 The customer request for an addition, change, or deletion to the ETN configuration is accepted by a TELCO representative who must contact the Marketing Control Office designated to handle the ETN customer account. The Marketing Control Office will then coordinate the issuance of proper orders to all the work centers involved.

3.04 Prior to actual order issuance, the order negotiator is responsible for contacting the appropriate organization in each TELCO involved to determine if hardware is required to complete the order. When a hardware change or addition is required, appropriate entries must be made on the order.

3.05 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 ETN) 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.

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. It is also a process to determine possible trouble conditions, to exercise service protection, to clear troubles, and to restore customer service. Maintenance is discussed in Section 309-400-300.

3.07 Trouble detection is the process whereby a trouble condition is found on an ETN. These trouble conditions may be reported by the customer, the users, TELCO employees, or an Operations Support System (OSS). Procedures for trouble

reporting are discussed in Section 309-400-004. It is expected that most trouble reports will come from the customers.

3.08 The ***Trouble Clearance Functions*** required are included in the corrective maintenance process. Work center responsibilities associated with each trouble clearing function are given in Section 309-400-004.

B. Network Control Office

3.09 Orders that affect the Electronic Tandem Network, ie, circuit changes, additions and deletions, major networks rearrangements as well as network feature changes are normally controlled by the NCO. Although the NCO function is assigned to the SSC/STC acting as PCO, the NCO is discussed separately to highlight its role.

3.10 ◗The NCO provides direct operations support for the customer for overall network operations. For example, the NCO responds to queries from the Customer Administration Center (CAC) personnel concerning network aspects of CACS operation, data interpretations, and invocation of network controls. The NCO assumes operations control of troubles identified by the CAC. This includes localizing and coordinating repair of the trouble. For other CAC-identified conditions, the NCO interprets the situation and refers the customer inquiry to the proper work center or organization (eg, the Repair Service Bureau (RSB) for a CACS maintenance problem or Business Services for unusual traffic behavior).◖

3.11 The ***Service Order Process*** involves several types of service orders which may be issued for ETN. These orders are divided into two categories ("Information Passive" and "Requiring Coordination").

3.12 ***Passive Orders*** cover adding or deleting a few circuits within a trunks group for a given location. None of these orders contain routing changes (non-routing affecting). Listed below is NCO involvement on passive orders:

   (a) Add/delete one or more circuits in a group

   (b) Add/delete local customer administration panel (CAP)

   (c) Add/delete queue on a circuit group

   (d) Add/delete authorization code feature

   (e) Add/delete local message detail record system

   (f) Change automatic route selection

   (g) Change automatic circuit assurance threshold

   (h) Change off-network route lists

   (i) Change facilities restriction levels.

3.13 ***Active Orders*** involve routing changes. The NCO has the responsibility to establish tests and to coordinate the job. The orders on this list which do not involve routing changes are of sufficient magnitude to require coordination of installations and testing. Listed below is NCO involvement on orders requiring coordination because of major or routing changes.

   (a) Add/delete a tandem, main satellite/tributary location

   (b) Add/delete a circuit group

   (c) Add/delete network queueing

   (d) Add/delete centralized message detail record system (CMDRS)

   (e) Add/delete customer administration center system (CACS)

   (f) Add/delete off-premises extension interexchange facilities if a separate RNX is assigned

   (g) Major routing changes

   (h) Major circuit changes.

3.14 The NCO must play a strong active role in the handling of service orders. On passive orders the NCO does not need to coordinate the installation, wiring, or testing of the services. The NCO is responsible for other aspects of these orders, (ie, tracking, jeopardy follow-ups, escalations, and network description updates). The NCO provides the necessary communications link between the field forces, engineering, operations, installations, etc, and staff groups involved in the Intercompany Service Coordination (ISC) Service Order Procedures. The NCO also keeps the SM informed.

3.15 The plant member of the ISC team for the NCO location is kept informed of all status reports and changes arising in connection with service orders. The ISC team will escalate problems via lines of organization as necessary. The Order Status Control and Reporting (OSCAR) system of reporting will be used extensively, and all offices designated as Responsible Reporting Offices on the network will be contacted to verify that procedures are being followed in accordance with Sections 010-520-105 and 010-510-137.

3.16 The *Installation* function for the NCO closely parallels its duties for day-to-day service order processing. It coordinates the installation and testing of orders involving major activity on the network.

3.17 An example of an order that uses all the functions of the NCO could be the addition of an off-premises station (OPS) with a separate RNX assigned. This OPS is to be located in a distant state from the tandem PBX and is in a different Bell Operating Company (BOC). This order crosses many lines of organization: facility engineering, toll terminal equipment assignments, PBX terminations, station equipment, and routing changes. Every switching point on the network must add a new RNX code for this OPS. Test calls must be made from all PBX/CTX tandems to verify that the new OPS can be reached.

3.18 Major network installations will likely be governed by a project team of which a cutover chairperson and/or SM is a member. The cutover chairperson and/or SM should prepare and propose a test plan to ensure overall testing and incorporation of the new service into the network analysis plan used by the customer and ETN work centers. If a project team is not formed, the NCO must form an installation coordination team consisting of representatives from the SM, NCO and PCOs involved. This team will meet to coordinate installation schedules, agree on the detail of the test plan, and agree with the customer on required network releases.

3.19 Test procedures will be established as soon as the preliminary office functions have been completed and the service order file established. The NCO will communicate directly with all involved offices. The NCO will compile a list of changes, corrections, etc, that may arise due to work schedules, test equipment availability and access

to customer premises. Any revisions will be transmitted to all offices. The final plan may be given to the Marketing/Business Service representative for assistance in obtaining release(s) from the customer.

3.20 In the *Maintenance* of ETN, the NCO has very definite responsibilities. These actions are taken in response to:

(a) Severe network troubles

(b) Unusual network behavior

(c) The performance of pattern analysis using the Special Services System (SSS) and other data.

3.21 ▶Two distinctly different time frames are defined for maintenance: (1) A shakedown period during which trouble report analysis is centralized and intensified to increase the effectiveness of network trouble localization techniques, and (2) a steady state period when trouble report volumes are sufficiently low that a longer trouble report collection period is most effective. The first shakedown period for an ETN occurs immediately following cutover and lasts for a short period following cutover.◀

3.22 During the shakedown period, the NCO is responsible for gathering all Class II troubles from the PCOs. This enables the NCO to analyze for possible ETN problems.

3.23 In both the shakedown and steady-state periods, the other work centers on the network have a responsibility to notify the NCO when adverse network conditions occur. The minimum reporting requirements for the other work centers are listed below:

(a) When 50 percent or more of any trunk group of 10 circuits or less or 25 percent or more of any trunk group of 11 circuits or more is interrupted simultaneously for any duration due to any cause

(b) Any switching problem that impairs the ability of that switcher to process traffic

(c) Any condition that does not allow the customer to administer his network via CACS

(d) Any single circuit outage that exceeds 24 hours.

3.24 When a *Severe Network Trouble* occurs, it will be necessary for the NCO to take positive action to reduce the impact of the failure on the network.

3.25 *Unusual Network Behavior* can be considered as anything out of the ordinary that occurs on the network. Reports may be received from the customer or other work centers on the network. Other reports may include chronic troubles, or excessive reports on the Automatic Circuit Assurance (ACA) audit trial. When the NCO receives an excessive number of trouble reports it should investigate to determine the cause of the reports. Extremely heavy traffic or a major failure could cause this type of report. The customer administration center system (CACS) may be used to determine if heavy traffic is the cause of the report. The NCO should be aware of any major failure. Excessive reports can also be generated by actions taken by the customer. The Customer Administration Center (CAC) may be aware of these situations and can assist the NCO in determining the cause of the report.

3.26 The NCO should perform pattern analyses (see Note) on reports received and determine if most or all of the reports are the responsibility of one PCO. The NCO must ascertain if the PCO is aware of any difficulties. In cases where the PCO is not aware, the NCO will request the PCO to make tests to localize the trouble. The tests requested will vary with the type of trouble report received. If more than one PCO is involved, the NCO must perform additional analysis. The NCO may request information from RMATS centers. The NCO may also use CACS output data. This data is available to the NCO via their teleprinter to the CACS dial-up access port. With this information and analysis, the NCO should contact the involved PCOs and request necessary tests.

> ◆*Note:* With NCOSS, the NCO will be able to access and analyze message detail data generated daily by each tandem. See Fig. 1 and 2.◆

3.27 In cases where no trouble is found on repeated reports, the NCO should explain to the customer that a hold and trace may be required to locate the trouble. The NCO must instruct the customer to hold the trouble and report it in the prescribed manner. On ACA problems, the NCO may verify, via CACS, that the attendant is in fact testing the circuits promptly for trouble conditions. Those circuits failing the attendant tests should be properly reported to the PCO.

3.28 ◆The NCO maintains a detailed network map indicating the current composition and routing discipline of the network as well as a detailed telephone directory of the customer contacts and the work centers serving the ETN. The NCO also maintains a service order log for network changes. During the shakedown period, the NCO also maintains a "network" trouble ticket log.

3.29 The specific functions for which the NCO is responsible are given in the following paragraphs:

(a) *Trouble Detection:* The NCO is responsible for detecting trouble conditions via pattern analysis techniques on network data, ACA audit trail, trunk made busy list (TMBL) from CACS, and trouble report data via SSS.

(b) *Trouble Report Reception:* The NCO will be responsible for reception of:

(1) Reports of troubles concerning ETN customer network management.

(2) ESS and DIMENSION reports of service affecting troubles from PCOs, RSB/ARSB and SCC/COs.

(3) CACS trouble reports when the trouble is not specifically referred to the RSB/ARSB (see Section 309-400-004).

(4) Customer trouble reports that should go to PCOs. Inform customer and refer to PCO.

(5) Trouble reports resulting in noticeable degradation in ETN performance. This may come from a PCO, SCC or RSB/ARSB.

(c) *Trouble Verification:* The NCO may have to verify reported troubles.

(d) *Trouble Report Screening:* Network troubles reported to the NCO are screened

by the NCO using available data to establish if further maintenance action is required.

(e) **Service Protection:** The NCO may initiate service protection activities on troubles affecting the ETN. This could involve circuit turn-down or calling the customer and recommending that the customer exercise a CACS function (eg, vary time of day routing pattern) or responding to a customer request for same.

(f) **ETN Localization:** The NCO will be responsible for determining the specific network element (switch, intertandem tie trunk, etc) which is involved in a trouble condition detected by pattern analysis. The NCO will be responsible for requesting assistance from the appropriate work centers.

(g) **Referral for Sectionalization:** The NCO is responsible for referral of a patterned trouble report to the PCO for sectionalization of the specific ETN element.

(h) **Tracking:** For this function, the NCO will be responsible for tracking maintenance activities of referred network troubles.

(i) **Report Completion:** After the trouble condition has been repaired, the NCO will be notified. For troubles referred by the NCO, the NCO is responsible for network repair verification and closing out the network trouble ticket. The customer should be advised of all network trouble conditions that have been cleared.◀

C. Plant Control Office

3.30 The SSC/STC nearest the PBX/CTX tandem switcher is assigned operations control responsibility as PCO. Circuit additions or deletions to existing groups may be controlled by the PCO.

3.31 The *Service Order Process* responsibilities of the PCO are as follows:

(a) Upon receipt of USOs, circuit orders, Network Routing Guides, etc, exercise order control functions for all service orders on all circuits under its control in the ETN configuration.

(b) Assume order tracking responsibility for all circuits under its control. Track Design Verified and Assigned (DVA) dates, Plant Test

Dates (PTD) for installation, and Inventory Availability Dates (IAD) for disconnects.

(c) Coordinates outside plant work with the proper organizations. SSCs should update Switched Access Remote Testing System (SARTS) records base to permit testing of new circuits or to discontinue testing of disconnected circuits.

(d) Report completion of all service orders for all circuits to the NCO, the CPB, Sales, Accounting, and the customer.

3.32 The SSC/STC at the far end of the circuit from the PCO has noncontrol responsibility. The specific functional responsibilities of the noncontrol SSC/STC for the service order tasks are the same as those specified for the PCO, only more limited in scope, except as follows:

(a) Order control and tracking are similar to PCO except that noncontrol SSC/STCs report to the PCO as necessary (eg, plant availability).

(b) Report completion of all service orders for all CP terminated circuits to the PCO.

3.33 The *Installation* responsibility covers all ETN CO-CO, CP-CP and CO-CP circuits. The PCO uses established interarea coordination capabilities for the installation of ETN circuits.

3.34 On CO-CO circuits the PCO must assure that the SCC makes all necessary installation tests. This is necessary because of the limited PCO test access on CO-CO circuits.

3.35 The PCO refers CP installation work to the proper PSC. It refers CO installation work to the proper SCC/CO work forces. It will coordinate the preservice testing of all newly installed circuits with other work centers.

3.36 The PCO has *Maintenance* responsibility for intertandem tie trunks, access tie trunks and bypass access tie trunks. Customer reports of trouble encountered after dialing the ETN access code(s) are directed to the PCO. The PCO is responsible for functions and associated activities described in the following paragraphs for CO-CO, CO-CP, and CP-CP circuits.

(a) ▶**Testing:** The PCO should try to duplicate a noncircuit-specific trouble three times if

NCOSS is not available. If NCOSS is available, after trying to duplicate the trouble, the PCO should refer the trouble to the NCO for additional trouble analysis.◀

(b) **Trouble Detection:** The PCO is responsible for the detection of trouble conditions on ETN circuits.

(c) **Trouble Report Reception:** The PCO will receive:

(1) Customer trouble reports and machine-detected trouble reports when available. The primary source of trouble reports in ETN will be the customer.

(2) Referrals from the NCO for performing sectionalization and repair of ETN elements.

(3) Trouble reports from the FCO/TFMC derived from facility surveillance and facility testing.

(4) Reports of troubles (CO-CO and CO-CP circuits) from the SCC concerning central office equipment and trouble conditions.

(5) Reports of troubles (CP-CP and CO-CP circuits) from the ARSB/RSB concerning CP equipment trouble conditions.

(d) **Trouble Verification:** The PCO will verify reported trouble conditions. Referred troubles from the NCO have already been verified.

(e) **Service Protection:** The PCO will be responsible for service protection activities on ETN elements. This includes making trunks "Maintenance Busy" until trouble is cleared. These activities also include keeping the NCO informed if troubles result in noticeable degradation of service.

(f) **ETN Localization:** The PCO will assist the NCO in ETN localization as required.

(g) **Element Sectionalization:** The PCO is responsible for performing sectionalization on ETN elements.

(h) **Repair:** The PCO is responsible for repair of customer premise troubles through directed dispatch of repair forces or through referral for

repair to RSB/ARSB. When repair is completed, the PCO is responsible for verifying that the repaired ETN element operates satisfactorily and notifying the customer that the trouble is cleared.

(i) **Referral for Repair:** After the precise location of the trouble is known, the PCO will be responsible for referral for repair. The referral for repair will be to an RSB/ARSB for loop, station, and PBX troubles, to the SCC for CO troubles, and to the FCO/TFMC for facility troubles.

(j) **Repair Tracking:** The PCO is responsible for tracking the repair activities of the center receiving the referral for repair (ie, SCC, RSB).

(k) **Report Completion:** The PCO reports completion of trouble repairs to the customer. The NCO should be advised of the clearance of major troubles that degraded the network.

(l) ◆**Trouble Tickets:** The PCO is responsible for filling out trouble tickets and inputting the Special Services System (SSS) plan.◀

3.37 The noncontrol SSC/STC assists the PCO in the circuit maintenance functions outlined above. These functional responsibilities are therefore similar to the PCO with the following exceptions. The noncontrol SSC/STC will:

(a) Have no responsibility for trouble detection

(b) Accept referrals from PCO

(c) Accept customer trouble reports. If misdirected, inform customer to direct future trouble reports to the PCO.

(d) Report completed trouble reports to the PCO.

D. Switching Control Center

3.38 The SCC is assigned responsibilities for the CO-CO circuits. If the SCC is not available, the CO may be responsible for the CO-CO circuits. Circuit arrangements and ease of access to data through the SCC make it impractical for the PCO to fulfill all of its responsibilities directly. The SCC responsibilities are a subset of the PCO

responsibilities. The PCO regularly requires the assistance of the SCC in carrying out its functions. The SCC is also assigned operations control responsibility for the No. 1 ESS CTX tandem switch.

3.39 The *Service Order Process* for CO-CO circuits will be the responsibility of the SCC. Upon receipt of the Universal Service Order (USO) circuit order, Network Routing Guide (NRG), etc, the SCC must exercise order control functions and report as necessary to the PCO. The SCC must assume CO/Circuit Layout Record (CLR) tracking responsibility, update record bases as required and report all service order completions to the PCO.

3.40 On CO-CO circuits, the SCC at the far end of the circuit has noncontrol responsibility. Similarly on CO-CP circuits, the SCC opposite the PCO has noncontrol responsibility. There are specific responsibilities for these SCCs on CO-CO and CO-CP type circuits. Upon receipt of the USO, circuit order, NRG, etc, the noncontrol SCC must report any problems to the SCO on CO-CO circuits or to the PCO on CO-CP circuits. The noncontrol SCC must assume CO/CLR tracking responsibility and report all completions to the control SCC or the ETS/ETN PCO.

3.41 The specific functional responsibilities of the SCC for the service order task when it has operations control responsibility for the No. 1 ESS CTX tandem switch are:

(a) Receive USOs for ETS features and NRGs

(b) Exercise order control and tracking responsibilities for USOs, and report as necessary to the PCO and NCO

(c) Report completion of USOs to the PCO, the NCO, Sales and Accounting.

3.42 The CO *installation* work will be directed by the SCC. The SCC will also perform preservice testing of new circuits, features, and translations in coordination with the PCO or NCO.

3.43 For *maintenance,* the SCC responsibilities include assisting the PCO on CO-CO circuits. In addition, the SCC has operations control responsibility for No. 1 ESS CTX tandem switches. Specific functional responsibilities for both of these

operations control oriented responsibilities are as follows:

(a) *Trouble Detection:* The SCC will detect trouble conditions on No. 1 ESS switches, ETS features, intertandem tie trunks, and access tie trunks terminating in a Centrex CO. The trouble detection strategies employed by the SCC include continuous monitoring testing, pre-use testing, periodic testing, and pattern analysis. The SCC will detect troubles via the ESS and the SCC support system.

(b) *Trouble Report Reception:* The SCC will perform the following for this function:

(1) Receive ESS and OSS detected reports for trouble conditions on ETN elements

(2) Receive referrals from the PCO for performing sectionalization and repair of ETN elements

(3) Receive referrals from PCO or RSB/ARSB concerning customer reported feature troubles

(4) Receive referrals from PCO/TFMC on CO equipment troubles relating to facilities.

(c) *Trouble Verification:* The SCC will verify a machine reported trouble condition. Troubles referred to the SCC by the PCO or NCO have already been verified.

(d) *Service Protection:* The SCC will be responsible for service protection activities, such as locking out circuits, on ETN elements located at or terminated in the CO. These activities include keeping the NCO and PCO informed of troubles resulting in noticeable degradation of services.

(e) *ETN Localization:* The SCC will assist the PCO in trouble localization as required.

(f) *Element Sectionalization:* The SCC will assist the PCO in sectionalization of troubles on ETN elements.

(g) *Repair:* The SCC will assist in verifying the repair of ETN elements. It is also responsible for directing the repair of the CO equipment portion of all ETN elements.

(h) **Referral for Repair:** The SCC organization will handle referral to the TFMC for facility related troubles and to RSB/ARSB for station troubles.

(i) **Tracking:** The SCC tracks repair activities involving ETN elements.

(j) **Report Completion:** It is responsible for reporting completion of troubles to the PCO on ETN elements.

3.44 On CO-CO circuits, the SCC at the far end from the control SCC is assigned noncontrol responsibilities. The noncontrol responsibilities are similar to the control SCC (on circuits) and operations control (on ESS CTX) responsibilities outlined above with the following exceptions:

(a) The SCC at the far end will track repair activities of SCC/CO forces involving CO equipment and will be responsible for reporting completion of troubles to the control SCC on ETN elements.

(b) On CO-CP circuits, the SCC at the far end from the PCO is assigned noncontrol responsibilities. These responsibilities are similar to the noncontrol responsibilities outlined above except that completion reports are given to the PCO.

E. Repair Service Bureau (RSB/ARSB)

3.45 The RSB/ARSB has operations control responsibility for the repair of the DIMENSION PBX switch, CACS, CAP, and CAT. In addition, the RSB/ARSB supports other operations centers (PCO and SCC) in the maintenance of circuits, station equipment and data sets. Specific functional responsibilities are:

(a) **Trouble Detection:** If an RMATS is provided, major and minor alarms can be detected during normal or special purpose polling on DIMENSION FP8. RMATS can also be used to diagnose CACS troubles.

(b) **Trouble Report Reception:** The RSB/ARSB will:

(1) Receive machine detected troubles for DIMENSION FP8 and CACS

(2) Receive customer CACS and SMDR complaints

(3) Receive customer complaints on non-network circuits and PBX related problems

(4) Receive referrals from the SSC/STC for performing sectionalization and repair of ETN elements

(5) Receive customer reports on ETN troubles. These reports should be referred to the PCO after informing the customer of trouble reporting procedures.

(c) **Trouble Verification:** The RSB/ARSB will:

(1) Be responsible for verifying troubles on station loops. Troubles referred in from the PCO or noncontrol SSC/STC are assumed to be verified.

(2) Be responsible for directing RMATS, if available, in analyzing and isolating troubles on the DIMENSION switch and CACS.

(3) In the absence of RMATS, dispatch repair forces to verify troubles on the DIMENSION switch and CACS.

(d) **Service Protection:** The RSB/ARSB is responsible for exercising service protection procedures for DIMENSION FP8 or CACs troubles.

(e) **Element Sectionalizaton:** The RSB/ARSB is responsible for assisting the PCO in sectionalizing troubles on ETN elements and has primary responsibility for sectionalizing trouble in the DIMENSION switch and CACS.

(f) **Repair:** The RSB/ARSB is responsible for dispatching repair forces in the repair of PBX, CACS, or SMDR troubles and assisting in verifying the repair of ETN elements.

(g) **Tracking:** The RSB/ARSB is responsible for tracking the repair activities on PBXs, CACS, or SMDR.

(h) **Completion Reporting:** The RSB/ARSB reports completion of repairs to the PCO, NCO, and the customer (on direct customer reports only).

F. Plant Service Center

3.46 The PSC is assigned operations control responsibility for installation of the DIMENSION FP8 tandem switches. All CAC/CAP/LCAS vehicles fall under the PSC's operations control responsibility. The PSC will be responsible for ETN feature activation/deactivation.

3.47 The *Service Order Process* responsibilities of the PSC are as follows:

(a) Order reception on all USOs, CLRs, and NRGs concerning stations, DIMENSION PBX tandems, CACS and LCAS.

(b) Exercise order control on implementation and assume order tracking responsibility for USOs, CLRs, and NRGs. Report to PCO or NCO as appropriate.

(c) Report completions to Accounting, Sales, the PCO and NCO.

3.48 *Installation* responsibilities of the PSC include directing installation forces and performing preservice testing on features, circuits and CACS vehicles in coordination with the PCO and the NCO.

G. Data Test Center

3.49 The *Service Order Process* for the DTC is usually limited to the receipt of USOs for data sets. The PSC usually has operations control responsibility for the installation of the data sets.

3.50 *Installation* involves performing preservice tests on data sets and reporting the completion of the tests to the PSC.

3.51 In *maintenance* the DTC has operations control responsibility for data sets (including CACS data sets). Specific functional responsibilities in support of maintenance are found in the following paragraphs:

(a) *Trouble Report:* The DTC wll receive trouble reports. Reports may be originated by the customer or referred from the NCO, PCO or the RSB/ARSB.

(b) *Trouble Verification:* The DTC will be responsible for testing both near-end and far-end data sets.

(c) *Tracking:* The DTC is responsible for tracking repair activities.

(d) *Completion Reporting:* The DTC reports completion to PCO, NCO, or trouble referring organization as appropriate.

H. Business Services

3.52 The responsibilities of the Business Services group for the service order process is as follows:

(a) Compile the necessary data (ie, traffic) to be used for network design studies

(b) Provide the NRG and network maps

(c) Forecast the customer's communication needs based on network design

(d) Transmit results of the design work to Sales to be used as input for USO generation.

I. OCC Procedures on ETN

3.53 See Sections 471-200-001, 471-210-030, 471-000-011 and 480-050-010 for procedures to be followed for Other Common Carrier.

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
190-130-205	Operations Support Systems—ETN
309-400-000	ETN General Description
309-400-002	CACS/CAP/LCAS
309-400-004	Trouble Reporting
309-400-005	Network Analysis

NCOSS MDR PATTERN SEARCH				TRAINCO TUE JUN 17 08:31 1980 CENTRAL						
(NOTE)			TANDEM: 1 (DIM PBX)	JUN 17						
TIME	SAC	CALLED_NUMBR	INCFAX	OUTFAX	E	F	AUTH_CD	DURATN	QT	AC_CD
1101	8	742-2222	x6633	1.01	7	2		01.5		
1101	8	751-5555	x6638	115.01	7	5		01.1		
1101	8	518-471-6787	x6642	153.01	7	6	2134566	01.6		12349
1101	8	671-1114	x6644	101.09	7	4	2134568	01.9		
1101	8	842-8365	x6651	100.09	7	3		01.4		12349
1101	8	671-1188	x6652	101.06	7	4		01.7		12348
1101	8	518-936-4753	101.08	153.08	7	5		01.3		
1101	9	723-2323	x6692	168.01	7	2		02.8		
1101		777-6621	185.03	.	9			03.6		
1101	9	949-7216	x6630	168.07	7	4		04.4		
1101		777-6670	185.07	.	9			03.2		
1101	8	892-7318	x6666	.	F	2		.		
1101	8	743-2443	3.01	123.01	7	4		00.1		
1101	8	744-5837	x6649	3.02	7	3		00.1		
1101	8	744-5861	100.16	3.01	7	3		3:10.6		
1102	8	67-1116	x6616	101.	7	5		.		
1102		777-6625	185.01	.	9			02.0		
1102	9	334-4137	x6663	168.02	7	3		03.1		
1102		777-6606	185.02	.	9			04.3		
1102	9	795-3068	x6697	168.06	7	5		03.5		
1102	8	742-2299	101.05	1.04	7	2		02.1		

Note: Following are column heading definitions:
TIME — Time call transmitted
SAC — Service access code (8 = on-net 9 = off-net)
INCFAX — Incoming facilities (dial access code or circuit number)
OUTFAX — Outgoing facilities
E — Call condition code
F — Facility restoration level
DURATN — Call duration (Hrs: Min: Tenths of Min)
QT — Time in queue
AC-CD — Account code

Fig. 1—DIMENSION PBX SMDR Pattern Search

| NCOSS | | | | | TRAINCO | | | | | | |
| MDR PATTERN SEARCH | | | | | TUE JUN 17 08:26 1980 CENTRAL | | | | | | |

(NOTE)				TANDEM: 3 (ESS) JUN 17							
TIME	D	CALLED_NUMBR	CALLING #	INC_FAX	OUT_FAX	E	F	AUTHCD	CALL_DUR	T_DUR	ACC_CD
1100	T	671-1111		101.002	.	0	5				
1100	T	672-4411		101.003	1.002	0	6				
1100	T	212-727-3794		101.004	111.001	0	4				
1100	T	671-1113		101.012	.	0	5				
1100	T	212-777-3646		101.010	111.002	0	2				
1100	T	671-1157		101.007	.	0	5				
1100	T	671-1187		102.008	.	0	5				
1100	T	671-1136		102.001	.	0	2				
1100	T	666-1104		175.000	.	0					
1100	T	666-1171		175.000	.	0					
1100	O	487-6118	671-1185	.	115.001	0	3			2:30	2
1100	O	741-2136	671-1123	.	115.008	0	4			3:30	2
1100	O	822-8361	671-1196	.	.	2	2			30	
1101	T	671-1114		101.009	.	0	4				
1101	T	671-1188		101.006	.	0	4				
1101	T	212-672-8387		102.003	.	0	4				
1101	T	672-4420		102.005	1.001	0	5				
1101	O	518-936-4753	671-1153	.	101.008	0	5	123482	1:18	2	12568
1101	T	671-1175		102.007	.	0	4				
1101	T	666-1105		175.000	.	0					
1101	T	666-1133		175.000	.	0					

Note: Following are column heading definitions:

TIME — Time call terminated

D — O = Operated from tandem or subtending main

    T = Terminated at tandem

INCFAX — Incoming facilities (dial access code or circuit number)

E — Call event code

F — Facility restoration level

T-DUR — Duration time in tandem (seconds)

AC-CD — Account code

CALL-DUR — Call duration (hrs: mins)

Fig. 2—ESS SMDR Pattern Search