

**NO. 4 ELECTRONIC SWITCHING SYSTEM
TERMINAL EQUIPMENT CENTER (TEC)
ORGANIZATION AND FUNCTION**

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- *Terminal equipment center (TEC)*
- *Trunk operations center (TOC).*

Two other work centers, the *machine administration center (MAC)* and the *network management center (NMC)*, are assigned to the No. 4 ESS. The *MAC* has primary responsibility for circuit order administration. The *NMC* has primary responsibility for network management. Table A provides a list of abbreviations and acronyms with applicable terms used in this section.

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

1.03 The TEC provides management and maintenance personnel a centralized location to administer repair and circuit order work on trunk and common control terminal equipment. This section describes the TEC in the following parts:

- *Description of functions*
- *Interrelationships with other work centers.*

1.04 The primary functions of the TEC are these:

- *Repair and routine testing*
- *Circuit order work*
- *Acceptance responsibilities*

1. INTRODUCTION

1.01 The quantity and complexity of equipment in a No. 4 *Electronic Switching System (ESS)* office requires a planned approach to principal work functions involved with control and maintenance responsibilities. The organization and function of work centers unique to the No. 4 ESS depend on such variables as office size, equipment ownership, and administrative policies and procedures. In a fully equipped office, control and maintenance responsibilities are assigned to these basic work centers:

- *Maintenance operations center (MOC)*

With the use of the *Circuit Maintenance System IA (CMS IA)* and the No. 4 ESS, TEC personnel perform these functions on analog and digital terminal equipment.

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2. DESCRIPTION OF FUNCTIONS

2.01 The TEC is normally located in proximity to the terminal equipment for which it is responsible. Large No. 4 ESS offices may consist of multi-TEC locations, called TEC *control areas (CAs)*; this may be due to multiple floors of terminal equipment or to dual company ownership of equipment in the office. Each CA has a control location for receiving and dispatching work order messages.

2.02 The primary functions of the TEC encompass three categories of equipment. One category involves common control terminal equipment:

- *Peripheral unit branch bus repeaters*
- *Voiceband interface (VTF) Frames*
- *Signal processors (SP, SP 2)*
- *Digroup terminals (DTs)*
- *Common channel interoffice signaling (CCIS).*

The second category involves trunk terminal equipment (ie, on a per circuit basis) and includes the following:

- *Unitized terminal equipment (UTE)*
- *Metallic terminal frames (MTFs)*
- *Service circuits (eg, recorded announcements)*
- *Distributing frames.*

The third category consists of trunk testing equipment and includes the following:

- *51A test positions*
- *Test sets*
- *Switched Maintenance Access System (SMAS) No. 3B, if available*
- *Other equipment mentioned in 3.11 and 3.12.*

REPAIR AND ROUTINE TESTING

2.03 The TEC is the repair center for common control terminal equipment and trunk terminal equipment within a No. 4 ESS office. TEC personnel are responsible for repair of equipment as requested by the TOC and/or the MOC. (The TOC is the control center for trunks; the MOC is the control center for the No. 4 ESS and common control terminal equipment.) The TEC has no maintenance control responsibilities except those necessary to carry out repair operations.

2.04 Faulty trunk equipment or trunks are usually placed in an out-of-service maintenance-lockout or out-of-service maintenance-disable state before any work orders are referred to the TEC by the TOC or the MOC. Upon receipt of the work order, the TEC repairs the equipment or circuits.

CIRCUIT ORDER WORK

2.05 The TEC is responsible for assisting the MAC and the TOC in circuit order work. The MAC schedules and control circuit orders, the TEC performs terminal equipment circuit order work, the TOC performs end-to-end tests and turnup/turndown, and the MAC completes the process. TEC circuit order duties involve activities in the following forms:

- Installation or removal of per trunk equipment
- Adjusting of pads
- Cross-connections
- Cross-office testing
- Interface of circuit order work with the other work centers as required.

ACCEPTANCE RESPONSIBILITIES

2.06 As use of the telephone network increases, system growth (ie, switching, terminal, and/or transmission equipment expansion) is necessary to increase the capability of the system to process more traffic. System growth pertains to frame additions in an operating No. 4 ESS office. The TEC must assume the following responsibilities:

- Ensuring that growth installation does not disrupt service in its area of responsibility

- Performing and coordinating acceptance tests on growth equipment before cutover in its area of responsibility.

3. INTERRELATIONSHIPS WITH OTHER WORK CENTERS

3.01 The following are work centers used by the No. 4 ESS to execute the trunk maintenance plan:

- MOC
- TEC
- TOC
- MAC
- *Transmission system center (TSC):* This is a functional designation for the carrier facilities group in the building. The *Carrier Transmission Measuring System (CTMS)* and the *T Carrier Administration System (TCAS)* are not independently considered a work center within No. 4 ESS.

Two other work centers are directly related to trunk maintenance: *Centralized Automatic Reporting On Trunks 2 (CAROT 2)* and the *Circuit Maintenance System Maintenance Center (CMSMC)*.

3.02 CAROT 2 performs a periodic routine transmission testing; demand transmission testing by CAROT 2 is also available to TEC (and TOC) personnel. These tests are performed on trunks, trunk subgroups, and facility groups on outgoing trunks or on 2-way trunks operating in the outgoing traffic mode. Single-trunk demand tests may be requested by CAROT 2 on trunks in an active, idle, out-of-service maintenance lockout, or out-of-service circuit order administration lockout state.

3.03 The function of the CMSMC is to monitor and administer the CMS 1A itself. The maintenance and circuit order work lists of existing trunks and trunk changes (additions or deletions) can be assigned and reassigned by the CMSMC at the request of the appropriate supervisor. CMS 1A will automatically update the CAROT 2 data base (per circuit portion) as circuit order changes occur.

3.04 The basic repair work centers are the MOC, the TEC, and the TSC. The MOC is responsible for control and repair of the No. 4 ESS switching equipment, and for control of all common control terminal equipment. The TEC is responsible for repair and circuit order functions on common control terminal equipment and on trunk terminal equipment. The TSC is responsible for repair and circuit order functions on the transmission facilities (ie, carrier and radio).

3.05 Individual trunk testing is a primary TOC responsibility. This includes testing of common control terminal equipment on a per-trunk basis. Any TEC maintenance on common control terminal equipment which was not referred by the MOC or TOC requires that TEC personnel notify the appropriate control center before turning down any equipment.

3.06 The MAC has primary responsibility for circuit order administration.

RELATED SYSTEMS

3.07 If SMAS No. 3B is provided, tests can be made from the TOC on trunks so equipped (metallic, T1 carrier equipped with D-type channel banks, and other analog carrier systems). SMAS No. 3B provides monitoring and splitting access for the transmission and signaling leads. SMAS No. 3B manual access panels are also provided on the equipment in the equipment aisles for portable test equipment access by the TEC.

3.08 The TSC is the conceptual work center comprising the carrier facilities group. The CTMS and/or the TCAS, if available, are maintenance tools used by TSC maintenance personnel. The CTMS provides testing for L-type multiplex coaxial and radio facilities equipment. CMS 1A and the CTMS interact to provide trunk trouble sectionalization features on those trunks which CTMS addresses. This feature is also available to TEC and TOC personnel. At present no specific interface between the TCAS and the TEC has been defined.

VARIATIONS OF INSTALLATION

3.09 The maintenance scheme of a No. 4 ESS office is very flexible. Installation variations include the size of work centers, office layout, equipment options (including nonstandard arrangements), and system options (SMAS No. 3B),

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CTMS, and TCAS). Because of varying office administration, actual maintenance environments as well as work center responsibilities may differ.

3.10 At certain times, such as nights or weekends, it may be desirable for the MOC to assume the TEC responsibilities. This is accomplished by alarm and channel transfer. Where equipment arrangements and trouble frequency allow, the TEC functions may become a permanent responsibility of the MOC, the TOC, or both. Because of equipment ownership and/or the dispersion of terminal equipment, multi-TEC locations may be required.

3.11 CAROT 2 and the CMSMC may be a combined work center, which may be attended or unattended. If it is attended, the TEC may be assigned the operational duties as required.

3.12 Finally, in some No. 4 ESS offices, TEC personnel may also be responsible for power system maintenance.

4. REFERENCES

4.01 The following sections and manuals will be useful in obtaining further information regarding the organization and function of the TEC:

SECTION	TITLE
966-220-000	No. 4 Electronic Switching System—Description

SECTION	TITLE
234-100-010	Interrelationships of Operational Work Centers, MOC, MAC, TOC, TEC, and NMC
234-105-000	Maintenance Operations Center (MOC)—Organization and Function
190-102-010	CAROT 2 Center—Duties and Responsibilities
103-270-100	CMS 1A—General Description
103-270-102	TEC Displays & Commands
667-301-100	Switched Maintenance Access System No. 3 A, 3 B, and 3C—Description
234-102-000	Machine Administration Center (MAC)—Organization and Function
234-103-000	Trunk Operations Center (TOC)—Organization and Function
234-104-000	CMS 1A and CAROT 2 Maintenance Center—Organization and Function

TABLE A
ABBREVIATIONS AND ACRONYMS

ABBREVIATION	TERM
CA	Control area
CAROT 2	Centralized Automatic Reporting On Trunks
CCIS	Common channel interoffice signaling
CMS 1A	Circuit Maintenance System 1A
CMSMC	Circuit Maintenance System Maintenance Center
CTMS	Carrier Transmission Maintenance System
DT	Digroup terminal
I/O	Input/Output
MAC	Machine administrative center
MOC	Maintenance operations center
MTF	Metallic terminal frame
NMC	Network Management Center
No. 4 ESS	No. 4 Electronic Switching System
SMAS No. 3B	Switched Maintenance Access System No. 3B
SP	Signal Processor
SP 2	Signal Processor 2
TCAS	T Carrier Administration System
TEC	Terminal equipment center
TOC	Trunk operations center
TSC	Transmission systems center
UTE	Unitized terminal equipment
VIF	Voiceband interface