



ATIS-1000116.2000(\$2020)

Signalling System Number 7 (SS7) – Operations,  
Maintenance, and Administration Park (OMAP)

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## ATIS-1000116.2000(S2020), Signaling System Number 7 (SS7) – Operations, Maintenance, and Administration Park (OMAP)

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**T1.116-2000(S2020)**

(Revision and consolidation of  
T1.116-1996 and T1.116a-1998)

**American National Standard for Telecommunications**

**Signalling System Number 7 (SS7) –  
Operations, Maintenance, and  
Administration Part (OMAP)**

Secretariat

**Alliance for Telecommunications Industry Solutions**

Approved December 13, 2000

**American National Standards Institute, Inc.**

**Abstract**

Signalling System Number 7 (SS7) - Operations, Maintenance, and Administration Part (OMAP) OMAP is an American National Standard based on ITU-T Recommendations Q.750 through Q.756 of Signalling System No. 7 (SS7) for international use, and is intended to be compatible with that standard. It has been modified for use within and between U.S. Networks to meet the anticipated needs and applications of those entities. These modifications are the result of extensive work by the members of the T1S1.3 Working Group on U.S. Standards for Common Channel Signalling.

Topics included are an Overview of Signalling System Number 7 (SS7) Management (OMAP), Monitoring and Measurements for Signalling System Number 7 Networks, Signalling System Number 7 (SS7) Management Functions MRVT, SRVT, CVT and Definition of the OMASE-User, Signalling System Number 7 (SS7) - OMAP Management ASE (OMASE) Definitions for Functions MRVT, SRVT and CVT, and a Signalling System Number 7 Guide Book to OMAP.

## Foreword

The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. As such, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the standard.

This document is entitled *American National Standard for Telecommunications – Signalling System Number 7 (SS7) – Operations, Maintenance and Administration Part (OMAP)*. It is based on the ITU-T Recommendations Q.750 through Q.756 of Signalling System No. 7 (SS7) for international use and is intended to be compatible with that standard. It has been modified for use within and between U.S. Networks to meet the anticipated needs and applications of those entities. These modifications are the result of extensive work by the members of the T1S1.3 Working Group on U.S. Standards for Common Channel Signalling. In general, these modifications fall into two categories:

1. the specification of options designated by the ITU-T for national use; and
2. extensions to the 1988 protocol to provide for new applications of the SS7 protocol. This is in accordance with current and projected ITU-T activity.

[A change bar on the right margin indicates a change from the 1996 issue of this American National Standard. These change bars are advisory only, and reflect the editors' views of which textual changes constitute significant technical changes. Because of the differences in style and content between this standard and the ITU-T Recommendations, it is not possible to indicate differences using margin marks.]

This standard contains the following seven chapters:

|           |   |
|-----------|---|
| T1.116.0, | Overview of Signalling System Number 7 (SS7) Management (OMAP)  |
| T1.116.1, | Network Element Management Information Model for the MTP (For Further Study)                                |
| T1.116.2, | Monitoring and Measurements for Signalling System Number 7 Networks   |
| T1.116.3, | Signalling System Number 7 (SS7) Management Functions MRVT, SRVT, CVT and Definition of the OMASE-User      |
| T1.116.4, | Signalling System Number 7 (SS7) - OMAP Management ASE (OMASE) Definitions for Functions MRVT, SRVT and CVT |
| T1.116.5, | Signalling System Number 7 Protocol Testers (For Further Study)   |
| T1.116.6, | Signalling System Number 7 Guide Book to OMAP   |

This standard is intended for use in conjunction with T1.110-1999 *Signalling System Number 7 (SS7) – General Information*, which includes an overview of SS7, a glossary, and a chapter on abbreviations.

The overall and detailed organization of these specifications parallels that used in the equivalent ITU-T recommendations. Thus, T1.116.0-2000 through T1.116.6-2000 of this standard corresponds to ITU-T Recommendations Q.750 through Q.756. The major changes in organization and appearance of these ITU-T Recommendations account for many of the changes to this standard from the previous issue. The following is an overview of the changes and additions incorporated into these specifications:

- the MRVT has been clarified and revised to enhance the capability of testing MTP routes to adjacent signalling networks;
- the SRVT has been clarified and revised to enhance the capability of testing MTP routes to adjacent signalling networks;

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- the SRVT has been clarified and revised to include new SCCP routing capabilities; and
- T1.116.0-2000, clause 6, was revised to include details on compatibility issues.

Information contained in a normative annex in these specifications *is* considered part of this standard. Information contained in an informative annex in these specifications is *not* considered part of this standard but is auxiliary to the standard. Similarly, footnotes are not officially part of this standard.

Caution should be exercised in using the Specification and Description Language (SDL) diagrams to interpret the standard since they may not fully align with the text. Please note that, in case of any conflict between the text and the SDL diagrams, the text always takes precedence over the SDL.

Future control of this document will reside with Accredited Standards Committee on Telecommunications, T1. This control of additions to the specification, such as ongoing protocol evolution, new applications, and operational requirements, will permit compatibility among U.S. networks. Such additions will be incorporated in an orderly manner with due consideration to the ITU-T-layered model principles, conventions, and functional boundaries.

Suggestions for improvement of this standard will be welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, 1200 G Street NW, Suite 500, Washington, DC 20005.

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## Master Abbreviations &amp; Acronyms List for T1.116-2000(S2020)

|         |   |       |   |
|---------|---|-------|---|
| AE      | Application Entity                            | NEMF  | Network Element Management Function             |
| AMI     | Application Management Interface              | NMF   | Network Management Function                     |
| APDU    | Application Protocol Data Unit                | NSAP  | Network Service Access Point                    |
| ASE     | Application Service Element                   | OM    | OMAP Management                                 |
| ASN.1   | Abstract Syntax Notation 1                    | OMAP  | Operations, Maintenance and Administration Part |
| CIC     | Circuit Identification Code                   | OMASE | OMAP Management ASE                             |
| CMIP    | Common Management Information Protocol        | OMC   | Operations and Maintenance Center               |
| CMIS    | Common Management Information Service         | OPC   | Originating Point Code                          |
| CR      | Connection Request                            | OS    | Operations System                               |
| CVT     | Circuit Validation Test                       | OSF   | Operations System Function                      |
| DPC     | Destination Point Code                        | OSI   | Operations System Interconnection               |
| DTSP    | Duplex Translation Signalling Point           | PC    | Point Code                                      |
| FTA     | Facility Test Acknowledgement                 | PPC   | Primary Point Code                              |
| FTL     | Facility Test Loopback                        | RPOA  | Recognized Public Operating Agency              |
| FTPC    | Final Translation Point Code                  | SCCP  | Signalling Connection Control Part              |
| FTR     | Facility Test Results                         | SDH   | Synchronous Digital Hierarchy                   |
| FTSP    | Final Translation Signalling Point            | SDL   | Specification and Description Language          |
| FTU     | Facility Test Underway                        | SIB   | Status Indication Busy                          |
| GT      | Global Title                                  | SIF   | Signalling Information Field                    |
| GTI     | Global Title Indicator                        | SIO   | Service Information Octet                       |
| GTT     | Global Title Translation                      | SL    | SubLayer  |
| ITPC    | Intermediate Translation Point Code           | SLC   | Signalling Link Code                            |
| ISDN-UP | Integrated Services Digital Network User Part | SMSI  | Systems Management Service Interface            |
| ISUP    | ISDN User Part                                | SP    | Signalling Point                                |
| ITSP    | Initial Translation Signalling Point          | SPC   | Secondary Point Code                            |
| ITU-T   | International Telecommunications Union        | SRVA  | SCCP Routing Verification Acknowledgment        |
| LEA     | Link Equipment Available                      | SRVR  | SCCP Routing Verification Result                |
| LEF     | Link Equipment Failure                        | SRVT  | SCCP Routing Verification Test                  |
| LEU     | Link Equipment Unavailable                    | SS7   | Signalling System Number 7                      |
| LFS     | Link Fault Sectionalization                   | SSN   | SubSystem Number                                |
| LME     | Layer Management Entity                       | ST    | SCCP Tester                                     |
| LMI     | Level Management Interface                    | STP   | Signalling Transfer Point                       |
| LSSU    | Link Status Signal Unit                       | SU    | Signal Unit                                     |
| MIB     | Management Information Base                   | TC    | Transaction Capabilities                        |
| MIS     | Management Information Service                | TCAP  | Transaction Capabilities Application Part       |
| MML     | Man-Machine Language                          | TFA   | Transfer Allowed                                |
| MRVA    | MTP Routing Verification Acknowledgment       | TFP   | Transfer Prohibited                             |
| MRVR    | MTP Routing Verification Result               | TID   | Transaction Identification                      |
| MRVT    | MTP Routing Verification Test                 | TMN   | Telecommunications Management Network           |
| MT      | MTP Tester                                    | TPC   | Tested Point Code                               |
| MTBF    | Mean Time Before Failure                      | TrVT  | Transaction Verification Test                   |
| MTP     | Message Transfer Part                         | TSP   | Translation Signalling Point                    |
| MTTR    | Mean Time to Repair                           | TUP   | Telephony User Part                             |
| NE      | Network Element                               | UDTS  | UnitData Service Message                        |
| NEF     | Network Element Functions                     | UP    | User Part                                       |
| NEF     | Network Element Function                      |       |   |

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**Chapter T1.116.0**  
**Overview of**  
**Signalling System Number 7 (SS7) Management**

**Overview of  
Signalling System Number 7 (SS7) Management**

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American National Standard for Telecommunications —

# Signalling System Number 7 (SS7) – Overview of Signalling System Number 7 (SS7) Management

## 1 Introduction

This series of standards on the Operations, Maintenance, and Administration Part (OMAP) define the functions, procedures, and entities for managing the Signalling System Number 7 (SS7) network.

The management functions of SS7 are divided into three main parts:

- a) management functions located in the Telecommunications Management Network (TMN) (which means the Network Element Functions (NEFs) and the Operations System Functions (OSF) - see Recommendation M.3000). These functions include measurement collection, and cover TMN to TMN interactions;
- b) management functions within the SS7 protocol itself (e.g., changeover, forced rerouting, subsystem management, etc.); and
- c) management functions defined to enable verification and validation of routing tables, Circuit Identification Codes (CICs), etc. These functions may require communication within the signalling network, and for this, a separate protocol is defined. Such management functions are modeled as managed objects at the interface between the network elements and an operations system.

Of the three sets of management functions defined above, OMAP provides a) and c). Set b) can be modeled as existing within the “Layer Management Entities” of SS7, and the functions are defined in the standards pertinent to those layers.

OMAP interacts with all layers (i.e., with all the levels) of SS7 in order to effect control of the network.

This standard comprises six chapters:

- T1.116.0 gives the OMAP overview;
- T1.116.1 defines the SS7 managed objects;
- T1.116.2 defines SS7 monitoring and measurements;
- T1.116.3-2000 defines the SS7 management functions for managed objects that themselves require SS7 communication in the network, and also the OMAP Management Application Service Element (OMASE)-User where the logic of these functions (MRVT, SRVT LEF and LFS) is modeled;
- T1.116.4-2000 defines the Application Service Element (ASE) for those functions defined in T1.116.3-2000, i.e., OMASE;
- T1.116.5-2000 defines the SS7 testers; and
- T1.116.6-2000 is a Guide Book to Operations, Maintenance, and Administration Part (OMAP).