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SERIES G: TRANSMISSION SYSTEMS AND MEDIA,
DIGITAL SYSTEMS AND NETWORKS

Digital terminal equipments – Operations, administration
and maintenance features of transmission equipment

Signal processing network equipment

Recommendation ITU-T G.776.4

ITU-T

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Recommendation ITU-T G.776.4

Signal processing network equipment

Summary

Recommendation ITU-T G.776.4 provides information and requirements for signal processing network equipment (SPNE). It can be applied to traditional networks and next generation networks (NGNs). SPNE such as network echo cancellers (ECs), voice gateways and digital circuit multiplication equipment (DCME) may include signal processing functions (SPFs) (echo cancellation, noise reduction (NR), automatic level control (ALC), circuit multiplication, etc.).

Information in this Recommendation is based on actual and planned equipment installed (or to be installed) in telecommunication networks. This Recommendation describes components, functionality, delay requirements, alarm handling and algorithms used by these devices. Transport, signalling, control, OAM and testing interfaces are also described.

History

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FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at <http://www.itu.int/ITU-T/ipr/>.

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Signal processing network equipment

1 Scope

Signal processing network equipment (SPNE) deployed in the network (located in a transmission path from network termination unit to network termination unit) provides functions for voice enhancement and the transport of voice and voiceband services. This Recommendation describes these functions and defines performance requirements necessary for successful operation in the network that are not covered in individual SPNE Recommendations. Typical applications of SPNE are also given in this Recommendation.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

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[ITU-T X.735]	Recommendation ITU-T X.735 (1992), <i>Information technology-Open Systems Interconnection-Systems Management: Log control function.</i>

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

None.

3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

3.2.1 acoustic echo: Acoustic echo is the reflected signal resulting from the acoustic path between the earphone/loudspeaker and microphone of a terminal, hand-held or hands-free mobile station (MS).

3.2.2 acoustic echo control: The functions performed by an acoustic echo controller (AEC).

3.2.3 cancelled end: The side of an echo canceller (EC) that contains the echo path on which this EC is intended to operate. This includes all transmission facilities and equipment (including the hybrid and terminating telephone set) which is included in the echo path.

3.2.4 signal processing network device (SPND): A physical entity (e.g., chipset) that contains one or more signal processing network functions (SPNFs).

3.2.5 signal processing network element/equipment (SPNE): A stand-alone physical entity that supports one or more SPNFs. It may also be controlled internally and/or externally and managed through a network management system (NMS) that contains managed objects, a management communications function and a management application function. SPNEs include e.g., ECs, voice enhancement devices and CME.

NOTE 1 – Examples of managed objects are: receive/transmit port, power supply, plug-in cards, SPNFs. The communications function provides facilities for the transport of telecommunications management network (TMN) messages to and from the management application function, as well as facilities for the transit of messages. The message communications function does not originate or terminate messages. A management application function is the origin and termination for all TMN messages.

NOTE 2 – A SPNE in this context is a combination of hardware and software that performs SPNFs.

3.2.6 signal processing network function (SPNF): A function within a physical entity (e.g., SPNE, SPND) that performs signal processing to provide support or services to the transport network and/or to the users. Examples include electric or acoustic echo control, NR, automatic level control (ALC), digital speech interpolation (DSI), low-rate encoding, and transcoding.

3.2.7 terminal acoustic echo controller: Terminal acoustic echo controllers are voice-operated devices installed in audio terminals on the customer premises, used for the purpose of eliminating acoustic echoes and protecting the communication from howling due to acoustic feedback from loudspeaker to microphone.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ADPCM	Adaptive Differential Pulse Code Modulation
AEC	Acoustic Echo Controller
ALC	Automatic Level Control
BTS	Base Transceiver Station
CAS	Channel Associated Signalling
CDMA	Code Division Multiple Access