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OF ITU

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SERIES Q: SWITCHING AND SIGNALLING

International automatic and semi-automatic working –
Signalling for circuit multiplication equipment

**Signalling between international switching
centres and stand-alone echo control devices**

ITU-T Recommendation Q.52

(Formerly CCITT Recommendation)

ITU-T Q-SERIES RECOMMENDATIONS
SWITCHING AND SIGNALLING

SIGNALLING IN THE INTERNATIONAL MANUAL SERVICE	Q.1–Q.3
INTERNATIONAL AUTOMATIC AND SEMI-AUTOMATIC WORKING	Q.4–Q.59
Basic Recommendations	Q.4–Q.9
Numbering plan and dialling procedures in the international service	Q.10–Q.11
Routing plan for international service	Q.12–Q.19
General Recommendations relative to signalling and switching systems (national or international)	Q.20–Q.34
Tones for use in national signalling systems	Q.35–Q.39
General characteristics for international telephone connections and circuits	Q.40–Q.47
Signalling for satellite systems	Q.48–Q.49
Signalling for circuit multiplication equipment	Q.50–Q.59
FUNCTIONS AND INFORMATION FLOWS FOR SERVICES IN THE ISDN	Q.60–Q.99
CLAUSES APPLICABLE TO ITU-T STANDARD SYSTEMS	Q.100–Q.119
SPECIFICATIONS OF SIGNALLING SYSTEMS No. 4 AND No. 5	Q.120–Q.249
SPECIFICATIONS OF SIGNALLING SYSTEM No. 6	Q.250–Q.309
SPECIFICATIONS OF SIGNALLING SYSTEM R1	Q.310–Q.399
SPECIFICATIONS OF SIGNALLING SYSTEM R2	Q.400–Q.499
DIGITAL EXCHANGES	Q.500–Q.599
INTERWORKING OF SIGNALLING SYSTEMS	Q.600–Q.699
SPECIFICATIONS OF SIGNALLING SYSTEM No. 7	Q.700–Q.799
Q3 INTERFACE	Q.800–Q.849
DIGITAL SUBSCRIBER SIGNALLING SYSTEM No. 1	Q.850–Q.999
PUBLIC LAND MOBILE NETWORK	Q.1000–Q.1099
INTERWORKING WITH SATELLITE MOBILE SYSTEMS	Q.1100–Q.1199
INTELLIGENT NETWORK	Q.1200–Q.1699
SIGNALLING REQUIREMENTS AND PROTOCOLS FOR IMT-2000	Q.1700–Q.1799
BROADBAND ISDN	Q.2000–Q.2999

For further details, please refer to the list of ITU-T Recommendations.

ITU-T Recommendation Q.52

Signalling between international switching centres and stand-alone echo control devices

Summary

This Recommendation describes a signalling interface between an International Switching Centre (ISC) and an external, stand-alone Echo Control Device (ECD). This signalling interface provides for the call by call control of an ECD in real time to ensure an appropriate speech/signal enhancement capability.

Source

ITU-T Recommendation Q.52 was prepared by ITU-T Study Group 11 (2001-2004) and approved under the WTSA Resolution 1 procedure on 1 March 2001.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

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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CONTENTS

	Page
1 Scope.....	1
2 References.....	1
3 Definitions	1
4 Abbreviations.....	2
5 Requirements/Principles	2
6 Conceptual Model.....	3
7 Network Architecture	3
7.1 E1-Network.....	3
7.2 T1-Network.....	3
8 International Switching Centre	4
9 External Echo Control Device	4
10 ECD control channel.....	4
10.1 E1-Network.....	4
10.1.1 Requirements for the control channel equipment.....	4
10.1.2 Coding	5
10.2 T1-Network.....	5

ITU-T Recommendation Q.52

Signalling between international switching centres and stand-alone echo control devices

1 Scope

This Recommendation describes a signalling interface between an International Switching Centre (ISC) and an external, stand-alone Echo Control Device (Echo Suppressor, Echo Canceller), referred to as an ECD.

This interface is supported in E1- and T1-networks.

The signalling interface defined in this Recommendation assumes a fixed relationship between the circuits of the ISC and the external ECD.

While this Recommendation is intended for use on international networks, the information defined here may be used within national networks.

2 References

The following 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: all 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.

- [1] ITU-T G.164 (1988), *Echo suppressors*.
- [2] ITU-T G.165 (1993), *Echo Cancellers*.
- [3] ITU-T G.168 (2000), *Digital network echo cancellers*.
- [4] ITU-T G.704 (1998), *Synchronous frame structures used at 1544, 6312, 2048, 8448 and 44 736 kbit/s hierarchical levels*.
- [5] ITU-T G.711 (1988), *Pulse code modulation (PCM) of voice frequencies*.
- [6] ITU-T Q.50 (1997), *Signalling between circuit multiplication equipments (CME) and international switching centres*.
- [7] ITU-T Q.50 Implementor's Guide (1998).
- [8] ITU-T Q.115 (1999), *Logic for the control of echo control devices*.
- [9] ITU-T Q.115 Implementor's Guide (1998).
- [10] ITU-T Q.422 (1988), *Clauses for exchange line signalling equipment*.

3 Definitions

This Recommendation defines the following terms:

- 3.1 channel associated signalling (CAS):** CAS refers to the channel associated signalling referred to in ITU-T G.704 [4].
- 3.2 echo control device (ECD):** Type of equipment which is able to remove some or all of the returned echo signal from a circuit carrying voice. Examples for such type of equipments are Echo Suppressor and Echo Canceller.
- 3.3 E1 facility:** A transmission link operating at 2048 kbit/s, supporting 30 or 31 64 kbit/s channels.
- 3.4 T1 facility:** A transmission link operating at 1544 kbit/s supporting 24 speech channels.
- 3.5 external:** A device is called external, when it is located outside of the switch.

4 Abbreviations

This Recommendation uses the following abbreviations:

CAS	Channel Associated Signalling
CCF	Call Control Function
DCME	Digital Circuit Multiplication Equipment
EC	Echo Control
ECD	Echo Control Device
ECDCF	ECD Control Function
ECDSF	ECD Switching Function
ISC	International Switching Centre
SPD	Speech Processing Device

5 Requirements/Principles

The control mechanism used between the ISC and the ECD [1], [2], [3] must allow for the use of the ECD on voice circuits controlled by any signalling system, e.g. CCITT R2, CCITT No. 5, TUP and ISUP. The coexistence of the two control mechanisms for ECD (this Recommendation) and Digital Circuit Multiplication Equipment (Annex A or B/Q.50 [6], [7]) must be guaranteed.

6 Conceptual Model

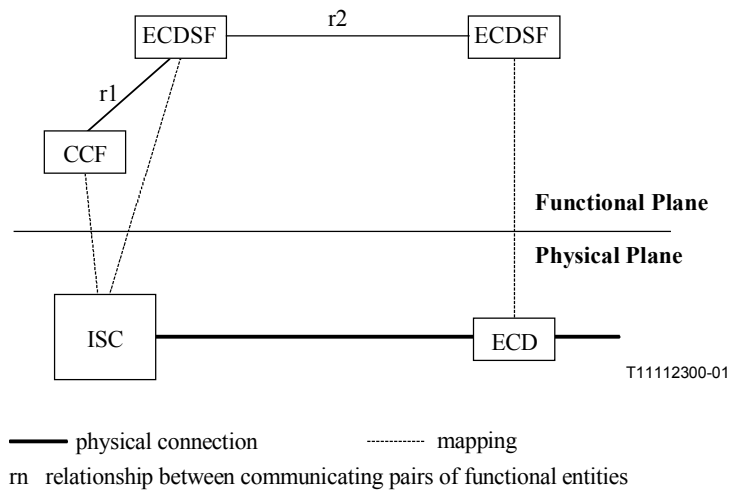


Figure 1/Q.52 – Conceptual methodology model

A master slave relation exists between the ECD switching function (located in the switch) and the ECD control function (located in the ECD).

7 Network Architecture

7.1 E1-Network

The ECD has a physical interface according to ITU-T G.704 [4] which allows the ECD to be inserted in an E1 transmission facility. The control channel is embedded in time slot 16 (CAS mode: c bit) of the E1 transmission facility. The use of time slot 16 in 2048 kbit/s networks for channel associated signalling is defined in ITU-T G.704 [4].

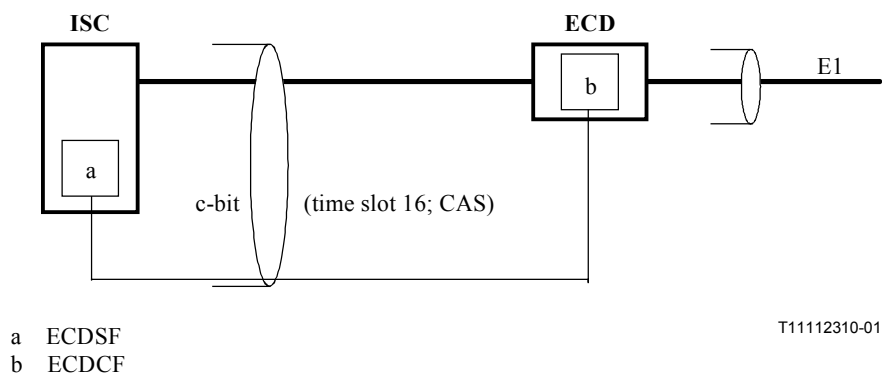


Figure 2/Q.52 – External ECD in an E1-Network

7.2 T1-Network

The ECD has a physical interface according to ITU-T G.704 [4] which allows the ECD to be inserted in a T1 transmission facility. The control channel is physically separated.

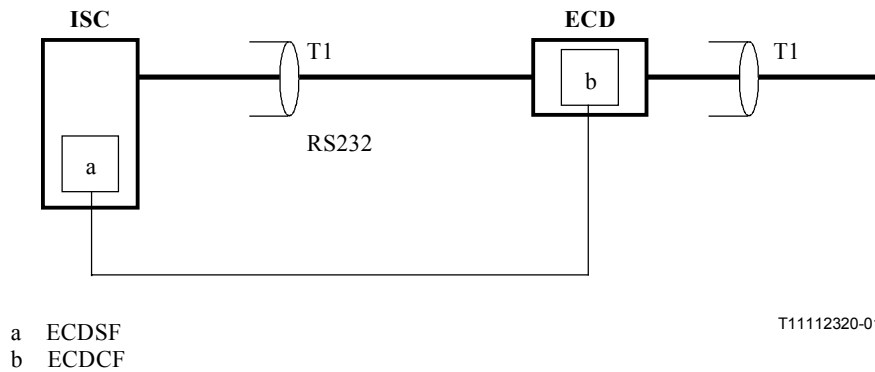


Figure 3/Q.52 – External ECD in a T1-Network

8 International Switching Centre

The ISC provides an E1 or T1 circuit interface and a control channel interface. The ISC also provides the logic to decide on a per call basis if an ECD is required; ITU-T Q.115 [8]. The result is conveyed to the ECD via a control channel, see clause 10.

9 External Echo Control Device

An external stand alone ECD provides an E1 or T1 circuit interface and a control channel interface. The echo control function can be enabled/disabled for each circuit individually.

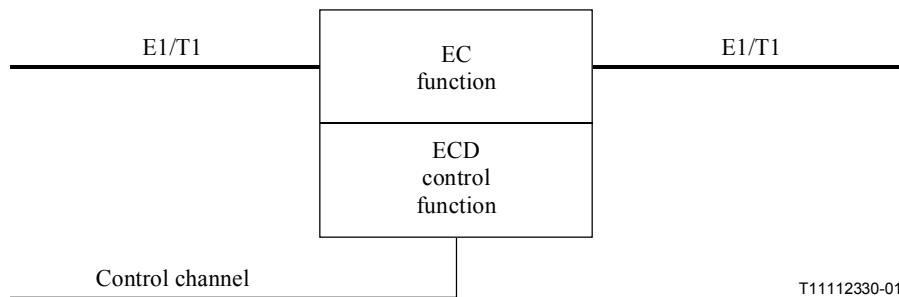


Figure 4/Q.52 – External stand alone Echo Control Device

10 ECD control channel

10.1 E1-Network

The c bit of time slot 16 (CAS mode) is used to convey the ECD control information from the ISC to the ECD.

10.1.1 Requirements for the control channel equipment

The recognition time for a transition from 0 to 1 or vice versa on the c bit is $20 \text{ ms} \pm 10 \text{ ms}$. These conditions are the same as those defined in ITU-T Q.422 [10].

10.1.2 Coding

Either Mode 1 or Mode 2 may be used, as described below. The selection of which mode is used is implementation dependent.

Mode 1:

0 = enable, 1 = disable

Mode 2:

0 = disable, 1 = enable

10.2 T1-Network

The protocol used to control T1 echo control devices over an RS-232 connection is proprietary and is not standardized.

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