

**IEEE Standard for
Information technology—
Telecommunications and information
exchange between systems—
Local and metropolitan area networks**

**Part 5: Token ring access method and
Physical Layer specifications—
Corrigendum 1**

Sponsor

LAN/MAN Standards Committee
of the
IEEE Computer Society

Approved 30 March 2000

IEEE-SA Standards Board

Abstract: This corrigendum to Local and Metropolitan Area Network standards, IEEE Std 802.5, 1998 Edition and IEEE Stds 802.5r and 802.5j, 1998 Edition, is part of a family of local area network (LAN) standards dealing with the physical and data link layers as defined by the ISO/IEC Open Systems Interconnection Basic Reference Model. Errors that have been identified in the two standards are corrected.

Keywords: data processing interconnection, dedicated token ring, fibre optic media, full duplex operation, insertion key, local area network (LAN), medium access control (MAC), token ring

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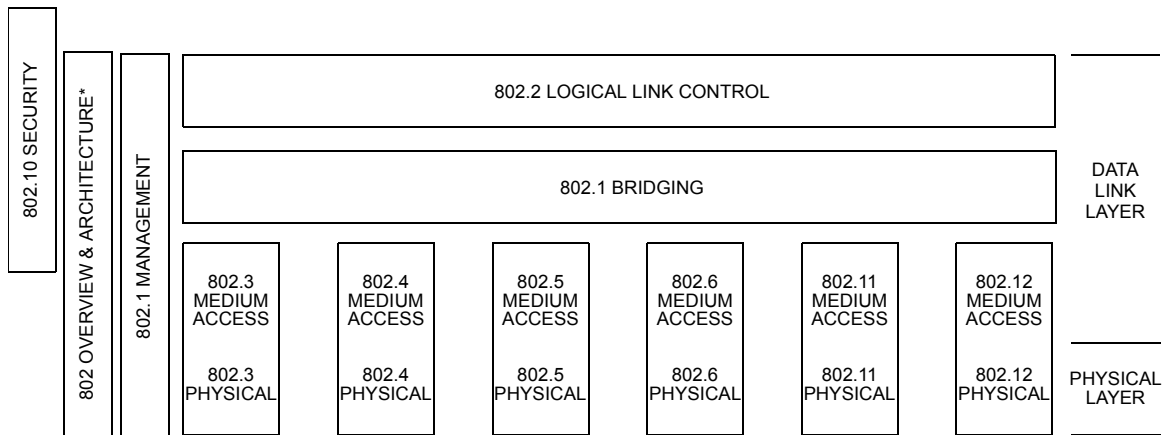
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Introduction

(This introduction is not part of IEEE Std 802.5w, IEEE Corrigenda to ISO/IEC 8802-5:1998 Third Edition and Amd. 1: 1998, Part 5: Token ring access method and physical layer specifications.)

This standard is part of a family of standards for local and metropolitan area networks. The relationship between the standard and other members of the family is shown below. (The numbers in the figure refer to IEEE standard numbers.)



* Formerly IEEE Std 802.1A.

This family of standards deals with the Physical and Data Link layers as defined by the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) Basic Reference Model (ISO/IEC 7498-1: 1994). The access standards define seven types of medium access technologies and associated physical media, each appropriate for particular applications or system objectives. Other types are under investigation.

The standards defining the technologies noted above are as follows:

- IEEE Std 802 *Overview and Architecture.* This standard provides an overview to the family of IEEE 802 Standards.
- ANSI/IEEE Std 802.1B and 802.1k [ISO/IEC 15802-2] *LAN/MAN Management.* Defines an OSI management-compatible architecture, and services and protocol elements for use in a LAN/MAN environment for performing remote management.
- ANSI/IEEE Std 802.1D *Media Access Control (MAC) Bridges.* Specifies an architecture and protocol for the interconnection of IEEE 802 LANs below the MAC service boundary.
- ANSI/IEEE Std 802.1E [ISO/IEC 15802-4] *System Load Protocol.* Specifies a set of services and protocol for those aspects of management concerned with the loading of systems on IEEE 802 LANs.
- ANSI/IEEE Std 802.1F *Common Definitions and Procedures for IEEE 802 Management Information.*
- ANSI/IEEE Std 802.1G [ISO/IEC 15802-5] *Remote Media Access Control (MAC) Bridging.* Specifies extensions for the interconnection, using non-LAN communication technologies, of geographically separated IEEE 802 LANs below the level of the logical link control protocol.
- IEEE Std 802.1H [ISO/IEC TR 11802-5] *Media Access Control (MAC) Bridging of Ethernet V2.0 in Local Area Networks.*

- ANSI/IEEE Std 802.2 [ISO/IEC 8802-2] *Logical Link Control.*
- ANSI/IEEE Std 802.3 *CSMA/CD Access Method and Physical Layer Specifications.*
- ANSI/IEEE Std 802.4 [ISO/IEC 8802-4] *Token Passing Bus Access Method and Physical Layer Specifications.*
- ANSI/IEEE Std 802.5 [ISO/IEC 8802-5] *Token Ring Access Method and Physical Layer Specifications.*
- ANSI/IEEE Std 802.6 [ISO/IEC 8802-6] *Distributed Queue Dual Bus Access Method and Physical Layer Specifications.*
- ANSI/IEEE Std 802.10 *Interoperable LAN/MAN Security.*
- ANSI/IEEE Std 802.11 [ISO/IEC DIS 8802-11] *Wireless LAN Medium Access Control (MAC) and Physical Layer Specifications.*
- ANSI/IEEE Std 802.12 [ISO/IEC 8802-12] *Demand Priority Access Method, Physical Layer and Repeater Specifications.*

In addition to the family of standards, the following is a recommended practice for a common Physical Layer technology:

- IEEE Std 802.7 *IEEE Recommended Practice for Broadband Local Area Networks.*

Conformance test methodology

An additional standard, 1802.3 provides conformance test information for 10BASE-T.

IEEE Std 802.3, 2000 Edition

This standard contains state-of-the-art material. The area covered by this standard is undergoing evolution. Revisions are anticipated to this standard within the next few years to clarify existing material, to correct possible errors, and to incorporate new related material. Details on the contents of this standard are provided on the following pages.

Participants

At the time this standard was approved, the following persons were members of the working group:

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**IEEE Standard for
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**Part 5: Token ring access method and
Physical Layer specifications—
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1. Overview

The token ring access method and physical layer specifications are described in ISO/IEC 8802-5:1998. Dedicated token ring operation and the use of fibre optic media are described in ISO/IEC 8802-5:1998/Amd. 1:1998. This corrigenda corrects errors in those standards.

1.1 Scope

Correct errors in 802.5:1998 and its amendments.

1.2 Purpose

Correct errors found in 802.5:1998 and its amendments.

2. References

This corrigenda shall be used in conjunction with the following publications:

ISO/IEC 8802-5:1998, Information Technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 5: Token ring access method and physical layer specifications.

ISO/IEC 8802-5:1998/Amd.1:1998, Information Technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 5: Token ring access method and physical layer specifications—Amendment 1: Dedicated token ring operation and fibre optic media.

3. Changes to ISO/IEC 8802-5:1998

NOTE—The editing instructions contained in this corrigenda define how to merge the material contained herein into the ISO/IEC 8802-5:1998 standard.

The editing instructions are shown in **bold italic**. Three editing instructions are used: *change*, *insert*, and *replace*. *Change* is used to make small corrections in existing text or tables. This editing instruction specifies the location and describes what is being changed by using ~~strike-through~~ (to remove old material) and underscore (to add new material). *Insert* adds new material without disturbing the existing material. Use of this change instruction may require that subsequent items be renumbered. If so, renumbering instructions are given in the editing instruction. When modifications are made to paragraphs of existing text, additions are underscored. *Replace* is used to make large changes in existing text, subclauses, tables, or pages by removing existing material and replacing it with new material. When modifications are made to paragraphs of existing text, deletions are shown in ~~strike-through type~~ and additions are underscored. Editorial notes will not be carried over into future editions.

Change page 37 Table 4-MAC frame transmit definitions for Vector X'20' as follows (change bars, underscore and strikethrough are against ISO/IEC 8802-5:1998):

X'20' **4 Request Initialization	X'00' or X'01' **1 **6	FA(RPS)	X'50'	op_tx op_tx op_tx <u>op_tx</u>	X'02' UNA X'21' Individual Address Count X'22' Product Instance ID X'23' Ring Station Version Number
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Insert on page 64 Subclause 4.2.2, second paragraph, two new starting conditions as items e) and f) as follows (change bars and underscore are against ISO/IEC 8802-5:1998):

- e) FA(monitor) shall be set to 0.
- f) All transmit and receive queues shall be flushed.

Change page 87, Table 7.2-MAC Transmit Station Operation table, transition REF 043 as follows (change bars, underscore and strikethrough are against ISO/IEC 8802-5:1998):

043	FR(P<Sx) <u>FR_AC(P<Sx)</u>	[CLEAR_STACK (optional-i)]
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4. Changes to ISO/IEC 8802-5:1998/Amd. 1:1998

Note—The editing instructions contained in this corrigenda define how to merge the material contained herein into ISO/IEC 8802-5:1998/Amd.1:1998.

The editing instructions are shown in *bold italic*. Three editing instructions are used: *change*, *insert*, and *replace*. *Change* is used to make small corrections in existing text or tables. This editing instruction specifies the location and describes what is being changed by using ~~strike-through~~ (to remove old material) and underscore (to add new material). *Insert* adds new material without disturbing the existing material. Use of this change instruction may require that subsequent items be renumbered. If so, renumbering instructions are given in the editing instruction. When modifications are made to paragraphs of existing text, additions are underscored. *Replace* is used to make large changes in existing text, sub-clauses, tables, or pages by removing existing material and replacing it with new material. When modifications are made to paragraphs of existing text, deletions are shown in ~~strike-through type~~ and additions are underscored. Editorial notes will not be carried over into future editions.

Replace Subclause 1.8 on pages 6 through 11 with the following (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

1.8 DTR conformance requirements

The conformance requirements for the dedicated token ring (DTR) entities (Clause 9 through Clause 13 in ISO/IEC 8802-5:1998/Amd.1:1998) are specified by Annex A.

The supplier of a protocol implementation that is claimed to conform to this supplement shall complete a copy of the PICS proforma in Annex A and shall provide the information necessary to identify both the supplier and the implementation.

Common Conformance Requirements – Station and C-Port

A DTR Station and DTR C-Port implementing the TKP Access Protocol or TXI Access Protocol claiming conformance to this standard shall be as follows:

- 1) Implement the frame format, associated address formats and fields, and MAC frame vectors and subvectors specified as follows:
 - Clause 3 and Clause 10 for the DTR C-Port or Station supporting the 4 Mbit/s or 16 Mbit/s media speeds.
- 2) Support 48 bit addressing and uses either a universally administered individual address or a locally administered individual address as specified in 3.2.4.
- 3) Recognize the first bit of the source address as the indication of the presence of the routing information field in the frame format defined in 3.2.5. Note that the ability to generate or respond to frames with source routing information is optional.
- 4) Exhibit external behavior corresponding to the system timing parameters specified as follows:
 - Clause 3 and Clause 10 for the DTR C-Port or Station supporting the 4 Mbit/s or 16 Mbit/s media speeds, and using the TKP or TXI access protocols.
- 5) Exhibit external behavior corresponding to the policy flags and variables specified as follows:
 - Clause 3 and Clause 10 for the DTR C-Port or Station supporting the 4 Mbit/s or 16 Mbit/s media speeds, and using the TKP or TXI access protocols.
- 6) Implement capabilities corresponding to the error counters specified as follows:
 - Clause 3 and Clause 10 for the DTR C-Port or Station supporting the 4 Mbit/s or 16 Mbit/s media speeds, and using the TKP or TXI access protocols.

- 7) Perform the TKP and TXI Access Protocol functions as follows:
- Dedicated token ring for 4 Mbit/s or 16 Mbit/s using the TKP access protocol operation specified by the Station and Port Operation Tables in 9.3 through 9.6 of ISO/IEC 8802-5:1998/Amd.1:1998.
 - Dedicated token ring for 4 Mbit/s or 16 Mbit/s using the TXI access protocol operation specified by the Station and Port Operation Tables in 9.2 and 9.3 in ISO/IEC 8802-5:1998/Amd.1:1998.

Insert on page 23 (Subclause 9.1.1.5, fifth paragraph), two new starting conditions after "— Timers are not running (stopped, thus cannot expire)" as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

— FA(monitor) shall be set to 0.

— All transmit and receive queues shall be flushed.

Insert on page 43 (Subclause 9.2.2.6) the abbreviation FSTAS immediately following "FSSLD" as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

FSTAS = flag, Station transmit abort sequence

Insert on page 47 as Subclause 9.2.3.2.12 the definition of FSTAS as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

Flag, Station transmit abort sequence (FSTAS).

The flag FSTAS is used to control the counting of abort sequences. When the transmitter detects a correctable error requiring the release of an abort sequence, it sets FSTAS to 1. The Error Handling Station Operation Table detects this condition and sets FSTAS to 0 and takes the appropriate action to increment the counter CSABE.

Renumber subclauses 9.2.3.2.12 through 9.2.3.2.16 on pages 47 and 48 as subclauses 9.2.3.2.13 through 9.2.3.2.17, respectively.

Delete transition 3152 on page 53 as follows (change bars and strikethroughs are against ISO/IEC 8802-5:1998/Amd.1:1998):

JD0A	3152	FR_PHB(SA↔SUA) & JS=SJC << A TXI access protocol error has been detected by the reception of a TXI Heart Beat or a TKP AMP MAC frame (SA↔SUA of the known C-Port). >>	JS=BP; Remove_Station << Station detects TXI access protocol error after Join Complete >>
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Change transitions 3207, 3204, 3212 and 3216 on page 57 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

TBAA	3207	CSBTX>SPV(MAX_TX) & FPASO=0 & FIPTXIS=1 & TS=STXD << C-Port in Station Emulation Mode has detected maximum frame size has been exceeded. >>	[TS=STXN; TX_AB; <u>FSTAS=FSTI=1</u> (optional-unk)] << Terminate the transmission of the frame by transmitting an abort sequence >>
TBAE	3204	CSBTX>SPV(MAX_TX) & FPASO=1 & FIPTXIS=1 & TS=STXD << C-Port in Station Emulation Mode has detected maximum frame size has been exceeded. >>	[TS=STXN; <u>FSTAS=FSTI=1</u> ; TX_INV_FCS; TX_EFS(I=0; E=1) (optional-unk)] << Terminate the transmission of the frame by transmitting an invalid FCS and setting the E bit to one >>
TBAF	3212	DTU_UNITDATA-STATUS.request(Fail) & FPTX_LTH=0 & FIPTXIS=1 & TS=STXD << Transmit FSM currently transmitting a frame of unknown length. This is an indication that a cut-through frame is being transmitted. >>	TS=STXN; TX_AB; <u>FSTAS=FSTI=1</u> << The cut-through frame has completed with a fail status and the frame is aborted by transmitting an abort sequence. >>
TBAC	3216	PORT_ERR(correctable) & FIPTXIS=1 & TS=STXD << C-Port could not complete transmission of frame being transmitted—abort frame. >>	TS=STXN; TX_AB; <u>FSTAS=FSTI=1</u> ; If JS=SDAC then CSTFQ=(CSTFQ-1) <<Transmit abort sequence>>

Change transition 3206 on page 58 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

TBAC	3206	STATION_ERR(correctable) & FIPTXIS=0 & TS=STXD << Station could not complete transmission of frame: enter the Transmit Normal state. >>	TS=STXN; TX_AB; <u>FSTAS=FSTI=1</u> ; If JS=SDAC then CSTFQ=(CSTFQ-1) << Transmit abort sequence >>
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Change transitions 3409, 3410, 3417 and 3418 on page 60 as follows (change bars, strikethroughs, and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

3409	FR_WITH_ERR(E=0) & CSLE<255 & FSJC=1 & FSER=1 & MS=SOPT	CSLE=(CSLE+1)
3410	FR_WITH_ERR(E=0) & FSJC=1 & FSER=0 & MS=SOPT	FSER=1; TSER=R; CSLE=(CSLE+1)
3417	PORT_ERR(correctable) <u>FSTAS=1 & TS=STXN</u> & FPTXIS=1 & TS=STXD & <u>CSABE<255</u> & FSJC=1 & <u>FSER=1</u> & FSER=0 & MS=SOPT	FSTAS=0; FSER=1; TSER=R; CSABE=(CSABE+1)
3418	PORT_ERR(correctable) <u>FSTAS=1 & TS=STXN</u> & FPTXIS=1 & TS=STXD & <u>CSABE<255</u> FSJC=1 & <u>FSER=0</u> & FSER=1 & MS=SOPT	FSTAS=0; FSER=1; TSER=R; CSABE=(CSABE+1)

Delete transitions 3420 and 3419 on page 60 as follows (change bars and strikethroughs are against ISO/IEC 8802-5:1998/Amd.1:1998):

3420	STATION_ERR(correctable) & TS=STXD & FSJC=1 & FSER=0 & MS=SOPT	FSER=1; TSER=R; CSABE=(CSABE+1)
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3419	STATION_ERR(correctable) & TS=STXD & CSABE<255 & FSJC=1 & FSER=1 & MS=SOPT	CSABE=(CSABE+1)
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Insert on page 77 (Subclause 9.3.2.4) the abbreviation FPTAS immediately following "FPSLD" as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

FPTAS = Flag, C-Port transmit abort sequence

Insert on page 81 the definition of "Flag, C-Port Transmit Abort Sequence (FPTAS)" prior to the definition of "Flag, C-Port Transmit from Crystal (FPTXC)" as follows, and re-order the definitions alphabetically (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

Flag, C-Port Transmit Abort Sequence (FPTAS). The flag FPTAS is used to control the counting of abort sequences. When the transmitter detects a correctable error requiring the release of an abort sequence, it sets FPTAS to 1. The C-Port Error Handling Station Operation Table detects this condition, sets FPTAS to 0 and takes the appropriate action to increment the counter CPABE.

Change transitions 1203, 1210, 1209, and 1205 on page 90 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

TEDa	1203	CPBTX>PPV(MAX_TX) & FPASO=0 & TS=PTXD << Maximum frame size has been exceeded. >>	[TS=PTXN; TX_AB; <u>FPTAS=FPTI=1</u> (optional-unk)] << Transmit abort sequence >>
TEDb	1210	CPBTX>PPV(MAX_TX) & FPASO=1 & TS=PTXD << Maximum frame size has been exceeded. >>	[TS=PTXN; <u>FPTAS=FPTI=1</u> ; TX_INV_FCS; TX_EFS(I=0, E=1) (optional-unk)] << Transmit invalid FCS sequence >>
<u>TEDc</u>	1209	DTU_UNITDATA-STATUS.request(Fail) & FPTX_LTH=0 & TS=PTXD << Transmit FSM currently transmitting a frame of unknown length. This is an indication that a cut-through frame is being transmitted. >>	TS=PTXN; TX_AB; <u>FPTAS=FPTI=1</u> << The cut-through frame has completed with a Fail status, the frame is aborted. >>
TEDe	1205	PORT_ERR(Correctable) & TS=PTXD << C-Port could not complete transmission of frame being transmitted—abort frame >>	TS=PTXN; TX_AB; <u>FPTAS=FPTI=1</u> <<Transmit Abort sequence >>

Change transitions 1606, 1607, 1614, and 1617 on page 92 as follows (change bars, strikethroughs, and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

	1606	FR_WITH_ERR(<u>E=0</u>) & CPLE<255 & FPJC=1 & FPER=1 & MS=POPT	CPLE=(CPLE+1)
	1607	FR_WITH_ERR(<u>E=0</u>) & FPJC=1 & FPER=0 & MS=POPT	FPER=1; TPER=R; CPLE=(CPLE+1)
	1614	PORT_ERR(correctable) & TS=PTXD <u>FPTAS=1 & TS=PTXN</u> & CPABE<255 & FPJC=1 & FPER=1 & MS=POPT	<u>FPTAS=0</u> ; CPABE=(CPABE+1)
	1617	PORT_ERR(correctable) & TS=PTXD <u>FPTAS=1 & TS=PTXN</u> & FPJC=1 & FPER=0 & MS=POPT	<u>FPTAS=0</u> ; FPER=1; TPER=R; CPABE=(CPABE+1)

Change transition 043 on page 111 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

	043	FR <u>AC</u> (P<Sx)	[CLEAR_STACKS (optional-i)]
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Change transition 043 on page 151 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

	043 FR_ <u>AC</u> (P<Sx)	[CLEAR_STACKS (optional-i)]
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Change transition 043 on page 182 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

	043 FR_ <u>AC</u> (P<Sx)	[CLEAR_STACKS (optional-i)]
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Change 10.6.1.5, definition of counter CSLE on page 227 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

The counter CSLE is incremented when a frame with error in which the E bit is equal to 0 [FR_WITH_ERR(E=0)] is received by the Station.

Change 10.6.2.5, definition of counter CPLE on page 228 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

The counter CPLE is incremented when a frame with error in which the E bit is equal to 0 [FR_WITH_ERR(E=0)] is received by the C-Port.

Replace Annex A on pages 298 through 315 with the revised Annex A at the end of this document (because of the large changes against ISO/IEC 8802-5:1998/Amd.1:1998, no revision marks are shown).

Change Figure L.2 in Annex L on page 369 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

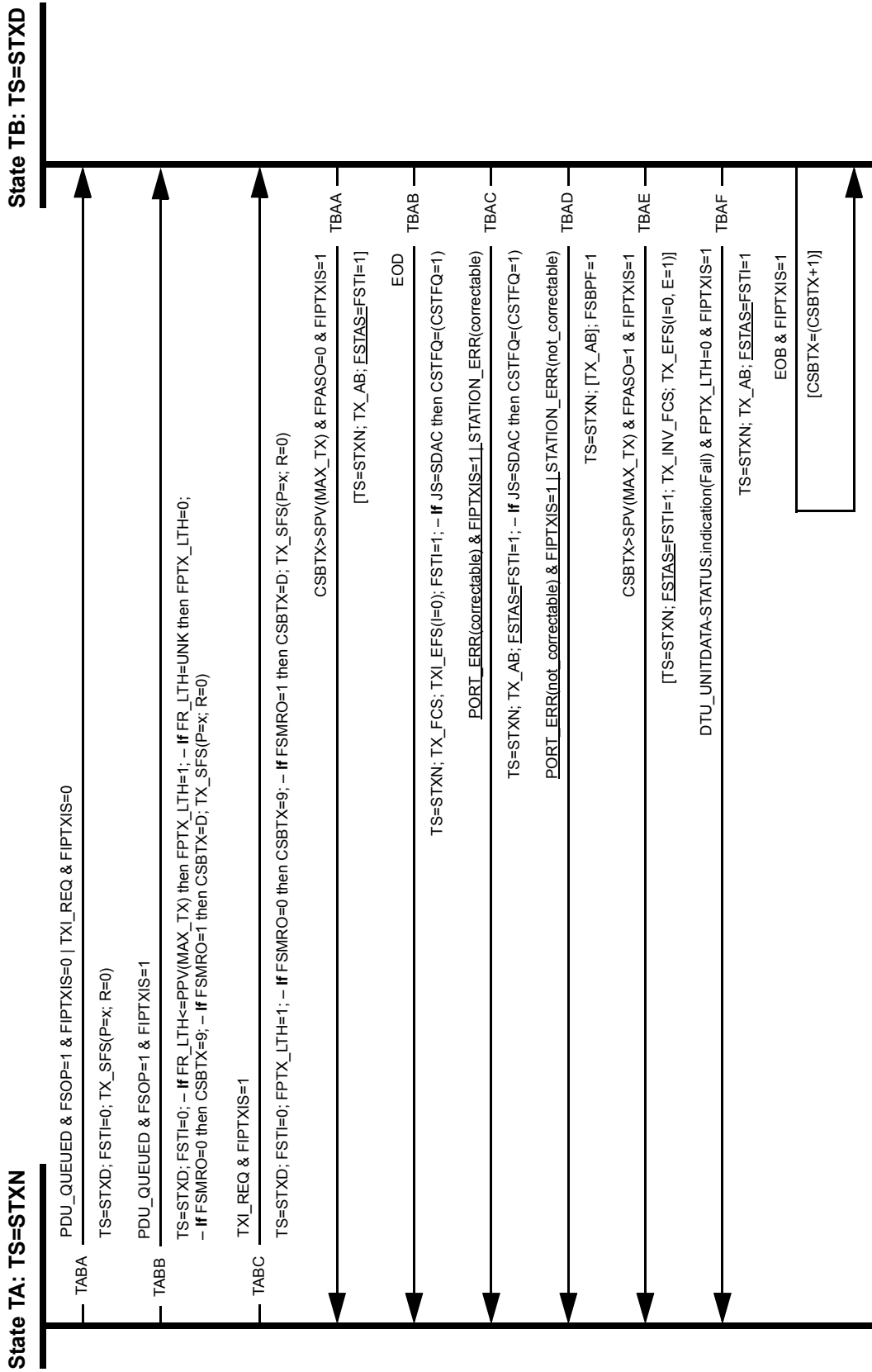


Figure L.2—Transmit FSM

Change Figure M.3 in Annex M on page 374 as follows (change bars and underscores are against ISO/IEC 8802-5:1998/Amd.1:1998):

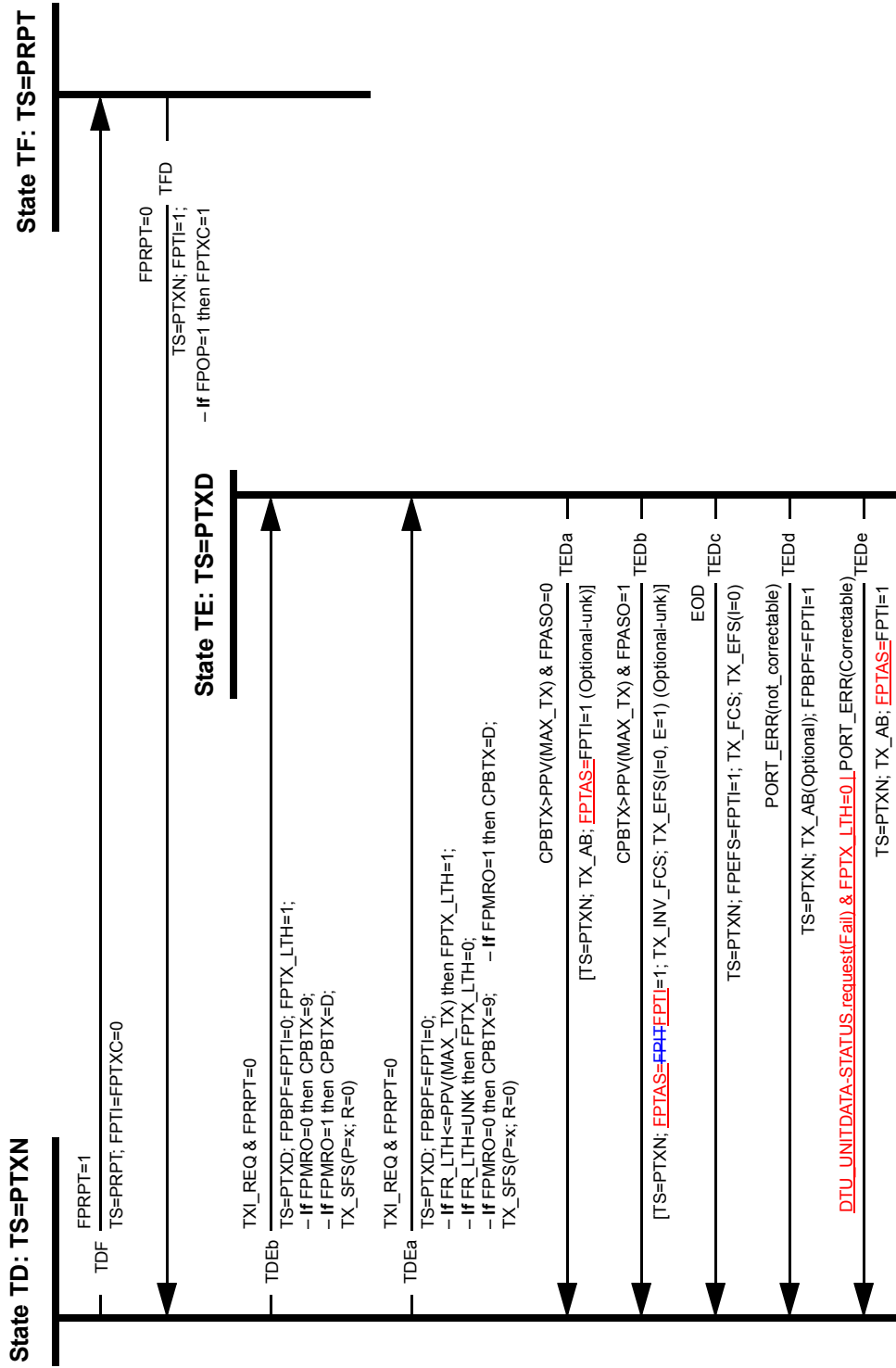


Figure M.3—C-Port Transmit (TS=State) FSM, TXI access protocol

Annex A

(normative)

Protocol Implementation Conformance Statement (PICS) Proforma¹

A.1 Introduction

The supplier of a protocol implementation that is claimed to conform to this standard shall complete the following Protocol Implementation Conformance Statement (PICS) proforma.

A completed PICS proforma is the PICS for the implementation in question. The PICS is a statement of which capabilities and options of the protocol have been implemented. The PICS can have a number of uses, including use by the following:

- a) The protocol implementor, as a check-list to reduce the risk of failure to conform to the standard through oversight.
- b) The supplier and acquirer, or potential acquirer, of the implementation, as a detailed indication of the capabilities of the implementation, stated relative to the common basis for understanding provided by the standard PICS proforma.
- c) The user, or potential user, of the implementation, as a basis for initially checking the possibility of interworking with another implementation (note that, while interworking can never be guaranteed, failure to interwork can often be predicted from incompatible PICSs).
- d) The protocol tester, as the basis for selecting appropriate tests against which to assess the claim for conformance of the implementation.

A.2 Abbreviations and special symbols

A.2.1 Status symbols

The following symbols are used in the PICS proforma:

M	mandatory field/function
O	optional field/function
O.<n>	optional field/function indicating mutually exclusive or selectable options among a set
X	prohibited field/function
<pred>:	simple-predicate condition for an item, dependent on the support marked for <pred>
<pred>::	simple-predicate condition for a table, dependent on the support marked for <pred>

A.2.2 Abbreviations

N/A	Not applicable
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¹*Copyright release for PICS proformas:* Users of this standard may freely reproduce the PICS proforma in this Annex so that it can be used for its intended purpose and may further publish the completed PICS.

A.3 Instructions for completing the PICS proforma

A.3.1 General structure for the PICS proforma

The first part of the PICS proforma, implementation identification and protocol summary, is to be completed as indicated with the information necessary to identify fully both the supplier and the implementation.

The main part of the PICS proforma is a fixed-format questionnaire divided into subclauses, each containing a group of items. Answers to the questionnaire items are to be provided in the right-most column, either by simply marking an answer to indicate a restricted choice (usually Yes, No, or Not Applicable), or by entering a value, or a set or a range of values. (Note that there are some items where two or more choices from a set of possible answers can apply; all relevant choices are to be marked.)

Each item is identified by an item reference in the first column; the second column contains the question to be answered; the third column contains the reference or references to the material that specifies the item in the main body of the standard. The remainder of the columns record the status of the item—whether the support is mandatory, optional, or conditional—and provide spaces for the answers; see also A.3.4.

The supplier may also provide, or be required to provide, further information, categorized as either “additional information” or “exception information.” When present, each kind of further information is to be provided in a further subclause of items labeled A<i> or E<i>, respectively, for cross-referencing purposes, where <i> is the unambiguous identification for the item (e.g., simply a numerical); there are no other restrictions on its format or presentation.

A completed PICS proforma, including any additional information or exception information, is the PICS for the implementation in question.

Note that where an implementation is capable of being configured in more than one way, according to the items listed in A.5, a single PICS may be able to describe all such configurations. However, the supplier has the choice of providing more than one PICS, each covering some subset of the implementation’s configuration capabilities, if that would make presentation of information easier and cleaner.

A.3.2 Additional information

Items of additional information allow a supplier to provide further information intended to assist the interpretation of the PICS. It is not intended or expected that a large quantity will be supplied, and the PICS can be considered complete without any such information. Examples might be an outline of the ways in which a (single) implementation can be set up to operate in a variety of environments and configurations; or a brief rationale, based perhaps upon specific application needs, for the exclusion of features which, although optional, are nonetheless commonly present in implementations of the token ring protocol.

References to items of additional information may be entered next to any answer in the questionnaire, and may be included in items of exception information.

A.3.3 Exception information

It may occasionally happen that a supplier will wish to answer an item with mandatory status or prohibited status (after any conditions have been applied) in a way that conflicts with the indicated requirement. No preprinted answer will be found in the Support column for this; instead, the supplier is required to write into the Support column an E<i> reference to an item of exception information, and to provide the appropriate rationale in the exception item itself.

An implementation for which an exception item is required in this way does not conform to this standard.

Note that a possible reason for the situation described above is that a defect in the standard has been reported, a correction for which is expected to change the requirement not met by the implementation.

A.3.4 Conditional status

A.3.4.1 Conditional items

The PICS proforma contains a number of conditional items. These are items for which the status—mandatory, optional, or prohibited—that applies is dependent upon whether or not certain other items are supported, or upon the value supported for other items.

In many cases, whether or not the item applies at all is conditional in this way, as well as the status when the item does not apply.

A conditional symbol is of the form “<pred>:<s>” where “<pred>” is a predicate as described in A.3.4.2, and “<s>” is one of the status symbols M, O, O.<n>, or X.

A conditional symbol of the form “<pred>: :” may be indicated above a particular table. That table shall be completed if and only if the condition evaluates to true.

A.3.4.2 Predicates

A predicate is one of the following:

- a) An item-reference for an item in the PICS proforma. The value of the predicate is true if the item is marked as supported, and is false otherwise.
- b) A predicate-name, for a predicate defined as a boolean expression constructed by combining item-references using the boolean operators AND and OR. The value of the predicate is true if the boolean expression evaluates to true.
- c) The logical negation symbol “¬” prefixed to an item-reference or predicate-name. The value of the predicate is true if the value of the predicate formed by omitting the “¬” symbol is false, and vice-versa.

An asterisk in the Item column indicates each item-reference that is used in a predicate or predicate definition. If such item reference is not supported (false), then the support of the item itself will be indicated as N/A (not applicable); otherwise, the support of the item will be indicated as YES.

A.4 Identification

A.4.1 Implementation identification

Supplier	
Contact point for queries about the PICS	
Implementation name(s) and version(s)	
Other information necessary for full identification—e.g., name(s) and version(s) for machines and/or operating systems; system name(s)	
<p>NOTES</p> <p>1—Only the first three items are required for all implementations; other information may be completed as appropriate in meeting the requirements for full identification.</p> <p>2—The terms <i>name</i> and <i>version</i> should be interpreted appropriately to correspond with a supplier’s terminology (e.g., type, series, model).</p>	

A.4.2 Protocol summary

Protocol version	
Amendments implemented	
Corrigenda implemented	
Have any exception items been required? No <input type="checkbox"/> Yes <input type="checkbox"/> (See A.3.3; the answer “Yes” means that the implementation does not conform to the standard.)	
Date of statement	

A.5 Major capabilities

Item	Feature	Reference	Status	Support
*DS	Data station	2.4	O.1	Yes [] No []
*DTRS	Dedicated token ring Station	9.2	O.1	Yes [] No []
*DTRP	Dedicated token ring C-Port	9.3	O.1	Yes [] No []
*ACON	Active retiming concentrator	8.5	O.1	Yes [] No []
*PCON	Passive concentrator	8.4	O.1	Yes [] No []
*DR4	4 Mbit/s data rate	5.3	O.3	Yes [] No []
*DR16	16 Mbit/s data rate	5.3	O.3	Yes [] No []
*STP	Shielded twisted pair cable attachment	7.2	O.4	Yes [] No []
*UTP	Unshielded twisted pair cable attachment	7.2	O.4	Yes [] No []
*FIB	Fibre attachment	13.2	O.4	Yes [] No []
*DTRSTXI	DTR Station using TXI Access Protocol	9.2	DTRS:M	N/A [] Yes []
*DTRSTKP	DTR Station using TKP Access Protocol	9.2, 9.6	PRED1:M	N/A [] Yes []
*DTRPPMTXI	DTR C-Port in port mode using TXI Access Protocol	9.3	DTRP:M	N/A [] Yes []
*DTRPPMTKP	DTR C-Port in port mode using TKP Access Protocol	9.3, 9.4	PRED3:M	N/A [] Yes []
*DTRPSETXI	DTR C-Port in station emulation mode using TXI Access Protocol	9.3, 9.2	DTRP:O	N/A [] Yes [] No []
*DTRPSETKP	DTR C-Port in station emulation mode using TKP Access Protocol	9.3, 9.5	PRED3:O	N/A [] Yes [] No []
*TKP	Station or C-Port using the TKP Access Protocol		PRED5:M	N/A [] Yes []
*TXI	Station or C-Port using the TXI Access Protocol		PRED6:M	N/A [] Yes []
*DTRPPM	C-Port in port mode		PRED7:M	N/A [] Yes []
*DTRPSE	C-Port in station emulation mode		PRED8:M	N/A [] Yes []
*LMR	Low Media Rate (4 Mbit/s or 16 Mbit/s)		PRED9:M	N/A [] Yes []
*COPPER	Copper attachment		PRED11:M	N/A [] Yes []
*FIBRE	Fibre attachment		PRED12:M	N/A [] Yes []
NOTES— O.1: Support for one and only one of the options is required		O.3, O.4: Support for at least one of the options is required		
PREDICATES— PRED1 = DTRS AND (DR4 OR DR16) PRED2 = <i>Reserved</i> PRED3 = DTRP AND (DR4 OR DR16) PRED4 = <i>Reserved</i> PRED5 = DS OR DTRSTKP OR DTRPSETKP OR DTRPPMTKP PRED6 = DTRSTXI OR DTRPSETXI OR DTRPPMTXI		PRED7 = DTRPPMTXI OR DTRPPMTKP PRED8 = DTRPSETXI OR DTRPSETKP PRED9 = DR4 OR DR16 PRED10 = <i>Reserved</i> PRED11 = STP OR UTP PRED12 = FIB		

A.6 PICS proforma for the MAC

A.6.1 Transmission and Reception Frame Formats

Item	Feature	Reference	Status	Support
FF1a	Token transmit	3.1.1	TKP:M	N/A [] Yes []
FF1b	Token receive	3.1.1	TKP:M	N/A [] Yes []
FF2a	MAC frame transmit	3.1.2	M	Yes []
FF2b	MAC frame receive	3.1.2	M	Yes []
FF3a	LLC frame transmit	3.1.2	M	Yes []
FF3b	LLC frame receive	3.1.2	M	Yes []
*FF3c	LLC frame cut-through	12	DTRP:O	N/A [] Yes [] No []
FF4a	Abort sequence transmit	3.1.3	M	Yes []
FF4b	Abort sequence receive	3.1.3	M	Yes []
FF4c	<i>Reserved</i>			
FF4d	<i>Reserved</i>			
FF4e	Generation of invalid FCS to abort transmit	10.1	PRED13:O	N/A [] Yes [] No []
FF4f	<i>Reserved</i>			
FF5a	Fill transmit	3.1.4	M	Yes []
FF5b	Fill receive	3.1.4	M	Yes []
PREDICATES— PRED13 = LMR AND FF3c PRED14 = <i>Reserved</i>				

A.6.2 Frame Transmit and Receive Parameters

Item	Feature	Reference	Status	Support
FP1a	Starting delimiter transmit	3.2.1	M	Yes []
FP1b	Starting delimiter receive	3.2.1	M	Yes []
FP1c	<i>Reserved</i>			
FP1d	<i>Reserved</i>			
FP2a	Access control transmit	3.2.2	TKP:M	N/A [] Yes []
FP2b	Access control receive	3.2.2	TKP:M	N/A [] Yes []
FP2c	Access control transmit	10.2.1	TXI:M	N/A [] Yes []
FP2d	Access control receive	10.2.1	TXI:M	N/A [] Yes []
FP3a	Frame control transmit	3.2.3	M	Yes []
FP3b	Frame control receive	3.2.3	M	Yes []
FP4a	Destination address transmit	3.2.4.1	TKP:M	N/A [] Yes []
FP4b	Destination address receive	3.2.4.1	TKP:M	N/A [] Yes []
FP4c	Destination address transmit	10.2.2	TXI:M	N/A [] Yes []
FP4d	Destination address receive	10.2.2	TXI:M	N/A [] Yes []
FP5a	Source address transmit	3.2.4.2	TKP:M	N/A [] Yes []
FP5b	Source address receive	3.2.4.2	TKP:M	N/A [] Yes []
FP5c	Source address transmit	10.2.2	TXI:M	N/A [] Yes []
FP5d	Source address receive	10.2.2	TXI:M	N/A [] Yes []
FP6a	Routing information indicator transmit	3.2.4.2	M	Yes []
FP6b	Routing information indicator receive	3.2.4.2	M	Yes []
*FP7a	Routing information field transmit	3.2.5	O	Yes [] No []
FP7b	Routing information field receive	3.2.5	M	Yes []
FP8a	RI field length bits transmit	3.2.5	FP7a:M	N/A [] Yes []
FP8b	RI field length bits receive	3.2.5	M	Yes []
FP9a	MAC frame, information field transmit	3.2.6.2	M	Yes []
FP9b	MAC frame, information field receive	3.2.6.2	M	Yes []
FP10a	LLC frame, information field transmit	3.2.6.3	M	Yes []
FP10b	LLC frame, information field receive	3.2.6.3	DR4:M	N/A [] Yes []
	Maximum LLC frame information field receive length (133 octet minimum)			_____octets
FP10c	LLC frame, information field receive	3.2.6.3	DR16:M	N/A [] Yes []
	Maximum LLC frame information field receive length (133 octet minimum)			_____octets
FP11a	Frame check sequence transmit	3.2.7	M	Yes []
FP11b	Frame check sequence receive	3.2.7	M	Yes []
FP12a	Ending delimiter transmit	3.2.8	PRED15:M	N/A [] Yes []
FP12b	Ending delimiter receive	3.2.8	PRED15:M	N/A [] Yes []
FP12c	Ending delimiter transmit	10.2.3	PRED16:M	N/A [] Yes []
FP12d	Ending delimiter receive	10.2.3	PRED16:M	N/A [] Yes []
FP13a	Frame status transmit	3.2.9	PRED15:M	N/A [] Yes []

Item	Feature	Reference	Status	Support
FP13b	Frame status receive	3.2.9	PRED15:M	N/A [] Yes []
FP13c	Frame status transmit	10.2.4	PRED16:M	N/A [] Yes []
FP13d	Frame status receive	10.2.4	PRED16:M	N/A [] Yes []
PREDICATES— PRED15 = LMR AND TKP PRED16 = LMR AND TXI PRED17 = <i>Reserved</i>				

A.6.3 Transitions relating to MAC Frames

Item	Feature	Reference	Status	Support
TRM	Transitions relating to MAC Frames	4, 9.2, 9.3, 9.4, 9.5, 9.6	M	Yes []

A.6.4 MAC Timers

A.6.4.1 Station or C-Port using TKP Access Protocol—TKP::

Item	Feature	Reference	Status	Support
TAM	Active monitor	3.4.2.1	M	Yes []
TBR	Beacon repeat	3.4.2.2	M	Yes []
TBT	Beacon transmit	3.4.2.3	M	Yes []
TCT	Claim token	3.4.2.4	M	Yes []
TER	Error report	3.4.2.5	M	Yes []
TID	Insert delay	3.4.2.6	M	Yes []
TJR	Join ring	3.4.2.7	M	Yes []
TNT	No token	3.4.2.8	M	Yes []
TQP	Queue PDU	3.4.2.9	M	Yes []
TRH	Remove hold	3.4.2.10	M	Yes []
TRI	Request initialization	3.4.2.12	M	Yes []
TRP	Ring purge	3.4.2.14	M	Yes []
TRR	Return to repeat	3.4.2.13	M	Yes []
TRW	Remove wait	3.4.2.11	M	Yes []
TSL	Signal loss	3.4.2.15	M	Yes []
TSM	Standby monitor	3.4.2.16	M	Yes []
TVX	Valid transmission	3.4.2.17	M	Yes []
TWF	Wire fault	3.4.2.19	M	Yes []
TWFD	Wire fault delay	3.4.2.18	M	Yes []
TSRW	Station registration wait	10.4.1.13	-DS:M	N/A [] Yes []
TLMTR	Station lobe media test running	10.4.3.1	-DS:O	N/A [] Yes [] No []

A.6.4.2 Station using TXI Access Protocol—(DTRS and TXI) or DTRPSETXI::

Item	Feature	Reference	Status	Support
TSER	Error report	10.4.1.1	M	Yes []
TSIP	Insert process	10.4.1.2	M	Yes []
TSIS	Initial sequence	10.4.1.3	M	Yes []
TSIT	Internal test	10.4.1.4	M	Yes []
TSJC	Join complete	10.4.1.5	M	Yes []
TSLMT	Lobe media test	10.4.1.6	M	Yes []
TSLMTC	Lobe media test complete	10.4.1.7	M	Yes []
TSLMTD	Lobe media test delay	10.4.1.8	M	Yes []
TSQHB	Queue heart beat	10.4.1.9	M	Yes []
TSQP	Queue PDU	10.4.1.10	M	Yes []
TSREQ	Registration request	10.4.1.11	M	Yes []
TSRHB	Receive heart beat	10.4.1.12	M	Yes []
TSRW	Station Registration Wait	10.4.1.13	M	Yes []
TSSL	Signal loss	10.4.1.14	M	Yes []
TSWF	Wire fault	10.4.1.15	SRA5:M	N/A [] Yes []
TSWFD	Wire fault delay	10.4.1.16	SRA5:M	N/A [] Yes []

A.6.4.3 C-Port in port mode using TXI Access Protocol—DTRPPMTXI::

Item	Feature	Reference	Status	Support
TPBLT	Break Lobe Test	10.4.2.1	M	Yes []
TPDLT	Disrupt Lobe Test	10.4.2.2	M	Yes []
TPER	Error report	10.4.2.3	M	Yes []
TPIRD	Insert request delay	10.4.2.4	M	Yes []
TPIT	Internal test	10.4.2.5	M	Yes []
TPLMTF	Lobe media test failure	10.4.2.6	M	Yes []
TPLMTR	Lobe media test running	10.4.2.7	M	Yes []
TPQHB	Queue heart beat	10.4.2.8	M	Yes []
TPQP	Queue PDU	10.4.2.9	M	Yes []
TPRHB	Received heart beat	10.4.2.10	M	Yes []
TPRQD	Registration query delay	10.4.2.11	M	Yes []
TPSL	Signal loss	10.4.2.12	M	Yes []
PREDICATES— PRED18 = <i>Reserved</i> PRED19 = <i>Reserved</i>				

A.6.5 MAC Policy Flags and Variables

A.6.5.1 Station or C-Port using TKP Access Protocol—TKP::

Item	Feature	Reference	Status	Support
FBHO_0	Beacon handling option — flag=0	3.5.1	O.5	Yes [] No []
FBHO_1	Beacon handling option — flag=1	3.5.1	O.5	Yes [] No []
FCCO_0	Claim contender option — flag=0	3.5.2	O.6	Yes [] No []
FCCO_1	Claim contender option — flag=1	3.5.2	O.6	Yes [] No []
FECO_0	Error counting option — flag=0	3.5.4	O.7	Yes [] No []
FECO_1	Error counting option — flag=1	3.5.4	O.7	Yes [] No []
FETO_0	Early token release option — flag=0	3.5.3	DR4: M DR16:O.8	N/A [] Yes [] N/A [] Yes [] No []
FETO_1	Early token release option — flag=1	3.5.3	DR16:O.8	N/A [] Yes [] No []
FGTO_0	Good token option — flag=0	3.5.10	O.9	Yes [] No []
FGTO_1	Good token option — flag=1	3.5.10	O.9	Yes [] No []
FMFTO_0	Multiple frame transmission — flag=0	3.5.6	O.10	Yes [] No []
FMFTO_1	Multiple frame transmission — flag=1	3.5.6	O.10	Yes [] No []
FMRO_0	Media rate — flag=0	3.5.5	DR4:M	N/A [] Yes []
FMRO_1	Media rate — flag=1	3.5.5	DR16:M	N/A [] Yes []
FRRO_0	Reject remove option — flag=0	3.5.7	O.11	Yes [] No []
FRRO_1	Reject remove option — flag=1	3.5.7	O.11	Yes [] No []
FTEO_0	Token error detect option — flag=0	3.5.8	O.12	Yes [] No []
FTEO_1	Token error detect option — flag=1	3.5.8	O.12	Yes [] No []
FTHO_0	Token handling option — flag=0	3.5.9	O.13	Yes [] No []
FTHO_1	Token handling option — flag=1	3.5.9	O.13	Yes [] No []
FTUBO_0	Transmit under-run behavior option — flag=0	3.5.9a	O.14	Yes [] No []
FTUBO_1	Transmit under-run behavior option — flag=1	3.5.9a	O.14	Yes [] No []
FWFDO_0	Wire fault detection option — flag=0	3.5.11	O.15	Yes [] No []
FWFDO_1	Wire fault detection option — flag=1	3.5.11	O.15	Yes [] No []
NOTES—				
O.5 to O.15: Support of at least one of the policy flag settings is required.				

A.6.5.2 Station using TXI Access Protocol—(DTRS and TXI) or DTRPSETXI::

Item	Feature	Reference	Status	Support
FSECO_0	Error Counting Option — flag=0	10.5.1.1.1	O.17	Yes [] No []
FSECO_1	Error Counting Option — flag=1	10.5.1.1.1	O.17	Yes [] No []
FSMRO_0	Media Rate Option — flag=0	10.5.1.1.2	DR4:O.19	N/A [] Yes [] No []
FSMRO_1	Media Rate Option — flag=1	10.5.1.1.2	DR16:O.19	N/A [] Yes [] No []
*FSOPO_0	Open Option — flag=0	10.5.1.1.3	O	Yes [] No []
FSOPO_1	Open Option — flag=1	10.5.1.1.3	M	Yes []
FSRDO_0	Registration Denied Option — flag=0	10.5.1.1.4	O.20	Yes [] No []
FSRDO_1	Registration Denied Option — flag=1	10.5.1.1.4	O.20	Yes [] No []
FSREGO_0a	Registration Option — flag=0	10.5.1.1.5	¬FSOPO_0:M	N/A [] Yes []
FSREGO_0b	Registration Option — flag=0	10.5.1.1.5	FSOPO_0:O	N/A [] Yes [] No []
FSREGO_1	Registration Option — flag=1	10.5.1.1.5	M	Yes []
FSRQO_0	Registration Query Option — flag=0	10.5.1.1.6	O.21	Yes [] No []
FSRQO_1	Registration Query Option — flag=1	10.5.1.1.6	O.21	Yes [] No []
FSRRO_0	Reject Remove Option — flag=0	10.5.1.1.7	O.22	Yes [] No []
FSRRO_1	Reject Remove Option — flag=1	10.5.1.1.7	O.22	Yes [] No []
NOTES— O.17, O.19 to O.22: Support of at least one of the options is required. O.16 and O.18: <i>Reserved</i>				

A.6.5.3 C-Port in port mode using TXI Access Protocol — DTRPPMTXI::

Item	Feature	Reference	Status	Support
FPACO_0	AC Repeat Path Option — flag=0	10.5.2.1.1	O.23	Yes [] No []
FPACO_1	AC Repeat Path Option — flag=1	10.5.2.1.1	O.23	Yes [] No []
FPASO_0	Abort Sequence Option — flag=0	10.5.2.1.2	O.24	Yes [] No []
*FPASO_1	Abort Sequence Option — flag=1	10.5.2.1.2	O.24	Yes [] No []
FPASO_1_FCS	Invalid FCS Generation Method	10.5.2.1.2	FPASO_1:M	N/A [] Method___
FPBHO_0	Beacon Handling Option — flag=0	10.5.2.1.3	O.25	Yes [] No []
FPBHO_1	Beacon Handling Option — flag=1	10.5.2.1.3	O.25	Yes [] No []
FPECO_0	Error Counting Option — flag=0	10.5.2.1.4	O.26	Yes [] No []
FPECO_1	Error Counting Option — flag=1	10.5.2.1.4	O.26	Yes [] No []
FPFCO_0	Frame Control Option — flag=0	10.5.2.1.5	O.27	Yes [] No []
FPFCO_1	Frame Control Option — flag=1	10.5.2.1.5	O.27	Yes [] No []
FPMRO_0	Media Rate Option — flag=0	10.5.2.1.6	DR4:O.29	N/A [] Yes [] No []
FPMRO_1	Media Rate Option — flag=1	10.5.2.1.6	DR16:O.29	N/A [] Yes [] No []
FPOTO_0	Operation Table Option — flag=0	10.5.3.3	M	Yes []
FPOTO_1	Operation Table Option — flag=1	10.5.3.3	O	Yes [] No []
NOTES— O.23 to O.27, O.29: Support of at least one of the options is required. O.28 and O.30: <i>Reserved</i>				

A.6.6 MAC Counters**A.6.6.1 Station or C-Port using TKP Access Protocol—TKP::**

Item	Feature	Reference	Status	Support
CABE	Abort error	3.6.1	M	Yes []
CACE	AC error	3.6.2	M	Yes []
CBE	Burst error	3.6.3	M	Yes []
CFCE	Frame-copied error	3.6.4	M	Yes []
CFE	Frequency error	3.6.5	M.31	Yes []
CIE	Internal error	3.6.6	M.31	Yes []
CLE	Line error	3.6.7	M	Yes []
CLFE	Lost frame error	3.6.8	M	Yes []
CRCE	Receive congestion error	3.6.9	M	Yes []
CTE	Token error	3.6.10	M	Yes []
NOTES— M.31: These counters are mandatory, but the indications that cause CFE and CIE to be incremented are optional.				

A.6.6.2 Station using TXI Access Protocol — (DTRS and TXI) or DTRPSETXI::

Item	Feature	Reference	Status	Support
CSABE	Abort Error	10.6.1.1	M	Yes []
CSBE	Burst Error	10.6.1.2	M	Yes []
CSFE	Frequency Error	10.6.1.3	M.32	Yes []
CSIE	Internal Error	10.6.1.4	M.32	Yes []
CSLE	Line Error	10.6.1.5	M	Yes []
CSRCE	Receive Congestion Error	10.6.1.6	M	Yes []
NOTES— M.32: These counters are mandatory, but the indications that cause CSFE and CSIE to be incremented are optional.				

A.6.6.3 C-Port in port mode using TXI Access Protocol — DTRPPMTXI::

Item	Feature	Reference	Status	Support
CPABE	Abort Error	10.6.2.1	M	Yes []
CPBE	Burst Error	10.6.2.2	M	Yes []
CPFE	Frequency Error	10.6.2.3	M.33	Yes []
CPIE	Internal Error	10.6.2.4	M.33	Yes []
CPLE	Line Error	10.6.2.5	M	Yes []
CPRCE	Receive Congestion Error	10.6.2.6	M	Yes []
NOTES— M.33: These counters are mandatory, but the indications that cause CPFE and CPIE to be incremented are optional.				

A.7 PICS proforma for the physical layer**A.7.1 PHY Characteristics at 4 Mbit/s and 16 Mbit/s****A.7.1.1 Symbol timing—(DS or DTRS or DTRP or ACON) and LMR::**

Item	Feature	Reference	Status	Support
ST1	4 Mbit/s data signaling rate	5.2	DR4:M	N/A [] Yes []
ST2	16 Mbit/s data signaling rate	5.2	DR16:M	N/A [] Yes []
ST3	Acquire phase lock within 1.5 ms	5.7.1	M	Yes []
ST4	Frequency error	5.7.2	O	Yes [] No []
ST5	Signal loss indication	5.7.1	O	Yes [] No []

A.7.1.2 Symbol encoding and decoding—(DS or DTRS or DTRP or ACON) and LMR::

Item	Feature	Reference	Status	Support
SY1	Symbol encoding	5.3	M	Yes []
SY2	Symbol decoding	5.6	M	Yes []
SY3	Burst error/idles transmit	5.4.2	M	Yes []

A.7.1.3 Station latency—(DS or DTRS or DTRP) and LMR and TKP::

Item	Feature	Reference	Status	Support
LB1	A fixed latency buffer of 24 symbols	5.8.2	M	Yes []
LB2	4 Mbit/s latency variation	5.8.3	DR4:M	N/A [] Yes []
LB3	16 Mbit/s latency variation	5.8.3	DR16:M	N/A [] Yes []

A.7.1.4 Accumulated correlated jitter—(DS or DTRS or DTRP or ACON) and LMR::

Item	Feature	Reference	Status	Support
AJ1a	Filtered accumulated phase jitter	7.1.1	DR4:M	N/A [] Yes []
AJ1b	Filtered accumulated phase jitter	7.1.1	DR16:M	N/A [] Yes []
AJ2a	Delta phase accumulated phase jitter	7.1.1	DR4:M	N/A [] Yes []
AJ2b	Delta phase accumulated phase jitter	7.1.1	DR16:M	N/A [] Yes []
AJ3a	Accumulated uncorrelated jitter	7.1.2	DR4:M	N/A [] Yes []
AJ3b	Accumulated uncorrelated jitter	7.1.2	DR16:M	N/A [] Yes []
AJ4	PHY net delay	7.1.3	M	Yes []

A.7.1.5 Transmitter specification**A.7.1.5.1 Transmitter specification—(DS or DTRS or DTRP or ACON) and LMR and COPPER:**

Item	Feature	Reference	Status	Support
TR1a	Transmit duty cycle distortion	7.2.2.1	DR4:M	N/A [] Yes []
TR1b	Transmit duty cycle distortion	7.2.2.1	DR16:M	N/A [] Yes []
TR2a	Transmit Tdiff01	7.2.2.2.1	DR4:M	N/A [] Yes []
TR2b	Transmit Tdiff01	7.2.2.2.1	DR16:M	N/A [] Yes []
TR3	Transmit Tdiffmax	7.2.2.2.1	M	Yes []
TR4a	Transmit waveform(zero/one/SDEL)	7.2.2.2.2	DR4:M	N/A [] Yes []
TR4b	Transmit waveform(zero/one/SDEL)	7.2.2.2.2	DR16:M	N/A [] Yes []
TR5a	Transmit output voltage	7.2.2.3	STP:M	N/A [] Yes []
TR5b	Transmit output voltage	7.2.2.3	UTP:M	N/A [] Yes []
TR6a	Transmit return loss	7.2.2.4	STP:M	N/A [] Yes []
TR6b	Transmit return loss	7.2.2.4	UTP:M	N/A [] Yes []

A.7.1.5.2 Transmitter specification—(DS or DTRS or DTRP or ACON) and LMR and FIBRE::

Item	Feature	Reference	Status	Support
FIBTR1a	Optical transmit asymmetry	13.7.2.3.1	DR4:M	N/A [] Yes []
FIBTR1b	Optical transmit asymmetry	13.7.2.3.1	DR16:M	N/A [] Yes []
FIBTR2a	Average optical power	13.7.2.3	DR4:M	N/A [] Yes []
FIBTR2b	Average optical power	13.7.2.3	DR16:M	N/A [] Yes []
FIBTR3	Average optical power off	13.7.2.3	M	Yes []
FIBTR4a	Rise/fall time	13.7.2.3	DR4:M	N/A [] Yes []
FIBTR4b	Rise/fall time	13.7.2.3	DR16:M	N/A [] Yes []
FIBTR5	Overshoot	13.7.2.3	M	Yes []

A.7.1.6 Receiver specification**A.7.1.6.1 Receiver specification—(DS or DTRS or DTRP or ACON) and LMR and COPPER::**

Item	Feature	Reference	Status	Support
RC1a	Receiver jitter tolerance (no noise)	7.2.3.1	DR4:M	N/A [] Yes []
RC1b	Receiver jitter tolerance (no noise)	7.2.3.1	DR16:M	N/A [] Yes []
RC2a	Receiver jitter tolerance (with noise)	7.2.3.1	DR4:M	N/A [] Yes []
RC2b	Receiver jitter tolerance (with noise)	7.2.3.1	DR16:M	N/A [] Yes []
RC3a	Receiver return loss	7.2.3.2	DR4:M	N/A [] Yes []
RC3b	Receiver return loss	7.2.3.2	DR16:M	N/A [] Yes []

A.7.1.6.2 Receiver specification—(DS or DTRS or DTRP or ACON) and LMR and FIBRE::

Item	Feature	Reference	Status	Support
FIBRC1	Average received power, Pr, operating	13.7.2.4	M	Yes []
FIBRC2	Signal detect threshold	13.7.2.4	M	Yes []
FIBRC3a	Input rise/fall time	13.7.2.4	DR4:M	N/A [] Yes []
FIBRC3b	Input rise/fall time	13.7.2.4	DR16:M	N/A [] Yes []
FIBRC4a	Receiver jitter tolerance (no noise)	7.2.3.1	DR4:M	N/A [] Yes []
FIBRC4b	Receiver jitter tolerance (no noise)	7.2.3.1	DR16:M	N/A [] Yes []

A.7.3 Access control**A.7.3.1 Station access control—(DS or DTRS or DTRPSE)::**

Item	Feature	Reference	Status	Support
SRA1	Perform station ring access control	5.9	M	Yes []

A.7.3.2 Station access control—(DS or DTRS or DTRPSE) and COPPER::

Item	Feature	Reference	Status	Support
*SRA2	Phantom circuit source/return	7.2.1.1	M	Yes []
SRA3	Ring insertion current/voltage	7.2.1.1	M	Yes []
SRA4	Ring bypass current/voltage	7.2.1.1	M	Yes []
*SRA5	Lobe fault indication	7.2.1.2	M	Yes []
PREDICATES— PRED20 = <i>Reserved</i>				

A.7.3.3 Station access control—(DS or DTRS or DTRPSE) and FIBRE::

Item	Feature	Reference	Status	Support
SRA6	Ring insertion	13.7.2.2	M	Yes []
SRA7	Ring bypass	13.7.2.2	M	Yes []
NOTES— X.34: <i>Reserved</i>				

A.7.3.4 C-Port in port mode access control—DTRPPM::

Item	Feature	Reference	Status	Support
PRA1	Perform port mode ring access control	8.3	M	Yes []

A.7.3.5 C-Port in port mode access control—DTRPPM and COPPER::

Item	Feature	Reference	Status	Support
PRA2	Phantom DC load	8.3.3	M	Yes []
*PRA3	Phantom circuit insert detection	8.3.1	M	Yes []

A.7.3.6 C-Port in port mode access control—DTRPPM and FIBRE::

Item	Feature	Reference	Status	Support
PRA4	Insertion/bypass detection	13.7.2.2	M	Yes []
NOTES— X.35: <i>Reserved</i>				

A.7.3.7 Concentrator access control—(ACON or PCON) and COPPER::

Item	Feature	Reference	Status	Support
CRA1	Ring insertion max time	8.3.2	M	Yes []
CRA2	Ring bypass max time	8.3.2	M	Yes []
CRA3	Phantom DC load	8.3.3	M	Yes []
CRA4	Max ring open time	8.3.2	M	Yes []
CRA5	Phantom path leakage resistance	8.3	M	Yes []
CRA6	Ring access control insert & bypass	8.3.1	M	Yes []

A.7.3.8 Concentrator access control—(ACON or PCON) and FIBRE::

Item	Feature	Reference	Status	Support
CRA7	Ring insertion	13.7.2.2	M	Yes []
CRA8	Ring bypass	13.7.2.2	M	Yes []

A.7.4 Connector specification

A.7.4.1 Connector specification—DS or DTRS or DTRP::

Item	Feature	Reference	Status	Support
MI1a	STP media interface station connector	7.2.5.1	PRED21:M	N/A [] Yes []
MI1b	STP media interface station contact mapping	7.2	PRED21:M	N/A [] Yes []
MI1c	STP media interface concentrator connector	8.1.1	PRED22:M	N/A [] Yes []
MI1d	STP media interface concentrator contact mapping	8.1.1	PRED22:M	N/A [] Yes []
MI2a	UTP media interface station connector	7.2.5.2	PRED23:M	N/A [] Yes []
MI2b	UTP media interface station contact mapping	7.2	PRED23:M	N/A [] Yes []
MI2c	UTP media interface concentrator connector	8.1.1	PRED24:M	N/A [] Yes []
MI2d	UTP media interface concentrator contact mapping	8.1.1	PRED24:M	N/A [] Yes []
MI3a	Fibre media interface connector: Duplex SC	13.7.2	PRED25:O.36	N/A [] Yes [] No []
MI3b	Fibre media interface connector: BFOC/2,5	13.7.2	PRED25:O.36	N/A [] Yes [] No []
MI3c	Fibre media interface connector: Other	13.7.2	PRED25:O.36	N/A [] Yes [] No []

Item	Feature	Reference	Status	Support
NOTES— O.36: Support for at least one of the options is required. O.37: <i>Reserved</i>				
PREDICATES— PRED21 = STP AND (DS OR DTRS OR DTRPSE) PRED22 = STP AND DTRPPM PRED23 = UTP AND (DS OR DTRS OR DTRPSE) PRED24 = UTP AND DTRPPM PRED25 = FIB AND LMR PRED26 = <i>Reserved</i>				

A.7.4.2 Connector specification—(ACON or PCON) and LMR::

Item	Feature	Reference	Status	Support
CC1a	STP media lobe connector	8.1.1	STP:M	N/A [] Yes []
CC1b	UTP media lobe connector	8.1.1	UTP:M	N/A [] Yes []
CC1c	Fibre media interface connector: Duplex SC	13.7.2	FIB:O.38	N/A [] Yes [] No []
CC1d	Fibre media interface connector: BFOC/2,5	13.7.2	FIB:O.38	N/A [] Yes [] No []
CC1e	Fibre media interface connector: Other	13.7.2	FIB:O.38	N/A [] Yes [] No []
CC2a	Trunk connected STP MIC	8.2.1	O.39	Yes [] No []
CC2b	Trunk connected UTP MIC	8.2.1	O.39	Yes [] No []
CC2c	Trunk connected Fibre	13.7.2	O.39	Yes [] No []
CC2d	No trunk connection	8.2.1	O.39	Yes [] No []
CC3	Main ring signal path	8.2.1	M	Yes []
CC4a	Trunk connected backup signal path	8.2.1	O.40	Yes [] No []
CC4b	No trunk connection	8.2.1	O.40	Yes [] No []
CC5	Lobe port indicators	8.2.1	O	Yes [] No []
NOTES— O.38 to O.40: Support of at least one of each option shown above is required.				

A.7.5 Concentrator specific requirements

A.7.5.1 Concentrator specific requirements—ACON and LMR::

Item	Feature	Reference	Status	Support
AC1	Burst error correction	8.5.2	O	Yes [] No []
AC2	Deleting interframe bits	8.5.2	O	Yes [] No []
AC3a	Ring segment trunk port	8.2	O.41	Yes [] No []
AC3b	No trunk port	8.2	O.41	Yes [] No []
NOTES— O.41: Support of at least one of each option shown above is required.				

A.7.5.2 Concentrator specific requirements—PCON and LMR::

Item	Feature	Reference	Status	Support
CPA1	Lobe return loss	8.4.1.1	M	Yes []
CPA2a	Trunk reflection coefficient	8.4.1.2	O.42	Yes [] No []
CPA2b	Ring segment boundary return loss	8.4.1.3	O.42	Yes [] No []
CPA2c	No passive trunk	8.4.1	O.42	Yes [] No []
CPA3	Maximum flat loss	8.4.2	M	Yes []
CPA4	Published lobe attenuation values	8.4.2	M	Yes []
CPA5	Crosstalk loss	8.4.4	M	Yes []
CPA6	Lobe low-frequency response	8.4.3	M	Yes []
CPA7a	Passive trunk low-frequency response	8.4.3	O.43	Yes [] No []
CPA7b	No passive trunk	8.4.3	O.43	Yes [] No []
CPA8a	Published passive trunk port	8.4	O.44	Yes [] No []
CPA8b	Published ring segment boundary trunk port	8.4	O.44	Yes [] No []
CPA8c	No trunk port	8.4	O.44	Yes [] No []
CPA9a	Published passive trunk attenuation values	8.4.2	O.45	Yes [] No []
CPA9b	No passive trunk	8.4.2	O.45	Yes [] No []
NOTES— O.42 to O.45: Support of at least one option shown above is required.				

<< End of Annex A >

