INTERNATIONAL TELECOMMUNICATION UNION

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

G.994.1

Amendment 3

(01/2005)

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

Digital sections and digital line system – Access networks

Handshake procedures for digital subscriber line (DSL) transceivers

Amendment 3: New codepoints

ITU-T Recommendation G.994.1 (2003) – Amendment 3

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ITU-T Recommendation G.994.1

Handshake procedures for digital subscriber line (DSL) transceivers

Amendment 3: New codepoints

Summary

This amendment adds the following functionality:

- Parameters to support the revision of G.991.2:
  - Annexes A and B PBO (power back-off);
  - new Annex G.
- Parameters to support the revision of G.992.3 Annexes J and M for upstream spectrum shaping.
- Parameters to support G.992.3 Annex C.B.

Source

Amendment 3 to ITU-T Recommendation G.994.1 (2003) was approved on 13 January 2005 by ITU-T Study Group 15 (2005-2008) under the ITU-T Recommendation A.8 procedure.

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.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure e.g. interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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As of the date of approval of this Recommendation, ITU had received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

ITU-T Recommendation G.994.1

Handshake procedures for digital subscriber line (DSL) transceivers

Amendment 3: New codepoints

1) *To support G.991.2 Annexes A/B power back-off, modify the following tables as shown with revision marks:*

Table 11.16.1/G.994.1 – Standard information field – G.991.2 Annex A Downstream training parameters – NPar(3) coding – Octet 1

Bits								G.991.2 Annex A downstream training NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	0	x	x	x	x	x	PBO-1: Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T

Table 11.16.2/G.994.1 – Standard information field – G.991.2 Annex A Upstream training parameters – NPar(3) coding – Octet 1

Bits								G.991.2 Annex A upstream training NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	0	x	x	x	x	x	PBO-1: Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T

Table 11.16.3/G.994.1 – Standard information field – G.991.2 Annex A Downstream PMMS parameters – NPar(3) coding – Octet 1

Bits								G.991.2 Annex A downstream PMMS NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	0	x	x	x	x	x	PBO-1: Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T

Table 11.16.4/G.994.1 – Standard information field – G.991.2 Annex A Upstream PMMS parameters – NPar(3) coding – Octet 1

Bits								G.991.2 Annex A Upstream PMMS NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	0	x	x	x	x	x	PBO-1: Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T

Table 11.18.1/G.994.1 – Standard information field – G.991.2 Annex B Downstream training parameters – NPar(3) coding – Octet 1

Bits								G.991.2 Annex B downstream training NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	0	x	x	x	x	x	PBO-1: Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T

Table 11.18.2/G.994.1 – Standard information field – G.991.2 Annex B Upstream training parameters – NPar(3) coding – Octet 1

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B upstream training NPar(3)s – Octet 1
x x	0 x x x x x	PBO-1: Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.3/G.994.1 – Standard information field – G.991.2 Annex B Downstream PMMS parameters – NPar(3) coding – Octet 1

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B downstream PMMS NPar(3)s – Octet 1
x x	0 x x x x x	PBO-1: Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.4/G.994.1 – Standard information field – G.991.2 Annex B Upstream PMMS parameters – NPar(3) coding – Octet 1

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B upstream PMMS NPar(3)s – Octet 1
x x	0 x x x x x	PBO-1: Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

2) *To support G.991.2 Annexes A/B power back-off, add the following new tables:*

Table 11.16.1.10/G.994.1 – Standard information field – G.991.2 Annex A Downstream training parameters – NPar(3) coding – Octet 11

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex A downstream training NPar(3)s – Octet 11
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.16.2.10/G.994.1 – Standard information field – G.991.2 Annex A Upstream training parameters – NPar(3) coding – Octet 11

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex A upstream training NPar(3)s – Octet 11
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.16.3.14/G.994.1 – Standard information field – G.991.2 Annex A Downstream PMMS parameters – NPar(3) coding – Octet 15

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex A downstream PMMS NPar(3)s – Octet 15
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.16.4.14/G.994.1 – Standard information field – G.991.2 Annex A Upstream PMMS parameters – NPar(3) coding – Octet 15

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex A upstream PMMS NPar(3)s – Octet 15
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.1.10/G.994.1 – Standard information field – G.991.2 Annex B Downstream training parameters – NPar(3) coding – Octet 11

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B downstream training NPar(3)s – Octet 11
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.2.10/G.994.1 – Standard information field – G.991.2 Annex B Upstream training parameters – NPar(3) coding – Octet 11

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B upstream training NPar(3)s – Octet 11
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.3.14/G.994.1 – Standard information field – G.991.2 Annex B Downstream PMMS parameters – NPar(3) coding – Octet 15

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B downstream PMMS NPar(3)s – Octet 15
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Downstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

Table 11.18.4.14/G.994.1 – Standard information field – G.991.2 Annex B Upstream PMMS parameters – NPar(3) coding – Octet 15

Bits 8 7	6 5 4 3 2 1	G.991.2 Annex B upstream PMMS NPar(3)s – Octet 15
x x	0 x x x x x	PBO-2 (4-wire/m-pair): Upstream PBO (dB) (bits 5-1 × 1.0 dB)
x x	1 x x x x x	Reserved for allocation by ITU-T

3) *To support G.991.2 Annex G, modify the following tables as shown with revision marks:*

Table 11.0.1/G.994.1 – Standard information field – SPar(1) coding – Octet 2

Bits								SPar(1)s – Octet 2
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	1	G.991.2 – Annexes A/F
x	x	x	x	x	x	1	x	G.991.2 – Annexes B/G
x	x	x	x	x	1	x	x	Committee T1* MCM VDSL (Note 1)
x	x	x	x	1	x	x	x	Committee T1 SCM VDSL (Note 2)
x	x	x	1	x	x	x	x	ETSI MCM VDSL (Note 3)
x	x	1	x	x	x	x	x	ETSI SCM VDSL (Note 3)
x	1	x	x	x	x	x	x	Committee T1 enhanced SHDSL
x	0	0	0	0	0	0	0	No parameters in this octet

NOTE 1 – Use of this bit is defined in "Draft Trial-Use Standard For Telecommunication – Interface Between Networks and Customer Installation – Very High Bit-rate Digital Subscriber Line (VDSL) Metallic Interface – Part 3: Technical Specification for Multi-Carrier Modulation (MCM) Transceivers".

NOTE 2 – Use of this bit is defined in "Draft Trial-Use Standard For Telecommunication – Interface Between Networks and Customer Installation – Very High Bit-rate Digital Subscriber Line (VDSL) Metallic Interface – Part 2: Technical Specification for Single-Carrier Modulation (SCM) Transceivers".

NOTE 3 – Use of this bit is defined in ETSI TS 101270-2.

Table 11.18.0.1/G.994.1 – Standard information field – G.991.2 Annex B – SPar(2) coding – Octet 2

Bits								G.991.2 Annex B SPar(2)s – Octet 2
8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
x	x	x	x	x	x	x	1	Upstream framing parameters
x	x	x	x	x	x	1	x	Dual-Mode TPS-TC Parameters
x	x	x	x	x	1	x	x	Multiple-Pair Operation parameters
x	x	x	x	1	x	x	x	Downstream extended training rates – 16-TCPAM symmetric (Annex G)~~Reserved for allocation by ITU-T~~
x	x	x	1	x	x	x	x	Downstream extended training rates – 32-TCPAM symmetric (Annex G)~~Reserved for allocation by ITU-T~~
x	x	1	x	x	x	x	x	Upstream extended training rates – 16-TCPAM symmetric (Annex G)~~Reserved for allocation by ITU-T~~
x	x	0	0	0	0	0	0	No parameters in this octet

* T1 standards are maintained since November 2003 by ATIS.

4) *To support G.991.2 Annex G, add the following new tables:*

Table 11.18.0.2/G.994.1 – Standard information field – G.991.2 Annex B – SPar(2) coding – Octet 3

Bits								G.991.2 Annex B SPar(2)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	Upstream extended training rates – 32-TCPAM symmetric (Annex G)
x	x	x	x	x	x	1	x	Downstream extended PMMS rates (Annex G)
x	x	x	x	x	1	x	x	Upstream extended PMMS rates (Annex G)
x	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

Table 11.18.10/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G downstream extended training rate – 16-TCPAM symmetric NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Downstream base data rate – Minimum 1 (bit 7), 16-TCPAM symmetric PSD
x	x					x		Downstream base data rate – Maximum 1 (bit 7), 16-TCPAM symmetric PSD
x	x				x			Downstream base data rate – Step 1 (bit 7), 16-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.10.1/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G downstream extended training rate – 16-TCPAM symmetric NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Minimum 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.10.2/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 3

Bits								G.991.2 Annex G downstream extended training rate – 16-TCPAM symmetric NPar(3)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Maximum 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.10.3/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 4

Bits								G.991.2 Annex G downstream training rate – 16-TCPAM symmetric NPar(3)s – Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Step 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.10.$j_1 \times 4$ – 4/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_1 \times 4$ – 3

Bits								G.991.2 Annex G downstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_1 \times 4$ – 3
8	7	6	5	4	3	2	1	
x	x						x	Downstream base data rate extension – Minimum j_1 (bit 7), 16-TCPAM symmetric PSD
x	x					x		Downstream base data rate extension – Maximum j_1 (bit 7), 16-TCPAM symmetric PSD
x	x				x			Downstream base data rate extension – Step j_1 (bit 7), 16-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.10.$j_1 \times 4$ – 3/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_1 \times 4$ – 2

Bits								G.991.2 Annex G downstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_1 \times 4$ – 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Minimum j_1 (bits 6-1), 16-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.10.$j_1 \times 4$ – 2/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_1 \times 4$ – 1

Bits								G.991.2 Annex G downstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_1 \times 4$ – 1
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Maximum j_1 (bits 6-1), 16-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.10.$j_1 \times 4$ – 1/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_1 \times 4$

Bits								G.991.2 Annex G downstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_1 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Step j_1 (bits 6-1), 16-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.11/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Downstream base data rate – Minimum 1 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Downstream base data rate – Maximum 1 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Downstream base data rate – Step 1 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.11.1/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Minimum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.11.2/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 3

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Maximum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.11.3/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 4

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Step 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.11.$j_2 \times 4 - 4$/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_2 \times 4 - 3$

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_2 \times 4 - 3$
8	7	6	5	4	3	2	1	
x	x						x	Downstream base data rate extension – Minimum j_2 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Downstream base data rate extension – Maximum j_2 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Downstream base data rate extension – Step j_2 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.11.$j_2 \times 4 - 3$/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_2 \times 4 - 2$

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_2 \times 4 - 2$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Minimum j_2 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.11.$j_2 \times 4$ – 2/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_2 \times 4 – 1$

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_2 \times 4 – 1$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Maximum j_2 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.11.$j_2 \times 4$ – 1/G.994.1 – Standard information field – G.991.2 Annex G Downstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_2 \times 4$

Bits								G.991.2 Annex G downstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_2 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Step j_2 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate – Minimum 1 (bit 7) , 16-TCPAM symmetric PSD
x	x					x		Upstream base data rate – Maximum 1 (bit 7), 16-TCPAM symmetric PSD
x	x				x			Upstream base data rate – Step 1 (bit 7), 16-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.12.1/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Minimum 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12.2/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 3

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Maximum 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12.3/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet 4

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Step 1 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12.$j_3 \times 4$ – 4/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_3 \times 4$ – 3

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_3 \times 4$ – 3
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate extension – Minimum j_3 (bit 7), 16-TCPAM symmetric PSD
x	x					x		Upstream base data rate extension – Maximum j_3 (bit 7), 16-TCPAM symmetric PSD
x	x				x			Upstream base data rate extension – Step j_3 (bit 7), 16-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.12.$j_3 \times 4$ – 3/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_3 \times 4$ – 2

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_3 \times 4$ – 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Minimum j_3 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12.$j_3 \times 4$ – 2/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_3 \times 4$ – 1

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_3 \times 4$ – 1
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Maximum j_3 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.12.$j_3 \times 4$ – 1/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 16-TCPAM symmetric – NPar(3) coding – Octet $j_3 \times 4$

Bits								G.991.2 Annex G upstream training rate – 16-TCPAM symmetric NPar(3)s – Octet $j_3 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Step j_3 (bits 6-1), 16-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.13/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate – Minimum 1 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Upstream base data rate – Maximum 1 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Upstream base data rate – Step 1 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.13.1/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Minimum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.13.2/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 3

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Maximum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.13.3/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet 4

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Step 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.13.$j_4 \times 4 - 4$/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_4 \times 4 - 3$

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_4 \times 4 - 3$
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate extension – Minimum j_4 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Upstream base data rate extension – Maximum j_4 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Upstream base data rate extension – Step j_4 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.13.$j_4 \times 4 - 3$/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_4 \times 4 - 2$

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_4 \times 4 - 2$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Minimum j_4 (bits 6-1), 32-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.13.$j_4 \times 4 - 2$/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_4 \times 4 - 1$

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_4 \times 4 - 1$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Maximum j_4 (bits 6-1), 32-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.13.$j_4 \times 4 - 1$/G.994.1 – Standard information field – G.991.2 Annex G Upstream extended training rates – 32-TCPAM symmetric – NPar(3) coding – Octet $j_4 \times 4$

Bits								G.991.2 Annex G upstream training rate – 32-TCPAM symmetric NPar(3)s – Octet $j_4 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Step j_4 (bits 6-1), 32-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.14/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Downstream base data rate – Minimum 1 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Downstream base data rate – Maximum 1 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Downstream base data rate – Step 1 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for use by ITU-T

Table 11.18.14.1/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate – Minimum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)
NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.								

Table 11.18.14.2/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet 3

Bits 8	7	6	5	4	3	2	1	G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet 3
x	x	x	x	x	x	x	x	Downstream base data rate – Maximum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.14.3/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet 4

Bits 8	7	6	5	4	3	2	1	G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet 4
x	x	x	x	x	x	x	x	Downstream base data rate – Step 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.14.$j_5 \times 4 - 4$/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet $j_5 \times 4 - 3$

Bits 8	7	6	5	4	3	2	1	G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet $j_5 \times 4 - 3$
x	x						x	Downstream base data rate extension – Minimum j_5 (bit 7) 32-TCPAM symmetric PSD
x	x					x		Downstream base data rate extension – Maximum j_5 (bit 7) 32-TCPAM symmetric PSD
x	x				x			Downstream base data rate extension – Step j_5 (bit 7) 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.14.$j_5 \times 4 - 3$/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet $j_5 \times 4 - 2$

Bits 8	7	6	5	4	3	2	1	G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet $j_5 \times 4 - 2$
x	x	x	x	x	x	x	x	Downstream base data rate extension – Minimum j_5 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.14.$j_5 \times 4 - 2$/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet $j_5 \times 4 - 1$

Bits 8	7	6	5	4	3	2	1	G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet $j_5 \times 4 - 1$
x	x	x	x	x	x	x	x	Downstream base data rate extension – Maximum j_5 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.14.$j_5 \times 4$ – 1/G.994.1 – Standard information field – G.991.2 Annex G Downstream Extended PMMS rates – NPar(3) coding – Octet $j_5 \times 4$

Bits								G.991.2 Annex G downstream PMMS rate NPar(3)s – Octet $j_5 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Downstream base data rate extension – Step j_5 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet 1

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate – Minimum 1 (bit 7), 32-TCPAM symmetric PSD
x	x					x		Upstream base data rate – Maximum 1 (bit 7), 32-TCPAM symmetric PSD
x	x				x			Upstream base data rate – Step 1 (bit 7), 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for use by ITU-T

Table 11.18.15.1/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet 2

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Minimum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15.2/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet 3

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet 3
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Maximum 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15.3/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet 4

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet 4
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate – Step 1 (bits 6-1), 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15.$j_6 \times 4 - 4$/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet $j_6 \times 4 - 3$

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet $j_6 \times 4 - 3$
8	7	6	5	4	3	2	1	
x	x						x	Upstream base data rate extension – Minimum j_6 (bit 7) 32-TCPAM symmetric PSD
x	x					x		Upstream base data rate extension – Maximum j_6 (bit 7) 32-TCPAM symmetric PSD
x	x				x			Upstream base data rate extension – Step j_6 (bit 7) 32-TCPAM symmetric PSD
x	x	x	x	x				Reserved for allocation by ITU-T

Table 11.18.15.$j_6 \times 4 - 3$/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet $j_6 \times 4 - 2$

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet $j_6 \times 4 - 2$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Minimum j_6 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15.$j_6 \times 4 - 2$/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet $j_6 \times 4 - 1$

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet $j_6 \times 4 - 1$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Maximum j_6 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

Table 11.18.15.$j_6 \times 4 - 1$/G.994.1 – Standard information field – G.991.2 Annex G Upstream Extended PMMS rates – NPar(3) coding – Octet $j_6 \times 4$

Bits								G.991.2 Annex G upstream PMMS rate NPar(3)s – Octet $j_6 \times 4$
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Upstream base data rate extension – Step j_6 (bits 6-1) 32-TCPAM symmetric PSD (Note)

NOTE – The rates are determined by combining (bit 7) and the 6-bits in this octet to create a 7-bit number.

5) *To support upstream spectral shaping in G.992.3 Annexes J and M, modify the following tables:*

Table 11.35/G.994.1/G.994.1 – Standard information field – G.992.3 Annex J NPar(2) coding

Bits								G.992.3 Annex J NPar(2)s
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	NTR
x	x	x	x	x	x	1	x	Short initialization
x	x	x	x	x	1	x	x	Diagnostics mode
x	x	x	x	1	x	x	x	~~Reserved for allocation by~~ PSD shape support
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

Table 11.49/G.994.1/G.994.1 – Standard information field – G.992.3 Annex M NPar(2) coding

Bits								G.992.3 Annex M NPar(2)s
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	NTR
x	x	x	x	x	x	1	x	Short initialization
x	x	x	x	x	1	x	x	Diagnostics mode
x	x	x	x	1	x	x	x	~~Reserved for allocation by~~ PSD shape support
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

6) *To support upstream spectral shaping in G.992.3 Annexes J and M, add the following new tables:*

Table 11.36.0.1/G.994.1 – Standard information field – G.992.3 Annex J SPar(2) coding – Octet 2

Bits								G.992.3 Annex J SPar(2)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	Submode PSD shape
x	x	x	x	x	x	1	x	Reserved for allocation by ITU-T
x	x	x	x	x	1	x	x	Reserved for allocation by ITU-T
x	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

Table 11.36.7/G.994.1 – Standard information field – G.992.3 Annex J Submode PSD shape NPar(3) coding – Octet 1

Bits								G.992.3 Annex J Submode PSD shape NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Tone index n (bits 6 to 1, coded as n – 1)

Table 11.36.7.1/G.994.1 – Standard information field – G.992.3 Annex J Submode PSD shape NPar(3) coding – Octet 2

Bits								G.992.3 Annex J Submode PSD shape NPar(3)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PSD at this Tone index n (bits 6 to 1, coded as n)

Table 11.36.7.2 × (j – 1)/G.994.1 – Standard information field – G.992.3 Annex J Submode PSD shape NPar(3) coding – Octet 2 × (j – 1) + 1

Bits								G.992.3 Annex J Submode PSD shape NPar(3)s – Octet 2 × (j – 1) + 1
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	Tone index n (bits 6 to 1, coded as n – 1)

NOTE – j is the number of subcarrier indices used to specify the spectral shape.

Table 11.36.7.2 × (j – 1) + 1/G.994.1 – Standard information field – G.992.3 Annex J Submode PSD shape NPar(3) coding – Octet 2 × (j – 1) + 2

Bits								G.992.3 Annex J Submode PSD shape NPar(3)s – Octet 2 × (j – 1) + 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	x	PSD at this Tone index n (bits 6 to 1, coded as n)

NOTE – j is the number of subcarrier indices used to specify the spectral shape.

Table 11.50.0.1/G.994.1 – Standard information field – G.992.3 Annex M SPar(2) coding – Octet 2

Bits								G.992.3 Annex M SPar(2)s – Octet 2
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	Submode PSD shape
x	x	x	x	x	x	1	x	Reserved for allocation by ITU-T
x	x	x	x	x	1	x	x	Reserved for allocation by ITU-T
x	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

Table 11.50.7/G.994.1 – Standard information field – G.992.3 Annex M Submode PSD shape NPar(3) coding – Octet 1

Bits 8	7	6	5	4	3	2	1	G.992.3 Annex M Submode PSD shape NPar(3)s – Octet 1
x	x	x	x	x	x	x	x	Tone index n (bits 6 to 1, coded as n – 1)

Table 11.50.7.1/G.994.1 – Standard information field – G.992.3 Annex M Submode PSD shape NPar(3) coding – Octet 2

Bits 8	7	6	5	4	3	2	1	G.992.3 Annex M Submode PSD shape NPar(3)s – Octet 2
x	x	x	x	x	x	x	x	PSD at this Tone index n (bits 6 to 1, coded as n)

Table 11.50.7.2 × (j – 1)/G.994.1 – Standard information field – G.992.3 Annex M Submode PSD shape NPar(3) coding – Octet 2 × (j – 1) + 1

Bits 8	7	6	5	4	3	2	1	G.992.3 Annex M Submode PSD shape NPar(3)s – Octet 2 × (j – 1) + 1
x	x	x	x	x	x	x	x	Tone index n (bits 6 to 1, coded as n – 1)
NOTE – j is the number of subcarrier indices used to specify the spectral shape.								

Table 11.50.7.2 × (j – 1) + 1/G.994.1 – Standard information field – G.992.3 Annex M Submode PSD shape NPar(3) coding – Octet 2 × (j – 1) + 2

Bits 8	7	6	5	4	3	2	1	G.992.3 Annex M Submode PSD shape NPar(3)s – Octet 2 × (j – 1) + 2
x	x	x	x	x	x	x	x	PSD at this Tone index n (bits 6 to 1, coded as n)
NOTE – j is the number of subcarrier indices used to specify the spectral shape.								

7) *To support new Annex C.B to G.992.3, modify Table 11.42 as shown with revision marks and add new Table 11.42.6:*

Table 11.42/G.994.1 – Standard information field – G.992.3 Annex C SPar(2) coding – Octet 1

Bits 8	7	6	5	4	3	2	1	G.992.3 Annex C SPar(2)s – Octet 1
x	x	x	x	x	x	x	1	Spectrum bounds upstream
x	x	x	x	x	x	1	x	Spectrum shaping upstream
x	x	x	x	x	1	x	x	Spectrum bounds downstream
x	x	x	x	1	x	x	x	Spectrum shaping downstream
x	x	x	1	x	x	x	x	Transmit signal images above the Nyquist frequency
x	x	1	x	x	x	x	x	Sub-annex~~Reserved for allocation by ITU-T~~
x	x	0	0	0	0	0	0	No parameters in this octet

Table 11.42.6/G.994.1 – Standard information field – G.992.3 Annex C Sub-annex NPar(3) coding – Octet 1

Bits								G.992.3 Annex C Sub-annex NPar(3)s – Octet 1
8	7	6	5	4	3	2	1	
x	x	x	x	x	x	x	1	CA
x	x	x	x	x	x	1	x	CB
x	x	x	x	x	1	x	x	Reserved for allocation by ITU-T
x	x	x	x	1	x	x	x	Reserved for allocation by ITU-T
x	x	x	1	x	x	x	x	Reserved for allocation by ITU-T
x	x	1	x	x	x	x	x	Reserved for allocation by ITU-T
x	x	0	0	0	0	0	0	No parameters in this octet

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