

Clause 63 should take advantage of the 32-TCPAM constellation to offer higher data rates using the 32-TCPAM mapping agreed by ITU for G.shdsl.bis. This comment proposes text modifications to clause 63 and annex 63A to include that mode. Note that this comment does not address the use of extended bandwidths. Instead, by restricting the maximum data rate to 3072 kbps ($2304/3 \times 4$), it keeps the maximum bandwidth to that currently defined in G.991.2 (Feb 2001). Three modifications are necessary. In addition, the editor should be given license to add appropriate G.994.1 codepoints. Those codepoints should be added to clause 61 as well.

Modification 1 (section 63.3.2.1).

a) Change line 9 to add the text in bold underline

The allowed rates r (in kb/s) **, using the 16-TCPAM constellation,** are given by

b) After line 20, add the following text:

The allowed rates r (in kb/s), using the 32-TCPAM constellation, are given by

$r = n \times 64$ where $36 < n \leq 48$

Modification 2 (section 63.3.2.2).

After line 25, add the following text:

Section 6.1.2.3 is superseded by the following text.

Mapper

The $K+1$ bits $Y_K(m)$, ..., $Y_I(m)$, and $Y_0(m)$ shall be mapped to a level $x(m)$. In §6.1.2.3, the mapper function is specified for 16-TCPAM. This text extends that mapping to include both 16- and 32-TCPAM encodings. Table 63-X shows the bit to level mapping for 16 and 32 level mapping.

TABLE 63-X
Mapping of bits to PAM levels

Y ₄ (m)	Y ₃ (m)	Y ₂ (m)	Y ₁ (m)	Y ₀ (m)	32-PAM (5 Bits)	16-PAM (4 Bits)
0	0	0	0	0	-31/32	-15/16
0	0	0	0	1	-29/32	-13/16
0	0	0	1	0	-27/32	-11/16
0	0	0	1	1	-25/32	-9/16
0	0	1	0	0	-23/32	-7/16
0	0	1	0	1	-21/32	-5/16
0	0	1	1	0	-19/32	-3/16
0	0	1	1	1	-17/32	-1/16
0	1	1	0	0	-15/32	1/16
0	1	1	0	1	-13/32	3/16
0	1	1	1	0	-11/32	5/16
0	1	1	1	1	-9/32	7/16
0	1	0	0	0	-7/32	9/16
0	1	0	0	1	-5/32	11/16
0	1	0	1	0	-3/32	13/16
0	1	0	1	1	-1/32	15/16
1	1	0	0	0	1/32	-
1	1	0	0	1	3/32	-
1	1	0	1	0	5/32	-
1	1	0	1	1	7/32	-
1	1	1	0	0	9/32	-
1	1	1	0	1	11/32	-
1	1	1	1	0	13/32	-
1	1	1	1	1	15/32	-
1	0	1	0	0	17/32	-
1	0	1	0	1	19/32	-
1	0	1	1	0	21/32	-
1	0	1	1	1	23/32	-
1	0	0	0	0	25/32	-
1	0	0	0	1	27/32	-
1	0	0	1	0	29/32	-
1	0	0	1	1	31/32	-

Modification 3 (annex 63 A)

Add the following profile to annex 63A.

Profile #	Data rate per pair (kbps)	Line rate per pair (kbps)	PSD Power (dBm)	Region	Constellation

	3072	3080	13.5	Annex A & Annex B	32-TCPAM
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