ISO/IEC JTC 1/SC 17	
Cards and personal identification	
Secretariat: BSI (United Kingdom)	

Document type: Disposition of Comments Report

Title: Disposition of comments on: CD ISO/IEC 14443-2:2010/AM1 — Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 2: Radio frequency power and signal interface — AMENDMENT 1: Bits rates higher than fc/16 and up to fc

Status:
Reference documents:
Ballot is in SC17 N 4097 = WG8 N 1772
Ballot Result is in SC17 N 4162 = WG8 N 1773

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Disposition of comments on:
CD ISO/IEC 14443-2:2010/AM1 — Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 2: Radio frequency power and signal interface — AMENDMENT 1: Bits rates higher than fc/16 and up to fc

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Project Editor:
Jean-Paul Caruana, France

The following pages provide the details of the comments and detailed information about their resolutions, how WG8 had resolved each received comment from the CD Ballot (PDAM) at the WG8 meeting held in Ispra, Italy, on 2011-03-28/30.

The three negative votes from France, Germany and Japan could be resolved primarily by the WG8 Resolution 49.03, (contained in WG8 N 1796 = SC17 N 4xxx), which determines a separation of the very high bit rate options into two spectrums with one related to the ASK and the other one to the PSK technology. That decision has an impact to this amendment which will be continued by renumbering it to Amendment 3, and just related to ASK. This one, as presented as the FCD text in WG8 N 1803, is to be processed as FCD furtheron, according to the WG8 Resolution 49.07.

1	2	(3)	4	5	(6)	(7)
MB[1]	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/Table/ Note (e.g. Table 1)	Type of com-ment[2]	Comment (justification for change) by the MB	Proposed change by the MB	Proposed Editors Disposition
[BE] 1			Te	BE requires 2 RF methods for modulation of VHBR which is in-line with current CDs. In terms of different FCC regulations which will become a critical obstacle for VHBR deployment and in terms of even higher speed PSK is regarded as more promising method whereas ASK will allow fast deployment of prototype systems.		accepted
FR1			GE	Two modulation methods make the standard too complex	Keep only one PCD to PICC modulation methods (ASK or PSK) in this document for all VHBR achievable with this method	Resolved by decision process
JP1	Whole documents		GE	JNB's (Japan National Body) stances for VHBR are shown in the following. JNB's comments on JTC 1/SC 17 N3925 JNB supports the rational of VHBR (Very High Bit Rate). JNB's positioning and requirements for this project are as follows: (1) Single method - JNB requires that SC 17 should adopt single method for this newly developed VHBR before going to PDAM ballot in order to improve interoperability and to avoid possible market confusion. - Though several methods for VHBR have been contributed in the previous SC 17/WG 8 Meetings, JNB does not support the idea of specifying two or more methods for VHBR. This is because JNB cannot see the purpose, the necessity, the market needs or the users' merits for specifying two or more methods. (2) Backward compatibility with ISO/IEC 14443 series - JNB supports the positioning of VHBR (amendments to ISO/IEC 14443 series, according to the Resolutions 47.02	Make the standards which are satisfied all following requests (1) to (4).	Partly resolved by decision process

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				and 47.03 of Summary Report of the 47th meeting of ISO/IEC JTC 1/SC 17/WG 8). *47.02 NP for Very High Bit Rate WG 8 instructs its Secretariat to forward the NP for Very High Bit Rate, as laid down in N 1683, to the SC 17 Secretariat for NP balloting process. 47.03 Project Editor for Very High Bit Rate WG 8 appoints Messr. Caruana, Meindl and Raggam, the Project Editors for the amendments to 14443-x and 10373-6 regarding Very High Bit Rate.* - JNB requires that the bit rates for VHBR should be OPTIONAL as higher bit rates (212k, 424k and 848 kbps) are optional in ISO/IEC 14443-3:2010. (3) Higher layer compatibility - JNB is of the opinion that application based on ISO/IEC 7816 series shall not be excluded even when using VHBR protocol because ISO/IEC 7816-4 (Organization, security and commands for interchange) is one of the normative references for ISO/IEC14443-4. (4) Parameter confirmation "after" the development of test method - JNB requires that the each parameter for VHBR should be fixed after the test method.		
DE1			ge	Germany disapproves because of the following reason: Germany requests to specify only one single VHBR Mode for bitrates up to 6,78 Mbit/s, which shall be ASK. The PSK modulation scheme shall be specified for data rates greater than 6,78 Mbit/s.	The document shall be updated accordingly to reflect the proposed changes.	accepted

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				If the above concept will be satisfyingly considered, Germany will change its vote to "Approval".		
JP2	Whole documents		TE	JNB requires to narrow down to one method based on the stances in NP vote. However, It isn't possible to judge which method to narrow down to the present draft, because there is the following problem. Lack of convincing grounds makes it harder for JNB to narrow down one particular method due to some concerns on the present draft described as follows: (1) Lack of clear definition for use case and its requirement makes it harder for JNB to judge the validity of the specification. (2) There are many items which have not been fully examined yet on each part of ISO/IEC14443. (3) The feasibility studies are insufficient Specifically, with regard to the PSK method, actual measurement and demonstration with real proto type device are missing. (4) There is no way for each national body to validate individual proposed method and its repeatability since the test methods are not established.	Until the following concerns are fully resolved, it is advisable to refrain from proceeding to the next ballot step. (1) At the next WG 8 meeting, to clarify VHBR use case, and to reconsider whether the proposed methods can be a solution for the assumed use case. (2) To conduct demonstration with real proto type device on PSK method supporter in order to examine the feasible potential. (3) To establish the test method so that individual proposed method and its repeatability can be validated. (4) JNB will fix its stance for the method selection after actual measurement and demonstration with real proto type are conducted by PSK supporter in addition to the above (1).	Resolved by demonstration, discussion and decision making process during the meeting
JP3	Whole documents		TE	For the ASK method, the ASK modulation in more than 8/fc has an influence on existing specification, or hasn't?	It is confirmed by the demonstration of the trial manufactures.	Resolved
FR2	4		ed	Consistency with other symbols definitions	Use only lower case for symbol definitions	Accepted to be confirm
UK1	Page 6; 8.1.1	Last bullet	te	fc/2 (~13,56 Mbit/s). Incorrect	fc/1 (~13,56 Mbit/s)."	Accepted
DE2	Page 6,	6th, 8th dash	te	ASK Mode not defined for 2,54 and 5,1 Mbit/s	Delete:	accepted

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	8.1.1				- fc/ (16/3) (2.54 Mbit/s) -fc/(8/3) (5.1 Mbit/s)	
DE3	Page 6, 8.1.1	11th dash	te	Wrong definition for 13,56 Mbit/s	Replace: - fc/2 (~13,56 Mbit/s)" By - fc (~13,56 Mbit/s)"	Resolved by UK1

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DE4	Page 14, 8.1.2.3	Subclause	te	Missing link to ASK Mode for Type A PICCs	Replace: "8.1.2.3 Modulation for bit rates higher than fc/16 see 11.2" By: "8.1.2.3 Modulation for bit rates higher than *fc*/16 up to *fc*/2 see 9.1.2.1 8.1.2.4 Modulation for bit rates higher than *fc*/2 up to *fc* see 11.2"	Accepted solved also A1
DE5	Page 15 8.1.4	Subclause	te	Missing link to ASK Mode for Type A PICCs	Replace: "8.1.4 Bit representation and coding for bit rates higher than fc/16 see 11.3" By: "8.1.4 Bit representation and coding for bit rates higher than *fc/*16 up to *fc*/2 Bit representation and coding is defined in 9.1.3. Start of communication is defined in ISO/IEC 14443-3:2011, 7.1.4. End of communication is defined in ISO/IEC 14443-3:2011, 7.1.5. 8.1.5 Bit representation and coding for bit rates higher than *fc/*2 up to *fc*	Accepted, to be managed by the new text amendment. Resolved A2

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				see 11.3"		
FR3	8.1.4		ED	The numbering for Bit representation is not consistent with the numbering for Modulation	Use 8.1.3.1 and 8.1.3.2 for the two bit codings, instead of 8.1.3 and 8.1.4	Resolved by the split of the Amendement
FR4	8.2.3		ed	Table 8 insertion will renumber subsequent tables	Add "and renumber subsequent tables" in the instruction "Replace "Replace 8.2.3 with the following:"	accepted
FR5	8.2.3.2	Table 8	ed	The frequency depends on the bit rate The exact bit rate is a division of *fc*, Mbit/s are only an approximation.	Switch the 2 columns to see "Bit rate" on the left Replace "1,695 Mbit/s" with "fc/8 (~1,695 Mbit/s)" and so on in the bit rate column (And unify table border thickness)	Accepted + the title of Table 8
NL1	8.2.5.2	*Paragraph*	TE	For bit rates higher than fc/16 a training sequence shall be appended to the start of communication in order to increase robustness.	Add the following sentence after the last sentence of the Start of communication definition. " For bit rates higher than fc/16 the following TSC may follow the inverted subcarrier: 0xD59BB49C5E51841E if supported by the PICC, in accordance with ISO/IEC14443-4:2008 Amd2, Clause 9, Table A.5. "	Project editor is instruct to put it in the text to get country comment(s) and to highlight the sentence.
DE6	8.2.5.2	*Paragraph*	te	For bit rates higher than fc/16 a training sequence shall be appended to the start of communication in order to increase robustness.	Add the following sentence after the last sentence of the Start of communication definition. " For bit rates higher than fc/16 the following TSC shall follow the inverted subcarrier: 0xD59BB49C5E51841E, unless suppressed by the PICC in accordance with	Resolved by NL1

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					ISO/IEC14443-4:2008 Amd2, Clause 9, Table A.5. "	
FR6	9.1.1		te	9.1.1 is not exactly 8.1.1 (nominal bit rate, bit boundary tolerances…)	Clarify which paragraph of 9.1.1 should be replaced by "See 8.1.1" and check carefully the technical content of 9.1.1.	Accepted by a new text (Add the new bit rates)

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DE7	Page 18
	
	9.1.2
		Paragraph	te	Maximum value of modulation index shall be extended for bit rates higher than fc/16 allowing higher antenna quality factors.	Replace paragraph between Figure 12 and Figure 13 with:
					
					"The PCD shall generate for any bit combination a modulation waveform with a modulation index m
					— greater than 8 % for all supported bit rates,
					
					— and less than
					
					  — 14 % for bit rates of $fc/128$, $fc/64$, $fc/32$ and $fc/16$,
					
					  — 20 % for bit rates of $fc/8$, $fc/4$ and $fc/2$.
					
					The PICC shall be able to receive for any bit combination a modulation waveform with a modulation index m
					— greater than
					
					  — both $(9,5 − H)$ % and 7 % for bit rates of $fc/128$, $fc/64$, $fc/32$ and $fc/16$,
					
					  — 8 % for bit rates of $fc/8$, $fc/4$ and $fc/2$.
					
					— and less than
					
					  — 15 % for bit rates of $fc/128$, $fc/64$, $fc/32$ and $fc/16$,
					
					  — 20 % for bit rates of $fc/8$, $fc/4$ and $fc/2$.
					
					NOTE 1 Minimum and maximum values of H are defined in Table 1 and Table 2.
					
					The limits for the modulation index m for bit rates $fc/128$, $fc/64$, $fc/32$ and $fc/16$ are illustrated in Figure 13.	

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FR7	9.1.2.1		te	There is no margin on maximum modulation index	Replace 18% with 19% for PICC maximum m	Accepted with 21% for PICC m
FR8	9.1.2		ed	Tables 8 and 9 have been renumbered to tables 9 and 10	Replace "Table 9" with "Table 8 renumbered to Table 9" in the instruction Replace "Table 10" with "Table 9 renumbered to Table 10" in the instruction	accepted
FR9	9.1.2	Figures 18 and 19	ED	The figure legend is misleading as type B modulation may either be ASK (9.1.2.1) or PSK (9.1.2.2)	Correct figures 12 to 19 legends to be consistent with the new modulation names Clause 7 should be updated to explain the relationship between type A/B and modulations/bit coding	Accepted by changing the Title by "modulation waveform for fc/n"
DE 8	Page 23, 9.1.2	Figure 19	ed	PDF conversion error, missing "PICC" and "PCD, no axis description	Replace figure 19 by figure in Annex 1	accepted
FR10	9.1.2	Figure 19	ed	Texts are missing		Accepted
FR11	9.1.2.1		ED	The names 2ASK2, 2ASK4 and 2ASK8 are not defined in 14443-2 but are used in 14443-4	Unify the definitions of the multiple modulation names in all parts of the standard	Resolve by FR1
FR12	9.1.4		ED	The numbering for Bit representation is not consistent with the numbering for Modulation	Use 9.1.3.1 and 9.1.3.2 for the two bit codings, instead of 9.1.3 and 9.1.4	Resolve by FR1
DE 9	11	Complete clause 11	GE, Te	The PSK modulation scheme shall be specified for data rates greater than 6,78 Mbit/s, see DE1 The specifications for PSK mode shall be updated to reflect this request.	Change PSK specifications accordingly e.g. Table 11 – 15, Table 18.	Resolved by the Second amendment according to FR1, DE1 and JP1

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FR13	11.1		ED	The PCD to PICC bit rate definition has already been given in 8.1.1 and 9.1.1	Change 11.1 title with "Introduction" or another appropriate general title Change the 1st sentence with: "The PSK modulation from PCD to PICC may use different number of phase states and different symbol durations. Table 11 defines the name and corresponding bit rate of each combination of number of phase states and symbol duration."	Accepted Project editor is instruct to propose the best draft wich can be done.
FR14	11.1		te	There is no technical reason why 8PSK should use 56° instead of 60°, only the division by 7 which gives an integer number of degrees.	Choose the maximum phase excursion ΦSeg to get the best performance/price ratio (it may not be exactly 60°). Name the phase states (e.g. P1, P2…P16) and define them once by a formula. Then use these names in all tables (symbol definitions, training sequences…)	60° cannot be used in all case. Resolved by explanation
FR15	11.2.1		ED	The PSK modulation order is named M, but was named N in Table 11.	Make the document consistent.	Resolved by the new draft document

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FR16	11.2.1		ED	"IQ segment" is not defined	Replace "For communication modes involving PSK modulation, the PCD shall generate a signal with IQ segment as specified by Table12." With "The PCD shall generate a PSK modulation with parameter ΦSeg within the limits specified by Table12." And similarly for PICC: "The PICC shall be able to receive a PSK modulation with parameter ΦSeg within the limits specified by Table13." Adapt tables 12 and 13 titles, lines and columns to show ΦSeg limits (or delete the table if ΦSeg is the same for all PSK combinations).	accepted
FR17	11.2.1	Table 13	ed	Table titles should be above the table	Move the table title	accepted

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FR18	11.2.2	5th paragraph	ed	L is the distance, not the cloud. Figure 21 shows R and L	Replace "Instead of observing ISI_m directly, one can measure distance between the two outermost points of an ISI cloud L and then calculate the corresponding ISI_m as: $ISI_m = arcsin(L/R)/\Phi_{SI}$ where R is the amplitude of the original constellation points. A visual clarification can be found in Figure .20" with "Instead of observing ISI_m directly, one can measure distance L between the two outermost points of an ISI cloud and then calculate the corresponding ISI_m as: $ISI_m = arcsin(L/R)/\Phi_{SI}$ where R is the amplitude of the original constellation points as shown in Figure 21."	accepted
FR19	11.2.2		ED	The text above Table 14 is not clear; Tables 14 and 15 define min and max but $ISI_{d,lim}$ has no min and max ISI_m and ISI_d are defined $ISI_{m,lim}$ is neither defined nor used $ISI_{d,lim}$ is not defined but is used in tables 14 and 15	Delete the rows $ISI_{d,lim}$ in both tables and use 20° and 21° directly in the condition columns because these values are only conditions, not parameters.	accepted
FR20	11.2.2		ed	ISO rules	Replace decimal points with commas in tables 14 and 15 (and 16 and 17)	accepted

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FR21	11.2.3		ED	The presentation of the maximum phase noise limit does not need a table because a minimum of zero is obvious	Delete tables 16 and 17 and change the requirement sentences, e.g. "The PCD shall not generate a normalized phase noise PN_{RMS} greater than 0,03." "The PICC shall be able to receive signals with a normalized phase noise less than 0,032." The phase noise could also be defined as an angle (not normalized) and the sentences would be: "The PCD shall not generate a phase noise PN_{RMS} greater than 0,03 times Φ_{SI}." "The PICC shall be able to receive signals with a phase noise less than 0,032 times Φ_{SI}."	accepted
FR22	11.2.3	Table 18	ED	Table 18 is not at the right place in Phase noise subclause		Accepted by simplify the table 18 and move it at the introduction of the new document
FR23	11.3	1st sentence	ed	typo	The full stop should be at the end of the sentence, after "Figure 22".	accepted
FR24	11.3	Figure 22	ed	ISO rules	Only arial font should be used, even in figures	accepted
FR25	11.3		ED	The words "very high bit rates" and "VHBR" should not be used in this part (VHBR is just the name of a tag in 14443-4).	Replace these expressions in the whole document with "bit rates higher than fc/16" or similar expression	accepted
FR26	11.3		te	As data transmitted is (pseudo) random, the benefit of Gray decoding/coding and the differential encoding is not obvious;	Directly map the source data into PSK states (like bit representation and codings for other bit rates) or justify the benefit of the added transformations	Reject, Error correction can benefit of this coding method. Explanation should be added.

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FR27	11.3.2	Table 22	ed	Typo in title	Upper case for first letter and no full stop	accepted
FR28	11.3.2		ed	Consistency with other PSK modulations	The sentence below table 23 should be a note	accepted
NL2	11.3.2	Table 23	ED	"Replace Table 23" due to a typo	(see table below)	accepted
NL3	11.3.5	Paragraph Heading	ED	SOF is already used	Change Heading to:" Start Of Communication (SOC)"	Accepted, PE is instruct to change also in the text of the document and add SOC in the symbol list
NL4	11.3.5	Replace paragraph	TE	Replace first paragraph; changes of definition for 2PSK and a symbol duration smaller equal than 4/fc.	"For very high bit rates, the standard frame contains a start of communication (SOC) field and an end of communication (EOC) field. The size of the SOC field depends on the PSK order and the etu duration. Thus, the SOC consists of 48 etu. For etu's equal or smaller to 4/fc and PSK order 2, or for 4PSK, 8PSK and 16PSK (irrespective of the etu), the SOC consists of 140 etu for the first frame and 76 etu for every other frame."	Resolved by rephrasing: to be propose to the project editor. Because there is only 4PSK and 8PSK
FR29	11.3.5		ED	This subclause needs to be editorially improved: SOF and EOF in two different subclauses, use of dashes for details, etc. In addition, the SOF length for 4PSK, 8PSK and 16 PSK is not always 76 etu but 140 etu the first time. The Cal sequence is 32 etu and not 44 etu.	Replace the whole 11.3.5 text with the following: "The SOF consists of 48, 76 or 140 etu: - calibration sequence CAL (44 etu), - synchronization sequence SYNC (4 etu), - and only for 4PSK, 8PSK and 16PSK a	Partly resolved by NL4 Add a subclause 11.3.6 for EOC: "The EOC consists of 8 etu with a phase state of

Table for NL2 comment:

Cumsum out	Phase state
00	$\phi_0 + 40\,°$
01	$\phi_0 + 20\,°$
10	ϕ_0
11	$\phi_0 - 20\,°$

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1	2	(3)	4	5	(6)	(7)
MB[1]	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/Table/ Note (e.g. Table 1)	Type of comment[2]	Comment (justification for change) by the MB	Proposed change by the MB	Proposed Editors Disposition
				A drawing could help to understand SOF. "first frame" is not defined	training sequence TSC (28 or 92 etu). CAL SYNC TSC 32 etu 4 etu 28 or 92 etu The calibration sequence consists of 8 repetitions of 4 symbols: - for 2PSK 2 symbols of 60° followed by 2 symbols of 0°; - for 4PSK 2 symbols of 20° followed by 2 symbols of − 20°.; - for 8PSK 2 symbols of 24° followed by 2 symbols of − 24°; - for 16PSK 2 symbols of 28° followed by 2 symbols of – 28° resulting in 32 etu in total. The synchronization sequence consists of 2 repetitions of the previous symbols: - for 2PSK 1 symbol of 60° followed by 1 symbol of 0°; - for 4PSK 1 symbol of 20° followed by 1 symbol of − 20°.; - for 8PSK 1 symbol of 24° followed by 1 symbol of − 24°; - for 16PSK 1 symbol of 28° followed by 1 symbol of – 28° resulting in 4 etu in total. The training sequence is a pseudo-random sequence which consists of: - 92 etu for the first frame; - 28 etu for all following frames.	Φ_0 - 180 °"

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					Its definition for the different types of PSK modulation is given in Tables 31 to 34. The "first frame" is the first frame which uses a particular type of PSK modulation. All other frames are "following frames" until either a change of type of PSK modulation or the deselection of the PICC. Add a subclause 11.3.6 for EOF: "The EOF consists of 8 etu with a phase state of Φ_0 - 180 °"	
NL5	11.3.5	First Figure/Table	TE	Update length definition for the TSC also incorporating 2PSK in the figure by	Replace Figure: " etu / CAL / SYNC / TSC <= 4/fc / 44 etu / 4 etu / first frame: 92 etu every other frame: 28 etu > 4/fc / 44 etu / 4 etu / for 4/8/16PSK, first frame: 92 etu for 4/8/16PSK, every other frame: 28 etu "	withdraw
NL6	11.3.5	paragraph	TE	Update paragraph with a definition of TSC for 2PSK and a symbol duration smaller equal than 4/fc.	Replace last paragraph before table 31: "For the 1st frame the training sequence consists of 92 etu. For all following frames the training sequence consists of 28 etu. For 2PSK and etu time duration greater than 4/fc	withdraw

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					no training sequence is transmitted, The concept is a pseudo-random sequence. A definition for every data rate is given in tables 31 - 35."	
NL7	11.3.5	Table	TE	Insert new table 31 with a TSC for 2PSK and symbol duration smaller equal than 4/fc:	Insert new table 31: "	withdraw

Insert new table 31: "

etu No	Phase state	etu No	Phase state	etu No	Phase state	Etu No	Phase state
1	60 °	24	0 °	47	60 °	70	60 °
2	0 °	25	0 °	48	0 °	71	60 °
3	60 °	26	60 °	49	60 °	72	0 °
4	0 °	27	60 °	50	0 °	73	60 °
5	0 °	28	60 °	51	0 °	74	60 °
6	60 °	29	0 °	52	60 °	75	0 °
7	0 °	30	60 °	53	0 °	76	0 °
8	0 °	31	0 °	54	0 °	77	60 °
9	0 °	32	0 °	55	60 °	78	0 °
10	0 °	33	0 °	56	60 °	79	0 °
11	60 °	34	0 °	57	60 °	80	0 °
12	60 °	35	60 °	58	60 °	81	60 °
13	0 °	36	0 °	59	60 °	82	0 °
14	60 °	37	60 °	60	0 °	83	0 °

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					15 60 ° 38 0 ° 61 0 ° 84 60 ° 16 0 ° 39 60 ° 62 0 ° 85 0 ° 17 60 ° 40 0 ° 63 60 ° 86 0 ° 18 60 ° 41 0 ° 64 0 ° 87 0 ° 19 0 ° 42 0 ° 65 60 ° 88 60 ° 20 60 ° 43 0 ° 66 60 ° 89 0 ° 21 0 ° 44 60 ° 67 60 ° 90 0 ° 22 0 ° 45 0 ° 68 0 ° 91 60 ° 23 60 ° 46 0 ° 69 60 ° 92 60 ° "Table 31 – Phase states of the training sequence for the 1st frame of 2PSK and etu <= fc/4. "	
NL8	11.3.5	Table		Replace Table 35 and caption -> includes 2PSK training sequence	etu No / 2 PSK / 4PSK / 8PSK / 16PSK table below	Withdraw

etu No	2 PSK	4PSK	8PSK	16PSK
1	**60°**	20 °	8 °	8 °
2	**0°**	-20 °	-16 °	-12 °
3	**60°**	20 °	24 °	32 °
4	**0°**	-20 °	-24 °	-28 °
5	**0°**	40 °	32 °	32 °
6	**60°**	-20 °	-24 °	-28 °
7	**0°**	40 °	32 °	32 °

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					8	**0°**	-20 °	-24 °	-28 °	
					9	**0°**	40 °	32 °	32 °	
					10	**0°**	-20 °	-24 °	-28 °	
					11	**60°**	40 °	32 °	32 °	
					12	**60°**	-20 °	-24 °	-28 °	
					13	**0°**	20 °	16 °	12 °	
					14	**60°**	0 °	0 °	0 °	
					15	**60°**	20 °	24 °	28 °	
					16	**0°**	0 °	16 °	24 °	
					17	**60°**	-20 °	0 °	8 °	
					18	**60°**	0 °	24 °	-28 °	
					19	**0°**	-20 °	16 °	28 °	
					20	**60°**	20 °	-8 °	4 °	
					21	**0°**	0 °	-24 °	-12 °	
					22	**0°**	0 °	-16 °	0 °	
					23	**60°**	40 °	24 °	-24 °	
					24	**0°**	20 °	16 °	32 °	
					25	**0°**	20 °	16 °	32 °	
					26	**60°**	-20 °	-16 °	-0 °	
					27	**60°**	-20 °	-8 °	12 °	
					28	**60°**	0 °	8 °	28 °	

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					Table 35 – Phase states of the training sequences for all following frames for VHBR PSK modes 2 PSK, 4PSK, 8PSK and 16PSK.	
FR30	Annex A		ed	"Furthermore" is not needed here	Replace "…with $v(t)$ the complex envelope and $v^*(t)$ the complex conjugate of v. Furthermore, j is the imaginary unit and f_c the carrier frequency " with "…with $v(t)$ the complex envelope, $v^*(t)$ the complex conjugate of v, j the imaginary unit and f_c the carrier frequency."	accepted
FR31	Annex B		ed	Some references are missing		accepted
FR32	Annex B	Top of page 24	ed	What is the "Baud rate samples"?	Clarify or use other words ("diagram", "phase as a function of time diagram"…)	Proposal 'by watching the figure B.1"
JP4	Annex B			Annex B is informative	Accepted change the title by adding informative	
JP5		Table 28		Table 28 is suspect…	Accepted PE shall double check with table 30	
JP6		Table 22, table 25 and table 28			Add a note Note: coding is defined by MSB first	
JP7		Figure 21	ed		Add a note on figure 21 to explain differences between black circle and others	

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US	Annex B	Annex B	Tech- nical	Annex B requires the addition of the appropriate references (with the following message: !ERROR!) which appear to have been dropped. This !ERROR! occurs in several places of Annex B.	Delete the !ERROR! message and add the appropriate references.	Resolved by the FR31

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