

## IMPLEMENTOR'S GUIDE FOR RECOMMENDATION G.712

### General comments on G.712

The frequently used term "voice frequency port" should be changed to "analogue port".

The terms "primary multiplexer", "multiplex", "multiplexer" and "PCM equipment" are used. If those terms are synonymous only one of them should be used.

The frequently used term "Administration" should be changed to "Network Operator"

In several other Recommendations (i.e. Q.551) references to a section YY in an ITU-T Recommendation G.XXX nowadays are given in the form "YY / G.XXX". This is consistent with a reference given as "Table ZZ / G.XXX".

The texts should be aligned in the figures that specifies to which ports the requirements apply:

Figure 2, 6 and A-5: "...for channels between 4-wire analogue ports (E4<sub>in</sub> to ...."

Figure 3, 7 and A-6: "...for channels between 2-wire analogue ports (E2<sub>in</sub> to ...."

Figure 4 and 8: "...for channels between a 4-wire analogue port and a digital port (E4<sub>in</sub> to ..."

Figure 5 and 9: "...for channels between a 2-wire analogue port and a digital port (E2<sub>in</sub> to ..."

Figure 11, 13, A-1 and A-3: "...for channels between analogue ports (E4<sub>in</sub> to ...."

Figure 12, 14, A-2 and A-4: "...for channels between an analogue port and a digital port (E4<sub>in</sub> to ..."

### Section specific comments on G.712

#### 1. General

Last paragraph, first line: The term line current needs no quotation marks. The term has been used without quotation marks previously in the section.

Last paragraph, line 2, 4 and 5: "Signalling" shall start with small "s".

#### 1.2. Port definitions

Paragraph 2, line 4: The text "(Ports A and B are defined in 1.1/Q.551.)" should be inserted.

Paragraph 4: "transmission levels" should be "transmission levels designations".

The last paragraph should be changed to "The performance characteristics between ports were previously specified in CCITT *Blue Book*, Volume III, Fascicle III.4, as shown in the Table 1/G.712".

#### Table 1 / G.712

The title: "connections" should be "channels".

The table head: "Recommendations" should be "Previous recommendation".

**2.2. Relative levels at 2-wire ports**

”input level ( $L_i$  encoding side)” should be

”input level ( $L_i$ ) at encoding side” or ”input level  $L_i$  (encoding side)”.

This remark applies also for output level.

**2.2. Relative levels at 2-wire ports**

Last line: ”Recommendation Q.552, §2.1.4” should be ”2.1.3/Q.552”.

**Table 2 / G.712**

The word ”measurement” should not be so frequently used as G.712 is not a measurement recommendation. ”Measurement configurations” should be ”Channel”.

The unit notation ”dB” in column 2 and 3 should be deleted and the head of these columns should read: ”Maximum permitted variation (dB)”.

The text in the NOTE should be: ”The 0 dBm0 sequence of Table 5/G.711 or Table 6/G.711 may be used.”

**5.1. Nominal impedance**

NOTE 1: ”Recommendation Q.552, §2.2.1” should be ”Table 1/Q.552”.

**5.2. Return loss**

First line: ”measured against” should be ”against”.

**Table 3 / G.712**

Table 3 should be designed in accordance with the other tables. A proposal:

Port	Return loss (dB)		NOTES
	300 Hz to 600 Hz	600 Hz to 3 400 Hz	
4-wire , $E_{4in}$	> 20	> 20	1
4-wire , $E_{4out}$	> 20	> 20	1
2-wire , $E_2$	> 12	> 15	2
NOTE 1 etc			

**6. Impedance unbalance about earth**

Last line: ”nominal characteristic impedance” should be ”nominal impedance”. The term characteristic impedance is not used anywhere else in G.712.

**Table 4 / G.712**

The head of the table: ”Measured port” should be ”Port”. ”Longitudinal conversion loss requirement” should be ”Longitudinal conversion loss (dB)”. The notation ”dB” in columns 3, 4 and 5 should be deleted.

## 6.2. Longitudinal conversion transfer loss

Table 5 specifies the configurations to which the requirements are applicable. Consequently the sentence starting "The measurements is only applicable..." should be deleted.

Last sentence: "The measurement should be made" should be "The requirements are applicable".

### Table 5 / G.712

The wordings in table 2, 5 and 6 should be aligned. Proposals for Table 5:

Channel	Z (Ω)	Difference between the longitudinal conversion transfer loss and the insertion loss (dB)			NOTES
		300 Hz to 600 Hz	600 Hz to 2 400 Hz	2 400 Hz to 3 400 Hz	
4-wire to 4-wire (E4 <sub>1in</sub> to E4 <sub>2out</sub> )	600	> 46	>46	>41	1, 2
2-wire to 2-wire (E2 <sub>1in</sub> to E2 <sub>2out</sub> )	600	> 40	>46	>41	1, 2, 3, 4
NOTE - See NOTES to Table 4/G.712					

## 7. Attenuation/frequency distortion

The last sentence gives the impression that the formula is applicable only in the case of complex nominal impedances. The text "If complex nominal impedance are used at 2-wire analogue ports" should be deleted and a new text "The formula also apply when complex nominal impedances are used at 2-wire ports" is inserted after the formula.

### Figure 4 / G.712 and Figure 5 / G.712

In the title of each figure should "T<sub>out</sub> or T<sub>in</sub>" be "T<sub>out</sub> and T<sub>in</sub>".

## 8.1. Absolute group delay

Last line: "contribute additional" should be "contribute with additional".

### Table 6 / G.712

Standardised abbreviations for units should be used: "microseconds" should be "μs".

The wordings in table 2, 5 and 6 should be aligned. E.g. in Table 6:

<b>Channel</b>	<b>Absolute group delay (<math>\mu</math>s)</b>
4-wire to 4-wire (E4 <sub>in</sub> to E4 <sub>out</sub> )	< 600
2-wire to 2-wire (E2 <sub>in</sub> to E2 <sub>out</sub> )	< 750
4-wire to digital (E4 <sub>in</sub> to A <sub>out</sub> or B <sub>out</sub> )	< 360
digital to 4-wire (A <sub>in</sub> or B <sub>in</sub> to E4 <sub>out</sub> )	< 240
2-wire to digital (E2 <sub>in</sub> to A <sub>out</sub> or B <sub>out</sub> )	< 450
digital to 2-wire (A <sub>in</sub> or B <sub>in</sub> to E2 <sub>out</sub> )	< 300

**Figure 8 / G.712 and 9 / G.712**

In the title of each figure should "T<sub>out</sub> or T<sub>in</sub>" be "T<sub>out</sub> and T<sub>in</sub>".

**Table 7 / G.712**

Either should "Weighted noise limit" be changed to "Weighted noise" in the head of the table, or the "<" should be deleted in the corresponding column.

"dBm0p" should be deleted from the third column and inserted as "(dBm0p)" after "Weighted noise" in the table head.

**Table 7 / G.712**

NOTE 4: The wording "Below -5 dBr and -8 dBr" is incomprehensible. "and -8 dBr" should be deleted.

**Table 7 / G.712**

NOTE 5: "Below -5 dBr" is vague and should be changed to "If L<sub>o</sub> <-5 dBr".

**10.2. Input signals ....**

This recommendation should also apply for 4-wire ports, specially as no particular value is recommended. The title should be aligned with the title of 10.1 and read: "Input signals below 300 Hz at analogue ports (E4 and E2)".

**12. Total distortion**

Line 3: "at the output port" should be "at the output port of the channel".

**13. Variation of gain**

Line 2: To align with i.e. section 12

"any channel" should be "a channel"

"variation of that channel" should be "variation at the output port of the channel"

**14.2.1. Far-end crosstalk measured with analogue test signal**

Digital test signals are of course not applicable in section 14.2 that deals only with analogue-to-analogue channels. Consequently the title of the section 14.2.1 should be shortened to "Far-end crosstalk".

#### **14.2.1. Far-end crosstalk**

Line 1: "Transmission paths" should be "channels".

Line 4: "analogue output of any other transmission path" should be "analogue output port of any other channel"

#### **14.2.2. Go-to-return crosstalk**

Line 4: "the same channel of the same primary multiplexer" should be "the corresponding return channel"

#### **Figure 15 / G.712**

The letters "A" and "D" are missing in the figure.

The port description "Analogue" is missing (input and output port).

#### **Figure 15 / G.712**

The title of the figure should be changed to "Measurement of interchannel crosstalk" to reflect the title of the section 14.2.

#### **14.3. Crosstalk measurements of individual primary multiplexers**

The title should be changed to "Interchannel crosstalk, analogue-to-digital channels " to align with the title of section 14.2.

#### **Figure 19 / G.712**

To align with the title of section 14.3.3 the following revised title is proposed: "FEXT and NEXT measurements with digital test signal for channels with 4-wire ports."

#### **Figure 20 / G.712**

To align with the title of section 14.3.3 the following revised title is proposed: "FEXT and NEXT measurements with digital test signal for channels with 2-wire ports."

#### **Figure 21 / G.712**

To align with the title of section 14.3.4 the following revised title is proposed: "Go-to-return crosstalk measurement with digital test signal."

#### **15.1, 15.2, 15.3 and 15.4**

"dial pulsing" should be "pulse dialling".

#### **16. Echo and stability**

In all other sections of G.712 the digital test points are denoted " $T_{in}$ " and " $T_{out}$ ". Consequently " $T_i$ " and " $T_o$ " should be changed to " $T_{in}$ " and " $T_{out}$ " on 4 places in sections 16.1 and 16.2 including the figure.

#### **Figure 23 / G.712**

"Standard digital generator" and "standard digital analyzer" should be replaced with the symbols used for generator and level meter in other figures (i.e. Figure 16).

**Annex A**

The title should be changed from "Alternative measurements" to "Alternative recommendations".

**Figure A-1, A-2, A-3 and A-4 / G.712**

In the title of each figure should "or" be changed to "and".

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