

**COMMON CONNECTION STANDARD (CCS) WORKING GROUP**

**Standardisation on Audible Tones and Ringing Pattern of Public Telecommunication Network (PTN) in Hong Kong**

**Introduction**

This paper describes the need of standardisation on the audible tones and ringing pattern of the Public Telecommunications Network (PTN) in Hong Kong and recommends to adopt an unified tone and ringing plan which will be applied to all wire-line HKTA-series specifications, whenever relevant.

**Background**

2. In Hong Kong, there are four Fixed Telecommunications Network Service (FTNS) operators namely the Hong Kong Telephone Company Limited, Hutchison Communication Limited, New T & T Hong Kong Limited (NT&T) and New World Telephone Limited (NWT) which operate the PTN. As different switching systems and technologies are employed by the four operators, the characteristics of the audible tones and ringing pattern provided by each FTNS operator's network are not exactly the same at present. Details of the current technical characteristics of the major tones and ringing pattern of the four networks in Hong Kong are summarised in Table 1 and 2 respectively.

3. It is considered that an unified tone and ringing plan should be adopted in Hong Kong for the following reasons :-

it allows the telephone users to recognise any tone and ringing transmitted from the network quickly;

it reduces possible confusion and disputes between the FTNS operators and local / overseas telephone users due to human's perception;

it facilitates the CPE's design on tone and/or ringing recognition for determining / implementing a particular application automatically; and

it assists the introduction of the new tone / ringing associated telephone services such as analogue display services interface (ADSI) etc.

**Recommendation**

3. It is proposed to adopt a unified tone and ringing plan in Hong Kong which specifies the technical parameters of the major audible tones and ringing pattern of the PTN. The TA should consult the FTNS Operators when preparing the tone and ringing plan. The tone and ringing plan should at least cover the following:-

a) Types of tone to be specified (e.g. ringback tone, busy tone, congestion tone etc.);

b) Types of ringing pattern to be specified;

c) Physical parameters (e.g. Frequency, cadence, power level, voltage etc.); and

d) Tolerance / preferred limits of individual parameters.

4. The PTNs should comply with the unified tone and ringing plan issued by the TA within a time frame to be agreed. In addition, mobile operators and manufacturers / agents of multi-lines CPE should be encouraged to adopt the same tone and ringing plan in their products to minimise the discrepancies.

**Advice Sought**

5. Members are requested to give views and comments on the proposal.

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<p><b>Table 1</b> Existing technical characteristics of major audible tones in PTN in Hong Kong</p>
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Item	Description	HKTC	New T&T (HK) Ltd. (NT&T)	Hutchison Telecom. Ltd. (HCL)	New World Telephone (NWT)	Proposed Alignment and required actions
1.	Dial Tone					Aligned
	i. Frequency (Hz)	350 + 440	350 + 440	350 + 440	350 + 440	350 + 440
	ii. Cadence	Continuous	Continuous	Continuous	Continuous	Continuous
2.	Audible Ringing Tone					
	i. Frequency (Hz)	440 + 480	440 + 480	440 + 480	440 + 480	440 + 480
	ii. Cadence	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON , 3.0 or 3.2 sec OFF  (the first ON period of the first cycle of ringback tone may vary from 0.4 to 0.8 sec due to the application of (immediate ringback tone)	<b>2.0 sec ON,</b>  <b>4.0 sec OFF</b>	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON, 3.0 sec OFF	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON, 3.0 sec OFF	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON, 3.0 sec OFF  <b>NT&amp;T should align their ringback tone with other FTNS operators</b>
3.	Busy Tone					Aligned
	i. Frequency (Hz)	480 + 620	480 + 620	480 + 620	480 + 620	480 + 620
	ii. Cadence	0.5 sec ON, 0.5 sec OFF	0.5 sec ON, 0.5 sec OFF	0.5 sec ON, 0.5 sec OFF	0.5 sec ON, 0.5 sec OFF	0.5 sec ON, 0.5 sec OFF
4.	Congestion Tone					Aligned
	i. Frequency (Hz)	480 + 620	480 + 620	480 + 620	480 + 620	480 + 620
	ii. Cadence	0.25 sec ON, 0.25 sec OFF	0.25 sec ON, 0.25 sec OFF	0.25 sec ON, 0.25 sec OFF	0.25 sec ON, 0.25 sec OFF	0.25 sec ON, 0.25 sec OFF
5.	Number Unobtainable Tone					Aligned
	i. Frequency (Hz)	480 + 620	480 + 620	480 + 620	480 + 620	480 + 620
	ii. Cadence	Continuous	Continuous	Continuous	Continuous	Continuous

**Table 1**

**Existing technical characteristics of major audible tones in PTN in Hong Kong**

Item	Description	HKTC	New T&T (HK) Ltd. (NT&T)	Hutchison Telecom. Ltd. (HCL)	New World Telephone (NWT)	Proposed Alignment and required actions
6.	Power Level of Audible Tone	at the public exchange MDF power level of each single frequency tone component is -19 +/- 1 dBm, giving	Combined tone power level  Dial Tone : -10dBm	For tones with 2 frequency, power level of each frequency should be less or equal to -10dBm	For combined tone, power level is -13 +/- 1 dBm	In accordance with ITU-T Recommendation E.180 (equivalent with Q.35), the level of tones to be

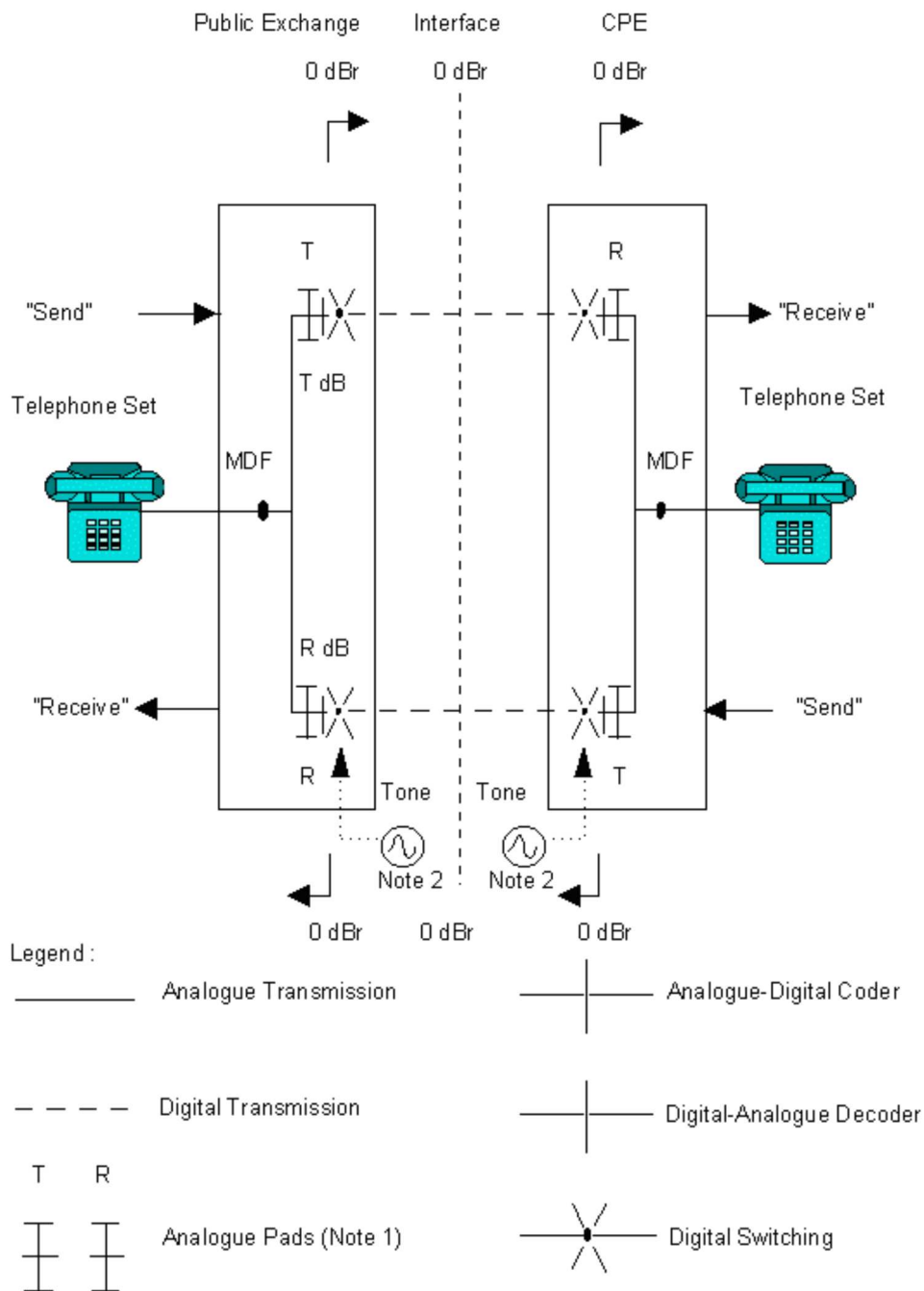
		a combined tone power level of -16 +/- 1 dBm	Ringing Back : -16dBm  Busy Tone : -21dBm  Congestion tone :  -21dbm  Number unobtainable tone : -10dBm			adopted in Hong Kong shall have a nominal value of -10 dBm0 measured with continuous tone (or -16 dBm0 at the MDF) and the values shall be in the range -5 to -15dBm0 (or -11 to -21dBm0 at the MDF) as shown in Figure 1 attached.  To avoid interference with multifrequency push button receivers at the local exchange, dial tone levels higher than -10dBm0 should be avoided.  <b>NT&amp;T and HCL should adjust their network to align with the above values.</b>
7.	Frequency tolerance of audible tone	+/- 0.5 %	+/- 0.5 %	+/- 1%	+/- 4Hz	All FTNS operators should align this parameter to +/- 1% of its nominal value
8.	Cadence tolerance of audible tone	+/- 10%	+/- 10%	+ /- 10%	+ / - 10 ms	<b>Aligned</b> <b>+/- 10%</b>
9.	Harmonic of audible tone	not exceed -50dBm	at least 30dB below signal level	30 dB below the main components	Less than -55 dBm	Alignment should be made to accept either one of : -  a) less than -50dBm ; or  b) -30 dB below the signal level.

**Table 2**

**Existing technical characteristic of major ringing pattern in PTN in Hong Kong**

Item	Description	HKTC	New T&T (HK) Ltd. (NT&T)	Hutchison Telecom. Ltd. (HCL)	New World Telephone (NWT)	Proposed Alignment and required actions
1.	Ringing Signal					
i.	Frequency (min, max) Hz	(23.5, 27.5)	<b>20</b>	(22, 28)	(22, 28)	<b>Nominal frequency should be 25 Hz and frequency range from 22 Hz to 28.Hz.</b>  <b>NT&amp;T should adjust their network to align with other operators.</b>
ii.	Cadence (sec)	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON,	0.4 sec ON, 0.2 sec OFF,	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON,	0.4 sec ON, 0.2 sec OFF, 0.4 sec ON,	Aligned  0.4 sec ON,  0.2 sec OFF,

		3.0 sec OFF	0.4 sec ON, 3.0 sec OFF	3.0 sec OFF with tolerance of +/- 10%	3.0 sec OFF with tolerance of +/- 10%	0.4 sec ON, 3.0 sec OFF with tolerance of +/- 10%
iii.	Voltage	75 +/- 20 Vrms  superimposed on -40 to -48V dc (at exchange MDF)	86 Vrms	75 +/- 20V	210V p-p (75Vrms)	Basically aligned  on 75 +/- 20 Vrms
iv.	Immediate Ringing (sec)	the first ON period of the first cycle of ringing cadence may vary from 0.4 to 0.8 sec.	Not Applicable	0.4 to 0.95 sec	Not Applicable	<b>If applicable, the alignment should be made on 0.4 to 0.95 sec.</b>
v..	Ringling Time-out (sec)	about 120 sec  Upon time-out, the called DEL will restore to idle and busy tone will be returned to the calling party in place of ringback tone.	Not Applicable	60 to 120 sec	<b>120 seconds</b>	If applicable, the alignment should be made :  60 to 120 sec.



**Figure 1 Pad Settings and Tone Levels**

**Note 1 - Pad Settings**

a) To comply with the ITU-T Recommendations concerning loudness ratings, stability and echo (G.121 and G.122), the nominal value of the differential loss (R-T) is recommended to be 6 dB and the value of (R-T) shall be in the range 3 to 9 dB.

b) The individual values for R and T shall be able to meet the long term objectives for the overall loudness requirement referred to the Virtual International Connecting Points (VICP) as specified in G.121, i.e.

Send Loudness Rating (SLR) = 7 to 9 dB;  
 Receive Loudness Rating (RLR) = 1 to 3 dB

c) The nominal values of the R/T pads set by the FTNS operators in Hong Kong are as follows:

HKTC: 6 / 0 dB (R/T) ; NWT: 6 / 0 dB (R/T) ;  
 NT&T: 6 / 2 dB (R/T) ; HCL : 7 / 0 dB (R/T) .

**Note 2 - Tone Levels**

For international purposes, the levels of audible supervisory tones are defined at a zero relative level point at the incoming end of the international circuit. In accordance with ITU-T Recommendation E.180

(equivalent with Q.35), the level of tones to be adopted in Hong Kong shall have a nominal value of -10 dBm0 measured with continuous tone (or -16 dBm0 at the MDF) and the values shall be in the range -5 to -15dBm0 (or -11 to -21dBm0 at the MDF).