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**NETWORK CONNECTION SPECIFICATION
OF CALLING NUMBER DISPLAY SERVICE
FOR CUSTOMER PREMISES EQUIPMENT
(CPE) TO BE CONNECTED BY DIRECT
EXCHANGE LINE (DEL) TO THE PUBLIC
SWITCHED TELEPHONE NETWORK (PSTN)
IN HONG KONG**



**TELECOMMUNICATIONS AUTHORITY
HONG KONG**

FOREWORD

1. This specification is issued pursuant to Section 32D of the Telecommunications Ordinance (Cap. 106). This specification sets out the technical requirements of customer premises equipment (CPE) to be connected to the direct exchange lines (DELS) of the Public Switched Telephone Networks (PSTNs) in Hong Kong for the support of the calling number display service.
2. DEL may be provided by any one of the FTNS operators in Hong Kong. The general technical characteristics of the FTNS networks are given in HKTA 2201. Supplementary information on network characteristics and services of the FTNS networks may be obtained direct from the operators. Contact information of the FTNS operators can be found in the information note OFTA I 412. For the purpose of certification, CPE supporting the calling number display service for connection to the PSTN shall comply with this specification.
3. At present, the Office of the Telecommunications Authority (OFTA) operates a **Hong Kong Telecommunications Equipment Evaluation and Certification (“HKTEC”)** Scheme. Details of the HKTEC Scheme can be found in the information note OFTA I 421. Under the Scheme, suppliers or manufacturers of CPE may apply to OFTA for certification of their equipment against this specification. The application procedures for certification of CPE can be found in the information note OFTA I 412. A prescribed label may be affixed to the equipment which has been certified by the Telecommunications Authority (TA). Details of the labelling arrangement can be found in the Standardisation Guide HKTA 3211.
4. The TA may amend any part of this specification as and when he deems necessary,
5. In case of doubt about the interpretation of this specification, the methods of carrying out the test and the validity of statements made by the manufacturers of the equipment, the decision of the TA shall be final.
6. The TA accepts no responsibility for the satisfactory performance of CPE connected to its network. CPE is not normally evaluated against performance, reliability or quality-of-service parameters.
7. The HKTA specifications and information notes issued by the TA can be obtained through one of the following methods:-
 - downloading direct through the OFTA's Internet Home Page. The Home Page address is <http://www.ofta.gov.hk>;
 - making a request for hard copies to :-

Senior Telecommunications Engineer (Standards)
Office of the Telecommunications Authority
29/F, Wu Chung House,
13 Queen's Road East,

Wanchai,
Hong Kong.

Fax: +852 2838 5004

Email: standards@ofta.gov.hk

8. Enquiries about this specification may be directed to:-

Senior Telecommunications Engineer (Standards)
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29/F, Wu Chung House,
213 Queen's Road East,
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AMENDMENT TABLE

Item	Issue No.	Paragraph	Descriptions
1.	Issue 02 June 97	Foreword	Revision was made to include contact information for the four FTNS operators in Hong Kong, evaluation and certification requirements for CPEs, reference to other HKTA specifications to support the display of calling line identity by CPEs, and methods to obtain HKTA series of specifications issued by the Telecommunication Authority.
2.	Issue 02 June 97	Content Page	Content page was added.
3.	Issue 02 June 97	Body - Paragraph 2	Under item 2 of the technical requirements for CPE, HKTA 2011 (which applies for both single-line and multi-line CPEs) was cited as the technical reference instead of HKTA 2003 (which applies for single-line CPE only). For items 3 to 5, detailed compliance to Bellcore technical references was added.
4.	Issue 02 June 97	Appendice	Appendix 1, 2 and 3 were added which contain detailed compliance to relevant Bellcore technical references for the support of CND services by CPEs used in Hong Kong.
5.	Issue 03 February 03	Foreword	Information on the Telecommunications Ordinance and HKTEC Scheme is added. The application procedure and labelling arrangement are referred to Information Note I412 and HKTA 3211. The contact information for the FTNS operators is referred to the Information Note OFTA I 412. The others types of interface in supporting the calling number display service are deleted.
6.	Issue 03 February 03	Body Paragraph 2	The updated technical specifications issued by the Telcordia Technologies are adopted.
7.	Issue 03 February 03	Body Paragraph 3	The new evaluation requirement is added.
8.	Issue 03 February 03	Appendix 4	The new Appendix 4 – Basic Test Items is added.

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- 3. Compliance list to GR-575 "Calling Identity Delivery on Call Waiting"**
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1. INTRODUCTION

This specification covers the technical requirements for customer premises equipment (CPE) to be connected to the direct exchange lines (DELs) of the public switched telephone networks (PSTNs) in Hong Kong for the support of the calling number display service.

2. TECHNICAL REQUIREMENTS

CPE designed to provide calling number display services shall comply with the following specifications:-

- . HKTA 2001 - Compliance Test Specification - Safety and Electrical Protection Requirements for Subscriber Equipment Connected to the Public Telecommunication Networks in Hong Kong; and
- . HKTA 2011 - Network Connection Specification for Connection of Customer Premises Equipment (CPE) to Direct Exchange Lines (DEL) of the Public Switched Telephone Network (PSTN) in Hong Kong; and
- . Telcordia Technologies specification SR-TSV-002476 - CPE Compatibility Considerations for the Voiceband Data Transmission Interface (refer to Appendix 1 for detailed compliance) ; and
- . Telcordia Technologies specification GR-31 - Calling Number Delivery (refer to Appendix 2 for detailed compliance); and
- . Telcordia Technologies specification GR-575 - Calling Identity Delivery on Call Waiting (refer to Appendix 3 for detailed compliance).

3. EVALUATION REQUIREMENT

CPE shall comply with technical requirements in Clause 2 and shall have received a test report covering the basic test items for calling number display service given in the Appendix 4 for certification by the TA.

4. HOW TO OBTAIN THE TECHNICAL SPECIFICATIONS

- 4.1 To obtain the HKTA series of specifications issued by the TA, please refer to paragraph 9 in the Foreword of this document.
- 4.2 The Telcordia Technologies specifications are available from the URL address at <http://www.telcordia.com/>.

- END -

APPENDIX 1

COMPLIANCE LIST TO SR-TSV-002476

(Former Bellcore SR-TSV-002476)

**CUSTOMER PREMISES EQUIPMENT
COMPATIBILITY CONSIDERATIONS FOR THE VOICEBAND
DATA TRANSMISSION INTERFACE**

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
1							O <u>Introduction</u>
1.1							O <u>Purpose</u>
1.2							O <u>Definitions</u>
1.3							O <u>Related Documents</u>
1.4							O <u>Scope</u>
2							O <u>Signalling Protocol</u>
2.1							O <u>Physical Layer</u>
2.1.1	O						<u>CPE Alerting Signal</u>
2.1.2		O					<u>Acknowledgement Signal</u> Wherever applicable, HKTA 2011 should be referred for the electrical characteristics other than those for the CPE Alerting Signal, Acknowledgement Signal and Data Signal (such as noise).
2.1.3		O					<u>Received Data Signal Characteristics</u> Wherever applicable, HKTA 2011 should be referred for the electrical characteristics other than those for the CPE Alerting Signal, Acknowledgement Signal and Data Signal (such as noise).
2.2	O						<u>Data Link Layer</u>
2.3	O						<u>Message Assembly Layer</u>
2.3.1	O						<u>Single Data Message Format</u>

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
2.3.2	O						<u>Multiple Data Message Format</u>
2.3.3	O						<u>Received Data Message Characteristics</u>
2.3.4	O						<u>Contents of Data Words</u> Services that make use of this data transmission interface are as follows: - TR-NWT-000031 Calling Number Delivery - TR-NWT-000575 Calling Identity Delivery on Call Waiting
3	O						<u>Data Transmission</u>
3.1		O					<u>On-Hook Data Transmission Associated with Power Ringing</u> Refer to HKTA 2201 for the basic ringing pattern adopted in Hong Kong.
3.2		O					<u>On-Hook Data Transmission Not Associated with Power Ringing</u> Data transmission will occur with the CPE on-hook without the data transmission being preceded by power ringing
3.3		O					<u>Off-Hook Data Transmission</u> Wherever applicable, HKTA 2011 should be referred for the requirements on electrical characteristics for on-hook and off-hook CPE (such as the resistance and the impedance).
3.3.1	O						<u>SPCS-CPE Handshaking Sequence</u>
3.3.2	O						<u>Extension Phones</u>
3.4		O					<u>Other CPE Considerations</u> Wherever applicable, HKTA 2011 should be referred for the requirements on electrical characteristics for on-hook and off-hook CPE (such as the resistance and the impedance).

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
3.4.1		O					<u>CPE Data Reception</u> Wherever applicable, HKTA 2011 should be referred for the requirements on electrical characteristics for on-hook and off-hook CPE (such as the resistance and the impedance).
3.4.2		O					<u>Network Access Facilities</u> Wherever applicable, HKTA 2011 should be referred for the requirements on electrical characteristics for on-hook and off-hook CPE (such as the resistance and the impedance).
4		O					<u>Error Treatment</u>
5		O					<u>Network-to-CPE Signal Detection</u>
6		O					<u>CPE-to-Network Signal Generation</u>
7		O					<u>Display</u>
8		O					<u>Memory Requirements</u>
9		O					<u>User Interface</u>
10		O					<u>Limitations and Restrictions</u>

APPENDIX 2

COMPLIANCE LIST TO GR-31

(Former Bellcore TR-NWT-000031)

CALLING NUMBER DISPLAY

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
							Note: Only the requirements applicable to CPE are listed in this compliance list.
R-27	O						
R-28	O						
R-29	O						
R-30	O						
O-3				O			If a line is assigned CND and no other delivery feature such as Calling Identity Delivery on Call Waiting (CIDCW), the public switch sends the date, time, and calling line DN via the SDMF only.
R-31	O						
R-32	O						
R-33	O						
R-34	O						
R-35	O						
R-36	O						
R-37	O						

APPENDIX 3

**COMPLIANCE LIST TO GR-575
(Former Bellcore TR-NWT-000575)**

**CALLING IDENTITY DELIVERY
ON CALL WAITING**

Item No.	Compliance						Descriptions / Notes
	A	B	C	D	E	F	
							Note: Only the requirements applicable to CPE are listed in this compliance list.
R-12	O						
R-13	O						
R-14	O						
R-15	O						
R-32			O				The Subscriber Alerting Signal (SAS) adopted shall be according to TR-NWT-00575 or to the Call Waiting (CW) tone(s) used in the local networks.
R-33			O				The Subscriber Alerting Signal (SAS) adopted shall be according to TR-NWT-00575 or to the Call Waiting (CW) tone(s) used in the local networks.
R-34	O						

APPENDIX 4

BASIC TEST ITEMS FOR CALLING NUMBER DISPLAY SERVICE

Basic Items

Item No.	Test Item	Descriptions	Limits/Results
1	Reception of Continuous-phase Binary Frequency Shift Keying Data (for both on-hook and off-hook)	Detection limits of: (a) Frequency of Mark (Logical 1) (b) Frequency of Space (Logical 0) (c) Received Signal Level of Mark (d) Received Signal Level of Space (e) Reception Rate	1200 +/- 12 Hz 2200 +/- 22 Hz -32 dBm to -12 dBm -36 dBm to -12 dBm 1200 +/- 12 baud
2	On-hook Data Associated with Power Ringing	Detection capability of data under: (a) different types of ringing signal as given in HKTA 2201 (b) the minimum silent period after the first ringing pattern	Support all ringing patterns in HKTA 2201 ≤ 250 ms
3	Display of Data	Display results of: (a) Normal Call with Calling Number (b) Private Call (c) Out-of-area Call	Show Calling Number Show "private" indication Show "Out-of-area" indication
4	Error Treatment	Display results of: (a) Invalid Checksum (b) Unrecognised Message Type Word	Display error message or no display Display error message or no display

Additional Items for CPE Supporting Off-hook Data Reception

Item No.	Test Item	Descriptions	Limits
5	Reception of CPE Alerting Signal (CAS)	Detection of CAS signal of: (a) Frequency of Lower Tone (b) Frequency of Upper Tone (c) Dynamic Range (d) Tone Duration	2130 Hz +/- 0.5% 2750 Hz +/- 0.5% -32 dB to -14 dBm per tone 75 to 85 ms
6	Transmission of Acknowledgement Signal (ACK)	Generation of ACK signal: (a) Frequency of Lower Tone (b) Frequency of Upper Tone (c) Power Level of Lower Tone (d) Power Level of Upper Tone (e) Signal Duration	941 Hz +/- 1.5% 1633 Hz +/- 1.5% -9.5 dBm +/- 1 dB -7.5 dBm +/- 1 dB 55 to 65 ms