Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services;

Part C: Data link message and parameter coding

Telenet Secretariat

.

Contents

1 Foreword

The present document is part C of a multi-part document covering the PSTN subscriber line protocol over the local loop for display (and related) services, as described below:

Part A: "On-hook data transmission": TS-103-A

Part B: "Off-hook data transmission": TS-103-B

Part C: "Data link message and parameter coding" : TS-103-C

2 Scope

The present document specifies the subscriber line protocol for the support of PSTN display services at Local Exchange (LE). The subscriber line protocol is accomplished by using asynchronous voice-band Frequency-Shift Keying (FSK) signalling.

The requirements imposed on the FSK signalling-based subscriber line protocol deal with data encoding, data transmission requirements and the three layers of the protocol at the network side of the interface: presentation layer, data link layer and physical layer.

3 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

[1]   ETSI ETS 300 659-1 : Public Switched Telephone Network(PSTN);Subscriber line protocol over the local loop for display (and related) services; part 1: On-hook data transmission.

[2]   ETSI ETS 300 778-1 : Public Switched Telephone Network(PSTN);Protocol over the local loop for display and related services; Terminal equipment requirements; Part 1: Off-line data transmission.

[3]   ETSI ETS 300 659-2 : Public Switched Telephone Network(PSTN);Subscriber line protocol over the local loop for display (and related) services; part 2: Off-hook data transmission.

[4]   ETSI ETS 300 778-2 : Public Switched Telephone Network(PSTN);Protocol over the local loop for display and related services; Terminal equipment requirements; Part 2: On-line data transmission.

[5]   ITU-T Recommendation V.23 (1998): "600/1200-baud modem standardized for use in the general switched network.

[6]   Bellcore GR-30-CORE : Voiceband Data Transmission Interface Requirements.

[7]   ITU-T Recommendation T.50 (1992): "International Reference Alphabet (IRA) (Formerly International Alphabet No.5 or IA5) - Information technology - 7-bit coded character set for information interchange".

[8]   Telenet Specification: TS-101: Specification of physical and electrical characteristics at the 2-wire analogue presented NTP on the Telenet network.

4   Definitions, symbols and abbreviations

4.1   Definitions

For the purposes of the present document, the following terms and definitions apply:

Answer signal   Indication that a terminal is answering an incoming call

Calling line identity   The number (information) identifying the calling party

Clear indication   Indication that the network is attempting to release a connection

Clear signal   Signal indicating that a terminal is attempting to release a connection

Long silent period   Silent period between ring patterns

Loop state   Status of the TE

Mark bit   Symbol "1", presented by a specific FSK signalling tone

Network Termination Point(NTP)   Physical point at boundary of the PSTN intended to accept the connection of a TE

"off hook"   Status of LE in which a DC current drawn by a TE in loop state is Sufficient to activate the LE. See Telenet Specification: TS-101[8].

"on hook"   Status of the LE in which a DC current drawn by a TE in quiescent state is insufficient to activate the LE. See Telenet Specification: TS-101 [8]

Ring pattern   A ring pattern consists of one or more ringing pulses separated by short silent periods

Ringing state   Condition of the network where a ringing/alerting signal has been applied at the NTP

Ring trip   Removal of the ringing signal at the NTP in response to a valid answer signal applied to the NTP

Ringing Pulse Alerting Signal (RP-AS)   Pulse of ringing current used to alert the TE that a data transmission will follow. Duration of RP-AS is specified in the present document.

Seize signal   Signal indicating that a terminal is attempting to establish a connection by means of applying a loop condition

Space bit   Symbol "0", presented by a specific FSK signalling tone

4.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

AN	Access Network
AS	Alerting Signal
CLI	Calling Line Identity
CPN	Calling Party Name
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
DT-AS	Dual Tone-Alerting Signal
FSK	Frequency-Shift Keying
IRA	International Reference Alphabet
LE	Local Exchange
MSG	Message
MWI	Message Waiting Indicator
NTP	Network Termination Point
PSTN	Public Switched Telephone Network
RP-AS	Ringing Pulse Alerting Signal
SAS	Subscriber Alerting Signal
TAS	TE Alerting Signal
TE	Terminal Equipment
TE-ACK	TE Acknowledgment Signal

5   Data link message and parameter codings

5.1   Supported data link message types

Table 1 summarizes the supported messages .

Table 1: Supported data link messages

Message name	Reference (subclause)
Call setup	5.1.1
Message Waiting Indicator (MWI)(only in on-hook state)	5.1.2

Table 2 summarizes the message type coding.

Table 2: Used message type coding

Type (binary) HGFE DCBA	Type (hexadecimal)	Message name
1000 0000	80H	Call setup
1000 0010	82H	Message Waiting Indicator (MWI)

5.1.1. Call setup message

This message is used to send information related with an incoming call.

The call setup message contains the following parameters. See table 3.

Table 3: Supported call setup message parameters

Parameter name	Reference (subclause)
Date and time	5.3.1
Calling Line Identity (CLI)	5.3.2
Reason for absence of calling line identity	5.3.3
Calling Party Name (CPN)	5.3.4
Reason for absence of calling party name	5.3.5

5.1.2. Message Waiting Indicator message (MWI)

This message is used to indicate the presence of waiting messages in the network message system.
The message waiting indicator message contains the parameter listed in table 4.

Table 4: Message waiting indicator message parameter

Parameter name	Reference (subclause)
Visual indicator	5.3.6

5.2   Parameter types

Table 5 summarizes the supported parameter types .

Table 5: Used parameter types

Type (binary) HGFE DCBA	Type (hexadecimal)	Length (bytes) (note 1)	Parameter name
0000 0001	01H	8	Date and time
0000 0010	02H	max. 24	Calling Line Identity (CLI)
0000 0100	04H	1	Reason for absence of calling line identity
0000 0111	07H	max. 15	Calling Party Name (CPN)
0000 1000	08H	1	Reason for absence of calling party name
0000 1011	0BH	1	Visual indicator

NOTE 1: Parameter type and parameter length are defined in detail in subclause 5.3.

5.3   Parameter coding

5.3.1.   Date and time parameter

The purpose of the date and time parameter is to provide the date and the time to the user. It indicates the point in time when the message has been generated by the LE.

Table 6: Date and time parameters

Octet number	Contents
1	0000 0001 (01H): Date and time parameter type
2	0000 1000 (08H): Parameter length (8)
3	Month's most significant octet
4	Month's least significant octet
5	Day's most significant octet
6	Day's least significant octet
7	Hour's most significant octet
8	Hour's least significant octet
9	Minute's most significant octet
10	Minute's least significant octet

The day range is from 01 to 31. Months from 01 (January) to 12 (December). Hours from 00 (midnight) to 23. Minutes from 00 to 59.
Each parameter octet shall be coded according to CCITT Recommendation T.50 [7].

5.3.2.   Calling line identity parameter

The purpose of the calling line identity parameter is to identify the origin of a call.

Table 7: Calling line identity parameters

Octet number	Contents
1	0000 0010 (02H): CLI parameter type
2	000X XXXX: Parameter length (max. 24 digits)
3	Digit 1
...	...
N + 2	Digit n

Digits (0 to 9, * and #) are coded according to CCITT Recommendation T.50 [7].

5.3.3. Reason for absence of calling line identity parameter

The purpose of parameter is to describe the reason for absence of calling line identity. The parameters "calling line identity" and "reason for absence of calling line identity" are mutually exclusive within a message. See table 9.

Table 9: Reason for absence of calling line identity parameters

Octet number	Contents
1	0000 0100 (04H):Reason for absence of CLI parameter type
2	0000 0001 (01H):Parameter length (1)
3	0100 1111 ("O"): Unavailable 0101 0000 ("P"): Private (CLIR involved)

Characters shall be coded according to CCITT Recommendation T.50 [7].

5.3.4. Calling party name parameter

The purpose of the Calling Party Name parameter is to identify the name of the party at the origin of a call.

Table 10: Calling party name parameters

Octet number	Contents
1	0000 0111 (07H): Name parameter type
2	00XX XXXX: Parameter length (max. 15 characters)
3	Character 1
...	...
N + 2	Character n

Characters shall be coded according to CCITT Recommendation T.50 [7].

5.3.5. Reason for absence of calling party name parameter

The purpose of this parameter is to describe the reason for absence of the calling party name. The parameters "calling party name" and "reason for absence of calling party name" are mutually exclusive within a message. See table 11.

Table 11: Reason for absence of calling party name parameter

Octet number	Contents
1	0000 1000 (08H): Reason for absence of calling party name parameter type
2	0000 0001 (01H): Parameter length (1)
3	0100 1111 ("O"): Unavailable 0101 0000 ("P"): Private (Name delivery has been blocked)

Characters shall be coded according to CCITT Recommendation T.50 [7].

5.3.6. Visual indicator parameter

The purpose of the visual indicator parameter is to switch on/off a TE visual indicator (presence of waiting messages).

Table 12: Visual indicator parameters

Octet number	Contents
1	0000 1011 (0BH):Visual indicator parameter type
2	0000 0001 (01H):Parameter length (1)
3	0000 0000 (00H):Deactivation (indicator off)
	1111 1111 (FFH):Activation (indicator on)

Characters shall be coded according to CCITT Recommendation T.50 [7].

Annex A (informative):
International reference alphabet - Basic code table

Table A.1: 7-bit basic code table

b₇		0	0	0	0	1	1	1	1
b₆		0	0	1	1	0	0	1	1
b₅		0	1	0	1	0	1	0	1
b₄ b₃ b₂ b₁		0	1	2	3	4	5	6	7
0 0 0 0	0			SP	0	②	P	②	p
0 0 0 1	1			!	1	A	Q	a	q
0 0 1 0	2			"	2	B	R	b	r
0 0 1 1	3			#／£	3	C	S	c	s
0 1 0 0	4			¤／$	4	D	T	d	t
0 1 0 1	5			%	5	E	U	e	u
0 1 1 0	6			&	6	F	V	f	v
0 1 1 1	7			'	7	G	W	g	w
1 0 0 0	8			(	8	H	X	h	x
1 0 0 1	9			)	9	I	Y	i	y
1 0 1 0	10			*	:	J	Z	j	z
1 0 1 1	11			+	;	K	②	k	②
1 1 0 0	12			,	<	L	②	l	②
1 1 0 1	13			-	=	M	②	m	②
1 1 1 0	14			.	>	N	②	n	②
1 1 1 1	15			/	?	O	_	o	DEL

NOTE: b_8, the most significant bit, is always 0.

Annex B:

Examples of CLIP messages on the Telenet network.

B.1. Call received from another Telenet PSTN line (CLI and CPN available):

CLIP-data field (in HEX) :

80 1E 01 08 30 37 33 30 30 38 33 32 07 07 54 65 6C 65 6E 65 74 02 09 30 31 35 33 33 33 30 30 30 19

Value of the CLIP-data field	Contents	Value in ASCII
80	Message type = call setup	
1E	Message length = 30 char	30
01	Parameter type = date and time	
08	Parameter length = 8 char	8
30 37 33 30 30 38 33 32	M M D D H H Min Min (in HEX) M= Month D= Day H= Hour Min= Minute	07300832 (= 30 July, 8 h 32 min)
07	Parameter type = calling party name	
07	Parameter length = 7 char	7
54 65 6C 65 6E 65 74	Calling party name (in HEX)	Telenet
02	Parameter type = calling line identity	
09	Parameter length = 9 char	9
30 31 35 33 33 33 30 30 30	Calling line identity(in HEX)	015333000
19	Checksum of the CLIP-data field (in HEX)	

B.2. Call received with CLI available and CPN unavailable :

CLIP-data field(in HEX):

80 18 01 08 30 37 33 30 30 38 33 33 08 01 4F 02 09 30 31 35 33 33 33 39 39 39 8A

Value of the CLIP-data field	Contents	Value in ASCII
80	Message type = call setup	
18	Message length = 24 char	24
01	Parameter type = date and time	
08	Parameter length = 8 char	8
30 37 33 30 30 38 33 33	M M D D H H Min Min (in HEX) M= Month D= Day H= Hour Min= Minute	07300833 (= 30 July, 8 h 32 min)
08	Parameter type = Reason for absence of CPN	
01	Parameter length = 1 char	1
4F	Reason of absence = 'O' :unavailable	'O'
02	Parameter type = calling line identity	
09	Parameter length = 9 char	9
30 31 35 33 33 33 39 39 39	Calling line identity(in HEX)	015333999
8A	Checksum of the CLIP-data field (in HEX)	

B.3. Call received with CLI and CPN suppressed (private call) :

CLIP-data field:

80 10 01 08 30 37 33 30 30 38 33 34 08 01 50 04 01 50 20

Value of the CLIP-data field	Contents	Value in ASCII
80	Message type = call setup	
10	Message length = 16 char	16
01	Parameter type = date and time	
08	Parameter length = 8 char	8
30 37 33 30 30 38 33 34	M M D D H H Min Min (in HEX) M= Month D= Day H= Hour Min= Minute	07300834 (= 30 July, 8 h 32 min)
08	Parameter type = Reason for absence of CPN	
01	Parameter length = 1 char	1
50	Reason of absence = 'P' : Private (Name delivery has been blocked)	'P'
04	Parameter type = Reason for absence of CLI	
01	Parameter length = 1 Char.	1
50	Reason for absence = 'P' : Private (CLIR involved)	'P'
20	Checksum of the CLIP-data field (in HEX)	

B.4. Message waiting indication : activation (only on-hook data transmission) :

CLIP-data field:

82 03 0B 01 FF 70

Value of the CLIP-data field	Contents	Value in ASCII
82	Message type = message waiting indicator	
03	Message length = 3 char	3
0B	Parameter type = visual indicator	
01	Parameter length = 1 char	1
FF	Activation (indicator ON)	
70	Checksum of the CLIP-data field (in HEX)	

B.5. Message waiting indication : deactivation (only on-hook data transmission) :

CLIP-data field:

82 03 0B 01 00 6F

Value of the CLIP-data field	Contents	Value in ASCII
82	Message type = message waiting indicator	
03	Message length = 3 char	3
0B	Parameter type = visual indicator	
01	Parameter length = 1 char	1
00	Deactivation (indicator OFF)	
6F	Checksum of the CLIP-data field (in HEX)	

History

Document history		
Version	Date	Milestone
1	15/06/2000	First released edition
2p1	13/07/2000	Error corrected
2	04/09/2000	Second released version : Cleaned version