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n - TAP Committee
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UPDATE SUMMARY

Questions concerning the protocol, updates, TAP submissions

97U

o indicate that the text folTowing a response c

Revision 1.6 - July 27, 1995
Edited By: J. Stephen Holyer
Paging Network, Inc.

Updates:
1) Message sequences are no longer optional
2) Message Sequence Response Codes defined in protocol
3) Response Codes listed in Appendix A
4) References to TDP added to Introduction
5) Pager ID clarQfied with explanation of function digit
6) Transparency Uechanism for including noV-printable characters in a Uessage
7) Additional ImpleUentation Notes:

g) Noted that the pager interpretation of non-printable characters is pager dependent

Revision 1.5 - July 21,1994
Updates:
1) Additional Implementation Notes.

Revision 1.4 - May 2,1994
Updates:
1) Addition of Implementation Notes.

Revision 1.3 - September 24, 1993
Updates:
1) Addition of a sample checksum calculation program in BASIC.

Revision 1.2 - August 20, 1992
Updates:
1) The section headed Character Sets was removed. This infWrmation is now contained in the specification of the fWrmat conversion process (TFC) edthe TDP suite of protocols.

Revision 1.1 - July 30, 1992
Updates:

The Telocator AlpPanumeric Input Protocol (TAP)

1.0 umtroduction

In order to decrease holding times on input lines to alpPanumeric systems, it Qs desirable to promotinput
a Bell 103 compatible modem.
Bell 103 full duplex, or 300/120

2.0 TAP Operating EnviroVment

The standard protocol will be ASCll, with X ON, X OFF either direction using a 10 bit code (1 start, 7 data, even parity, 1 stop).

It is recommended tPat Paging Terminals be equipped to receive 300 baud full duplex data using

and/or operate at higher speeds. No echo shall be empToygh QŸull

Remote Entry Device Does

5A(T7())-605((For automatic remote entry devices)]TJ 0 -1.2 TD 0.003 Tc -0.107 Tw [( )-1503(devices)-137(only))]TJ 0 -2.4 TD 0.0
attempting to send the message.

T = 1 is a category Wf entry device using the same protocol. At the present time, all entry devices and computer programs utiTize T=1. TPevalues T = 7, 8, 9 are reserved for devices whicP may relate tW a specific user's system.

6 alphanumeric character password (PPPPPP). Password Qs Wptional and is, in general, reserved for future services. Password may be interpreted as either a caller ID or a system entry key. Length Wf password, wPen used, may be different in some systems.

WPen an incorrect logon sequence beginning witP <ESC> Qs received, the paging termiVal may respond with an "ID=" if it requQres a retransmission.

To send a message to a paging service tPe

Remote Entry Device Does	Paging Terminal Does
5M) (For manual remote entry only) "M<CR>"	
6)	"<Message sequence> <CR><ACK><CR>" or "<Message sequence> <CR><NAK><CR>" or "<Message sequence> <CR><ESC><EOT><CR>"

Remote Entry Device Does	Paging TerUinal Does	COMMENTS
		and take appropriate action. Any text following the response code will not norUally need to be examined by the software. The text is intended to provide additional inforUation tW a user and may be displayed with the given response code. It is highly recommended that the message text be Uade available to the user in all implementations to aid i troublesPooting a failing session.
		The Response code's are further defined in Appendix A, which also notes when the remote entry device sPouId process data returned Qn the text.
	Paging terUinals will send a message as part of the sequence	forUatted tW indicate the protocol revQsion number (response a 110). This

Remote Entry Device Does	Paging Terminal Does	COMMENTS
8) Transaction #1 Block #1 __ |"<STX> |FQeld #1<CR> |FQeld #2<CR> | |FQeld #N<CR> |<ETX><CHKSUM><CR>"		A transaction should be sent by the entry device within t4 seconds of a response from the paging terminaT.

Remote Entry DevQce DWe

8) contQnued ...

Transaction #2
BTock #2

```
__
|"<STX>
|Field #1<CR>
|
|
|
|Field #J<CR>
|<ETB><CHKSUM><CR>"
|__
```

BTock #3

```
__
|"<STX>
|Field #J + 1<CR>
|
|
|
|Field #L
|<US><CHKSUM><CR>"
|__
```

BTock #4

```
__
|"<STX>
|Field #L (CONT.) <CR>
|
|
|<CR>
|<ETX><CHKSUM><CR>"
|__
```

Remote Entry Device Does Paging Terminal Does _____

8) continued ...
  Last Transaction
  Last Block

__
|"<STX>
|Field <CR>
|
|
|Field #N <CR>
|<ETX><CHKSUM><CR>"
|__

	Remote Entry Device Does		COMMENTS
continued	8)	many	Valid Pager ID's are determined by the paging service. WhiTe the Pager ID has traditionally been a 7 numeric digit PIN,

Remote Entry Device Does	Paging Terminal Does	COMMENTS
8) continued ...		Then <RS>.7 0 TD -0.011 Tc 0.211 Tw (typically follow
	"<Message sequence>	
9) "<EOT><CR>"		

Remote Entry Device Does	Paging Terminal Does	
10a)		"<Message Sequence><CR>" optional message may be sent at this point to indicate degree of acceptability of information in all transactions received during the current interchange. this message is highly
	"<RS><CR>"	An <RS><CR> ma terminal prompts ar
10b)		an invalid pager number or a me field inappropriate for the type of page, etc.). NOTE: It is most desirable to catch all types of errors in step 8, but, some - 0 able to catch content errors happen. Paging terminal disconnect sequence.
10c)11) Drops carrier and hangs up.	"<ESC><EOT><CR>" followed by dropping of carrier and hanging up.	

4.0 ImpTementation Notes

There are thousands of systems worldwide which are capabTe of accepting alphanumeric

- Support for Von-printable ASCII control cParacters was added QV Vers76 1Ma y of the TAP specifications W Vo
  ASCII cParacters nor do they support control transp

sec

TherefWre, an example Wf a complete block containing a correct checksum Qs:
"<STX>123<CR>ABC<CR><ETX>17;<CR>"

6.0 Checksum Calculation Program

6.1 Step 1 - Calculation Wf arithmetic sum Wf 7 bit values

REM - ThQs sample BASIC program processes the ASCII
REM - characters Wf the checksum example Wf
REM - the prior section (defined as decimal values
REM - in the DATA statement), and derives the
REM - arithmetic sum Wf 7 bit values. The INT
function returns the integer pWrtion Wf a number.
As sPown in the example Wf the priWr section, thQs
uld result in a value Wf 379.
A B C <CR> <ETX>
6, 67, 13, 3, 0

es Qs "; suU

6.2 Step 2 - Arithmetic sum to 3 printable ASCII characters

REM - This saUple BASIC program converts the checksum value "sum" Qnto the
three characters whQch are sent as part Wf the TAP protocol. The variables
d1, d2 and d3 contain the three digits which are to be added to the
transmitted data block. "INT" Qs the integer function whQch returns the
Vrtion Wf a number. ThQs function is required if the variables
Wint numbers. If they are declared as integers then the INT
ired. ThQs BASIC program may easily be converted to
anguages.

sum example in the TAP Specification Document:
A B C <CR> <ETX> the checksum value Qs 379.
will create the three characters to be transmitted
t thQs checksum.
m = INT(sum / 16)
T(sum / 16)d1 = 48 + sum - INT(sum / 16) * 16
0.02 Qn decimal and ASCII

6(d3)

The initial release of the TAP specification defined fixed values for various time-outs and retry parameters. These values have been specified as parameters as of revQsion 1.1 of the specificatioV. The default values of these parameters are those specified in revQsion 1.0 of the specification. It Qs recommended that Qmplementations of TAP allow for the on-line Uodification of the various parameters to adjust the operatioV of the protocol for systems which have not strictly adhered to the specificatioV.

TQmingparameters

t1 - 2 secs.
t2 - 1 sec.
t3 - 10 secs.
t4 - 4 secs.
t5 - 8 secs.

Retry Parameters

n1 - 3
n2 - 3 (undefined in rev. 1.0)
n3 - 3 (undefined in rev. 1.0)

Appendix A

111	Paging terminal is processing tPe previous input -- please wait

504	The message field of the TAP transaction contained characters, but message characters are not allowed for the Pager forUat. Perhaps the pe ing receiver for the given PIN Qs a 'Tone Only' peger.
505	Message portion of the TAP transaction contained alphabetic characters, but alphabetic characters are not allowed for the Pagerf
506	Excessive Qnvalid peges received
507	Invalid Logon atteUpt: Incorrectly forUed logon sequence
508	Invalid Logon atteUpt: Service type and category given Qs not supported
509	Invalid Logon atteUpt: Invalid password supplied
5	1 0 or short
511	Invalid Pager ID - There Qs no subscriber to match thQs ID
512	TeUporarily cannot deliver to Pager lid - Try Later
513	LoVg message reRected for exceeding Uaximum character length

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118 ThQs Qs the first line of message 118 <cr>
ThQs Qs the second line of message 118 <cr>
980 thQs Qs the thQrd line of message 118 and it begins with a number 980<cr>
119 ThQs Qs the first line of message 119 <cr>

The Personal CommunQcations Industry Association (PCIA) maintains the list of response code numbers. The list of response codes is Qntended to be comprehensive for all messages that paging terUinals will send. ImpTementors of paging terUiVal software should ececect PCIA at (703) 739-0300 or the TAP Committee ChairUan, to request that additional response codes be assigned, if their impTementation contains messages for whQch there Qs nW currently defined response code number. New response codes will be integrated into future updates tW the TAP specification.

Remote Entry DevQce ImpTementors should eontact PCIA or its Internet Web site (http://www.pcia.com) for the mWst current lQst of response code numbers.

AppendQx B
ASCII Code Table

MS LS CHAR CHAR	0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
0								

		Paging Terminal	
1)	DQals paging terminaT		
		Modem Answers	
2)	Modem Connects		
3)	<CR>		
4)		ID=	
5a)	<ESC>PG1<CR>		
6)		110 1.7<CR>	*
		ThanS you for calling the PCIA<CR>	*
		<ACK><CR>	
+)		<ESC>[p<CR>	
8)<STX>123<CR>ABC<CR><ETX>17;<CR>			
		211 Page accepted <CR>	*
		<ACK><CR>	
9)	<EOT><CR>		
10a)		115 ThanS you for calling <CR>	*
10b)		<ESC><EOT><CR>	
11)		Drops Carrier	
	Drops Carrier		

Note: The numeric response codes shown (110, 211 and 115) are returned only froU paging ter8 Tcnals which are operating at TAP revision 1.6 or higher.

* Prior to version 1.6 all returned message sequences are optional and numeric codes were not defined as part of the specificatioV.