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G. Hellstrom  
Omnitor  
A. van Wijk  
Real-Time Text Taskforce (R3TF)  
G. Vanderheiden  
Trace R&D Center, University  
of Wisconsin-Madison  
N. Williams  
Gallaudet University  
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**Presentation of Text Conversation in real-time and en-bloc form  
draft-hellstrom-textpreview-08**

Abstract

This specification defines methods for presentation of a text conversation with focus on the real-time features. The aim is to give the participants in a conversation a good opportunity to perceive the real-time flow of the conversation and also provide a display of the history of the conversation that makes it easy to read. Both two-party and multi-party situations are defined.

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## Table of Contents

<a href="#">1.</a>	<a href="#">Introduction . . . . .</a>	<a href="#">4</a>
<a href="#">1.1.</a>	<a href="#">Requirements Language . . . . .</a>	<a href="#">4</a>
<a href="#">2.</a>	<a href="#">Scope . . . . .</a>	<a href="#">4</a>
<a href="#">3.</a>	<a href="#">Real-time text presentation methods . . . . .</a>	<a href="#">4</a>
<a href="#">3.1.</a>	<a href="#">Common Aspects . . . . .</a>	<a href="#">6</a>
<a href="#">3.1.1.</a>	<a href="#">Paragraph dividing . . . . .</a>	<a href="#">6</a>
<a href="#">3.1.2.</a>	<a href="#">Completion of local entry . . . . .</a>	<a href="#">6</a>
<a href="#">3.1.3.</a>	<a href="#">Moving between different states . . . . .</a>	<a href="#">7</a>
<a href="#">3.1.4.</a>	<a href="#">Erasure . . . . .</a>	<a href="#">7</a>
<a href="#">3.1.5.</a>	<a href="#">Presentation of detected errors . . . . .</a>	<a href="#">8</a>
<a href="#">3.1.6.</a>	<a href="#">Display formatting . . . . .</a>	<a href="#">8</a>
<a href="#">3.1.7.</a>	<a href="#">En bloc transmission . . . . .</a>	<a href="#">8</a>
<a href="#">3.1.8.</a>	<a href="#">Multi-party sessions . . . . .</a>	<a href="#">9</a>
<a href="#">3.2.</a>	<a href="#">Real-time Text Preview . . . . .</a>	<a href="#">11</a>
<a href="#">3.2.1.</a>	<a href="#">Entries in creation . . . . .</a>	<a href="#">11</a>
<a href="#">3.2.2.</a>	<a href="#">Completion of local entry . . . . .</a>	<a href="#">12</a>
<a href="#">3.2.3.</a>	<a href="#">Completion of preview entry . . . . .</a>	<a href="#">12</a>
<a href="#">3.2.4.</a>	<a href="#">Order of entries . . . . .</a>	<a href="#">12</a>
<a href="#">3.2.5.</a>	<a href="#">Display formatting . . . . .</a>	<a href="#">12</a>
<a href="#">3.2.6.</a>	<a href="#">Scrolling and buffering . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.</a>	<a href="#">Column view . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.1.</a>	<a href="#">Entries in creation . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.2.</a>	<a href="#">Presentation of local entry . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.3.</a>	<a href="#">Completion of entries . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.4.</a>	<a href="#">Order of entries . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.5.</a>	<a href="#">Display formatting . . . . .</a>	<a href="#">13</a>
<a href="#">3.3.6.</a>	<a href="#">Scrolling and buffering . . . . .</a>	<a href="#">14</a>
<a href="#">4.</a>	<a href="#">PSTN Aspects . . . . .</a>	<a href="#">14</a>
<a href="#">4.1.</a>	<a href="#">Auto real-time for Emergency calls and Textphone calls . . . . .</a>	<a href="#">14</a>
<a href="#">4.2.</a>	<a href="#">Reasons to finish an entry . . . . .</a>	<a href="#">14</a>
<a href="#">4.3.</a>	<a href="#">Interoperability considerations with PSTN . . . . .</a>	<a href="#">14</a>
<a href="#">5.</a>	<a href="#">Transport and presentation considerations . . . . .</a>	<a href="#">15</a>
<a href="#">5.1.</a>	<a href="#">Time sampling and smooth display . . . . .</a>	<a href="#">15</a>
<a href="#">5.2.</a>	<a href="#">RTP based transport . . . . .</a>	<a href="#">15</a>
<a href="#">5.3.</a>	<a href="#">Message based transport . . . . .</a>	<a href="#">15</a>
<a href="#">5.4.</a>	<a href="#">Identification of entries . . . . .</a>	<a href="#">16</a>
<a href="#">6.</a>	<a href="#">Presence indication . . . . .</a>	<a href="#">16</a>
<a href="#">7.</a>	<a href="#">Alerting . . . . .</a>	<a href="#">16</a>
<a href="#">8.</a>	<a href="#">IANA Considerations . . . . .</a>	<a href="#">17</a>
<a href="#">9.</a>	<a href="#">Security Considerations . . . . .</a>	<a href="#">17</a>
<a href="#">10.</a>	<a href="#">Normative References . . . . .</a>	<a href="#">17</a>
	<a href="#">Authors' Addresses . . . . .</a>	<a href="#">17</a>



## **1. Introduction**

This is a specification of methods for presentation of a real-time text conversation. The aim is to give the participants in a conversation a good opportunity to perceive the real-time flow of the conversation and also provide a display of the history of the conversation that makes it easy to follow the flow. One reason to specify the presentation method is to be able to give participants a synchronized view of the conversation even if they use different presentation characteristics. The methods are intended for use in a protocol environment where text can be transmitted in real-time or in fragments of messages. Both two-party situations and multi-party session presentations are specified. The specification is mainly held on the presentation level, relatively independent of the transport layer. It has though some requirements on the lower layers, as well as some characteristics of the lower layers cause slightly different user experience of the presentation.

### **1.1. Requirements Language**

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

## **2. Scope**

This specification describes methods for presenting a text conversation so that the gradual entry of text is made visible to the users. One method has text flowing in real-time in a way that is similar to common text chat, but with the possibility to follow entries while they are created in a real-time preview area. The method may be applied on any text conversation transport method that transmits text character by character, time-sampled, word by word, or any other method based on small chunks. The methods cover both two-party and multi-party situations.

## **3. Real-time text presentation methods**

The presentation method described here are intended to give a convenient view of a text conversation between two or more participants in a session. It is intended to fulfill the requirements of ITU-T T.140 [[T140.refs](#)], and be feasible to implement in terminals with small displays. The basic concept however could be implemented in other text technologies as well and displayed in different ways. ITU-T T.140 [[T140.refs](#)], [Appendix I](#), describes a traditional chat view and a two-column view. The display formats



shall be implemented so that terminals in a session can implement different display views meeting the requirements and giving the users a synchronized view of the flow of the conversation.

An example of a two-party view is shown in Figure 1.

	^
[Anne] Hi, Anne here.	
[Eve] Hi, this is Eve, calling from Paris.	
I thought you should be here.	
[Anne] I am coming on Thursday,	
my performance is not until Friday	
morning.	
[Anne] Can we meet on Thursday evening?	
[Eve] Yes, definitely. How about 7pm.	
at the entrance of the restaurant	
Le Lion Blanc?	
[Eve] we can have dinner and then take a	
walk	_
<Eve-typing> But I need to be back at the	_
hotel by 11 because I have t	v
	_
OK, no probl	

Figure 1: Two-party call with real-time text preview.

Figure 1: The text is here displayed in a traditional chat view, with labelled entries from each participant ordered in a list with newest entry last. Older entries are scrolled up, out of the screen area when there is no room for them.

Real-time text arriving from other participants is displayed in 'preview areas' within the scrolling 'history' window. They are formatted to look different and are presented at the bottom of the history window until they are completed. When completed they move up in the history window and added to the history record. The text being entered by the local participant appears in a separate entry field that is preferably placed below the history field (to minimize eye movements when reading and typing).





Figure 2 : Column view is an alternative presentation mode to real-time preview.

Bob	Eve	Alice
My flight is to Orly	Hi all, can we plan for the seminar?	I will arrive by TGV. Convenient to the main station.
Eve, will you do your presentation on Friday?	Yes, Friday at 10.	
Fine, wo		We need to meet befo

Figure 2: Two-party call with column view.

An alternative view is presented in Figure 2, where text from each participant occupies one panel, and text is placed in its vertical position to show its time relation.

### **3.1. Common Aspects**

#### **3.1.1. Paragraph dividing**

Text entries are divided into paragraphs by hard or soft return. Hard return finalizes a text entry. Once a text entry has been terminated by hard return it can no longer be erased or modified. The control sequences used for producing hard return are CRLF or paragraph separator U+2029.

When soft return is used for creating a new paragraph, previous paragraph can still be erased or modified. Soft return is produced by line separator U+2028.

#### **3.1.2. Completion of local entry**

The end-of-entry event may be triggered by a send button, a RETURN, or when another condition selectable by the local user to "post what I have so far" is met ( such as a pause in typing, a delimiting character such as a period, or a turn-taking token).

When an end-of-entry event occurs, if the entry does not end with end of paragraph as defined by the device, the sending system SHALL append one.



### **3.1.3. Moving between different states**

Entries can be either "real-time (preview)" or "historical" and they can be either "displayed" or "hidden". When real-time text is received it SHALL BE classified as a real-time entry until an end-of-entry indicator is received. Real-time entries SHOULD be displayed in the real-time preview field. Once an end-of-entry indicator is received, the entry SHALL become historical and SHOULD be move into the history display field. Its position within the history SHALL be determined by the time that its end-of-entry indicator was received.

The local user may select to hide either the entries while they are real-time (previews) or when they are historical. Hiding entries when they are in real-time state may be done to avoid distraction for the local participant. The feature to hide the entries while in real-time state SHOULD provide some alert when an end-of-entry indicator is received as well as when real-time text stops coming in for a period of time. (The alert due to pause in incoming text is important because some real-time text users are not accustomed to sending end-of-entry indications(e.g. RETURNS) or may use a text based end-of-entry indication (such as GA).

An entry (or category of entries) can be placed in a hidden state by user command to hide it (them). (e.g. Hide all but "Mary" to make it easier to see her thread)

The default SHALL be that both real-time and history are not hidden.

### **3.1.4. Erasure**

Erasure SHALL only be done from the last displayed character per participant.

Transmitted characters that take no position on the display (e.g. Bell or Alert in Session) SHALL not take any specific erasing action, but be regarded to be erased simultaneously with the succeeding character.

Characters that are composed by multiple keystrokes SHALL be erased by one erasing action.

New lines inserted by automatic line break and word wrap actions purely for display formatting purposes by the local system SHALL not require any specific erasing action.

New lines inserted by the user shall be erased in one erasing action even if they are represented by multiple characters.



The erasing action **MUST** be performed strictly according to the rules above, in order to maintain a synchronized view of the conversation for the participants, even if conversation participants use different display formats, such as the side-by-side-panel mode described in [section 6](#) and ITU-T T.140 1 [[T140.refs](#)] and the real-time preview mode described here.

The scope of erasure shall only be possible back to the latest new paragraph (hard return) sent from the erasing party. This may be valid for message borders in certain message based transmission systems. When using T.140, an erasure emitted when the cursor is already at the beginning of the message should be responded with an "unsupported request" protocol element from the entity that cannot perform the requested erasure.

#### **[3.1.5.](#) Presentation of detected errors**

If a transmission error is detected and it is likely that it has resulted in loss of text, a character **SHALL** be inserted in the text for display at that point. The character should be the "Replacement character", a question mark within a rhombus. For cases when this character cannot be represented on the display, the replacement character **SHOULD** be presented as an apostrophe (" ' ") .

The same applies for incoming text that cannot be presented on the local terminal because of limitations in available fonts.

#### **[3.1.6.](#) Display formatting**

The display **SHALL** be word-wrapped within the limits of the window.

The following operations **SHOULD** be possible to do:

- o Select font size
- o Select text color and background color for each participant.
- o Set window size

#### **[3.1.7.](#) En bloc transmission**

It **SHOULD** be possible for the participants to hold their text and not have it sent to the other participants until after the end-of-message event occurs. This enables users who do not want their message to be viewed by other participants until they have verified it. This also facilitates editing since random editing can be done on the text block before it is sent. This also allows a block of text to be pasted into the text entry area and then edited before it is sent.



This could be new text or a previous text entry that the user would like to resend with edits. The en bloc method SHALL NOT be the only method for sending. A 'real-time / block send' switch SHOULD be located near the local user's text entry field Real-time SHALL be the default method for sending but a user preference setting MAY change the default to en bloc.

### 3.1.8. Multi-party sessions

A multi-party session can be presented in a similar manner as the two-party session. The chat-view with real-time entry at the bottom of the window is one possible view.

A three-party view is shown in this example.

	^
[Alice] Hi, Alice here.	
[Bob] Bob as well.	
[Eve] Hi, this is Eve, calling from Paris.	
I thought you should be here.	
[Alice] I am coming on Thursday, my	
performance is not until Friday morning.	
[Bob] And I on Wednesday evening.	
[Alice] Can we meet on Thursday evening?	
[Eve] Yes, definitely. How about 7pm.	
at the entrance of the restaurant	
Le Lion Blanc?	
[Eve] we can have dinner and then take a walk	
<Eve-typing> But I need to be back to	
the hotel by 11 because I need	
	-
<Bob-typing> I wou	-
	v
of course, I underst	

Figure 3: Three-party call with real-time preview.





This figure shows how a coordinated column view MAY be presented on Alice's device.

Bob	Eve	Alice
		I will arrive by TGV.
My flight is to Orly		Convenient to the main
	Hi all, can we plan	station.
	for the seminar?	
Eve, will you do		
your presentation on		
Friday?	Yes, Friday at 10.	
Fine, wo		We need to meet befo

Figure 4: A coordinated column-view of a three-party session with entries ordered in approximate time-order.

In the column view, the column showing text transmitted from the device where the presentation is made, SHOULD be placed to the right of all other columns, so that users recognize the operating environment between different devices.

In an environment with less space in the display it MAY be necessary to give up on displaying the relative time order in the column view in order to display more of the conversation contents in available space.

Yet other situations may call for display in separate windows for example underneath video images from each participant.

Bob	Eve	Alice
ooooo	888	...
/ o o \	8/- -\8	
( _ )	0     0	o o
\ _ /	_	v
	\ _ /	\ _ /
Help me to spell	necessary	ne.... OK you take
nessessarry,I always		it
get it wrong		

Figure 5: Example of text conversation entries placed underneath video images from each participant.

When implemented in an environment that supports multi-party calls,



it may be felt less important to maintain a real-time preview view of text from all participants. It may be very important for some participants to have rapid real-time preview presentation of selected participants, e.g. for live captioning of the call by a third party.

Thus it may be desirable to be able to turn on or off the preview presentation per user. When turning off real-time preview from one participant, its presentation SHALL disappear from the preview window, and text SHALL be entered en-bloc to the history display as they are finished for that participant.

### **3.2. Real-time Text Preview**

#### **3.2.1. Entries in creation**

Entries in creation SHALL be displayed in a real-time preview area, one for each participant who has entries in creation. The real-time preview areas MAY be placed under the list of completed entries as shown in Figure 1 and Figure 3, or at any other suitable place in the user interface. If video from the participants is also displayed, then it MAY be suitable to display the real-time preview areas under the video image of the participant. The real-time text MAY also be displayed in a manner more closely associated with earlier exchanged text entries by the same participant (e.g. text from each participant goes in its own column).

If real-time previews from other participants are placed under the list of completed entries as in Figure 1 and Figure 3, the text being entered by the local participant SHOULD be placed at the bottom in its own text entry field. This is recommended for a number of reasons. First, this is the only "editable" text on the screen. It also facilitates an optional input behavior where the local user may sometimes be holding their text back until it is completed while normally transmission occurs in real-time. Having the user input area be in a separate field MAY also be useful when scrolling the output field so that the input field always stays in view even as the history and text previews are scrolled out of view to read older text.

For ease of reading different entries, it is RECOMMENDED that all entries be placed close together in the display area.

For text input technologies requiring a number of keystrokes before the character or characters are finally decided, no characters shall be submitted to communication until they are decided from this input preparation process. This is for example valid for input of some Asian languages, and for some text entry methods from number keypads, and word prediction systems.



During entry, the following actions MAY be requested:

- o Alert. Requests alerting of the remote participant.
- o Erase last character. Erases the last ( non-erased) character in the entry. (See [Section 3.1.4](#))

#### **3.2.2. Completion of local entry**

Text from the local participant SHALL be entered in the local user input field, until an end-of-entry event occurs. The completed entry SHALL be moved to the history display area. If the protocol used defines an end-of-message indicator, it SHALL also be issued.

#### **3.2.3. Completion of preview entry**

Text from the remote participants SHALL be entered in the preview area until an end-of entry event occurs. The end-of-entry is identified by any variant of a NEW LINE coded in the character set used, or an end of message indicator if there is a specific coding of that event. When an end-of-entry event occurs, the completed entry SHALL be moved to the history display area.

#### **3.2.4. Order of entries**

The order of displayed entries in the display area SHALL be the timing order when the entries were "posted" to the display from the preview area. That is, when the new line or end-of-message indicator is received.

#### **3.2.5. Display formatting**

The labels on the entries SHOULD display the user name of the participant. If this information is not available, labels indicating "Received" and "Transmitted" or other suitable names for the participants SHOULD be used.

The real-time preview display area MAY follow the same display formatting regarding font size, colors etc as the display area or MAY be different.

Each real-time preview area MAY have a fixed or adjustable size. It MAY also have no specific scrolling features or its own scrolling mechanism.



### **3.2.6. Scrolling and buffering**

When there are entries in the history area that have been pushed (scrolled) out of the view by new text coming in, it SHOULD be possible to scroll back to them within a practical limit. When the display area is scrolled, it SHALL stay in that scrolled position until scrolling is changed again or (at the user's option) when a new entry is received. When scrolled to the bottom, the display area SHALL auto-scroll as needed to show new entries. When the display arrangement is made with the preview field placed just under the history field as in Figure 1 and Figure 3, the preview field and the history field SHOULD scroll together as one display area.

The input field of the local participant SHOULD always be visible regardless of the scroll position of the history field.

### **3.3. Column view**

The column view is an alternative presentation mode. Figure 4 provides a picture of a possible column view presentation.

#### **3.3.1. Entries in creation**

Entries shall be placed in one column for each participant. Entries in creation are presented in real-time.

#### **3.3.2. Presentation of local entry**

A column is used for the local entries in a similar manner as the remote entries.

#### **3.3.3. Completion of entries**

Completion of an entry is shown by a new line in the column display.

#### **3.3.4. Order of entries**

It is preferable to position the entries vertically in approximately the order they started, so that the conversation order can be perceived by the vertical position of the entries.

#### **3.3.5. Display formatting**

Each column should have a title line indicating the source of text.





#### **3.3.6. Scrolling and buffering**

It is preferred to provide a common scrolling mechanism for all columns together, so that the vertical order is maintained even during scrolling.

### **4. PSTN Aspects**

#### **4.1. Auto real-time for Emergency calls and Textphone calls**

When it is detected that the session is used for emergency purposes, the text transmission SHALL be switched to real-time regardless of its previous setting.

The user SHALL still be provided with a possibility to switch to en bloc sending after the session is established.

#### **4.2. Reasons to finish an entry**

The default end-of-entry action SHOULD be a new line request from the user.

A specific send button MAY also be used.

Users with dominating experience from real-time text communication in PSTN may have a habit of not ending entries with a new line. There will be a risk that entries are left in real-time mode unintentionally not displayed and not read if the receiving end has hidden real-time display. Some actions are needed in order to avoid this risk.

If an entry is left in real-time mode without any input activity for a long period (e.g. 10 seconds), the local participant should be given an indication that there is an unfinished entry in the input field, and given a hint to complete it. Optionally, e.g. when using a voice-to-text application for generating text, the application SHOULD create the end-of-entry.

A period (".") followed by a short inactivity MAY also be configured to be used as an end-of-entry indication.

#### **4.3. Interoperability considerations with PSTN**

For PSTN text gateways having user input from PSTN text telephones, the following sequences SHOULD be included among those causing an entry to be finished. These terminations would usually be done by the PSTN gateway in its transmission towards the IP side:



- o Letters "GA" or "GASK" or "SKSK" followed by short inactivity (e.g. 3 seconds), for interaction with TTY users.
- o Character "+" or "x" followed by short inactivity (e.g. 3 seconds), for European textphone users.
- o Characters "\*" or "KOM" followed by short inactivity (e.g. 3 seconds), for Northern Europe textphone users.

White spaces (space bar, New line, CR, and LF) after those characters SHALL be accepted and included in the finished entry. (Some users do type a space character after the turn-taking indicator and some textphones will send return after the turn-taking symbol).

## **5. Transport and presentation considerations**

### **5.1. Time sampling and smooth display**

It is RECOMMENDED that characters be buffered and transmitted in 300 ms intervals on the transport level. It is permissible to buffer characters for transmission in up to 1000 ms intervals. Display of received chunks of text SHOULD be done one character at a time spread over the transmission interval so that adding a chunk of text to the real-time preview window approximately covers the transmission interval to give a smoother flow.

The presentation method MAY be used with transport methods for real-time text and for all text message methods where it is possible to use timer based transmission to transmit fragments of message entries.

### **5.2. RTP based transport**

The method MAY be applied on various text transmission technologies. It is designed in order to be usable for real-time text conversation with coding and presentation according to ITU-T T.140 including its amendment 1 [[T140.refs](#)], and IETF RTP [[RFC3550](#)] transport with packetization as defined in [RFC 4103](#) [[RFC4103](#)]. The methods for applying this in a multi-party situation is described in IETF Text media handling in RTP based real-time and message conferences [draft-hellstrom-text-conference](#) [[I-D.hellstrom-text-conference](#)].

### **5.3. Message based transport**

The real-time text with preview presentation is also feasible to use with the transport protocol used by messaging protocols. For each transport protocol used, there must be a definition of a negotiation



method to explain that the real-time variant of presentation is supported on reception and is used in transmission. When an implementation is made for the SIP environment [RFC3261](#) [[RFC3261](#)], the RTP based transport [RFC4103](#) [[RFC4103](#)] MUST also be supported in order to guarantee interoperability with other implementations.

#### **5.4. Identification of entries**

The transport method SHALL allow identification of the source of text, so that text from different sources can be arranged for convenient and readable presentation at the receiving end [e.g. to attach labels to the incoming text).

### **6. Presence indication**

Appropriate SIP based presence features SHOULD be used to indicate status in the user interface, e.g. that the user is typing when in 'en bloc' mode.

### **7. Alerting**

In order to be useful for users who are deaf, hard of hearing and deaf-blind as well as all situations with all users, it is important to provide audible, visual and, where possible, tactile alerting from events in the text conversation application.

It should be possible for a user to get external alerting signals with a method preferred by the user. It may for example be vibration, light flashes or sound as selected by the user. It should also be possible to get alerting on the screen at certain events. The signals to external alerting systems should be issued when an incoming request for session initiation is received. When the method is used in connection with T.140 [[T140.refs](#)] presentation, it should also be issued when the alert-in-session T.140 control event is received.

For minor events, for example when an entry from a user is completed and displayed in the conversation display area, an indication MAY be given e.g. by an on-screen flashing or any other suitable alerting signal.

It may be useful to provide external alerting also for these minor events in specific situations. If the user has not touched the application for a number of minutes when the minor event occurs it may be of interest to get an external alert. Details of such arrangements are outside the scope of this document



## **8. IANA Considerations**

This specification includes no request to IANA.

## **9. Security Considerations**

This specification does not introduce any procedures that change security issues from what is already specified for the session and transport environment where the presentation method is applied.

## **10. Normative References**

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## Authors' Addresses

Gunnar Hellstrom  
Omnitor  
Box 92054  
Stockholm SE-120 06  
SE

Phone: +46 858900056  
Fax: +46 858900051  
Email: [gunnar.hellstrom@omnitor.se](mailto:gunnar.hellstrom@omnitor.se)  
URI: [www.omnitor.se](http://www.omnitor.se)

Arnoud van Wijk  
Real-Time Text Taskforce (R3TF)  
NL

Fax: +31 412614000  
Email: [arnoud@realtimetext.org](mailto:arnoud@realtimetext.org)  
URI: [www.realtimetext.org](http://www.realtimetext.org)

Gregg C. Vanderheiden  
Trace R&D Center, University of Wisconsin-Madison  
1550 Engineering Drive  
Madison, WI 53706  
USA

Email: [gv@trace.wisc.edu](mailto:gv@trace.wisc.edu)  
URI: [www.engr.wisc.edu/ie/faculty/vanderheiden\\_gregg.html](http://www.engr.wisc.edu/ie/faculty/vanderheiden_gregg.html)

Norman Williams  
Gallaudet University  
800 Florida Ave  
SLCC-1120  
Washington, DC 20002  
USA

Email: [norman.williams@gallaudet.edu](mailto:norman.williams@gallaudet.edu)  
URI: [tap.gallaudet.edu](http://tap.gallaudet.edu)

