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798792

Joshua K. Robin, Director of Innovation and Special Projects
Massachusetts Bay Transportation Authority
10 Park Plaza, Suite 3910
Boston, MA 02116
JRobin@mbta.com

Subject: ARINC Incorporated Proposal – Public Address – Electronic Sign System

Dear Mr. Robin:

ARINC is pleased to provide our Proposal for the Public Address – Electronic Sign System changes as requested. Our firm fixed price for Phase 1 is \$438,711, FFP for Phase 2 is \$306,382 and is based on the following tasks/assumptions:

1. Our Statement of Work and Assumptions attached hereto.
2. Our price is valid for a period of sixty (60) days from the date of this letter.
3. The negotiation of an equitable payment schedule. Net 30 days.
4. The exclusion of provisions for taxes, liquidated damages, DBE participation, bonds, non-standard insurance and warranty.
5. The negotiation of mutually acceptable terms and conditions.

We look forward to working with the MBTA on this important project. Should you have any questions of a technical nature, please contact Bill Mosberg at 410-266-2955. Contractual matters should be referred to Marilyn Murphy at 410-266-2375.

Sincerely,

A handwritten signature in black ink, appearing to read 'Eric S. Pelli', is written over a horizontal line.

Eric S. Pelli
Director

Attachments as stated



**Massachusetts Bay Transportation Authority
Public Address – Electronic Sign System
(MBTA PA/ESS)**

**PA/ESS DISPLAY MODIFICATIONS
SCOPE OF WORK**

JULY 28, 2011

Prepared For: Massachusetts Bay Transportation Authority
Boston, MA

Prepared By: ARINC Incorporated
2551 Riva Road
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Revision History

<i>Change Log</i>		
<i>Date</i>	<i>Revision No.</i>	<i>Description</i>
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June 29, 2011	1	Updated and Expanded
July 1, 2011	2	Updated and Expanded by MBTA
July 5, 2011	3	Updated and Expanded by ARINC
July 8, 2011	4	Updated and Modified by MBTA
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July 28, 2011	7	MBTA Final Edits

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1 Scope

1.1 Identification

This scope of work describes ARINC's proposed tasks undertaken to address functional changes requested by the MBTA in the way PA/ESS receives and displays text announcements on the LED signs.

1.2 System Overview

The MBTA Public Address/Electronic Signs System (PA/ESS) makes available to MBTA Passengers access to information regarding: general service announcements, status of trains, train arrivals, as well as safety and emergency instructions. The information is provided in the form of synchronized audio and visual announcements to the platforms and within MBTA stations. MBTA PA/ESS components are distributed and scalable and can be deployed from a central controller, locally at the station, or any combination thereof. With this scalability comes a great deal of extensibility, allowing for an installed central or local station configuration to be modified to support additional functionality, additionally installed station equipment, as well as seamless integration for adding whole stations.

The MBTA PA/ESS implementation provides the following functionality:

- PA/ESS utilizes open standards, such as XML, to facilitate easy integration between PA/ESS components, as well as any external interfaces.
- PA/ESS uses state-of-the-art software technologies to provide MBTA with thin-client; browser based graphical user interface used for system configuration and maintenance, template-based manual generation of audio and visual messages. In addition, an up-to-date standard browser, such as Microsoft Internet Explorer 6.0, enables the user community to work remotely.
- PA/ESS provides the capability to log the visual and audio messages that are processed, and allows a user to produce related summary and detailed reports.
- PA/ESS also provides digital Voice over Internet Protocol (VoIP) for live audio announcements.

The PA/ESS design combines Commercial-off-the-Shelf (COTS) hardware, COTS software, and newly developed software into a distributed PA architecture that provides two distinct ways of sending audio messages.

1. Machine generated announcements may be prerecorded ("canned") or generated dynamically ("Ad Hoc"), and may be audio only, visual ("VMS") only, or synchronized audio and visual.
2. Live announcements are sent using VoIP and are audio only.

Visual monitors or Customer Information Screens (CIS) display general service announcements, train status information, arrival information, public safety messages, and custom Ad Hoc messages.

The MBTA PA/ESS software is part of ARINC's existing family of AIM® software products and provides functionality that supports:

- Creation, scheduling, distribution, and monitoring of audio/visual announcements
- Creation and presentation of automated announcements based on inputs from the MBTA's Train Arrival Announcement System (TAAS) inputs
- Creation and presentation of custom PA and sign messages
- PA/ESS system monitoring and test
- Interfaces with existing MBTA Consoles and station equipment (PA and signage).

1.2.1 System Architecture Overview

The system architecture is based upon ARINC's AIM® CIS product suite. Central Core servers host the announcement scheduling and interface functions as well as the digital audio building blocks and messages. PA/ESS operators create, monitor, and control announcements from Console workstations attached to either the PA/ESS or the existing MBTA LAN. A separate set of VoIP processors convert the digital audio into an analog form compatible with the existing MBTA audio distribution network. A separate PA/ESS LAN links these elements to the existing MBTA infrastructure for redundancy and security.

Manual announcements are initiated from a Console workstation and stored on the server. The existing Train Arrival Announcement System (TAAS) sends train information over the MBTA and PA/ESS LAN to the AIM® CIS Server, which generates and stores automated announcements based on the information received. At the scheduled time, the AIM® CIS Server retrieves the stored announcement and sends the visual portion through the PA/ESS LAN and the MBTA WAN directly to the selected sign(s) in the appropriate station(s). Timed for simultaneous presentation, the AIM® CIS Server software sends the digital audio portion of the announcement via the PA/ESS LAN to the PA/ESS VoIP processors, which convert it to analog and send it via the existing MBTA network to the station PA equipment.

1.3 Document Overview

This document is organized as follows:

1 Scope – Contains the project identification, system and document overviews, and a list of the terms, definitions and acronyms used in this document.

2 Applicable Documents – Provides a list of the documents referenced in this document.

3 Proposed Changes – Describes the desired functionality and how ARINC proposes to provide it.

1.4 Terms and Acronyms

AAHA	Automated Ad Hoc Announcements
APA	Automated Prerecorded Announcements
AIM®	Advanced Information Management
CIS	Customer Information Screen
CO	Change Order
COTS	Commercial Off The Shelf
E&M	Ear and Mouth
GUI	Graphical User Interface
IIS	Microsoft Internet Information Server
IP	Internet Protocol
iSYS	Intelligent Systems & Controls Contractors, Inc
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MBTA	Massachusetts Bay Transportation Authority
MTBF	Mean Time Between Failures
NTP	Network Time Protocol
NTP	Notice to Proceed
OCC	Operations Control Center
PA	Public Address
PA/ESS	Public Address – Electronic Sign System
RFQ	Request For Quotation
RTD	Real Time Data
SCU	Station Control Unit
STM	Signal Transmission Media
STP	System Test Plan
TAAS	Train Arrival Announcement System
TAW	Train Approach Warnings
TBD	To Be Determined
VMS	Variable Message Sign
VoIP	Voice over IP
WAN	Wide Area Network
XML	eXtensible Markup Language

2 Applicable Documents

The following documents were used or referenced in the preparation of the Maintenance and Support Plan:

MBTA PA/ESS User's Manual, Contract No. CAP 65-04 CDRL# 26A,
REVISION 4

3 Proposed Changes

3.1 Functional Requirements

The MBTA-requested functional changes include providing three types of control inputs from an automated source external to PA/ESS:

- Remotely provided sign content scheduled at the SCU
- Remotely scheduled Ad Hoc Announcements
- Remotely scheduled Prerecorded Announcements

These are the requirements that ARINC will meet.

3.1.1 General Requirements

The MBTA wants to maintain all functionality and performance of the existing MBTA PA/ESS System, except where specifically altered in this document.

3.1.1.1 Latency

End-to-end latency shall be considered to be the number of seconds from the time a message is posted to the specified interface to that message appearing on a sign in the station, assuming no conflicting/priority messages exist. If the MBTA network, which is assigned a latency of one (1) second, is proven to be introducing excessive latency to end-to-end message delivery time, ARINC's latency obligation will be adjusted second-for-second for the estimated impact, rounded up to the nearest second, of the latency introduced by the MBTA network.

For the changes referenced in sections 3.1.3 and 3.1.4, end-to-end latency for a single posting shall be no more than twenty-five (25) seconds for messages scheduled to be displayed immediately. Messages not scheduled to be displayed immediately shall play within five (5) seconds of the scheduled display time OR within five (5) seconds of the elapsed end-to-end maximum allowed latency, whichever is later.

For the changes referenced in section 3.1.2, end-to-end latency for a single posting shall be no more than ten (10) seconds for messages scheduled to be displayed immediately. Messages not scheduled to be displayed immediately shall play within five (5) seconds of the scheduled display time OR within five (5) seconds of the elapsed end-to-end maximum allowed latency, whichever is later.

3.1.1.2 Logging

The SCU shall include a function to log to local text file(s) each message actually sent to signs at that station. The log file(s) shall include, at a minimum, a timestamp, zone identifier, the type of message, and the text to be displayed (separated into two fields in the case of the functionality in section 3.1.2).

3.1.1.3 Error Reporting

Error messages associated with this functionality shall be posted to an IP address configurable by the MBTA. Specific error messages and formats will be determined by the parties during final software design.

3.1.2 Remote Sign Content Requirements

The MBTA wants to provide sign content from an automated source external to PA/ESS with the following characteristics:

- Signs addressable by zone, with all signs in a zone displaying the same data.
- Each sign has two lines, which are independently addressable.
- External data provided via an HTTP POST to a web service on the PA/ESS head-end servers which forwards the data to the appropriate SCU.
- External content displayed whenever no other announcement is being displayed.
- SCU stores a schedule of upcoming updates to external content and applies them at their scheduled time.
- SCU stores common strings used, so that they can be referenced and used without the need to send them over the network each time. Common strings are referenced by keys and the list can be updated via commands to the SCU.

The desired format of the two-line external content display is:

- Left justified
- Positioned in the leftmost portion of the display
- Placed one above the other
- Non-scrolling
- Font style and size the same as existing announcement text to meet ADA requirements

It is desired that the external content display include a clock display with the following characteristics:

- Generated within the PA/ESS
- Right justified
- Positioned in the upper right corner of the display
- In the format HH:MM (omitting leading zero if any)
- AM/PM will not be displayed to minimize character length
- May be a smaller font

There is no audio associated with this functionality

A conceptual sketch is shown below.

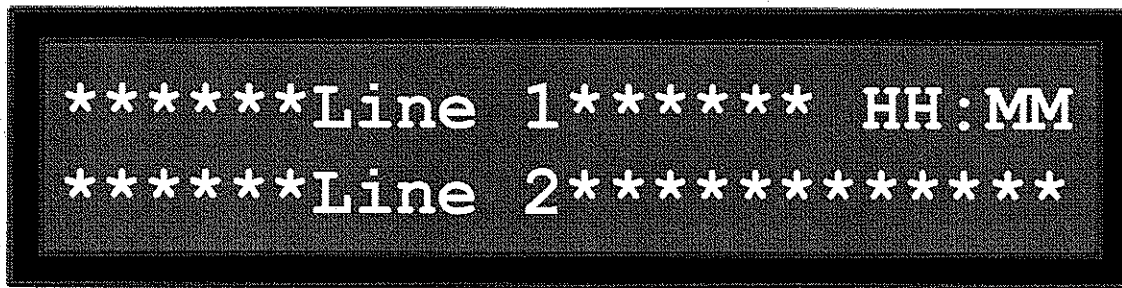


Figure 1 External Data Display

3.1.3 Automated Ad Hoc Announcement Requirements

The MBTA wants the ability to create and play Automated Ad Hoc Announcements (AAHA) from an automated source external to PA/ESS – without using the GUI. The intent is that these Automated Ad Hoc Announcements be created and played without human intervention. Unlike the remote content described above, Ad Hoc announcements:

- Can be more than 2 lines
- Can have an audio component added by the text-to-speech engine
- Can be scheduled to play, repeatedly if desired, at specific times in the future

The external data to create and play these messages would be provided via an HTTP POST to a web service on the PA/ESS head-end servers.

These Automated Ad Hoc Announcements would, in principle, have access to all of the parameters of an operator-produced Ad Hoc message. However, parameters not specified would default to predetermined values:

- Default number of plays: 1 (one)
- Default scheduled play time: 5 minutes from present time

Being automated, this interface cannot respond to feedback such as error messages. Should, for example, an AAHA time out or fail to pass the profanity filter, a reply would indicate an error prevented the announcement from being played.

3.1.4 Automated Prerecorded Announcement Requirements

The MBTA wants the ability to create and play Automated Prerecorded Announcements (APA) from an automated source external to PA/ESS – without using the GUI. The intent is that these Automated Prerecorded Announcements be created and played without human intervention. Prerecorded announcements can be scheduled to play, repeatedly if desired, at specific times in the future. Unlike the remote content and AAHA described above, prerecorded announcements:

- Have pre-defined text content
- Have pre-defined audio content

The external data to create and play these messages would be provided via an HTTP POST to a web service on the PA/ESS head-end servers.

These Prerecorded Ad Hoc Announcements would, in principle, have access to all of the parameters of an operator-scheduled prerecorded message.

Being automated, this interface cannot respond to feedback such as error messages. Should, for example, an APA parameter such as number of plays, exceed the system limits, a reply would indicate an error prevented the announcement from being played.

3.2 Proposed Implementation

These are the tasks that ARINC proposes to perform.

3.2.1 Remote Sign Content Implementation

The implementation of remote sign content is designed to let the system schedule, to the second, multiple upcoming changes to the remote sign contents of signs in all zones in all stations. A command might be sent via HTTP POST to the Harvard station SCU at 2:59:30pm instructing it to show "Alewife 4 min" on line 1 of the northbound zone and line 1 of the mezzanine zone at 3:00:10pm. Multiple commands to the same station can be included in the same HTTP POST, so the same POST could contain that command, and a command to show "Alewife 3 min" in the same places at 3:01:10pm, and a command to show something else on the second line of the southbound zone signs at 3:00:42pm, etc. The sign controller will intelligently add new commands to the list of commands it has already received and execute them at the designated times.

The implementation also allows for "rotating" or "paging" text. A line may flash back and forth between "Alewife 5 min" and "Express train 5 min" every 5 seconds, without each flash being identified as its own command – rather "flash back and forth between these two pieces of text every 5 seconds" is the command.

3.2.1.1 Overview

Figure 2 shows the relationship of POST messages, command strings, and their contents.

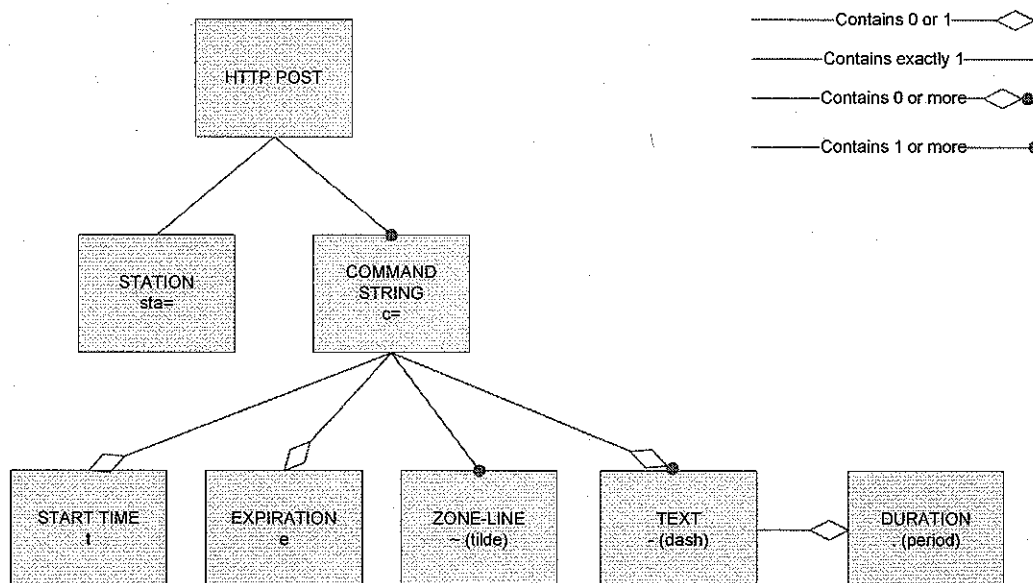


Figure 2 POST Message Components

- ARINC would modify the head end software to accept data via HTTP posts, using the following format:
 - Post Data Fields
 - *sta*= {4-character unique id of station; appears once}
 - *c*= {command string; appears at least once}

A command string consists of:

- *t* {time at which the assignment is effective, in seconds from midnight; defaults to the time message received by SCU}
- *e* {number of seconds from *t* that assignment expires; defaults to 60}
- *~* {identifier for a zone and line (top/bottom) that string is assigned to; there may be multiple such items each with its own *~* if the same display string is assigned to more than one place, such as the top line in the northbound zone and the bottom line of the mezzanine}
- *-* {identifier for display string to be assigned, either using a key or a literal string surrounded by quotes (see below); may repeat if more than one string is to be assigned, in which case the sign will rotate between the display strings in the order in which they appear in the command string}
- *.* {number of seconds the immediately preceding display string should be held before being replaced; defaults to 5}

The following is the valid list of zone/line identifiers:

- *m1*: Mezzanine zone – LINE 1
- *m2*: Mezzanine zone – LINE 2
- *c1*: Center Platform zone – LINE 1
- *c2*: Center Platform zone – LINE 2
- *n1*: Northbound Platform zone–LINE 1
- *n2*: Northbound Platform zone–LINE 2
- *s1*: Southbound Platform zone–LINE 1
- *s2*: Southbound Platform zone–LINE 2
- *e1*: Eastbound Platform zone – LINE 1
- *e2*: Eastbound Platform zone – LINE 2
- *w1*: Westbound Platform zone – LINE 1
- *w2*: Westbound Platform zone – LINE 2

Some stations have “non-standard” zones. May have to identify additional zone ID's. ARINC would provide the font parameters to the MBTA so that the external msg text can be sized to fit.

Notes:

- One command string can have multiple zone/line identifiers (each preceded by ~), in which case the display string(s) applies in the same way to all of them.
- One command string can have multiple display strings (each preceded by -), in which case they are to be displayed in the order they are listed, repeating until command expiry time.
- Each display string may or may not be followed with the number of seconds it is to be displayed (preceded by .) before the next display string is shown.
- If no zone/line identifier is included the command is invalid and should be ignored.
- If no display string identifier is included then the applicable zone/lines should be blanked out.
- A display string identifier may either be a key (referencing a common string the SCU has on record) or a literal string. If it is a literal string, it will be surrounded by quotes (percent-encoded as %22).
- Any literal strings will be encoded normally for http, i.e. a space will be represented as %20. For clarity they will not be shown in this document that way.

Here are some sample command strings and how they should be interpreted.

~m1-A	Immediately show the string identified by key A on the top line of mezzanine-zone signs. (Actual key format TBD.)
t54030~m1-"Braintree 1 min"	At 3:00:30pm (54030 seconds past midnight) show "Braintree 1 min" on the top line of mezzanine-zone signs.
t54030e30~m1~s1-"Braintree 1 min"	At 3:00:30pm, for 30 seconds (or until superseded), show "Braintree 1 min" on the top line of mezzanine-zone signs and the top line of southbound-zone signs.
e30~m1~s1-"Braintree 1 min"- "Express 1 min"	Immediately, for the next 30 seconds (or until superseded), start showing "Braintree 1 min" and "Express 1 min" one after another in a loop on the top line of mezzanine-zone signs and the top line of southbound-zone signs.
~m1~s1-"Braintree 1 min".5-"Express 1 min".2-"to JFK 1 min".2	<p>Immediately, on the top line of mezzanine-zone signs and the top line of southbound-zone signs, show the included strings in order:</p> <ul style="list-style-type: none"> • Display "Braintree 1 min" for 5 secs • Display "Express 1 min" for 2 secs • Display "to JFK 1 min" for 2 secs • Then repeat.

The following is an example of an entire POST to demonstrate multiple command strings in the same POST:

```
?sta=RHAR&c=~m1~s1~xdq&c=~m2~n1~r7d&c=t54060~m1~s2~re3&c=54060~m2~n1~kr&c=t54094~m1~jj
```

This can be broken down as follows:

sta=RHAR	These commands are for station RHAR
c=~m1~s1-A	Immediately show string A on mezzanine line 1 and SB line 1
c=~m2~n1-B	Immediately show string B on mezzanine line 2 and NB line 1
c=t54060~m1~s2-C	At 54060 (3:01:00pm) show string C on mezz. line 1 and SB line 1.
c=54060~m2~n1-D	At 54060 (3:01:00pm) show string D on mezzanine line 2 and NB line 1
c=t54094~m1-E	At 54094 (3:01:34pm) show string E on mezzanine line 1

Note that there is no change to southbound line 1 at 3:01:34pm. Only mezzanine line 1 is affected by the last command.

More notes:

- *sta* is a required field where the value matches one from the station list provided. If there is no match, the post would be flagged as an error and ignored.
- *t* has an allowable range of 0-86399 (12:00:00am to 11:59:59pm.) If it is not included, then the sign controller shall assign *t* to be equal to the time the message is received. If the current time is after 11:00pm, values of *t* up to 1:00am will be considered the future, not the past. If *t* is more than 3660 seconds in the past or future then it will be considered an invalid value and the messages will be disregarded. If *t* is in the past the text will be effective immediately, but that is not the same as setting *t* equal to the time received – see *exp* below.
- *e* has an allowable range of 10 – 65535 seconds (about 18 hours) and a default value of 60. Expiration time is calculated based on *e* and the *t* value.
- If separate commands (possibly in separate POSTs to the same station) with the same *t*-value each apply multiple rotating/paging strings to separate zone/lines, the timing of the different zone-lines will be updated synchronously. For example: *c=54000~m1~aa.10~x.5&c=54000~m2~bb.10~y.5* would cause signs in the mezzanine zone to show *aa* and *bb* together for 10 seconds, then show *x* and *y* together for 5 seconds, then repeat.
- If a zone or station-zone combination is specified which is not configured in the system, no error will occur and the PA/ESS system will correctly process all DTF updates for remaining zones for that station.
- External data would be posted to all head-end servers, including those in secondary mode and/or located in a backup control center.

3.2.1.2 Head-end, SCU and Sign Controller Behavior

- ARINC would modify the PA/ESS head-end software to forward the external data posts to the SCU identified by the *sta* parameter, if there is one.
- ARINC would modify the PA/ESS head-end software to create, maintain, and update a table of 10 recent requests sent to stations. This table serves two purposes: (1) On start-up, an SCU would query the head-end table to get its "existing" external content. (2) This table would maintain the external content for the 10 or so stations that do not have an SCU.
 - The six rightmost characters of Line 1 would be used for the current time in the format "[sp]12:00".
 - The entries in this table would be updated whenever an HTTP POST was received
- ARINC would modify the PA/ESS SCU software to create, maintain, and update a table of up to 30 current and upcoming strings for every line of every zone of that station. This table would maintain the external content for the zones driven by that SCU. On start-up, the SCU would query the head-end table to populate this table.
- ARINC would modify the PA/ESS Sign Controller software to establish the .M2M Real Time Data (RTD) as the default display on all the signs.
 - The RTD default setting would be re-established at a configurable interval to assure that it does not "roll off" the sign. Thus, the content of the RTD fields would be displayed whenever the sign was not displaying an announcement.
 - The external data would be queued with other messages going to the signs and written to the appropriate RTD memory locations within each sign in a zone from the SCU (or head-end).
 - The time would be written asynchronously to the appropriate RTD memory location within the sign from the sign firmware.
 - All other message processing would be unchanged.

3.2.1.3 Superseding Earlier Messages

If a sign controller receives a new command that has a change to a line which precedes planned change(s) to a line it already has in memory, then it will replace all of the changes it has with values of t greater than the new value of t with the ones it has just received.

For example, suppose a sign controller received following commands at 2:59:30pm.

?sta=SULL&c=~m1~n1-"Oak Grove 5 min"&c=~n2-"Oak Grove 10 min"&c=t54000~m1~n1-"Oak Grove 4 min"&c=t45025~n2-"Oak Grove 9 min"

This can be understood as:

?sta=SULL	These commands are for SULL station.
&c=~m1~n1-"Oak Grove 5 min"	Immediately show "Oak Grove 5 min" on upper mezzanine and upper northbound lines.
&c=~n2-"Oak Grove 10 min"	Immediately show "Oak Grove 10 min" on lower northbound line.
&c=t54000~m1~n1-"Oak Grove 4 min"	At 3:00:00pm show "Oak Grove 4 min" on upper mezzanine and upper northbound lines.
&c=t45025~n2-"Oak Grove 9 min"	At 3:00:25pm show "Oak Grove 9 min" on lower northbound line.

Then, at 2:59:50pm it receives the following command:

?sta=SULL&c=~n2-"Oak Grove delayed"

?sta=SULL	These commands are for SULL station.
&c=~n2-"Oak Grove delayed"	Immediately show "Oak Grove delayed" on lower northbound line.

This would replace the instructions to display "Oak Grove 9 mins" on the lower northbound line because that is on the same line. The instructions to display "Oak Grove 5 mins" and then "Oak Grove 4 mins" on the upper mezzanine and northbound lines would be unaffected because they are different lines.

On the other hand, if at 2:59:55 the sign received the following message:

&sta=SULL&c=t54060~m1~n1-"Oak Grove 3 mins"

?sta=SULL	These commands are for SULL station.
&c=t54060~m1~n1-"Oak Grove 3 mins"	At 3:01:00pm show "Oak Grove 3 mins" on upper mezzanine and upper northbound lines.

That command would follow, not replace, the prior instructions for the upper mezzanine and northbound lines, because the t -value is later than the t -values of the prior instructions. The sign would continue to show "Oak Grove 5 mins" until 2:59:59pm, show "Oak Grove 4 mins" at 3:00:00pm, and show "Oak Grove 3 mins" at 3:01:00pm.

3.2.2 Automated Ad Hoc Announcement Implementation

The Ad Hoc Announcement User functions are replicated below.

3.2.2.1 Existing Ad Hoc Announcement Functionality

Ad Hoc Announcements are unplanned messages. Ad Hoc messages uses Text to Speech. The user can type a message into the message area and have the text converted to speech.

To create an Ad Hoc message, select **Ad Hoc Message** subtopic from the **Messages** topic. Refer to Figure 3 through Figure 6. Table 1 through Table 4 contain descriptions of the Ad Hoc Message fields.

Figure 3 Ad Hoc Message Subtopic – Message Tab

Table 1 Ad Hoc Message Fields	
Field	Description
Priority	Pick list that allows you to select the message priority. 1 = highest to 7 = lowest
Enter Text to Create Message	Text box that allows you to enter a message up to 511 characters.
Preview	Click to preview the audio portion of the Ad Hoc Message.

Table 1 Ad Hoc Message Fields

Field	Description
Clear Message Text	Clears the text that was entered into the Enter Text to Create Message textbox.

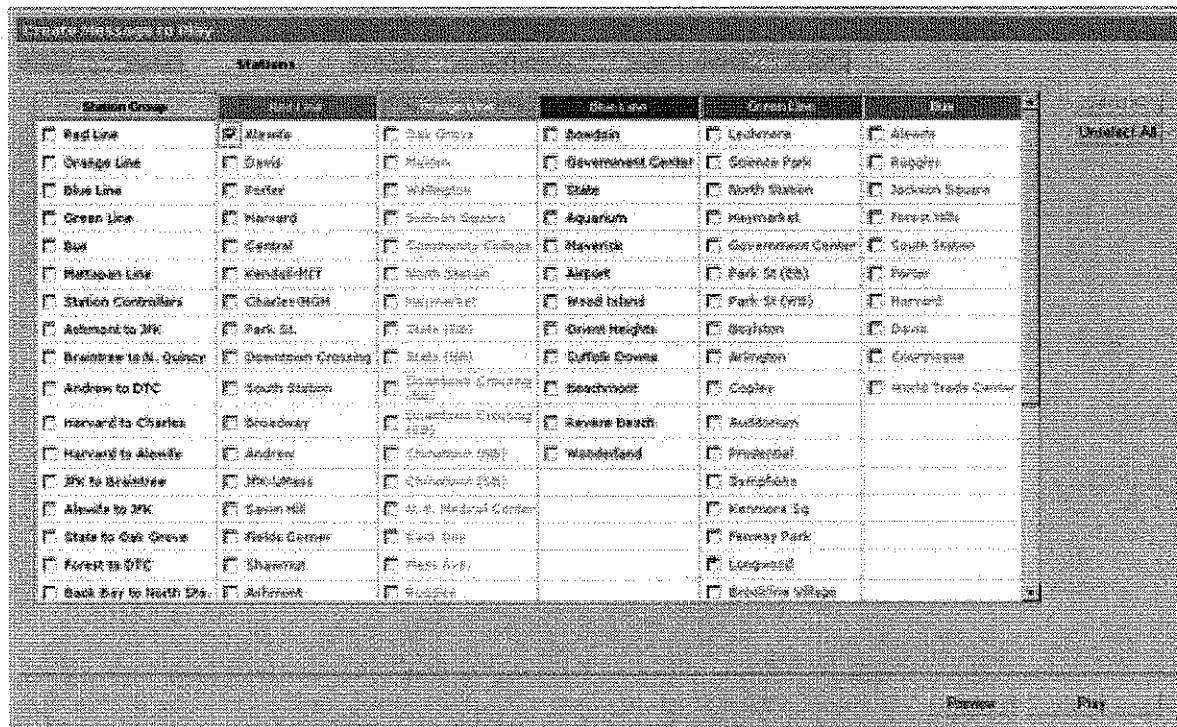


Figure 4 Ad Hoc Message Subtopic - Stations Tab

Table 2 Ad Hoc Message Fields – Stations Tab

Field	Description
Station Group	List allows you to select a station group to send messages to. (i.e., Red Line, Blue Line, etc.)
Selected Station	Stations are listed under the line they belong to. One or more stations or station groups may be selected for the destination. Note: At least one station must be selected and previewed before the message can be played.

Station	M2	CP	VE	EB	EB	WD	M2	AM	WD	MA	AA
<input checked="" type="checkbox"/> Alameda	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Davis	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Foster	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Harvard	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Central	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Kendall-MIT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Charles-MG	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Park St.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Downtown Crossing	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> South Station	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Broadway	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Andrew	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> 29th-UMass	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> South Mall	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Park Center	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 5 Ad Hoc Message Subtopic – Zones Tab

Table 3 Ad Hoc Message Fields – Zones Tab	
Field	Description
Line	Pick list that contains all available lines to view on the zones tab.
Station	Stations are listed under the line they belong to. One or more stations may be selected.
Zone Selection	List the available zones at a station where the announcement can play. Note: All zones are checked by default.
Status	Lists the status of the network, audio and visual media at a station.
Suspension	Lists whether manual (MA) or automated (AA) announcements are suspended at the station.

Schedule

Start Date: 02/08/2006 Start Time: 9:28 AM

End Date: 02/08/2006 End Time: 10:28 AM

Interval (hh:mm:ss): 1:00:00

☐ Sunday ☐ Tuesday ☐ Thursday ☐ Saturday

☐ Monday ☒ Wednesday ☐ Friday ☒ Check All

☐ Audio ☒ Visual Priority: 5

Schedule Reset

Preview Play

Figure 6 Ad Hoc Message Subtopic - Schedule Tab

Table 4 Ad Hoc Message Fields – Schedule Tab	
Field	Description
Start Date	The date the message is scheduled to be played.
Start Time	The time the message is scheduled to be played.
End Date	The date the message is scheduled to be stopped.
End Time	The time the message is scheduled to be stopped.
Interval (hh:mm:ss)	Time between scheduled plays for the message.
Days of the Week checkbox	Checkboxes that allows you to select what days the message should be played. (Sunday – Saturday) The Check All box will select everyday of the week.
Audio and Visual (read only)	Shows the checkboxes that were selected on the Message tab. Tells if the scheduled message is to be Audio or Visual or both.
Priority Level (read only)	Shows the message priority selected on the Message tab.

3.2.2.2 Proposed Automated Ad Hoc Announcement Functionality

ARINC would modify the head end software to accept data via HTTP posts and apply it as if it had been entered using the above screens.

This data would be posted to all head-end servers, including those in secondary mode and/or located in a backup control center.

This data would have the format:

- Post Data Fields

- *msg*={text message string}
- *pri*={ priority: 2 (emergency) -7 (lowest)} with the default = 5 if not specified
- *typ*={Play Control: 0,1 or 2} with default 0 if not specified, where
0= Audio & Video
1= Audio Only
2=Visual Only
- *sta*={4 character unique id of station followed by bits for the zones (MZ,CP,NB,SB,EB,WB)
Example : Red Line Alewife and Red Line Davis
(*sta*=RALE110000,RDAV101000)
Some stations have "non-standard" zones. May have to identify additional zone ID's – or these can be lumped with the listed zones or assigned to a new category – "Other".
- *grp*={All Stations, Red Line, Orange Line, Blue Line ,Green Line, Bus, Mattapan Line,...}
- *std*={start date: mmddyyyy} Default = current date
- *end*={end date: mmddyyyy} Default = current date
- *stt*={start time: hhmmAM/PM} Default = current time + one minute
- *ent*={end time: hhmmAM/PM} Default = current time + two minutes (one play)
- *int*={repeat interval: hh:mm:ss} Default = five minutes (one play with default start and end times)
- *tim*={1-600} (number of seconds to timeout if station busy, (defaults to 60 if not specified). You do NOT want the option to never time out, which is a vulnerability to a deliberate or accidental "denial of service attack".

- Post Data Field requirements and processing information
 - *'msg'* is a required field; if it is absent, the post will be ignored
 - Either *'sta'* or *'grp'* must be defined but not both; if both are defined, the post will be ignored
 - *'sta'*
 - Can be a comma separated list of station/zones
 - Must contain at least one valid station/zone combination or the post will be ignored.
 - If a zone and station combination is specified which is not configured in the system, no error shall occur and the PA/ESS system shall ignore it and correctly process the remaining station/zones
 - *'grp'*
 - Can only be one of the existing defined station groups. Announcement will play at the existing default zones for the stations in the group.
 - Must contain at least one valid station group or the post will be ignored.

Note that the PA/ESS is an interactive system. If an Automated Ad Hoc Announcement post contains inconsistencies, out-of-range or missing data, or other errors not previously identified as “ignorable”, the post will be ignored and an error message will be sent in response.

3.2.3 Automated Prerecorded Announcement Implementation

The available Prerecorded Announcement (Canned Message) User functions are replicated below. While the PA/ESS system allows users to create, store, and schedule canned messages and “macros”, the Automated Prerecorded Announcement functionality only allows external machines to *schedule* existing canned messages.

3.2.3.1 Existing Canned Message Functionality

Canned Messages are a series of prerecorded audio and visual takes. Each variable corresponds to a list box value. The list box values change according to the message variable selected.

To create a canned message, *select Canned Message* subtopic from the **Messages** topic. Refer to Figure 7 through Figure 12. Table 5 through Table 9 contains descriptions of the Canned Message fields.

ID	Description	Convert	Audio	Visual
1	Track Change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Alternative Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Global Service Disruption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76	Service Disruption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 7 Canned Message Subtopic – Message Tab

Table 5 Canned Message Fields – Message Tab	
Field	Description
Select Category	Pick list that allows you to select the message category.
Priority	Pick list that allows you to select the message priority.
Play Control	Select audio and/or visual message display
Play	The play button is disabled until the message is complete and a destination is selected. After the criteria is met the 'Play' button is enabled and the message is sent to the PA and signage.

Type	Textual Value
Attention Station Customers	Select Attention Station Customers
The Hour	Select The Hour
Minutes	Select Minutes
Time of Day	Select Time of Day
Direction Class	Select Direction Class
Stations	Select Stations
Track	Select Track
Track	Select Track

Figure 8 Canned Message Subtopic - Complete Tab

Table 6 Canned Message Fields – Complete Tab	
Field	Description
Message View Area	Initially shows the message template with information types. Selecting Update causes message to be shown with selected values for information types.
Information Select Area	Lists the message template information types and provides capability to enter values. Type – description of data to be entered Textual Value – pick list for selecting a value Note: A value for all information types must be provided before message can be played.

Select Canned Message

Stations

Station Group	Station	Station	Station Line	Station Line	Station
<input type="checkbox"/> Red Line	<input type="checkbox"/> Alewife	<input type="checkbox"/> Oak Grove	<input type="checkbox"/> Downtown Crossing	<input type="checkbox"/> North Station	<input type="checkbox"/> Alewife
<input type="checkbox"/> Orange Line	<input type="checkbox"/> Davis	<input type="checkbox"/> Indian	<input type="checkbox"/> Government Center	<input type="checkbox"/> Science Park	<input type="checkbox"/> Ruggles
<input type="checkbox"/> Blue Line	<input type="checkbox"/> Porter	<input type="checkbox"/> Washington	<input type="checkbox"/> State	<input type="checkbox"/> North Station	<input type="checkbox"/> Jackson Square
<input type="checkbox"/> Green Line	<input type="checkbox"/> Harvard	<input type="checkbox"/> Arborway Square	<input type="checkbox"/> Aquarium	<input type="checkbox"/> Haymarket	<input type="checkbox"/> Forest Hills
<input type="checkbox"/> Bus	<input type="checkbox"/> Center	<input type="checkbox"/> Government Center	<input type="checkbox"/> Maverick	<input type="checkbox"/> Government Center	<input type="checkbox"/> South Station
<input type="checkbox"/> Mattapan Line	<input type="checkbox"/> Kendall/MIT	<input type="checkbox"/> North Station	<input type="checkbox"/> Airport	<input type="checkbox"/> Park St (R)	<input type="checkbox"/> Porter
<input type="checkbox"/> Station Controllers	<input type="checkbox"/> Charles/MGH	<input type="checkbox"/> North Station	<input type="checkbox"/> World Island	<input type="checkbox"/> Park St (R)	<input type="checkbox"/> Harvard
<input type="checkbox"/> Ashmont to JFK	<input type="checkbox"/> Park St	<input type="checkbox"/> State (R)	<input type="checkbox"/> Orient Heights	<input type="checkbox"/> Airport	<input type="checkbox"/> Davis
<input type="checkbox"/> Braintree to N. Quincy	<input type="checkbox"/> Downtown Crossing	<input type="checkbox"/> State (R)	<input type="checkbox"/> Suffolk Downs	<input type="checkbox"/> Arlington	<input type="checkbox"/> Courthouse
<input type="checkbox"/> Andrew to OTC	<input type="checkbox"/> South Station	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Beachmont	<input type="checkbox"/> Center	<input type="checkbox"/> World Trade Center
<input type="checkbox"/> Harvard to Charles	<input type="checkbox"/> Braintree	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Revere Beach	<input type="checkbox"/> Audubon	
<input type="checkbox"/> Harvard to Alewife	<input type="checkbox"/> Andrew	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Wonderland	<input type="checkbox"/> Franklin	
<input type="checkbox"/> JFK to Braintree	<input type="checkbox"/> JFK/UMass	<input type="checkbox"/> Downtown Crossing (R)		<input type="checkbox"/> Symphony	
<input type="checkbox"/> Alewife to JFK	<input type="checkbox"/> South Hill	<input type="checkbox"/> N. R. Wadsworth Center		<input type="checkbox"/> Wadsworth Sq	
<input type="checkbox"/> State to Oak Grove	<input type="checkbox"/> Fields Corner	<input type="checkbox"/> Oak Grove		<input type="checkbox"/> Fenway Park	
<input type="checkbox"/> Forest to JFK	<input type="checkbox"/> Braintree	<input type="checkbox"/> Oak Grove		<input type="checkbox"/> Longwood	
<input type="checkbox"/> Oak Grove to North Sta.	<input type="checkbox"/> Ashmont	<input type="checkbox"/> Airport		<input type="checkbox"/> Franklin Village	

Select All

Figure 9 Canned Message Subtopic - Stations Tab

Select Canned Message

Stations

Station Group	Station	Station	Station Line	Station Line	Station
<input type="checkbox"/> Red Line	<input checked="" type="checkbox"/> Alewife	<input type="checkbox"/> Oak Grove	<input type="checkbox"/> Downtown Crossing	<input type="checkbox"/> North Station	<input type="checkbox"/> Alewife
<input type="checkbox"/> Orange Line	<input type="checkbox"/> Davis	<input type="checkbox"/> Indian	<input type="checkbox"/> Government Center	<input type="checkbox"/> Science Park	<input type="checkbox"/> Ruggles
<input type="checkbox"/> Blue Line	<input type="checkbox"/> Porter	<input type="checkbox"/> Washington	<input type="checkbox"/> State	<input type="checkbox"/> North Station	<input type="checkbox"/> Jackson Square
<input type="checkbox"/> Green Line	<input type="checkbox"/> Harvard	<input type="checkbox"/> Arborway Square	<input type="checkbox"/> Aquarium	<input type="checkbox"/> Haymarket	<input type="checkbox"/> Forest Hills
<input type="checkbox"/> Bus	<input type="checkbox"/> Center	<input type="checkbox"/> Government Center	<input type="checkbox"/> Maverick	<input type="checkbox"/> Government Center	<input type="checkbox"/> South Station
<input type="checkbox"/> Mattapan Line	<input type="checkbox"/> Kendall/MIT	<input type="checkbox"/> North Station	<input type="checkbox"/> Airport	<input type="checkbox"/> Park St (R)	<input type="checkbox"/> Porter
<input type="checkbox"/> Station Controllers	<input type="checkbox"/> Charles/MGH	<input type="checkbox"/> North Station	<input type="checkbox"/> World Island	<input type="checkbox"/> Park St (R)	<input type="checkbox"/> Harvard
<input type="checkbox"/> Ashmont to JFK	<input type="checkbox"/> Park St	<input type="checkbox"/> State (R)	<input type="checkbox"/> Orient Heights	<input type="checkbox"/> Airport	<input type="checkbox"/> Davis
<input type="checkbox"/> Braintree to N. Quincy	<input type="checkbox"/> Downtown Crossing	<input type="checkbox"/> State (R)	<input type="checkbox"/> Suffolk Downs	<input type="checkbox"/> Arlington	<input type="checkbox"/> Courthouse
<input type="checkbox"/> Andrew to OTC	<input type="checkbox"/> South Station	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Beachmont	<input type="checkbox"/> Center	<input type="checkbox"/> World Trade Center
<input type="checkbox"/> Harvard to Charles	<input type="checkbox"/> Braintree	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Revere Beach	<input type="checkbox"/> Audubon	
<input type="checkbox"/> Harvard to Alewife	<input type="checkbox"/> Andrew	<input type="checkbox"/> Downtown Crossing (R)	<input type="checkbox"/> Wonderland	<input type="checkbox"/> Franklin	
<input type="checkbox"/> JFK to Braintree	<input type="checkbox"/> JFK/UMass	<input type="checkbox"/> Downtown Crossing (R)		<input type="checkbox"/> Symphony	
<input type="checkbox"/> Alewife to JFK	<input type="checkbox"/> South Hill	<input type="checkbox"/> N. R. Wadsworth Center		<input type="checkbox"/> Wadsworth Sq	
<input type="checkbox"/> State to Oak Grove	<input type="checkbox"/> Fields Corner	<input type="checkbox"/> Oak Grove		<input type="checkbox"/> Fenway Park	
<input type="checkbox"/> Forest to JFK	<input type="checkbox"/> Braintree	<input type="checkbox"/> Oak Grove		<input type="checkbox"/> Longwood	
<input type="checkbox"/> Oak Grove to North Sta.	<input type="checkbox"/> Ashmont	<input type="checkbox"/> Airport		<input type="checkbox"/> Franklin Village	

Select All

Unselect All

Play

Figure 10 Canned Message Subtopic – Stations Tab – Selected Stations

Table 7 Canned Message Fields – Stations Tab	
Field	Description
Station Group	List allows you to select a station group to send messages to. (i.e., Red Line, Blue Line, etc.)
Selected Station	Stations are listed under the line they belong to. One or more stations or station groups may be selected for the destination. Note: At least one station must be selected and previewed before the message can be played.

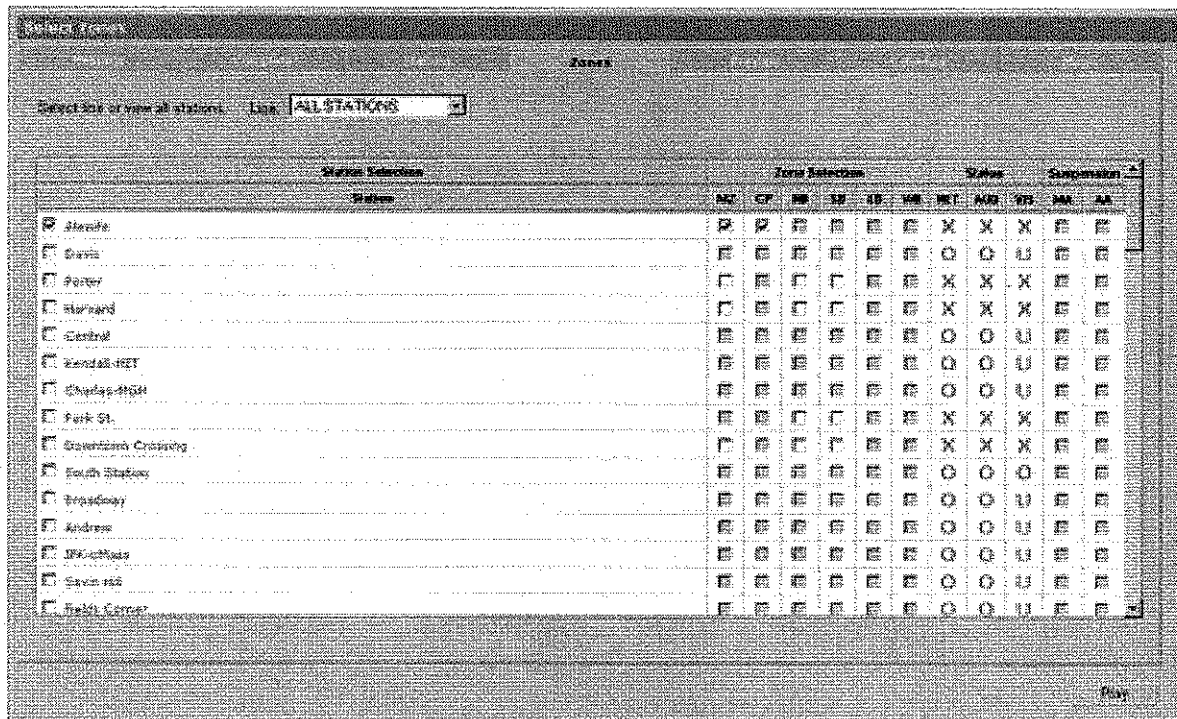


Figure 11 Canned Message Subtopic – Zones Tab

Table 8 Canned Message Fields – Zones Tab	
Field	Description
Line	Pick list that contains all available lines to view on the zones tab.
Station	Stations are listed under the line they belong to. One or more stations may be selected.
Zone Selection	List the available zones at a station where the announcement can play. Note: All zones are checked by default.
Status	Lists the status of the network, audio and visual media at a station.
Suspension	Lists whether manual (MA) or automated (AA) announcements are suspended at the station.

Schedule Message

Schedule

Start Date: 02/08/2006 Start Time: 9:26 AM

End Date: 02/08/2006 End Time: 10:26 AM

Interval (hh:mm:ss): 1:00:00

☐ Sunday ☐ Tuesday ☐ Thursday ☐ Saturday

☐ Monday ☒ Wednesday ☐ Friday ☒ Check All

☐ Audio ☒ Visual Priority: 5

Schedule Reset

Play

Figure 12 Canned Message Subtopic - Schedule Tab

Table 9 Canned Message Fields – Schedule Tab	
Field	Description
Start Date	The date the message is scheduled to be played.
Start Time	The time the message is scheduled to be played.
End Date	The date the message is scheduled to be stopped.
End Time	The time the message is scheduled to be stopped.
Interval (hh:mm:ss)	Time between scheduled plays for the message.
Days of the Week checkbox	Checkboxes that allow you to select what days the message should be played. (Sunday – Saturday) The Check All box will select every day of the week.
Priority Level (read only)	Shows the message priority selected on the Message tab.
Audio and Visual (read only)	Shows the checkboxes that were selected on the Message tab. Tells if the scheduled message is to be Audio or Visual or both.

3.2.3.2 Scheduling a Canned Message from the GUI

1. *Select* the **Canned Message** subtopic from the **Messages Screen**.
2. On the **Message** tab *select* the desired components.
3. *Enter* the requested information on all other tabs.
 - A. *Select* **Complete** tab - Figure 8 and Table 6.
 - *Select* message components.
 - *Select* **Update**; verify the message that appears in the window is correct.
 - B. *Select* **Stations** tab - Figure 10 and Table 7.
 - **Stations/Groups** *select* one or **Select All** button**Note:** The Play button is enabled after selecting a Station/Group ID and the message is completed in Step A.
 - C. *Select* **Zones** tab.
 - Enter a Zone for the station or leave as default.
 - D. *Select* **Schedule** tab - Figure 12 and Table 9
 - *Enter* the requested information. (start/end dates and times, interval, and day(s) of the week)
 - *Select* the **Schedule** button.
4. *Select* **Play** to send the message.

3.2.3.3 Proposed Automated Prerecorded Announcement Functionality

ARINC would modify the head end software to accept data via HTTP posts and apply it as if it had been entered using the above screens, allowing external machines to *schedule* existing canned messages.

This data would be posted to all head-end servers, including those in secondary mode and/or located in a backup control center.

This data would have the format:

- Post Data Fields

- *mid*={ message id: 1-n} Each prerecorded message has a unique numeric ID; ARINC will provide a list of the existing prerecorded messages with their IDs.
- *var*={text entries for variable fields} see Figure 8; ARINC will provide a list of the existing prerecorded entries with their IDs. There will be one 'var=' post data field for each variable field entry; extra 'var=' post data fields will be ignored; and too few 'var=' post data fields will be treated as an error.
- *pri*={priority: 2 (emergency) -7 (lowest)} with the default stored with the message if not specified
- *typ*={Play Control: 0,1 or 2} with default 0 if not specified, where
 - 0= Audio & Video
 - 1= Audio Only
 - 2=Visual Only
- *sta*={4 character unique id of station followed by bits for the zones (MZ,CP,NB,SB,EB,WB). If no zones are selected the default stored with the message would be used.
 Example : Red Line Alewife and Red Line Davis
 (*sta*=RALE110000,RDAV101000)
 Some stations have "non-standard" zones. May have to identify additional zone ID's – or these can be lumped with the listed zones or assigned to a new category – "Other".
- *grp*={All Stations, Red Line, Orange Line, Blue Line ,Green Line, Bus, Mattapan Line,...}
- *std*={start date: mmddyyyy} Default = current date
- *end*={end date: mmddyyyy} Default = current date
- *stt*={start time: hhmmAM/PM} Default = current time + one minute
- *ent*={end time: hhmmAM/PM} Default = current time + two minutes (one play)
- *int*={repeat interval: hh:mm:ss} Default = five minutes (one play with default start and end times)

- *tim*={1-600} (number of seconds to timeout if station busy, (defaults to 60 if not specified). You do NOT want the option to never time out, which is a vulnerability to a deliberate or accidental “denial of service attack”.
- Post Data Field requirements and processing information
 - '*mid*' is a required field; if it is absent or invalid, the post will be ignored.
 - If the message specified by '*mid*' has variable fields, '*var*' is a required field.
 - Either '*sta*' or '*grp*' must be defined but not both; if both are defined, the post will be ignored
 - '*sta*'
 - Can be a comma separated list of station/zones
 - Must contain at least one valid station/zone combination or the post will be ignored.
 - If a zone and station combination is specified which is not configured in the system, no error shall occur and the PA/ESS system shall ignore it and correctly process the remaining station/zones
 - '*grp*'
 - Can only be one of the existing defined station groups. Announcement will play at the existing default zones for the stations in the group.
 - Must contain at least one valid station group or the post will be ignored.

Note that the PA/ESS is an interactive system. If an Automated Prerecorded Announcement post contains inconsistencies, out-of-range or missing data, or other errors not previously identified as “ignorable”, the post will be ignored and an error message will be sent in response.

Note that the PA/ESS allows authorized Users to create their own messages and takes. ARINC is not responsible for the content or consistency (i.e., between the audio and text versions) of any messages or takes that ARINC did not provide.

3.3 Interaction Between Display Functions

These display functions necessarily interact. Their interactions are prioritized as follows:

- The RTD display fields will be the default display. Their content will be on the sign whenever it is not displaying a scheduled or immediate text announcement.
- When external RTD content is supplied, it will include (or default to) an expiration time. The SCU will upload the external content to the sign RTD buffers, overwriting the current content of those buffers, and reset the expiration time to the new value. Once the expiration time has elapsed, the SCU will blank those lines.
- When a scheduled or immediate text announcement (which includes external ad Hoc and Prerecorded announcements) is received by the SCU, it is sent to the signs, which display it in place of the default RTD buffer content and in accordance with the announcement parameters selected.

3.4 Implementation

Upon notice to proceed, ARINC will provide a detailed project schedule within the following parameters.

- Implementation Overview
 - This statement of work consists of two phases.
 - Phase I consists of all features in this document *except* for the scheduling of Remote Sign Content. In phase 1 all remote sign content messages will be displayed as appropriate as soon as they are received by the SCU.. Phase I is included in the base award.
 - Phase II consists of the addition of Remote Sign Content scheduling. Phase II is a firm fixed-price option which the MBTA may elect to exercise at any time within 6 months of the final acceptance of Phase 1.
- See attached Implementation Schedule

MBTA PA/ESS Countdown Assumptions

The following assumptions affect the pricing of the MBTA PA/ESS Countdown proposal, ARINC Project 798792.

Business Assumptions

1. **New Servers:** The MBTA will provide two new servers to upgrade the servers currently hosting the PA/ESS head-end software in the OCC.
 - a. The MBTA will provide one of those new servers to ARINC in a timely manner to support development.
 - b. With those two new servers, the MBTA will provide Windows Server 2008 Enterprise edition and Oracle 11g.
2. **Warranty:** The software functionality provided under this contract is warranted to perform in accordance with the Statement of Work. That implied warranty will be discharged upon completion of deployment.
 - a. General warranty/maintenance of the PA/ESS software will be included under a separate maintenance contract, currently under negotiation with the MBTA.
3. **Bonds:** ARINC will not post any bond for this contract.
4. **Liquidated Damages:** There are no liquidated damages associated with this contract.
5. **Other Contract Provisions:** There are no provisions for taxes, DBE participation, or non-standard insurance associated with this contract.
6. **Payment Milestones:** ARINC's price is contingent upon negotiating a mutually acceptable, neutral cash flow payment schedule.

Phase 1 payment will be in accordance with the schedule stated below. Net 30 days.

Milestone	Time	% of Contract Value
Mobilization	NTP	20%
Progress Payment Month 1	NTP + 1 month	15%
Progress Payment Month 2	NTP + 2 months	15%
Progress Payment Month 3	NTP + 3 months	15%
Progress Payment Month 4	NTP + 4 months	15%
On-Site STP Complete	Milestone	7%
Pilot Implementation & Deployment Complete	Milestone	13%
Totals:		100 %

Phase 2 payment will be in accordance with the schedule stated below. Net 30 days.

Milestone	Time	% of Contract Value
Mobilization	NTP	20%
Progress Payment Month 1	NTP + 1 month	10%
Progress Payment Month 2	NTP + 2 months	10%
Progress Payment Month 3	NTP + 3 months	10%
Progress Payment Month 4	NTP + 4 months	10%
Progress Payment Month 5	NTP + 5 months	10%
On-Site STP Complete	Milestone	10%
Pilot Implementation Test Complete	Milestone	5%
Deployment Complete	Milestone	15%
Totals:		100 %

7. **T's & C's:** ARINC's price is subject to mutually acceptable terms and conditions.
8. **Software Licensing:** ARINC has already granted software rights to the MBTA under an existing license. No additional licensing is required.

Technical Assumptions

9. ARINC will not provide formal status reports or updated schedules.
10. The MBTA will provide a live data feed or simulator to support development.
11. ARINC assumes that the OCC installation and STP execution can be completed in 4 days.
12. ARINC assumes that the Pilot station installation and STP execution can be completed in 2 weeks.
13. ARINC assumes that the Station Deployments will be completed at the rate of 2.5 per day.
14. ARINC assumes that Final Acceptance consists solely of successfully executing the existing System Test Plan described in the SOW.
15. ARINC assumes that the MBTA's network infrastructure is adequate to carry the message traffic resulting from the additional functionality described in the SOW.
16. Note that there is no synchronization between scheduled or immediate text announcements and the RTD display.
 - a. There is no guaranteed minimum display time for RTD messages.
 - b. There is no guarantee that an RTD message that is scheduled to play at the same time as a scheduled or immediate text announcement will display at all.
17. The MBTA will be responsible for all mechanical installation of the new servers in the test bed and OCC Head-End racks.
18. ARINC will not provide any updated drawings or other documentation under this contract.

MBTA PA/ESS Countdown Assumptions

The following assumptions affect the pricing of the MBTA PA/ESS Countdown proposal, ARINC Project 798792.

Business Assumptions

1. **New Servers:** The MBTA will provide two new servers to upgrade the servers currently hosting the PA/ESS head-end software in the OCC.
 - a. The MBTA will provide one of those new servers to ARINC in a timely manner to support development.
 - b. With those two new servers, the MBTA will provide Windows Server 2008 Enterprise edition and Oracle 11g.
2. **Warranty:** The software functionality provided under this contract is warranted to perform in accordance with the Statement of Work. That implied warranty will be discharged upon completion of deployment.
 - a. General warranty/maintenance of the PA/ESS software will be included under a separate maintenance contract, currently under negotiation with the MBTA.
3. **Bonds:** ARINC will not post any bond for this contract.
4. **Liquidated Damages:** There are no liquidated damages associated with this contract.
5. **Other Contract Provisions:** There are no provisions for taxes, DBE participation, or non-standard insurance associated with this contract.
6. **Payment Milestones:** ARINC's price is contingent upon negotiating a mutually acceptable, neutral cash flow payment schedule.

Phase 1 payment will be in accordance with the schedule stated below. Net 30 days.

Milestone	Time	% of Contract Value
Mobilization	NTP	20%
Progress Payment Month 1	NTP + 1 month	15%
Progress Payment Month 2	NTP + 2 months	15%
Progress Payment Month 3	NTP + 3 months	15%
Progress Payment Month 4	NTP + 4 months	15%
On-Site STP Complete	Milestone	7%
Pilot Implementation & Deployment Complete	Milestone	13%
Totals:		100 %

Phase 2 payment will be in accordance with the schedule stated below. Net 30 days.

Milestone	Time	% of Contract Value
Mobilization	NTP	20%
Progress Payment Month 1	NTP + 1 month	10%
Progress Payment Month 2	NTP + 2 months	10%
Progress Payment Month 3	NTP + 3 months	10%
Progress Payment Month 4	NTP + 4 months	10%
Progress Payment Month 5	NTP + 5 months	10%
On-Site STP Complete	Milestone	10%
Pilot Implementation Test Complete	Milestone	5%
Deployment Complete	Milestone	15%
Totals:		100 %

7. **T's & C's:** ARINC's price is subject to mutually acceptable terms and conditions.
8. **Software Licensing:** ARINC has already granted software rights to the MBTA under an existing license. No additional licensing is required.

Technical Assumptions

9. ARINC will not provide formal status reports or updated schedules.
10. The MBTA will provide a live data feed or simulator to support development.
11. ARINC assumes that the OCC installation and STP execution can be completed in 4 days.
12. ARINC assumes that the Pilot station installation and STP execution can be completed in 2 weeks.
13. ARINC assumes that the Station Deployments will be completed at the rate of 2.5 per day.
14. ARINC assumes that Final Acceptance consists solely of successfully executing the existing System Test Plan described in the SOW.
15. ARINC assumes that the MBTA's network infrastructure is adequate to carry the message traffic resulting from the additional functionality described in the SOW.
16. Note that there is no synchronization between scheduled or immediate text announcements and the RTD display.
 - a. There is no guaranteed minimum display time for RTD messages.
 - b. There is no guarantee that an RTD message that is scheduled to play at the same time as a scheduled or immediate text announcement will display at all.
17. The MBTA will be responsible for all mechanical installation of the new servers in the test bed and OCC Head-End racks.
18. ARINC will not provide any updated drawings or other documentation under this contract.