Sign System Upgrade

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David Rojas, TPM

Signal & Train Control Program

SIITS, Technology Services & Integration

Key Part of a Huge Project

Fiber optic link between Legacy West Portal OCC and new TMC at 1455 Market

Fiber based broadband data network/switches throughout subway

New UPS' for new installed systems

New facilities command and control system (SCAD)

New motive (traction) power command and control system

Integrated audio/video management system at TMC

New HVAC equipment for subway equipment rooms

New station signs systems

All civil works to support

Remember this?

Finally full color bright LED signs!


```
11:45am  INBOUND
J 8, 12   L 1, 16   N 7, 21
K 2, 20   M 5, 35   T 12, 30
Public message line here
```

```
11:45am  OUTBOUND
J 8, 12   L 1, 16   N 7, 21
K 2, 20   M 5, 35   T 12, 30
Public message line here
```

```
K   2-CAR    8 MIN, 15 MIN
L   1-CAR    12 MIN, 17 MIN
M   2-CAR    22 MIN, 26 MIN
11:45am  Public message line
```

```
M  OCEAN VIEW
   BALVOA PARK
J 8, 12  L 1, 16  N 7, 21
K 2, 20  M 5, 35  T 12, 30
```

Messages

Messages are building blocks of passenger information. They are text linked with audio.

6   Message Explorer

The Message Explorer allows users to create new messages and modify existing messages. Messages consist of audio, sign text, and other identifying information such as name, description, and notes.

6.1   Message Explorer > General Overview

The window is divided into three panels arranged from left to right. The first panel contains an expandable tree of message categories. Selecting a category will display the associated messages in adjacent branch. There is a New and a Delete button to add or remove entries. The second panel contains specific announcement messages which will change depending on what item in the tree menu is selected. There is a scrollbar for navigation as well as New and Delete buttons used to add or remove entries. The remaining two thirds of the window is populated by a panel which is used to edit the properties of the currently selected message. A depiction of the Message Explorer Window can be seen in Figure 6-1: Message Explorer.
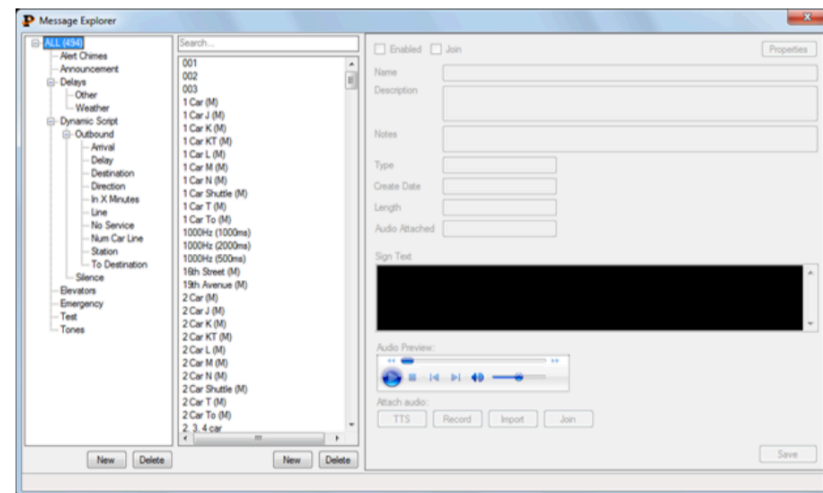

FIGURE 6-1: MESSAGE EXPLORER

Schedules

Schedules are messages with additional attributes attached such as time, location to be played, priority.

3   Schedule Explorer

The SCHEDULE EXPLORER is used to build messages and schedule messages to play at specific times on specific devices or groups of devices. The Schedule Explorer window contains a navigation tree and a message panel on the *left* and a workspace on the *right* which contains panels for Basic Information, Start and Stop, Repeat Settings, Restrictions, Link Devices, and Attach Messages. There is also a Save button on the *bottom right*. This is shown below in Figure 3-1: Schedule Explorer.
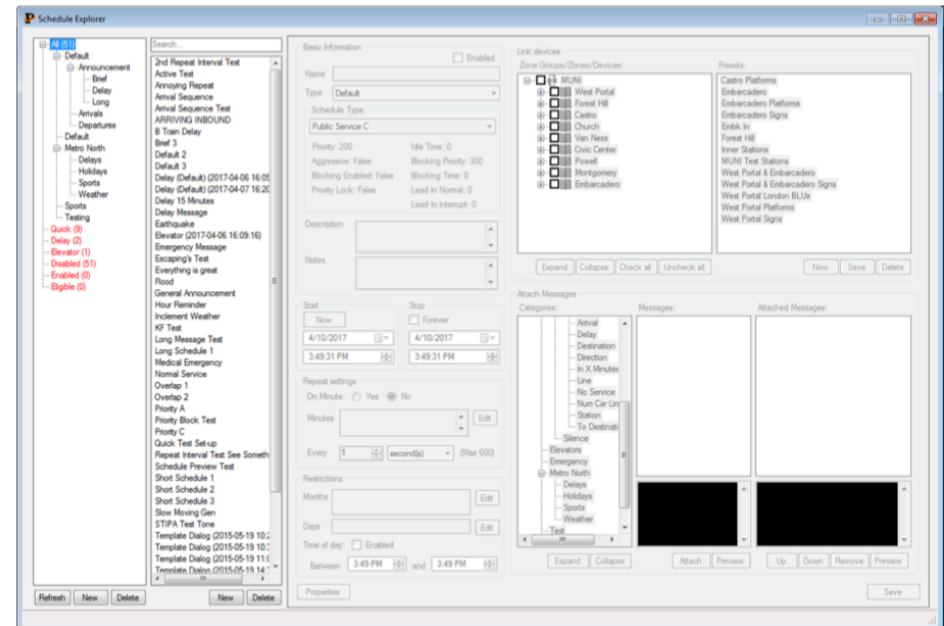

FIGURE 3-1: SCHEDULE EXPLORER

Suite of functions available

Schedule
Schedule scripts to run with configurable parameters.

Delay
Activate a delay message in under five seconds.

Exception Modes
Filter the types of information that signs display.

Messages
View, add, edit, and delete messages to be used in scripts.

Select
Deliver adhoc messages and view status of devices.

Quick Schedule
Activate schedules with read-only presets.

Template Dialog
Opens the Template Dialog. Different templates can be created and saved to serve as a base for messages.

Services
Launches the Penta Services Manager, allowing administrators to configure how services are distributed across primary and backup servers.

Elevator
Set information announcements about offline elevators.

Status OK / Alert
View and address alarms.

Schedule Status
See a summary of messages that are playing and recently played messages.

Chat
Send text messages to other users.

Settings
View software version, configure connection, update database records, etc.

Elevator outages

7 Elevator

The Elevator TOOLBAR icon launches the ELEVATOR OUT-OF-SERVICE DIALOG (Figure 7-1). This window is used to set station announcements in the event that an SFMTA elevator is down for maintenance.
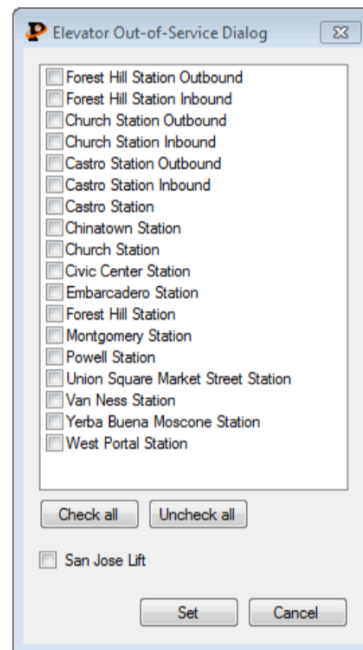
FIGURE 7-1: ELEVATOR OUT-OF-SERVICE DIALOG

Quick delay messages

8 Delay Dialog

The DELAY DIALOG allows for delay messages to be quickly composed and scheduled for immediate playback. The window, as shown in Figure 8-1 below, is divided into three panels. Selectable templates are on the *left*, a workspace to create a message using the selected template is in the *middle*, and a list of stations is on the *right*. There are also Create and Close buttons at the *bottom right* corner of the screen.

Clicking the Create button will schedule the message for immediate playback at the selected stations. This schedule may be edited or deleted via the Schedule Explorer.

Clicking the Close button will close the DELAY DIALOG and return the user to the user to the WavWriterII TOOLBAR.
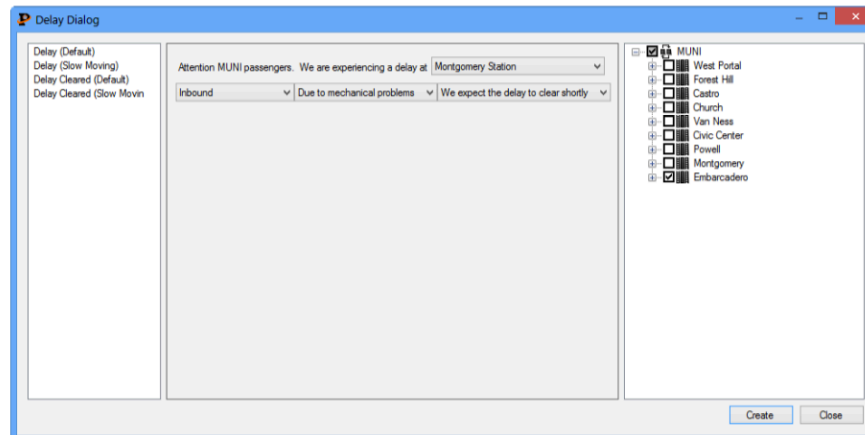

FIGURE 8-1: DELAY DIALOG

Other templates

9 Template Dialog

The TEMPLATE DIALOG is used to quickly compose new messages using a series of drop-down menus. The window is divided into three sections. On the *left* panel is a list box of existing templates. The *center* panel contains a workspace where new messages may be constructed based on the chosen template. The *right* panel contains an expandable tree showing zone groups, zones, and then individual devices that a template can be assigned to.
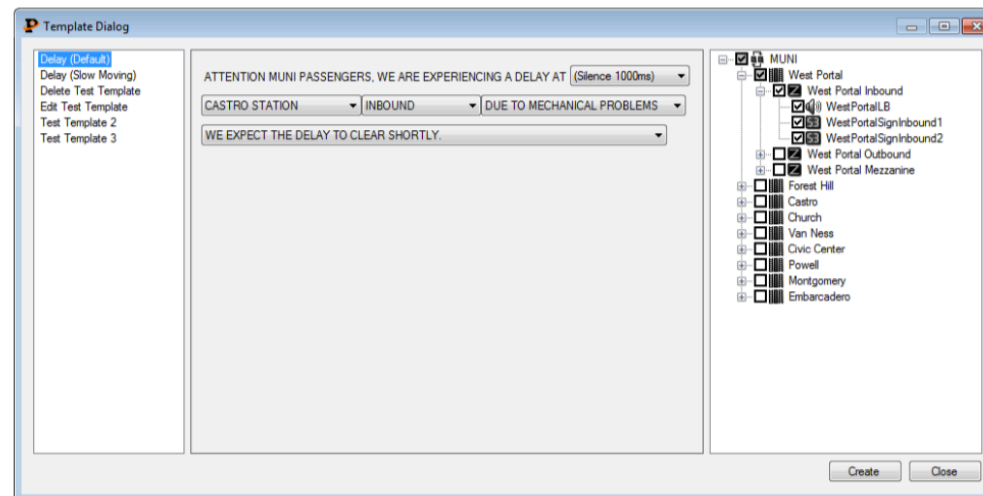
Live announcements

11 Select Dialog

The SELECT DIALOG allows ad-hoc messages to be made to different station zones.

It contains a navigation tree on the *left* panel, a panel of presets in the *center*, and various controls on the *right*. There is also a File menu at the *top* and a status bar at the *bottom*.
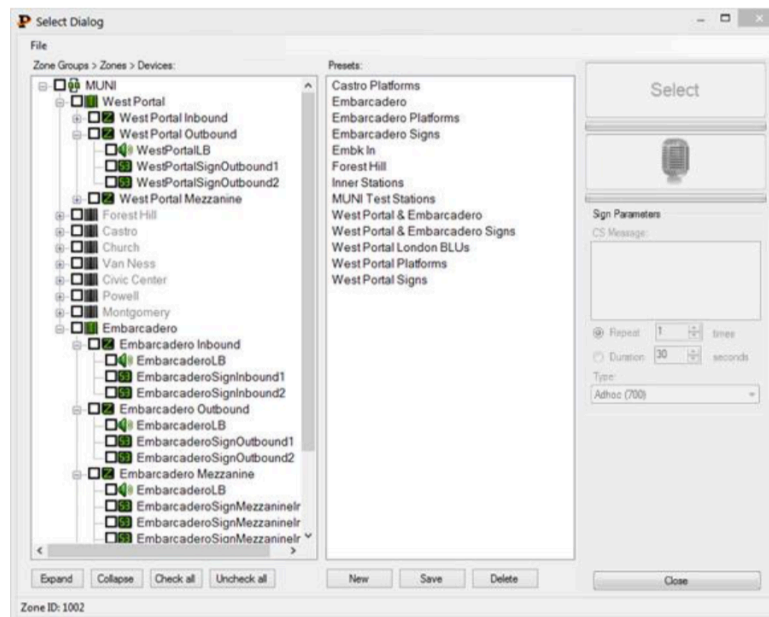

FIGURE 11-1: SELECT DIALOG

Managing passenger ETA/arrival information

13 Exception Modes

The EXCEPTION MODES window is accessed by clicking its icon in the TOOLBAR. The Exception Modes window is used to turn-off NextBus, Prediction, or Arrival feeds for platforms and signs. This is useful during periods of maintenance.

13.1 Enabling Exceptions at Specific Platforms

To turn-off a feed at a station platform, first click the name of the platform to act on. Then uncheck the checkbox or checkboxes corresponding services and lines that are offline. The color of the platform name will turn to red (Figure 13-2) to indicate that a service is disabled at this platform. The EXCEPTION MODES window may be closed at this point and the disabled services will remain that way. When it is time to re-enable a service, simply reopen the EXCEPTION MODES window and check the boxes that were unmarked previously. The corresponding platform or platforms will change back to black and the window may be closed.
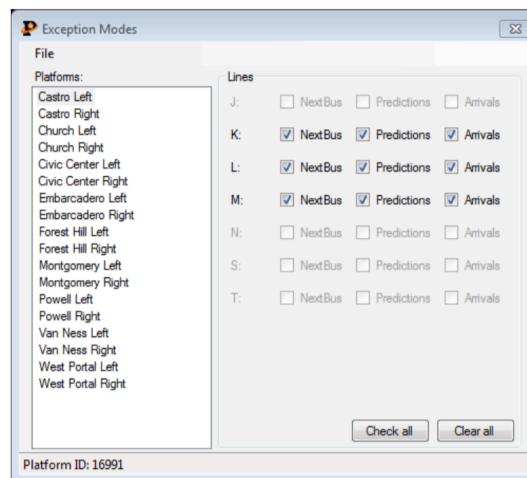
FIGURE 13-1: EXCEPTION MODES WINDOW – NO EXCEPTIONS SET

Customizations for SFMTA/Muni

Train arrival prediction information from Nextbus: vehicle number, scheduling information, time to arrival

Subway status information from train control: train number, arrivals, mode changes, entry, exit, track section. Primarily used for arrival at platform and delay annunciation.

System Block Diagram
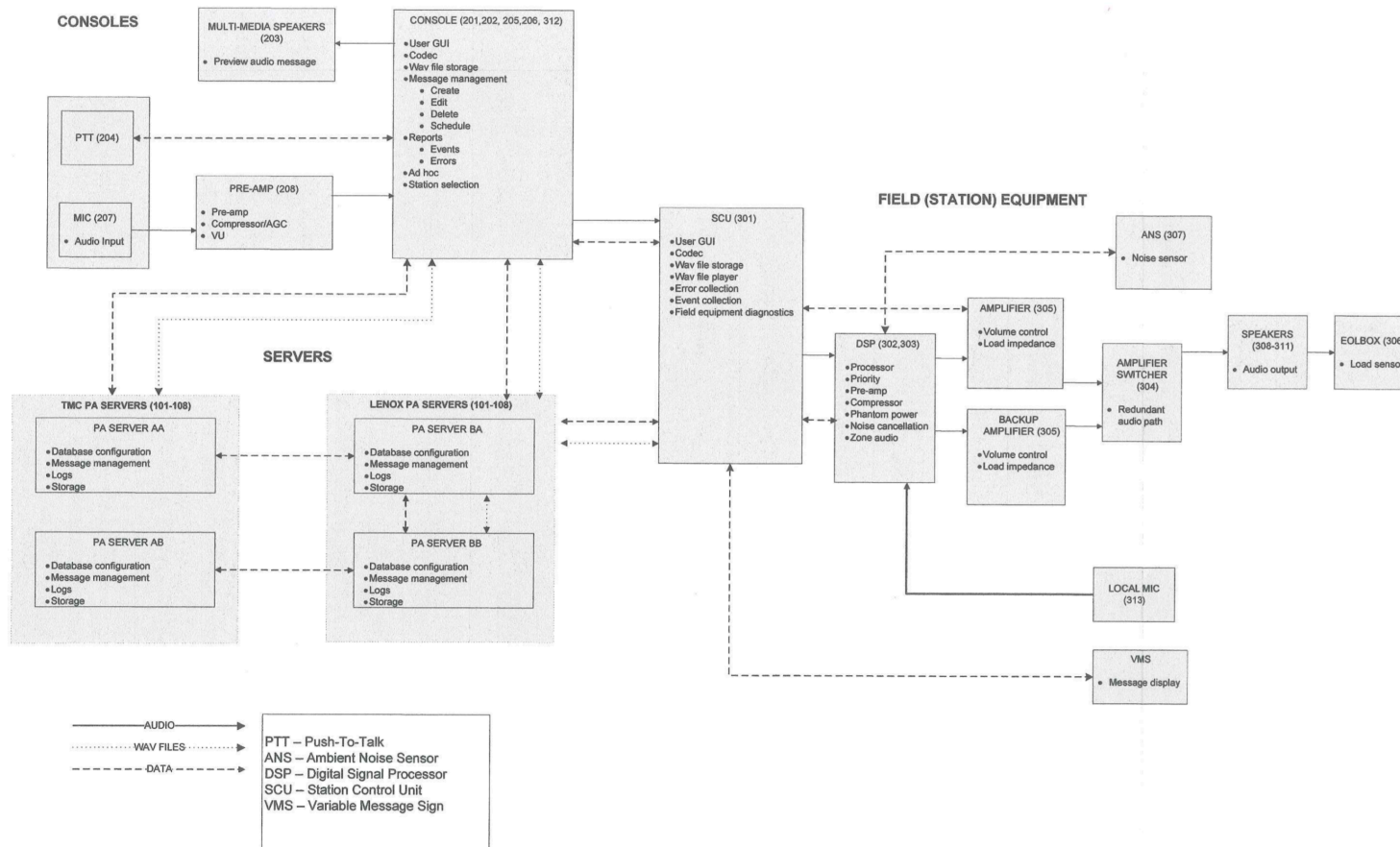
Console Block Diagram

User GUI and live
announcement interface.

CONSOLES

MULTI-MEDIA SPEAKERS (203)
- Preview audio message

CONSOLE (201,202, 205,206, 312)
- User GUI
- Codec
- Wav file storage
- Message management
  - Create
  - Edit
  - Delete
  - Schedule
- Reports
  - Events
  - Errors
- Ad hoc
- Station selection

PTT (204)

PRE-AMP (208)
- Pre-amp
- Compressor/AGC
- VU

MIC (207)
- Audio Input
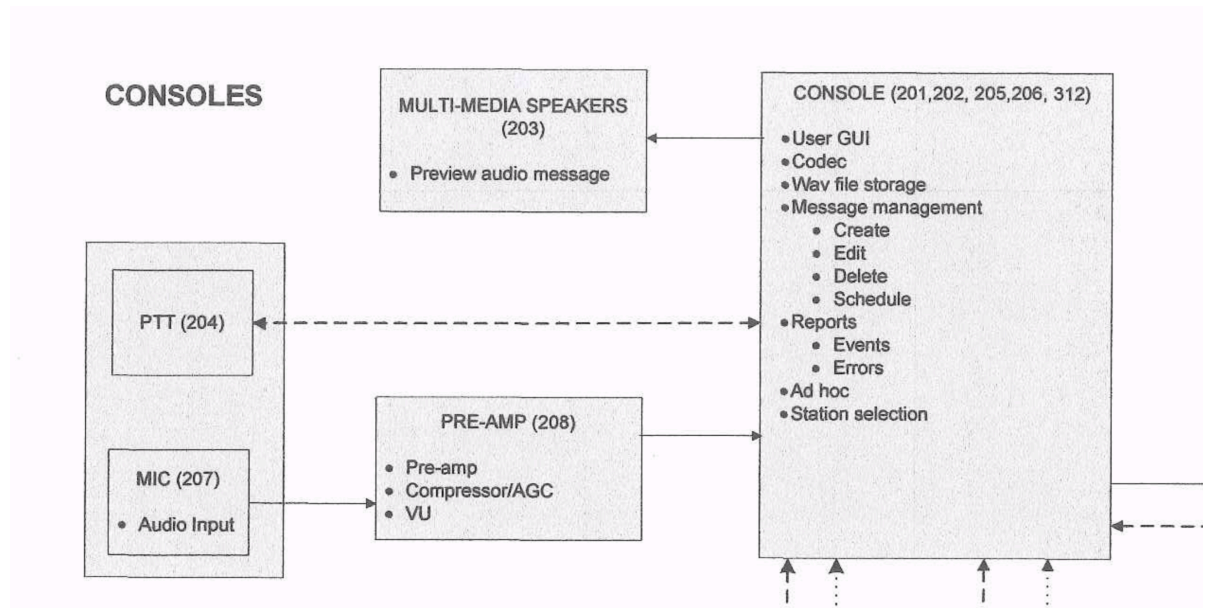
Head-end servers

Each PA Server has a copy of the database that stores messages, logs, schedule information, and alarms. The servers are configured in a redundant fault tolerant format.

SERVERS

TMC PA SERVERS (101-108)	LENOX PA SERVERS (101-108)
PA SERVER AA • Database configuration • Message management • Logs • Storage	**PA SERVER BA** • Database configuration • Message management • Logs • Storage
PA SERVER AB • Database configuration • Message management • Logs • Storage	**PA SERVER BB** • Database configuration • Message management • Logs • Storage
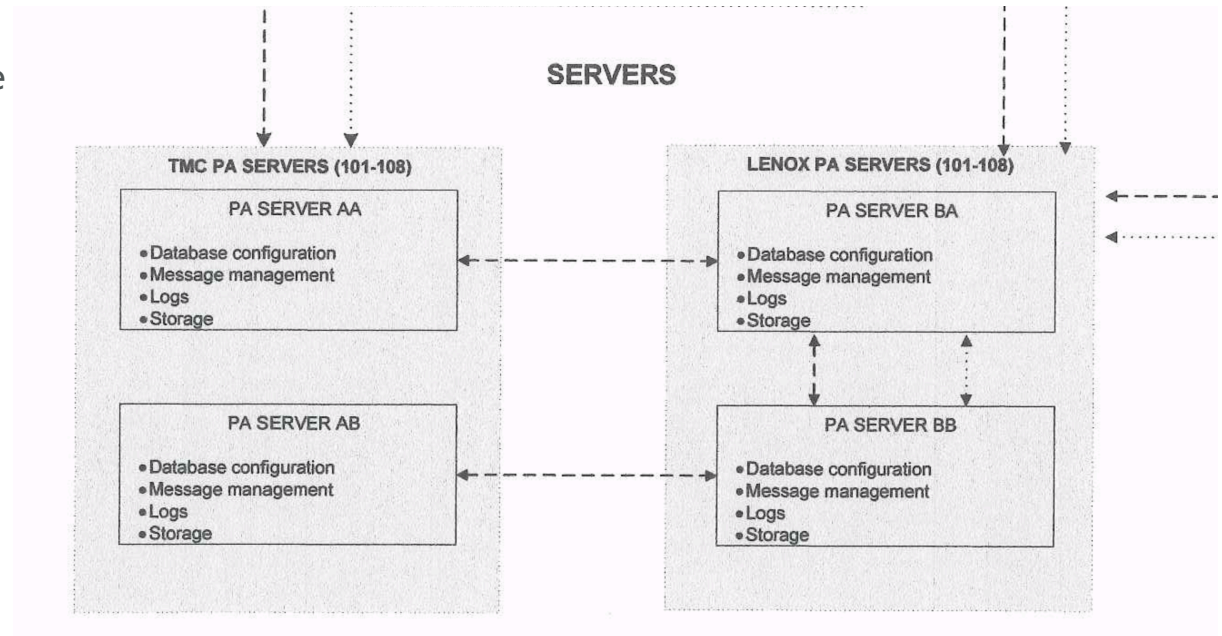
Field Equipment in every station

Station computer audio software application receives commands from the PA server to play prerecorded message to the field. This reduces network bandwidth. When a request is received from the PA Server, the computer plays the audio using the Windows on-board soundcard. The analog audio is then sent to the London BLU.

FIELD (STATION) EQUIPMENT

SCU (301)
- User GUI
- Codec
- Wav file storage
- Wav file player
- Error collection
- Event collection
- Field equipment diagnostics

DSP (302,303)
- Processor
- Priority
- Pre-amp
- Compressor
- Phantom power
- Noise cancellation
- Zone audio

AMPLIFIER (305)
- Volume control
- Load impedance

BACKUP AMPLIFIER (305)
- Volume control
- Load impedance

ANS (307)
- Noise sensor

AMPLIFIER SWITCHER (304)
- Redundant audio path

SPEAKERS (308-311)
- Audio output

EOLBOX (306)
- Load sensor

LOCAL MIC (313)

VMS
- Message display

Station Agent Computer

Allows station agent to make live announcements.

Station Signs

Image is created in the computer in the sign. Output to image controller for further processing and distribution of image data internally.

Circuit Breaker

Single Board Computer (SBC)

Image Controller

HDMI to DVI Cable

Fuse (10)

Filter

D-120A PSU — 1

RSP-200-5 PSU (8) — 8 6 4 2

9 7 5 3

Globus Controller (4)

Display Board (16)

USB A to USB B Cable

Light Sensor (2)
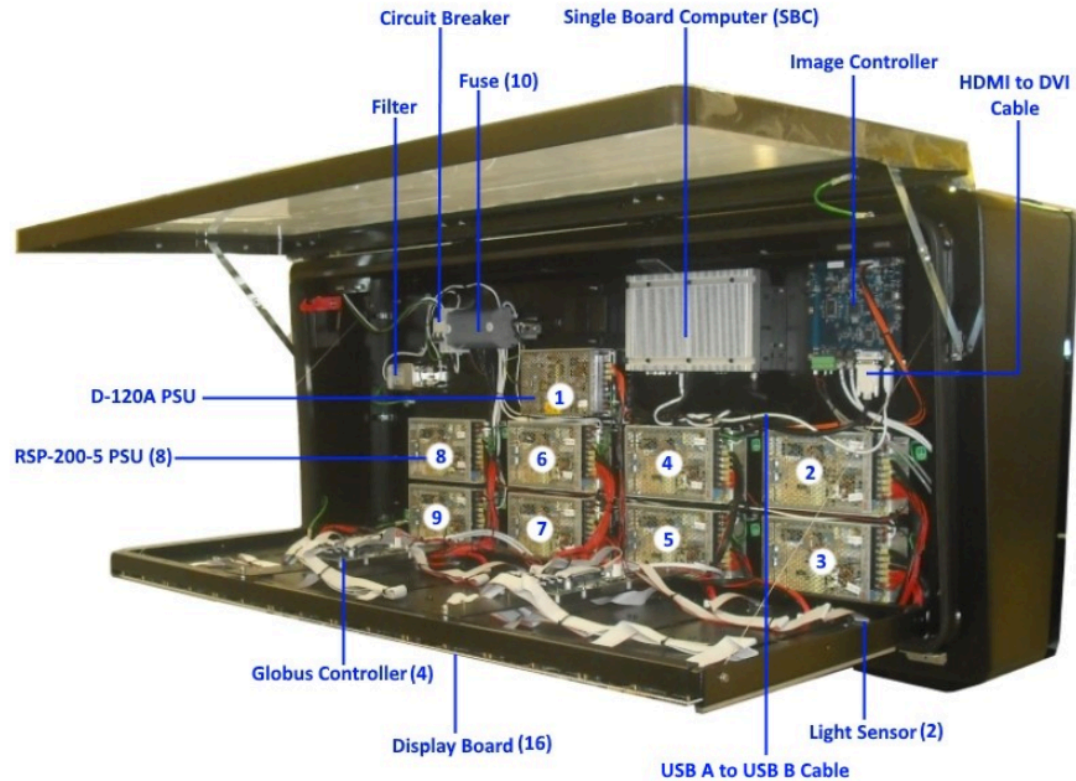
Single Board Computer

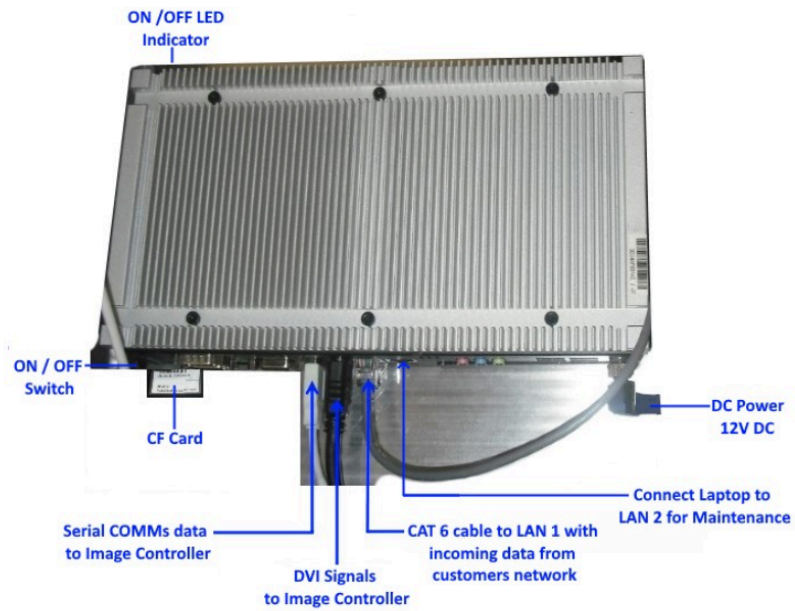# Image controller board

Interface between the single board computer that produces DVI image and low level LED controller boards. Input is DVI and output is two cat5 cables outputting LVDS (low voltage differential signaling) low latency very high data rate feeds. Each cat5 feeds one side of the sign, or two display buffers.
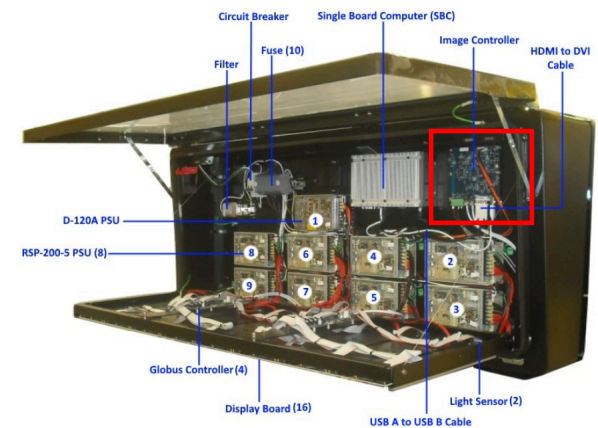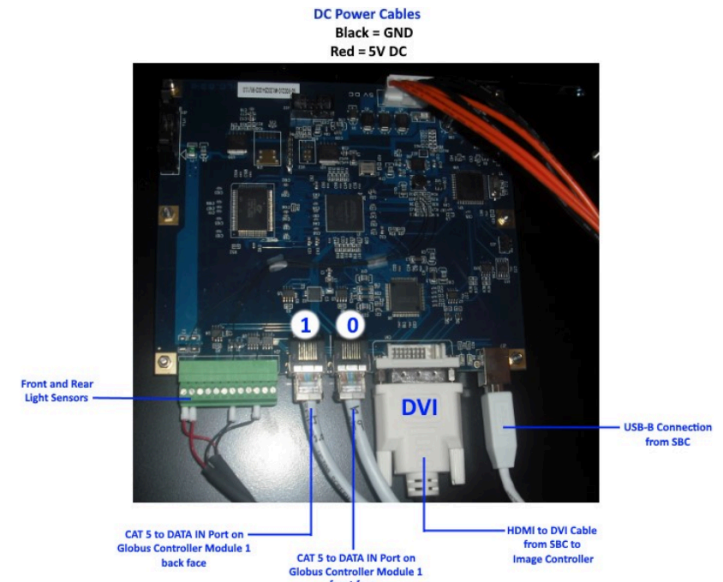
LED Display Buffers

The buffer module are daisy chained using cat5 on each side of the sign back to image controller. Each buffer controls four display panels. Two buffers per side. Each buffer can control 16k pixels, 32 bps.
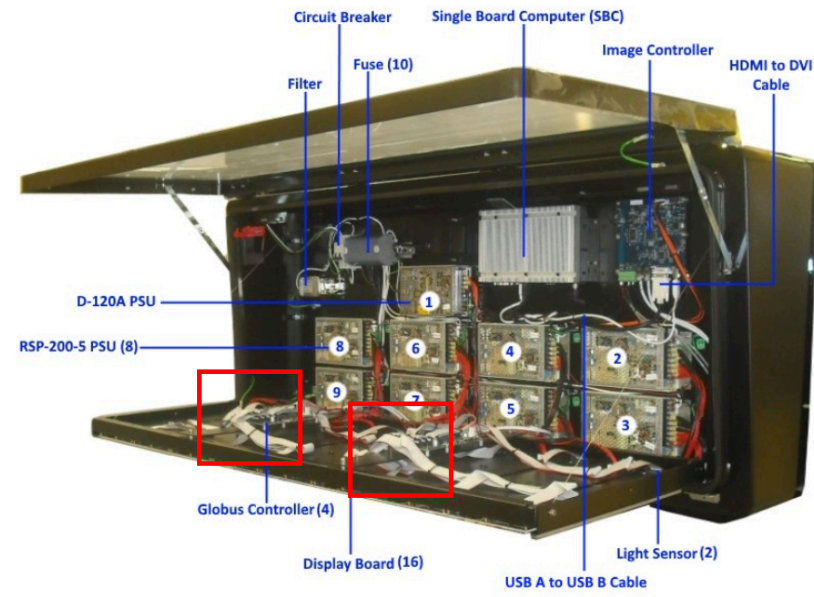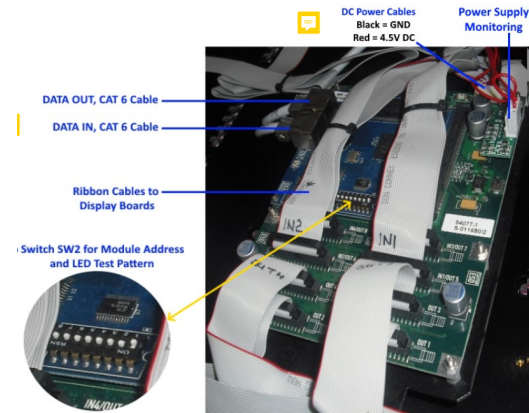
LED Display Panels

8 display board per sign side. Each board is 32x88 pixels and contains the LED driver circuitry. Receives data from the image buffer module. 4 panels per image buffer.

Data Cables
Data bussed along horizontal ribbon cables

DC Power Cables
Black = GND
Red = 4.5V DC

Panels

Panels

LIGHT SENSOR BOARD

Image Controller

0A-1000-0677
0A-1000-0436
0A-1000-0677
0A-1000-0436
0A-1000-0677
0A-1000-0436
0A-1000-0436
0A-1000-0436
0A-1000-0677
0A-1000-0677
0A-1000-0677
0A-1000-0677
W-4096779
0A-1000-0348

CN2
CN2
CN2
CN2
CN2
CN2
CN2
CN2

MODULE A1
MODULE A2
MODULE A3
MODULE A4

GLOBUS A
GLOBUS CONTROLLER
PORT 0 (IN)
DC POWER
PORT 1 (OUT)
IN 4
IN 3
IN 2
IN 1
OUT 4
OUT 3
OUT 2
OUT 1

MODULE B1
MODULE B2
MODULE B3
MODULE B4

GLOBUS B
GLOBUS CONTROLLER
IN 4
IN 3
IN 2
IN 1
OUT 4
OUT 3
OUT 2
OUT 1

LIGHT SENSOR CABLE
IMAGE CONTROLLER BOARD
PORT 1
PORT 0
DC POWER

CN1
CN1
CN1
CN1
CN1
CN1
CN1
CN1

0A-1000-0436
0A-1000-0436

Buffer

Buffer

W-3689775
DVI SIGNAL CABLE
FROM SBC
W-3230368
W-3230492

PSU 5
+V
+V
+V
-V
-V
-V
INPUTS OUTPUTS
EARTH
NEUTRAL
LIVE
POWER SUPPLY RSP-200-5

PSU 4
+V
+V
+V
-V
-V
-V
INPUTS OUTPUTS
EARTH
NEUTRAL
LIVE
POWER SUPPLY RSP-200-5

PSU 3
+V
+V
+V
-V
-V
-V
INPUTS OUTPUTS
EARTH
NEUTRAL
LIVE
POWER SUPPLY RSP-200-5

PSU 2
+V
+V
+V
-V
-V
-V
INPUTS OUTPUTS
EARTH
NEUTRAL
LIVE
POWER SUPPLY RSP-200-5

0A-1000-0678
0A-1000-0676
0A-1000-0678

SBC

TO IMAGE CONTROLLER
DVI SIGNAL CABLE
LOCAL AREA NETWORK
MAINTENANCE PORT
DC POWER
SINGLE BOARD COMP

0A-1000-0243
0A-1000-0243
0A-1000-0243
0A-1000-0243

0A-1000-0

0A-1000-0674
0A-1000-0590
0A-1000-0643
0A-1000-0671

PSU 1
+V
+V
-V
-V
INPUTS OUTPUTS
EARTH
NEUTRAL
LIVE
POWER SUPPLY S-100-5

0A-1000-0675

TRANSFORMER

0A-1000-0641
0A-1000-0243
0A-1000-0641

WHITE
GREEN
BLACK
0A-1000-0646

0A-1000-0669
0A-1000-0375

0A-1000-0668
0A-1000-0646
0A-1000-0242
POWER FILTER
LIVE OUT
NEUTRAL
BLACK
GREEN
WHITE

0A-1000-0670
0A-1000-0640

0A-1000-0373
0A-1000-0668

0A-1000-0241
0A-1000-0374

0A-1000-0639

THIRD ANGLE PROJECTION

PROJECT:	SAN FRANSISCO MTA			
TITLE:	4189561.dwg			
DATE:	05/15/2019	DIM UNITS: INCHES [MILLIMETERS]	SHEET	REV
SCALE:	NTS	DO NOT SCALE DRAWING	1	A
DESIGN:	MF	JOB NO.	FUNC - TYPE - SIZE	4189561
DRAWN:	MF	C24782	R - 06 - A3	

Questions?