

# AUDIENCE DISPLAY

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# Disclaimer

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## WARNING

### WARNING

Robot can be dangerous. By using the Field Management System (FMS) Software, you understand that in addition to the safety mechanisms built into the software, you, the operator, play a critical part in making sure that the environment around you is safe before enabling robots. You should only enable robots (use the "Match Start" button) when the robots are in a contained area and segregated from humans, who may be injured due to the robot's motion. If you disagree, or are not willing to use the software under these conditions, you should not proceed.

# Configuration

## About Audience Display

### Introduction

Audience Display is a software program, built and distributed by *FIRST* that is used to relay game and status information from FMS to the Audience at the venue. Audience Display can only be run as a standalone application on a separate machine connected to the field network via Ethernet. This manual will walk through the available displays, configuration options, and best practices related to the Audience Display.

**NEW FOR 2018: DO NOT INSTALL THE AUDIENCE DISPLAY ON OFFICIAL FIRST SERVERS ("SCORPION CASE #33") - USE ONLY THE REMOTE AUDIENCE DISPLAY MACHINE!**

### Wiring Audience Display

In order to connect to FMS, the Audience Display must have a wired connection to FMS. The target machine (if running a remote instance) needs to be on the same network as the FMS machine (10.0.100.X), and no additional LANs. While a wired Ethernet connection is **highly advised**, it's possible for the Audience Display to operate on a wireless connection. For wireless access, if field wireless is available, connect to the appropriate wireless network and ensure the target machine receives an address of 10.0.100.X. Wireless networks for *FIRST* fields have different names from truck to truck, contact the FTA for additional information.

Whenever possible, the Audience Display should be on a wired Ethernet connection.

### Opening Audience Display



To open the Audience Display, after installation, simply double-click on the television icon containing the *FIRST* logo. A splash screen will be displayed while background processes complete, and the display will go to either the Background, or, if instructions are actively being sent (such as during a match) will jump to the appropriate position for that point in time.

# Audience Display

## Audio Output

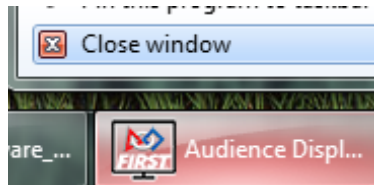
The game sounds commonly associated with FRC events, such as the start of match 'charge' sound and the end of match buzzer, are processed by the Audience Display. On *FIRST* official fields, output is made available for the venue from a standard 1/8" female connection ("headphone jack") on a laptop that runs the Audience Display.

**NOTE: IN ORDER TO HEAR GAME SOUNDS, THE AUDIENCE DISPLAY PROGRAM MUST BE RUNNING**

## Event Setup Order

In order to properly synchronize with FMS, it is highly recommended that you do not run the Audience Display program until after initial configuration of the event is complete through the Event Wizard. Opening the programs out of order may result in freezing while event data is attempting to process.

## Closing Audience Display



To close the software, either right-click on the taskbar icon and select 'Close window' or use the Windows hotkey combination of ALT-F4 (making sure the active window is the Audience Display)

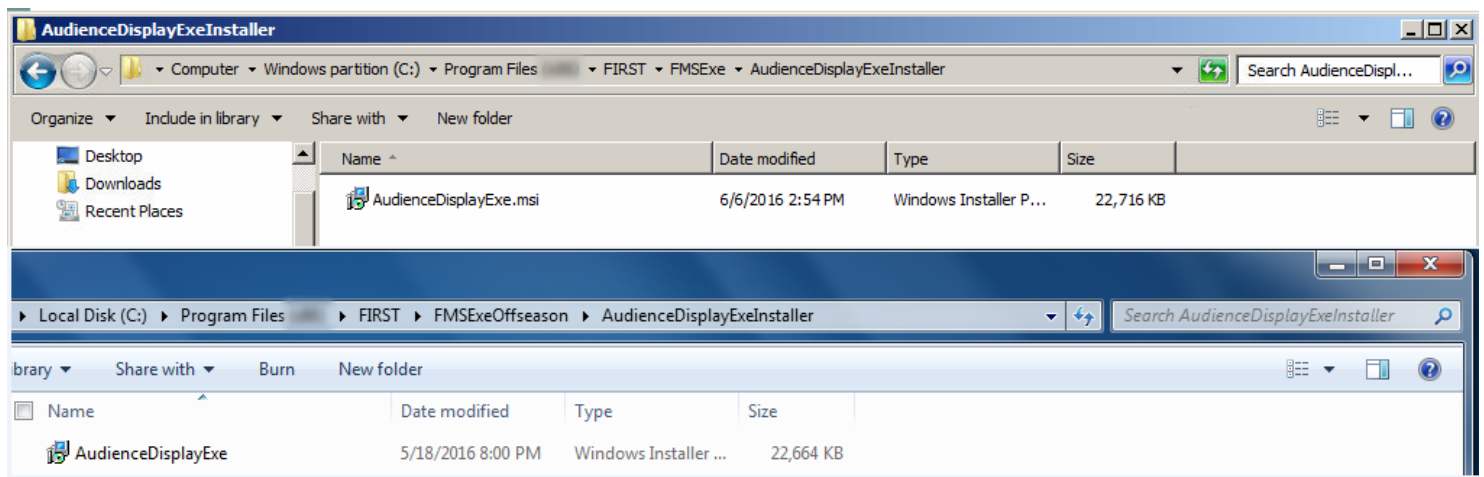
# Audience Display

## Installation

### Running on Extended Displays

**NEW FOR 2018: DO NOT INSTALL THE AUDIENCE DISPLAY ON OFFICIAL FIRST SERVERS ("SCORPION CASE #33") - USE ONLY THE REMOTE AUDIENCE DISPLAY MACHINE!**

### Installation on Remote Computers



The Audience Display version number 4.X and higher will not operate on Windows 7 machines. Windows 8.1 is not officially supported, though should operate properly. Windows 10 or higher is the recommended operating system for best performance. As noted later, the machine running a remote Audience Display must also have an Ethernet port.

On the machine containing the full FMS installation (version 4.X or higher) using File Explorer to browse to the following location:

- On most installations: C:\Program Files\FIRST\FMSExe\AudienceDisplayExeInstaller

Inside you will find an MSI (installer) file called AudienceDisplayExe.msi

Copy the MSI file to the target machine, and run the installer by double-clicking the MSI file (you may need to "unblock" the file on a Windows 10 machine Properties menu).

Merely copying the contents of the "AudienceDisplayExe" folder to another computer is not sufficient, remote installations must be initiated by the MSI installer.



# Audience Display

**NEVER RUN THE AUDIENCE SCREEN INSTALLER ON A FIRST SERVER**

## Version Matching

When running on a remote computer, the Audience Display instance will verify itself against FMS to ensure the version numbers are the same. If they do not match, you'll see an "FMS Mismatch" watermark shown on top of all screens until the version is updated/downgraded to match the FMS version.

## Communicating with FMS

When using a remote installation, the Audience Screen must be connected to the machine hosting the FMS software via Ethernet (such as through a switch or router). In addition, the installation will tell Audience Display to look for FMS at the IP of 10.0.100.5. It's recommended recommended that you ping the FMS machine from the target remote Audience Display machine to make sure the Ethernet connection has been established properly.

It is recommended that there be no more than two (2) instances of the Audience Screen running on the FMS network at any given time. The software is not tested beyond this capacity.

# Audience Display

## Settings

Details the options available through the configuration and setting panels within the Audience Display software.

## Accessing Settings

### Accessing Settings

To access the settings panel, with the Audience Display open and running (see [About](#)) use the hotkey combination of CTRL-SHIFT-F12 (or, alternatively, CTRL-SHIFT-C). This will trigger the upper portion of the Audience Display (or Lower, depending on the Vertical Position setting) to flip to the settings pane as shown in the graphic.

To close the settings panel, either click the 'Save Changes' button (saves changes and closes) or the 'Cancel' button (does not save changes and closes). Note that hitting 'Cancel' will not undo any adjustments you may have made to the position of the window on the screen.

## Video Background Style

### Video Background Style

The 'Video Background Style' option has two choices:

- Chroma Background
- Ranking Display

This selection will control the behavior of the upper "two thirds" of the screen in the "Video Only" and "Video and Score" modes.

#### Chroma Background:

Show the selected color in the area, to be keyed (or cut) out and replaced with live event video from a camera or production feed. (The actually "keying" process and mixing of video would need to be done through external software, not through FMS/Audience Display)

# Audience Display

## Ranking Display:

Removes the background screen color (Chroma) and shows a ranking screen show 8 team rankings at a time. The list automatically scrolls through all the possible teams at the event, in rank order. Teams must have played one or more qualification matches to be included in the listings. Updates to the qualification rankings via out-of-band processes (such as Match Review) will not update the rankings if the rankings are shown during the update process; to update rankings, the Video Switch must be used to select another view (such as "Background") and then reload the desired view ("Video Only" or "Video and Score"). During Playoff matches, the rankings are replaced with the playoff bracket to show progression through the tournament phase.

## Background Screen Color

### Background Screen Color

The Background Screen Color dropdown allows selection of the color which will be used for 'Chroma' process described previously. In the "Video Only" and "Video and Score" modes, the Chroma color is overlayed in the top "two thirds" of the screen to allow for video overlay. The Background Screen Color is not used if the "Video Background Style" is set to "Ranking Display" (the Background Screen Color would be hidden in this case).

In addition to the available colors in the dropdown, a specific RGB value can be specified via the "Advanced" button on the bottom. Occasionally, a production company or video software will specify a color to be used for the keying process most accurately. If no specific requests are made, the default value of "Fuchsia" or alternate of "LawnGreen" should be sufficient.

## Real-Time Orientation

### Real-Time Orientation

Careful consideration should be used before changing these options, and they may cause confusion for audience members who are "use to" a traditional layout from year to year. For official FRC Events, if in doubt, please contact your Engineering support contact.

[Above *Red Line*] The horizontal orientation of the real-time scoring screen can be modified through settings to select whether the red alliance is on the left, or the right, side of the screen. At a traditional FRC Event and setup, the red alliance is setup to the right side when sitting at the scoring table. As such, a projection screen mounted above the scoring table (viewed by the

# Audience Display

audience sitting across from it) would see the red alliance on the left side when viewing the field. However, some situations (such as webcasting) display the view of the field from the same side as the scoring table. In these situations, the horizontal orientation could be flipped so that the display will properly align overlaid elements with those seen on the live video feed.

[*Below Red Line*] The vertical orientation allows for flipping of the "Video and Score" panel from the bottom of the Audience Display to the top. This is useful in situations where the venue has obstructed views, there is conflicting light, or it's more convenient for spectators. The only display affected by this setting is "Video and Score"- all others continue to behave the same way as they normally would.

## Sounds

### Sounds

Using the third "bar" of the settings panel sounds can be force played to test the connection with the audio/video group. Depending on the season, one or more buttons may not trigger a sound to be played (2015 did not use "Warning #2" for example). Each sound plays once upon click.

## Resolution and Positioning

### Resolution and Positioning

[*Resolutions*] Audience Display is compatible with three (3) resolutions- 1024x768 (3:4 aspect ratio) and 1920x1080 / 1280x720 (16:9 aspect ratio). The resolution can be adjusted using the radio buttons, and takes effect upon clicking the "Save Changes" button. There are slight differences between the display of data in the various resolutions- but the critical game data remains the same.

[*Positioning*] To position the Audience Display on the monitor, either click the "Center on Screen" button or "Hold and drag" on the designated area to manually adjust the placement on the screen. The "Center on Screen" button will not properly align the Audience Display if it is being placed on a monitor that is to the left of the primary (and thus falls in "negative" coordinates). Either set the external monitor to the right, above, or below the primary screen (or use the manual adjustment).

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## Control Bar

### Control Bar

On the bottom of the settings pane is the control bar. On the left is the version of the Audience Display software (which must match FMS, see [Installation](#)). On the right are options to View Log File (Engineering use only), Restore Defaults (return the Audience Display to it's "out of the box" settings, colors, etc), Save Changes (save any changes made and close settings) and Cancel (don't save any changes, and close the settings panel). Note that "Cancel" does not undo any positioning changes made, either through centering or manual adjustments.

## Jump Menu

Details coming soon!

# Displays

# Audience Display

## Match Flow

The typical display flow within a match, from pre-match to post-match.

## Match Preview

### Match Preview

The Match Preview screen displays team names and rankings for the teams scheduled to compete in the next match. Specific to *FIRST STRONGHOLD*, the Match Preview also shows the defenses that the alliances chose for that match. The Match Preview is a mandatory screen in the FCUI process and can even be selected again (it will turn YELLOW) once the "Set Audience Screen" button has been pressed until the Match is started.

[Qual] Team rankings are displayed next to their team name

[Playoff] Team rankings are replaced by a collective Alliance number next to the captain. Additionally, a small indicator is added below the event name to reveal series status (like "Blue leads series")

## Video and Score

### Video and Score

Video and Score is the audience display most typically used at an FRC competition. Event Name, match time, score, game-specific details such as Tower Strength and Defense Strength, and match number information overlayed on the "bottom third" of the screen. The *Match Under Review* icon is used to show that the Head Referee has marked the match for further review after completion- and indicated by a yellow referee icon appearing between the scores. If the event name is too long for the space provided, it will horizontally scroll to the right of the timer indicator.

[Left] Traditionally, the Video and Score will have a space for chroma to add video or production data

# Audience Display

[Right] If set to Rankings (see [Settings](#)) the upper portion of the screen will be replaced with current rankings or the bracket

## Match Result

### Match Result

Match results is used to show the audience the final stats about the match they just witnessed. Teams, cards issued to the teams in the match, their new ranking, and how that rank changed are shown. Also shown are the scoring details for the match, as well as the match outcome (which alliance is victorious, or indicates a tied match). Also shown is a HIGH SCORE indicator if one or both of the teams broke the previous high score for the tournament (this is event specific, and counts on qual and playoff matches). It is accompanied by a short audio clip and the "background" screen prior to being displayed.

[Playoffs] All teams and the alliance number are shown on a single line, as seen on the right



# Playoff Specific

Screens available specifically for the Playoff process.

## Alliance Selection

### Alliance Selection

Used in conjunction with the "Available Teams" display to guide Teams and the Audience through the alliance selection process. It shows the captains and each of their picks, as entered by the scorekeeper. Teams appear on the display once the scorekeeper loses focus on the box containing their team number (see Alliance Selection).

## Available Teams

### Available Teams

Teams not yet selected during Alliance Selection are shown in the "Available Teams" display. Up to 60 teams are displayed in order of their Qualification rank. This display should be used in conjunction with the "Alliance Selection" view to assist Teams and the Audience in knowing who remains available for selection.

## Bracket

### Bracket

The bracket display is used during the Playoff tournament to indicate standings of all alliances. It is useful to show the Audience when an alliance advances from one level of the tournament to the next (e.g. Quarterfinals to Semifinals). Until a phase is complete (i.e. Quarterfinals) the bracket will continue to show the active phase with alliance numbers filled in on the following phase as applicable.

# Audience Display

## Ancillary

Additional screens available for event use.

## Video Only

### Video Only

The Video Only audience screen is used when it is desirable to overlay no scoring, time, or match information on the audience screen.

[Left] Full screen chroma for replacement with video or production information. Chroma color can be adjusted in [Settings](#).

[Right] Instead of chroma, display a full screen version of the current rankings (Qual) or bracket (Playoff). Mode depends on [Settings](#).

## Background

### Background

The background screen contains the game logo for the season, and can be used during breaks, lunch, etc as an alternative to video overlay ("Video Only") or as a way to show the audience the game logo.

[Left] The default Background containing the game logo and event name.

[Right] Optionally, the "Message" tab (Match Play/Match Test) can be used to add a banner message to the bottom of the display, such as important event announcements, notification of breaks, etc. These messages will appear on all instances of Audience Display, remote or local.

# Audience Display

## Timeout

### Timeout

The timeout display is available during both Qualification and Playoff matches, though is typically only used in Playoffs when back-to-back matches are necessary (or a Team calls a timeout). The display contains the match number or phase ("Test Match" above) as well as the event name and time remaining. Upon timer expiry/cancel, the "buzzer" sound will be played.

[Left] Traditional timeout display, with chroma available for video overlay.

[Right] If configured for Rankings (see [Settings](#)) instead of Chroma, the current rankings or bracket will be displayed in place of the Chroma.