

Setting Up a VRC Event With Equipment

Regional Support Managers:

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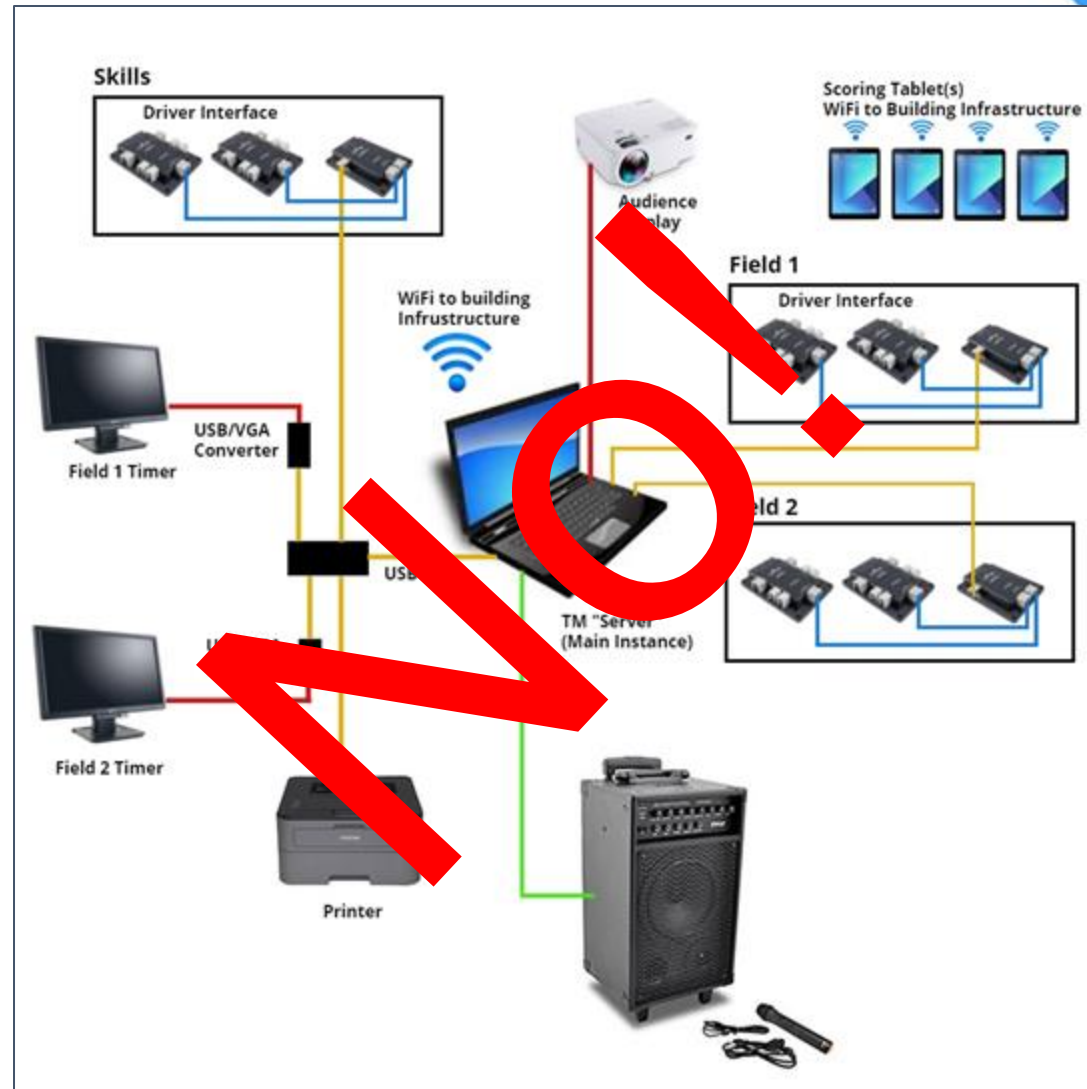
Agenda

- Review VRC event layout
- Discuss main elements of VRC event layout
 - Local TM Network
 - Displays & Match Controllers
 - Printer & PA System
 - Tablets
- Review and discuss a full VRC event setup
- Time permitting
 - Video mixing: Audience display overlay & live streaming
 - PoE for powering Field Displays & RPi's (no AC power to fields required!)



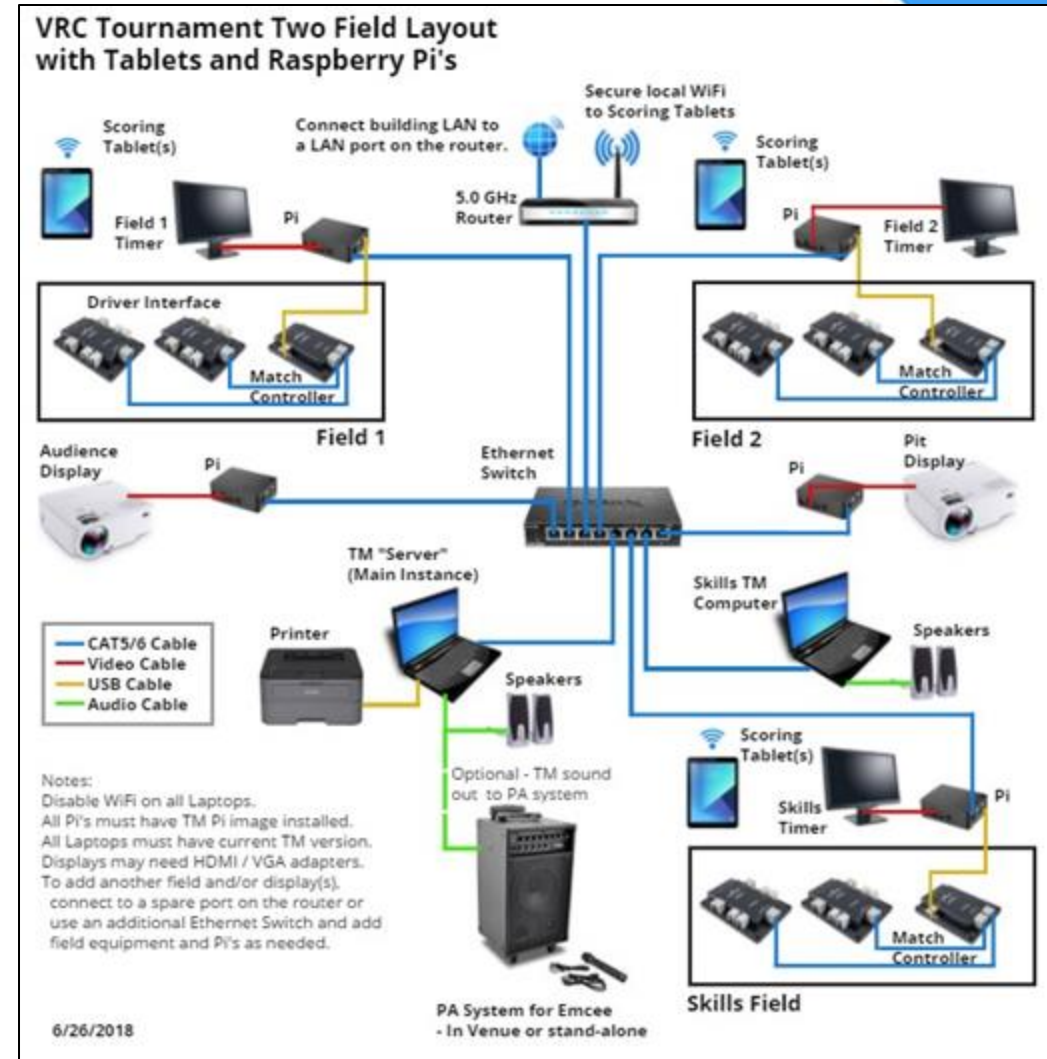
VRC Event Full Setup

- One laptop runs everything. Questions?
- Is something wrong?
- What is #1 cause of TM crashes?
- TM laptop overload...
- Do as little with TM “server” as possible!
- Do not drive any displays with server!
- Do not connect to building WiFi!



VRC Event Full Setup

- Local TM Network
- Displays
- Match Controllers
- Printer & PA
- Tablets
- Full VRC Setup
- Laptops can be used in place of Pi's, but less convenient...
- What useful display is missing? Queue...



Local TM Network

- Local TM network connects:
 - TM computers and RPi's (or laptops if no RPi's)
 - 5.0 GHz router connects wirelessly to scoring tablets
 - 5.0 GHz router connects by CAT5 to building Internet
 - Allows TM to “push” to VEX VIA app
 - Allows results to be immediately uploaded after tournament
- Main instance of TM is the “remote server”
- Skills TM, if used, connects to “remote server”
- TM resources:
 - While a tournament is open in TM, click Help, View User Guide.
- TM Computer - may need a powered USB hub!



Displays & Match Controllers

- RPi's are inexpensive and reliable drivers for displays and Match Controllers
 - Distributes display processing load to individual RPi
 - RPi as Field Display manages Match Controller
 - RPi remembers its display setting through power cycles; convenient if power is interrupted
- RPi resources:
 - <https://www.roboticseducation.org/event-partner-training-topics-raspberry-pi/>
- Powering Display & RPi
 - Piggyback or Splitter
 - PoE (Power over Ethernet) described later...



Printer & PA System

- Printer connects via USB to a TM computer
 - **REQUIRED!** Not Optional!
 - Suggest an inexpensive laser printer, keep it simple!
 - DO NOT try to use a networked printer!
 - Needed for match lists, announcer sheets, finals brackets, award announcements
- Local PA or Gym PA connects to TM computer
 - Great for opening ceremony to play National Anthem
 - Allows game sounds to be heard by audience
 - If PA connection unavailable, use powered speakers



Tablets

- Tablet must have TM Mobile app installed
 - Navigate to Google Play Store (Android) or iTunes (Apple) and download app “VEX Tournament Manager Mobile” by DWAB Technology
- Tablets connect via WiFi to local wireless router
- Web Server must be started at TM “remote server”
- Can now start/stop matches using TM Mobile
- TM Mobile resources:
 - <https://www.roboticseducation.org/documents/2016/09/getting-started-with-tm-mobile.pdf>



Complete VRC Event Setup

Q: How do you add another field?

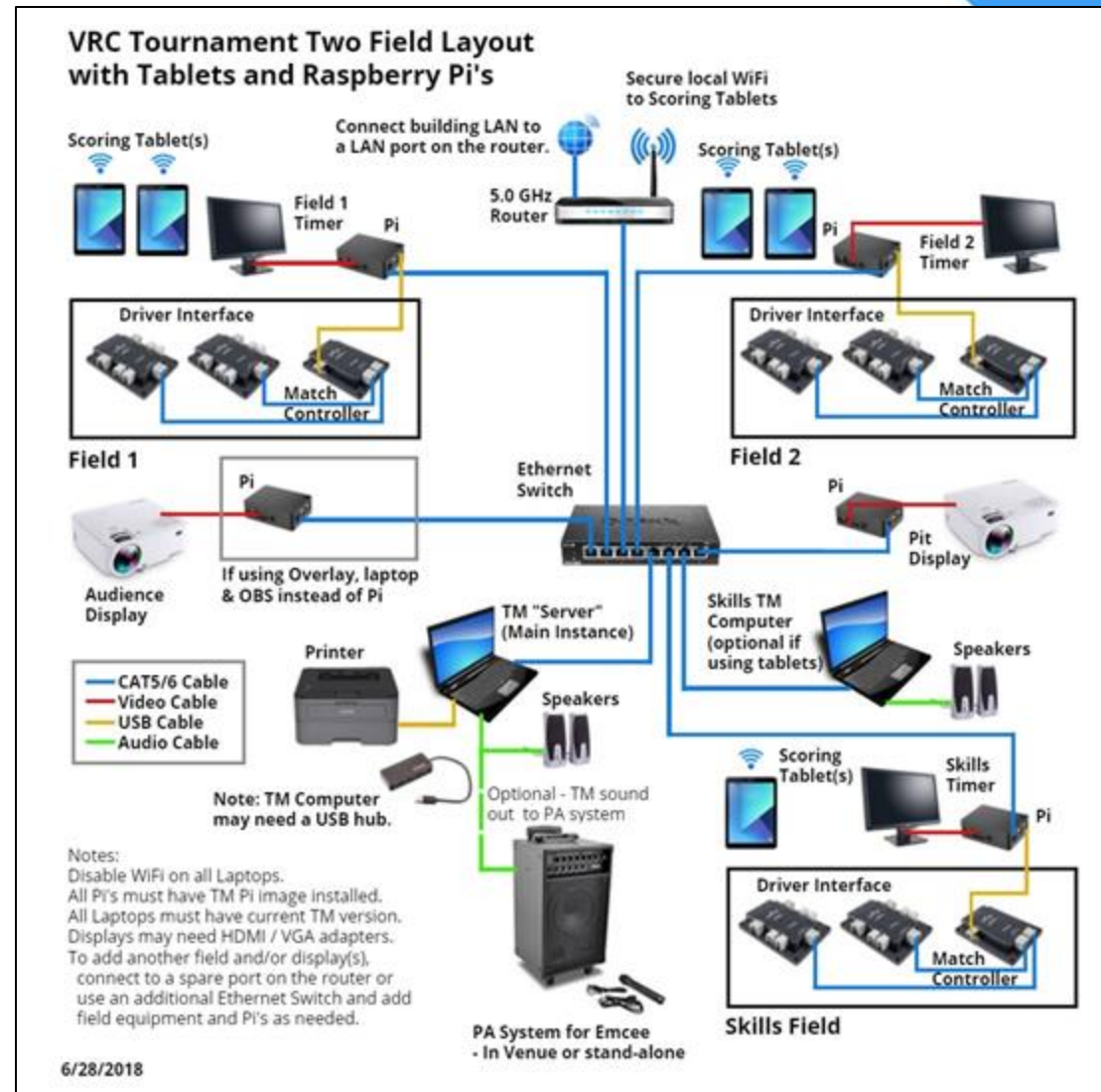
A: Plug in another RPi.

Q: How do you add video overlay?

A: Connect laptop/OBS Studio or video mixer in place of RPi.

Q: How do you live stream?

A: OBS Studio to a YouTube channel.



Video Mixing for Audience Display Overlay & Live Streaming

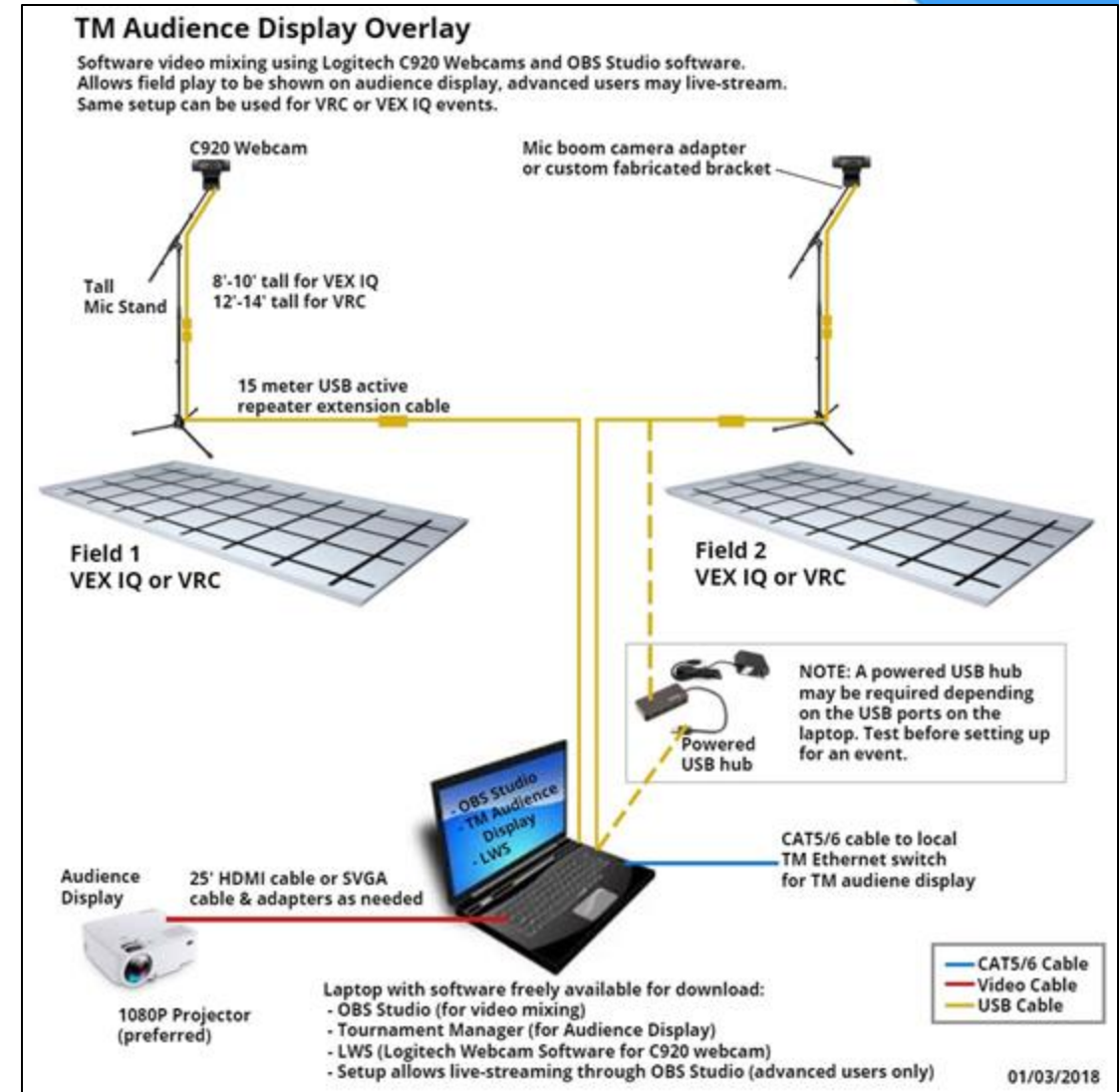
Equipment:

- (2) Logitech C920 webcams
- (2) 15 meter USB active repeater extension cables
- (2) tall mic or speaker stands with mount adapter for webcams
- (1) powered USB hub (if needed)
- (1) 25' video cable & adapters
- (1) laptop with software installed:
 - Open Broadcaster Software
 - Tournament Manager
 - Logitech Webcam Software



Resources:

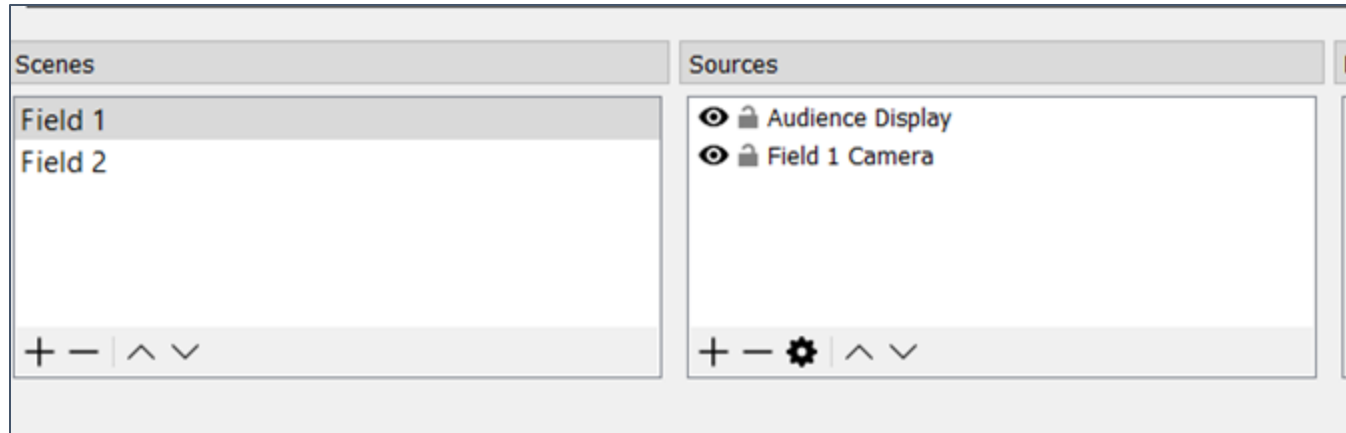
<https://obsproject.com/>



Video - OBS Setup for Overlay

- Make sure both cameras are connected to laptop
- Launch a sample TM event, and open the Audience Display (Overlay)
- Setup 2 “scenes”, Field 1 and Field 2
- Add “Window Capture” - Audience Display (Overlay) to both scenes
- Right-click each Audience Display and apply a chroma key filter
- Add “Video Capture Device” and the correct camera for each scene
- Make sure for each scene that the Audience Display is above the camera
- Resize the windows as needed for each scene
- To send to projector, right-click on the right window and select the Full Screen item and the projector from the list of displays.

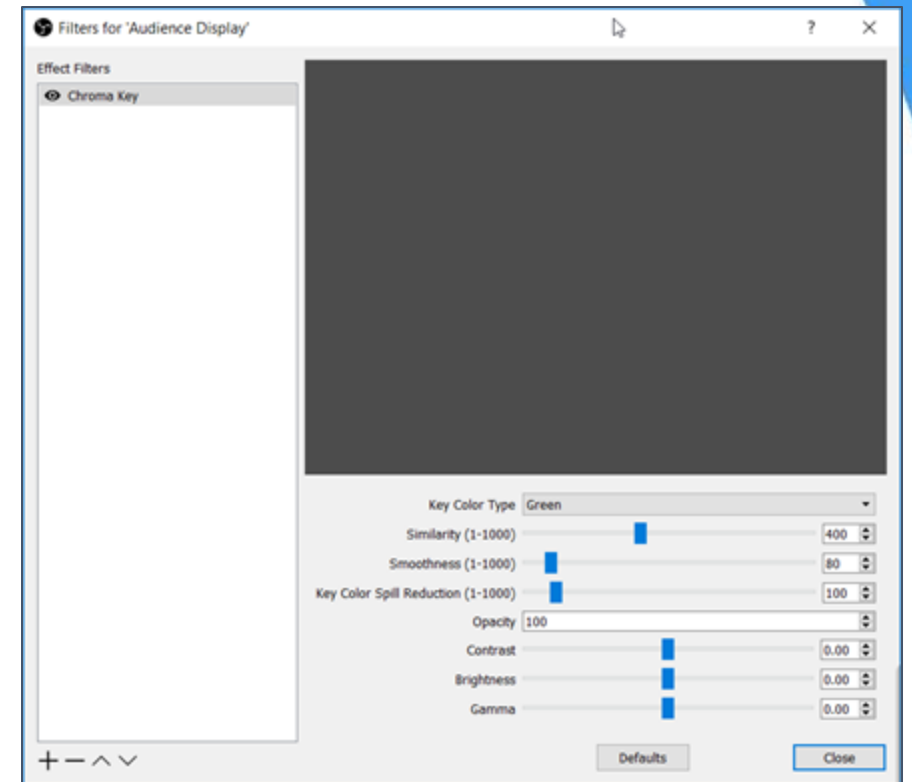
Video - OBS Setup for Overlay



Scenes



Chroma key



Video - OBS Setup for Live Streaming

- Advanced topic...
- Beyond the scope of this brief presentation...



PoE for Powering Displays & RPi's



Use a PoE switch...



...and a PoE splitter...



to provide power and data to RPi and Field Timer display.

PoE for Powering Displays & RPi's

For detailed instructions:

- [One Cable... to rule them all!](#)

Special Thanks to Chris Allen

IRON EAGLES
9364



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Summary

- Why bother setting up a separate TM network, and using a separate RPi or Laptop for each display?
 - To prevent TM server crashes! Distribute processing power!
- Why bother using a field timer display?
 - Helps referees and teams make sure they are right place / right time
 - Helps event staff keep matches on schedule
 - Allows teams to plan their on-field play
 - For IQ - Allows referees and teams to see tiebreaker “remaining time”, if needed
- Why bother using Tablets for scoring?
 - Completely eliminates need for a Skills computer (if using RPi at field)
 - Allows scorekeeper/referees to start/stop matches at the field
 - Allows scorekeeper/referees to confirm score with teams at the field
 - Allows scores to be entered much faster, without transcription errors

Thank you!

Contact your Regional Support Manager if you have questions!

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