

VEX Robotics Competition

# Live Remote Tournaments (LRT)

Team Setup & Instructions

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## Introduction to Live Remote Tournament (LRT) Gameplay

Live Remote Tournament (LRT) gameplay is a new format developed by the REC Foundation for the 2020-2021 competition season. LRT gameplay allows teams to compete remotely in live interactive competitions using a web-based portal through RobotEvents.com. The purpose of this document is to outline the technical requirements, equipment set up, and event instructions for registered VRC teams to compete in Live Remote Tournaments.

Previously, traditional VEX Robotics Competition events have been held “in-person” in a single location such as a school, gymnasium, community center, or a myriad of other public venues. By utilizing the RobotEvents.com Live Remote Tournament system, Teams can choose to attend events entirely remotely. This allows teams to compete together while remaining in physical isolation from one another, and additionally allows teams to compete within their region or beyond without the expenses of travel.

Teams participating in Live Remote Tournaments must be proactive and detail oriented in preparing for and participating in these events. Many aspects of the competition that might have been handled by volunteers at in-person events, including proper field setup and reset, and ensuring teams are on the field for their upcoming match are responsibilities that now fall to team members and their designated adult team Facilitator, the coach, or other responsible adult who will be supervising students during the event. Failure to follow proper procedures may result in substantial delays to the event and/or an inability of a team to participate in the event.

In a Live Remote Tournament, VRC Change Up is played by two Alliances – one “red” and one “blue” – composed of two Teams each. Each Team competes on a separate field (i.e., there are four Robots, four Teams, and four fields involved in each Match).

For the full game rules, please consult the current version of the [VRC Change Up Game Manual](#) including the section on Live Remote Tournament Rules.

All student and adult participants must abide by the [REC Foundation Student Centered Policy](#) as noted in rule <G2>, and the [REC Foundation Code of Conduct](#) as noted in rule <G1> of the [Game Manual](#).

General information for Team Advisors is found in the [Team Guide](#). Additional resources for Teams is available at [RoboticsEducation.org](#) or by contacting your [Regional Support Manager](#).

## LRT Coach/Mentor Team Facilitator Policy

The REC Foundation provides a number of remote competition options for teams. By registering and participating in remote competitions, your team is required to perform additional tasks and engage in a heightened level of event preparation. This section outlines the roles and responsibilities for the coach or mentor who registers their team for a Live Remote Tournament.

While remote competitions provide an opportunity for student-centered engagement, many of the challenges with remote competitions result from teams being unprepared (e.g., failing to properly set up their fields or equipment, not reading the Game Rules or other documentation related to Live Remote Tournaments). As a robotics community, we want every participant to have a positive competition experience, which is why we are providing this guidance to coaches and mentors who participate in Live Remote Tournaments.

All teams registered for a Live Remote Tournament will need to appoint a team Facilitator to ensure the integrity of the event. At a minimum, the Facilitator will:

- Be an adult of 18 years or older and not enrolled in high school. The Facilitator can be the Coach, the Primary Contact, or an adult Mentor.
- Provide their full name at the start of the event to the Event Partner.
- The Facilitator will also provide the Event Partner with a day of contact phone number prior to the event.
- Read and be familiar with the current game and the Live Remote Tournament rules as listed in the [VRC Game Manual](#).
- Read all REC Foundation documentation and understand the requirements for teams participating in Live Remote Tournaments, including the [LRT Team Instructions](#) and the [LRT Field & Technology Inspection Checklist](#).

The Facilitator must:

- Review all aspects of the event on RobotEvents.com prior to registering and follow up on all communications from the Event Partner in a timely manner.
- Pre-Event Setup:** Read, understand, and follow all items covered in the LRT Team Instructions and the [LRT Field & Technology Inspection Checklist](#), including correct field setup. If you have a question or concern, you need to raise this issue well before the event.
- Inspection:** Ensure the team can confirm that the team's robot is ready to pass an official inspection using the [VRC Robot Inspection Form](#).
- Safety:** Ensure that all equipment is safely set up and that all local health and safety rules are being enforced; see [REC Foundation Covid-19 Policy - Student Safety at Remote Events](#) (found in the Documents tab for all event pages on RobotEvents.com).
- Match Readiness:** Ensure the team is ready before every match! Actively monitor the match schedule for the team, and ensure the team and field are ready 2 to 3 matches prior to your match; teams must not practice on their field during this time. Additionally:
  - Field is correctly set up with all game elements correctly placed.
  - Confirm that the robot placement is as per the Game Manual.
  - Confirm that the field layout including the [LRT Field & Technology Inspection Checklist](#) has been completed and the team remains in compliance for the duration of the event.
  - Confirm that the camera is operational and captures the full field correctly aligned with appropriate lighting.
  - Confirm working audio capability with the event.

- ❑ **Scoring:** Per the Game Manuals, any questions of scoring must be raised by Drive Team members only. The Facilitator will not make a ruling or provide any opinion as to any aspect of the Match. This is the sole responsibility of the Head Referee.
- ❑ **Physical Presence:** The Facilitator must be physically present at all times at the immediate location where the Live Remote Tournament matches are occurring and may not be in another room or nearby at the site.

Every coach or mentor who registers their team for a Live Remote Tournament should meet these responsibilities. The failure to meet any of these requirements may result in a negative experience for your team and other event participants. In some instances this may result in a violation of G1 and the [REC Foundation Code of Conduct](#). The REC Foundation, our Event Partners and all participating teams need and appreciate your commitment and support in achieving a quality competition experience.

## Engaging Your Team & Social Distancing

One of the goals of Live Remote Tournament gameplay is to give teams opportunities to play in exciting cooperative matches while being able to maintain physical isolation from one another. Every LRT event will be automatically live streamed via a YouTube link found on the event's information page on RobotEvents.com. Sharing that link will allow spectators to follow along with the event with a slight delay from the live event. **Teams should only use the LRT system for video and audio in their match, and NOT the delayed livestream.**

Teams will be participating from public venues such as gymnasiums, but also classrooms, homes, garages, libraries, and many other non-traditional event locations. Teams should test their camera setup early and be aware of what is visible in their backgrounds. Many teams may choose to include banners, team signs, or other appropriate decorations around their event space. Teams are encouraged to have fun and show their team spirit!

Please be mindful of any health and safety regulations in your area. The health and safety of all participants should be top priority for every team.

## Document Overview

The instructions in this guide are divided into five sections:

### [Section 1: Technology & Equipment Requirements](#)

This section will explain the technology and equipment requirements needed to participate in a Live Remote Tournament

### [Section 2: Field and Technology Setup](#)

This section will explain best practices for setting up your field and equipment. It does not replace the Field & Technology Inspection document, but rather is an annotated guide for meeting those requirements

### [Section 3: Connecting to an Event Procedures](#)

This section will show the step-by-step procedures teams will follow to connect to an event.

### [Section 4: In-Event Procedures](#)

This section will show the step-by-step procedures teams will follow while in the event.

### [Section 5: Troubleshooting](#)

Please [click here](#) for the LRT Troubleshooting Guide.

## Section 1: Technology & Equipment Requirements

**Note:** All equipment should be set up and dedicated to a single team in the tournament - teams are unable to share equipment with this format. Please refer to the [LRT Field and Technology Inspection Checklist](#).

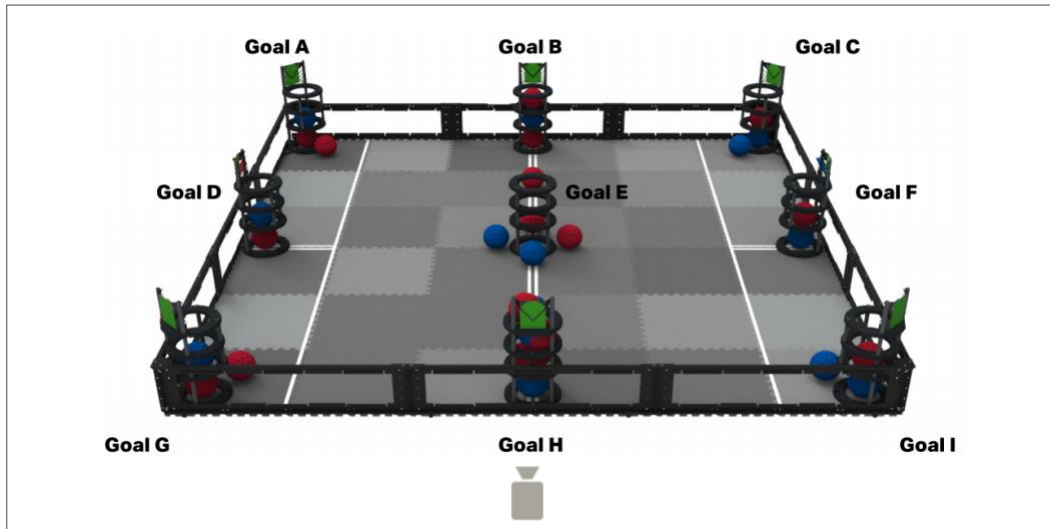
### Technology & Equipment Requirements

- Active and paid team registration on RobotEvents.com
- Full competition field and game elements (VRC)
- Internet access
- It is recommended teams used a wired ethernet connection whenever possible. Computer solely dedicated to using the Live Remote Tournament platform on RobotEvents.com by a single team.
  - Up to date version of [Chrome web browser installed with “Experimental Web Platform Features” Enabled](#)
- Connected USB webcam (720p or higher resolution) that can be set up to provide a full view of the field and driver station; a tripod or other device may be needed to hold the camera in place
- V5 Robot with [updated firmware](#).
- Micro USB to USB cable to connect robot controller to computer
  - Teams may wish to use a long (10-12 foot) cord for more flexibility in computer and camera placement
- An additional monitor or TV screen/projector for viewing alliance partner and opponent fields as well as Event Chat from the driver station.

**Safety Note:** Like an in-person event, Teams must ensure that they can set up their equipment and field safely in accordance with the Game Manual and Safety Rule <S1>.

## Section 2: Field & Technology Setup

### VRC Field & Camera Setup



- ❑ Team's camera must be placed on the "audience side" of the field, i.e. the Red Alliance Station on the left side of the screen & Goal A should be in the upper left corner of the remote webcam feed. As per rule <LRT1> & <RSE7> in the [VRC Game Manual](#)
- ❑ The Driver(s), Robot, Controller(s), and **complete & unobstructed competition field, including the field perimeter** must remain on camera at all times during the match. As per rules <LRT1> & <RSE7> in the [VRC Game Manual](#)
  - A starting recommendation is to place your web camera 7 feet back from the field and 7 feet above the level of the field, but the exact camera placement is dependent on your camera and setup.
- ❑ Game Elements should be properly set up as shown in the above image. Game elements are always set up the same way no matter what color alliance the team is assigned to in a match.
- ❑ Teams are responsible for setting up their own fields. Please keep a copy of the above diagram handy for reference and reset your field in a timely manner.

Field Inspection will take place in accordance with the [VRC Game Manual](#) and specifically <LRT7>:

**<LRT7>** In a Live Remote Tournament Match, Teams must set up their own field in accordance with the layouts, tolerances, and specifications found in the [Game Manual](#) and [Appendix A](#).

- A. Prior to a Match, a Head Referee will verify each Team's field layout and request any adjustments as needed. A Team will not be permitted to play in a Match until the Head Referee has approved their field layout; refusal to comply with any requested adjustments **in a timely manner** may be considered a violation of **<G1>** at the Head Referee's discretion.
- B. Teams are permitted to construct their own field perimeters, in accordance with the Non-Standard Field Perimeter Guidelines found in Appendix A.
  - i. If using an unofficial field perimeter, teams may be asked to verify their compliance with these guidelines as a part of the inspection process.
  - ii. Official VRC foam tiles (VEX Robotics SKU 278-1502 or 276-7175) must be used.
  - iii. The official VRC Change Up Full Field & Game Elements Kit (VEX Robotics SKU 276-6501) must be used.
- C. Teams must still utilize their one (1) Preload Ball as specified in rule **<SG1>**. The three (3) Balls that would be used as Preloads by the other Teams in the Match are not placed on the field.

## VRC Camera & Technology Setup

Computer/Technology Requirements:

- A computer (LRT Computer) with Google [Chrome installed with "Experimental Web Platform Features" enabled](#).
- Note:** This computer must be solely dedicated to using the Live Remote Tournament platform on RobotEvents.com and cannot run other video streamlining tools or apps (e.g., Discord, Zoom, etc.) during the event as it can prevent video from appearing correctly.
- Robot controller connected to LRT Computer via micro-USB cable.
- External USB Webcam (720p or higher resolution) connected to LRT Computer
  - Camera is set up to provide a full view of the field and driver station.
  - **Note:** This **cannot** be an integrated camera. It must be an **external USB** camera.
  - **Note:** It is recommended that teams have enough slack in their camera connection to prevent the unintended movement of the camera, possibly using a 10 foot or less USB extension.
- The camera must be mounted to a tripod, stand, or fixture.
- The field and camera should be well lit with even and consistent light sources.
 

**Note:** Windows and off-color light sources should be avoided.

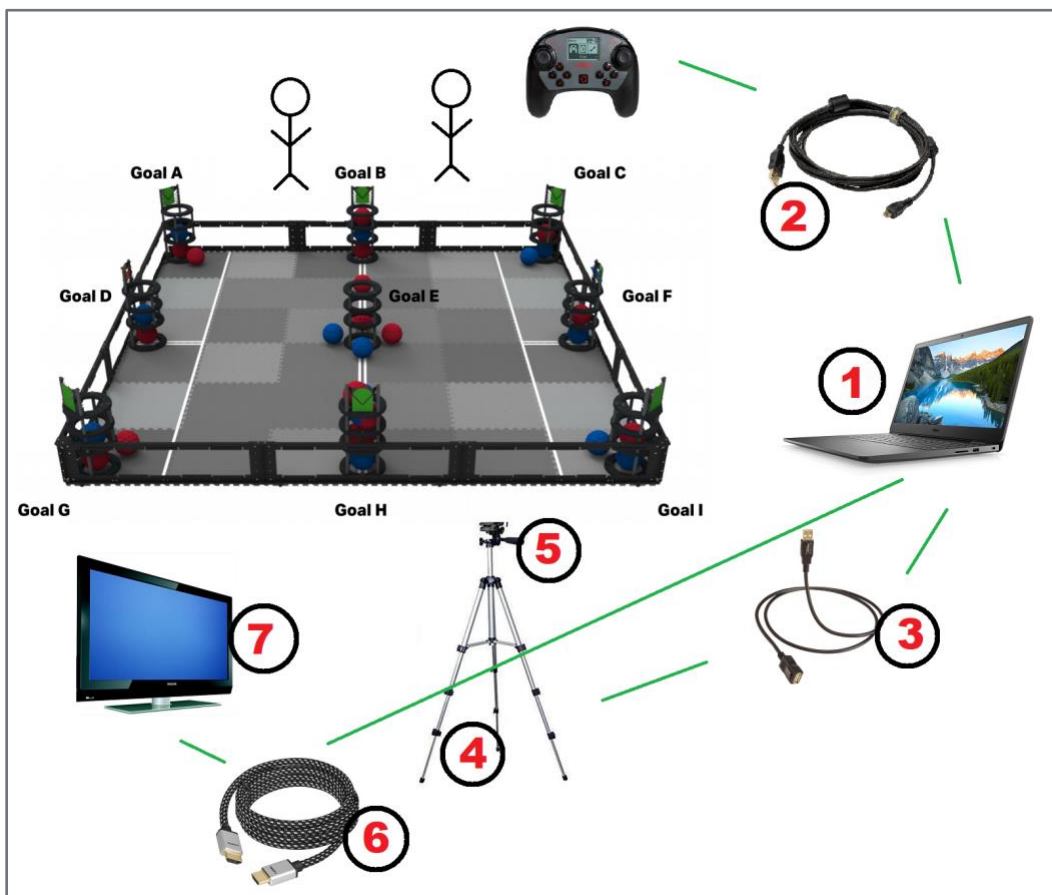


Recommended Additional Equipment:

- ❑ A large monitor or screen for viewing your partner's field and the Event Chat from the driver's station.  
**Note:** This may require running a cable from a laptop or computer to a larger screen more conveniently placed
- ❑ External speakers for hearing match sounds and referee/announcer instructions clearly from your driver's station.

All cables should be taped down to prevent tripping hazards, and the setup for all electronics must maintain the safety of participants as a top priority.

**Example Technology & Field Layout**



This image is a sample diagram of the equipment you will need to participate in a Live Remote Tournament.

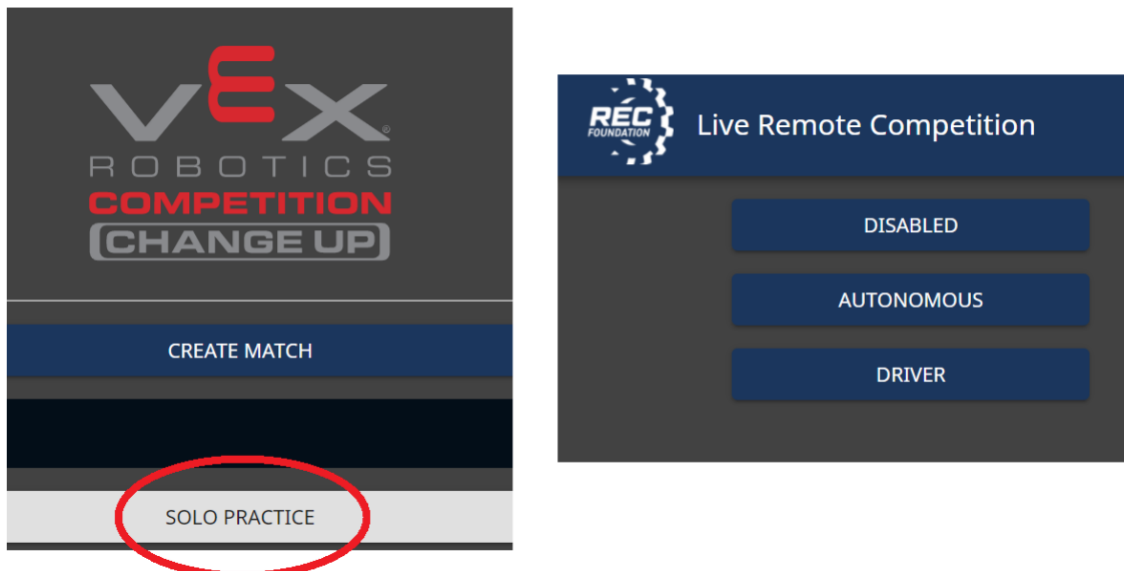
Labeled items:

1. Laptop or computer
2. MicroUSB cable for connecting V5 controller to computer
3. USB extension cable to connect computer to camera. (This may not be needed depending on your setup/equipment)
4. Camera tripod or stand
5. USB web camera
6. Video cable to connect to a large display
7. Large display for viewing the match from the driver's position

## Pre-Event Camera & Video Set-Up / Solo Practice Mode

Teams should test their computer setup ahead of the event, including webcam, microphone, and speakers. Testing in advance gives teams time to troubleshoot issues before competing.

It is highly recommended that teams utilize the solo practice system on [remote.robotevents.com](https://remote.robotevents.com) to test their robot's controller connectivity, autonomous function, and camera setup. Solo practice allows a team to test Driver and Autonomous modes as well as view their webcam. Remember that often what a webcam will see in terms of visibility and brightness may not match what your eyes see, so use the webcam view in Solo Practice to make adjustments to lighting or viewing angles as needed.



These screenshots include the button for the “Solo Practice” feature in the remote practice system, as well as the panel for testing different robot modes. Your webcam feed will also be shown on screen to assist you in checking your camera settings.

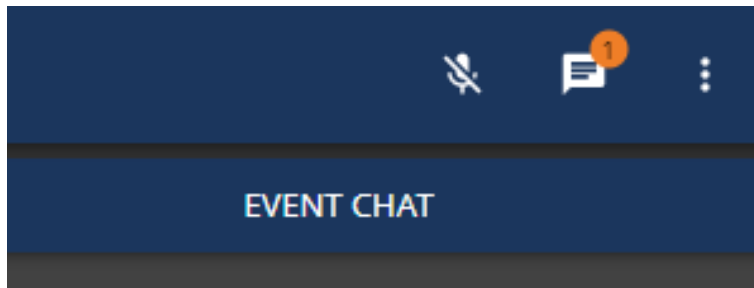
If you are not able to view your webcam or get your computer to work on [remote.robotevents.com](https://remote.robotevents.com) please contact [centralsupport@roboticseducation.org](mailto:centralsupport@roboticseducation.org) or use the chat function on the bottom right-hand corner of the screen for assistance.

It is recommended that teams set up a large TV/monitor, if available, to be able to duplicate their monitors to be able to view other teams' fields better. Teams may also consider using an external set of speakers pointed at the driver's station so teams can clearly hear the audio stream.

## Team Communications

Teams should make use of the Live Remote Tournament in-event private chat feature in the upper right corner of the interface to contact the Tournament Operator and other teams. When teams use the chat feature to talk directly with each other, that information is not shared with other teams or the Tournament Operator. A red dot indicator will appear next to the chat button to indicate that a team has an unread message. Teams should use this private chat for strategizing with future match partners. In each match, there is also a match chat which is used by the teams in the match, as well as scorekeepers and referees to ask teams questions.

Teams should always have someone monitoring their chat windows in case they are asked a question by event staff or another team, or if event staff post information into the Event Chat.



This is a detail of the private chat icon in the upper right corner of the LRT interface. Clicking on the icon will bring up a list of teams and volunteers in the Tournament to send a private message. The orange icon indicates that you have an unread private message.

For emergency communications (i.e., a team's Internet goes down and they cannot communicate with the event) teams should provide the Event Partner with the contact information for the team Facilitator, the coach, or other responsible adult who will be supervising Students during the event. The Event Partner's event day contact information is found on the event's General Information page on RobotEvents.com.

## Section 3: Connecting to Event Procedure

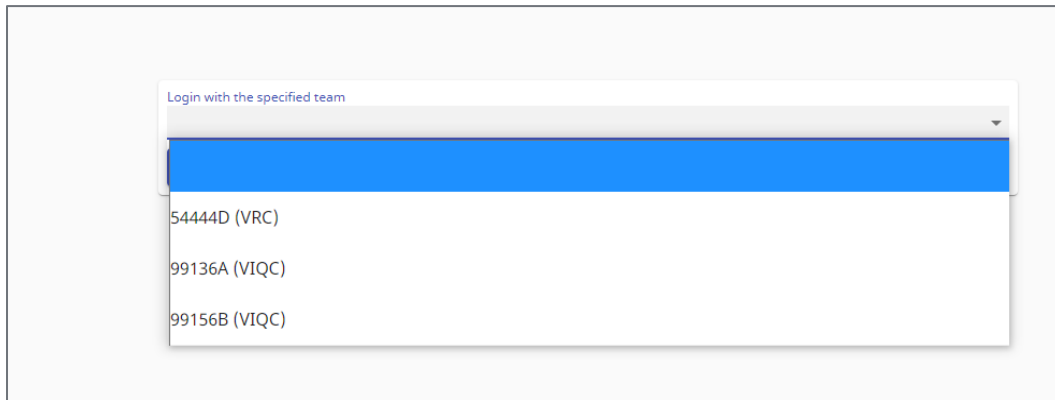
### Step 1: Registering for the Event

Teams need to be registered for the correct Live Remote Tournament on RobotEvents.com. To find events, visit [www.robotevents.com](http://www.robotevents.com) and search by program and event type "Live Remote Tournament." Teams are able to attend LRT events outside of their geographic region, however some events may be restricted to only teams from that region. The event's information page should state if any such restrictions are in place.

## Step 2: Logging into the LRT System

On the day of the event, the **Primary or Secondary Contact** on RobotEvents.com for the registered team needs to be logged into their RobotEvents.com account via the Google Chrome web browser on the same computer the team will be using for audio and video for the Live Remote Tournament.

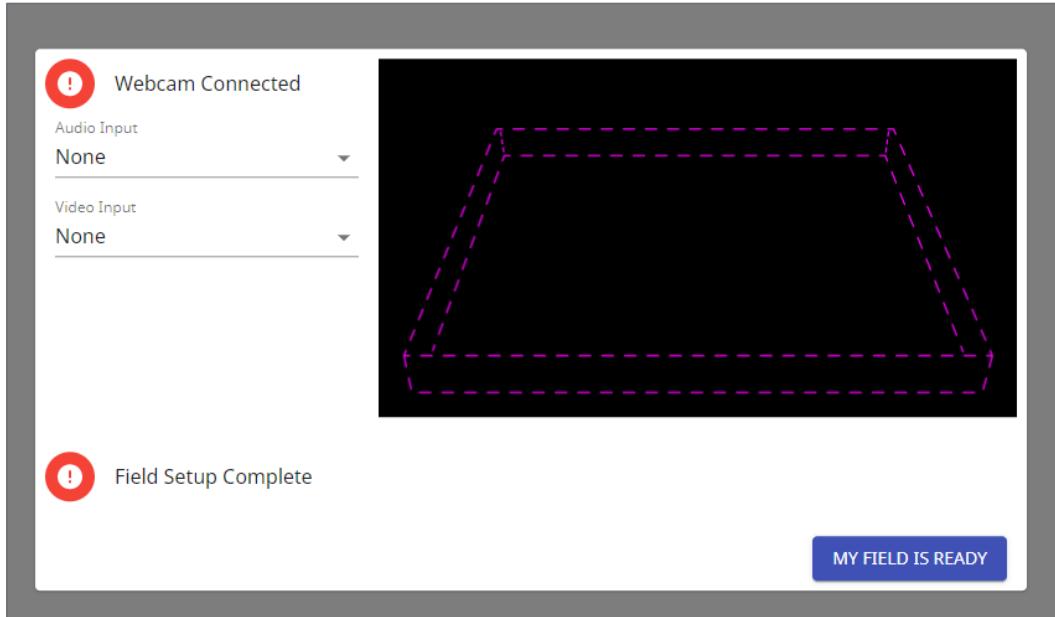
Once logged in, the coach should go to [remote.robotevents.com](https://remote.robotevents.com) and select the desired team registered for the event from the dropdown menu. If you have selected the incorrect team, you may be able to change it via the gear icon on the top right-hand side of the screen and select “Change Teams.”



All teams in a coach's RobotEvents.com account should appear in a drop-down list. Only one team can be selected per computer.

## Step 3: Setting up Audio & Video Inputs, Robot Controller

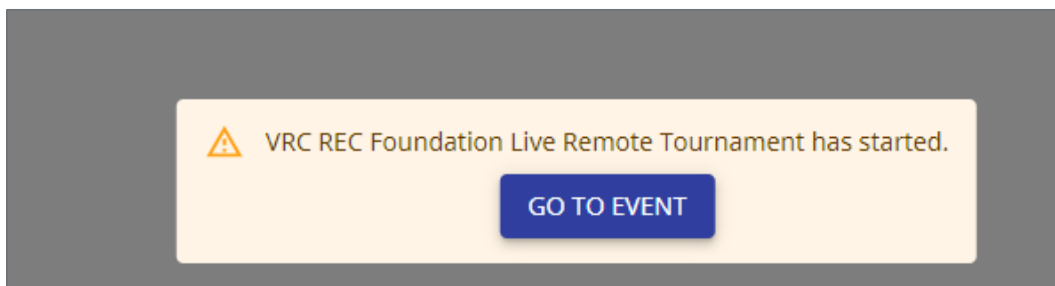
Once the team logs into remote.RobotEvents.com, the team will be asked to connect their webcam (and be prompted to make sure their field fits in the purple outline) and select their microphone. The teams will be asked to select their Autonomous Program via their V5 controller in order to be able to connect the controller to the system.



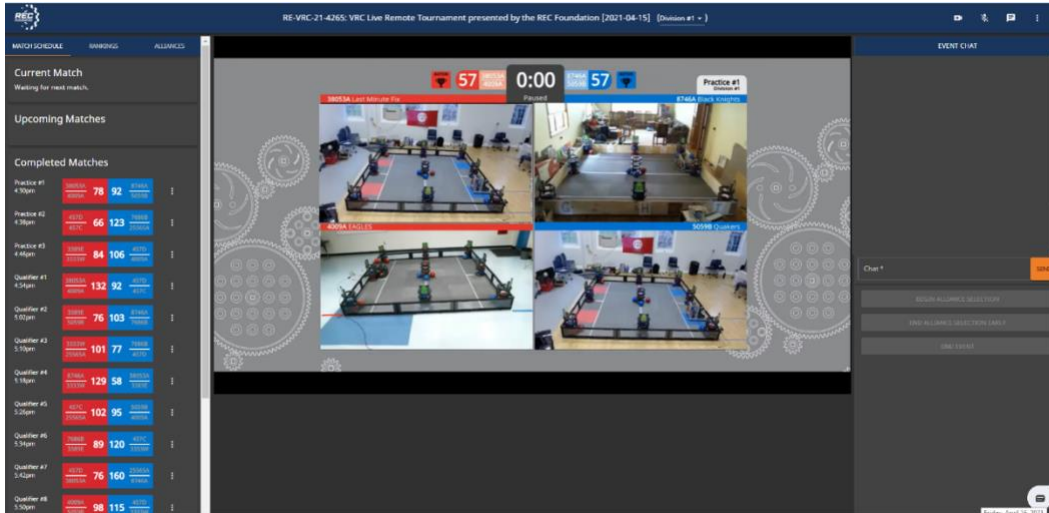
#### Step 4: Joining the Live Remote Tournament

If the team logs on **before** the Tournament Operator has started the event, the team will be sent to the practice match lobby at [remote.robotevents.com](https://remote.robotevents.com). This is a great opportunity to test your camera setup and practice driving with other teams logged into the practice system.

**Once the Tournament Operator has started the event**, the team will see a pop up on the bottom of their screen in the [remote.robotevents.com](https://remote.robotevents.com) system that will allow them to join the event by selecting “Go to Event.” Once a team joins the event, they will be automatically placed into the Event Lobby. In the Event Lobby, teams can view the match list on the left-hand side of the screen. Teams can communicate with the other teams and event staff via both the public Event Chat on the right-hand side of the screen and private chat by clicking on the icon in the upper right-hand side and selecting who they wish to chat with. This is useful for discussing strategies with future alliance partners. The team will remain in the lobby until the Tournament Operator starts a match the team is participating in.



This is the pop-up notification that a Tournament Operator has started an event that a team is registered for.

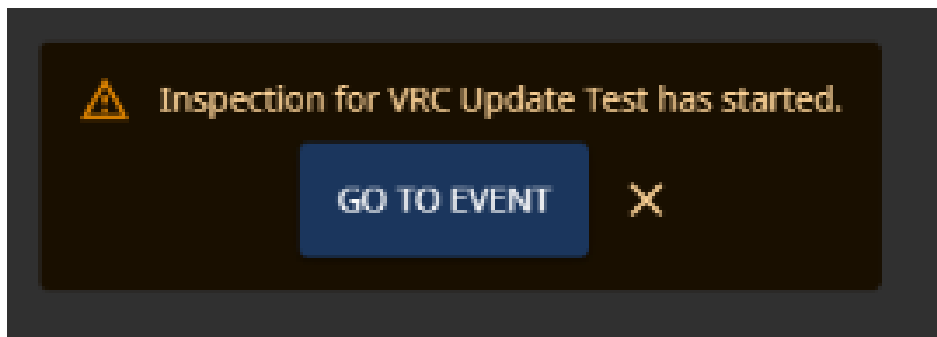


This is a view of the lobby screen, with the match list on the left and event chat on the right. A team's number will be highlighted in yellow for their upcoming matches.

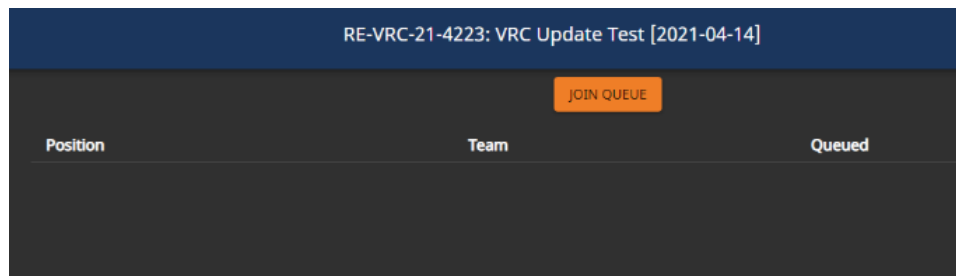
## Step 5: Robot Inspection

Event Partners will schedule a period and format for Robot Inspection. This section will discuss the LRT system's inspection portal.

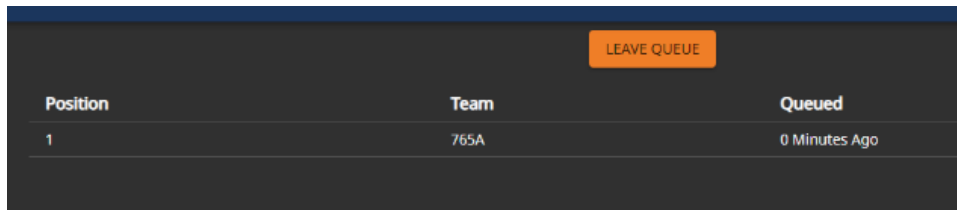
Once an Event Partner starts inspection, teams will receive a notification as shown below:



This button will bring teams into the event's inspection queue. Teams can also be automatically brought into the inspection system by the EP if they are logged into the LRT system.



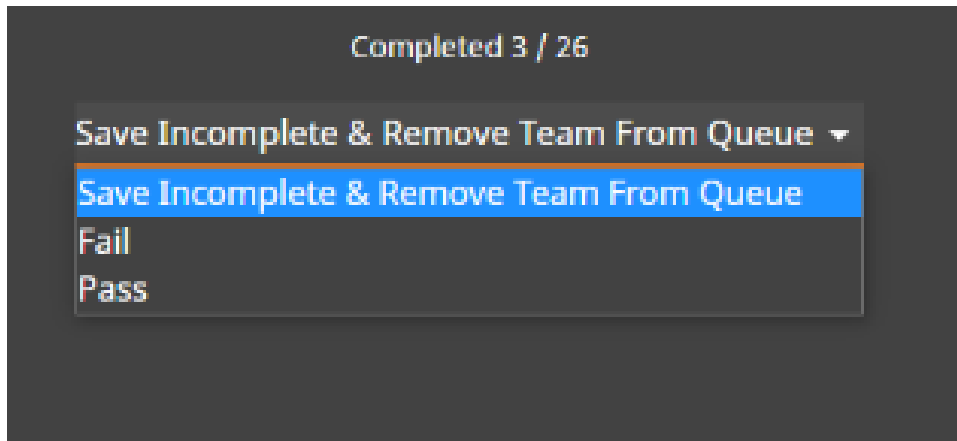
The “Join Queue” Button will add the team to the list of teams ready to be inspected. Once it is their turn, event staff will go through the inspection checklist with teams.



Position	Team	Queued
1	765A	0 Minutes Ago

LEAVE QUEUE

This is the view once in the Inspection Queue – teams can leave the queue if they realize they are not ready to be inspected.



Inspection Status: There are 3 states a team can be marked as: Pass, Fail, and Save Incomplete and Remote from Queue – teams that are marked “Fail” will be automatically removed from the match list.

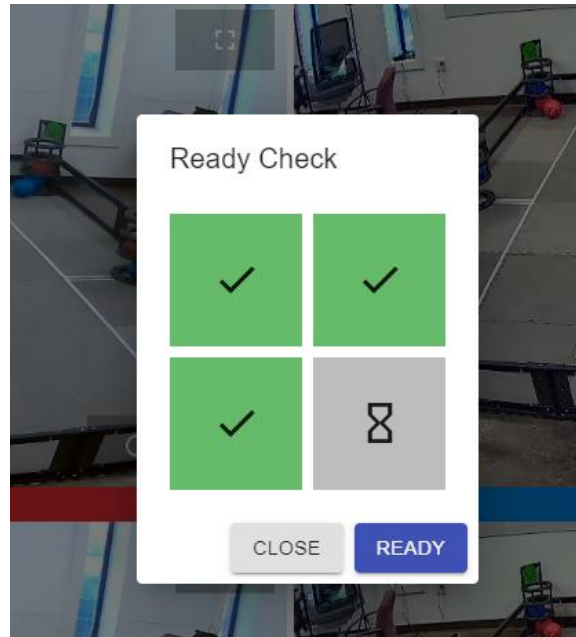
## Section 4: In-Event Procedures

### Step 1: Joining a Match

**Note:** Teams will be automatically joined to the match when the Tournament Operator clicks on the “Start Match” button.

### Step 2: The Ready Check

When the Tournament Operator asks for a “Ready Check,” click on the “Ready” button to show that the team is ready for the match. This is analogous to giving the referee a thumbs up at an in-person event to show they are ready to start their match. Teams should check that their robot, field, and video connections are ready before confirming the Ready Check. Teams should contact the Tournament Operator via the match chat if there is an issue preventing them from competing.



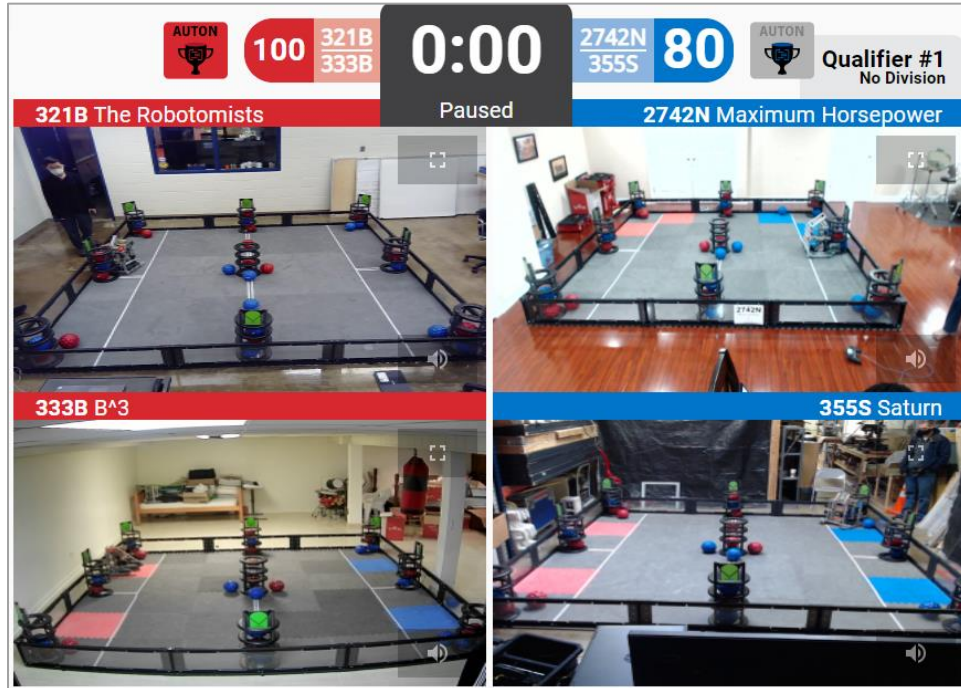
### Step 3: Match Start/Autonomous Period

Once the match is started, there will be a 5 second countdown on the match timer along with an audio prompt. All teams will run their autonomous programs simultaneously. Once the timer reaches zero, the autonomous period will stop and robots should automatically cease movement. The autonomous period will then be scored to check for not only the assignment of an Autonomous Bonus, but also the extra Win Point for each alliance that completes their home row.

### Step 4: Driver Controlled Period

Once the Autonomous period has been scored, there will be another 5 second countdown on the match timer followed by the 1:45 driver-controlled portion of the match. At its conclusion, robots should cease operation automatically.





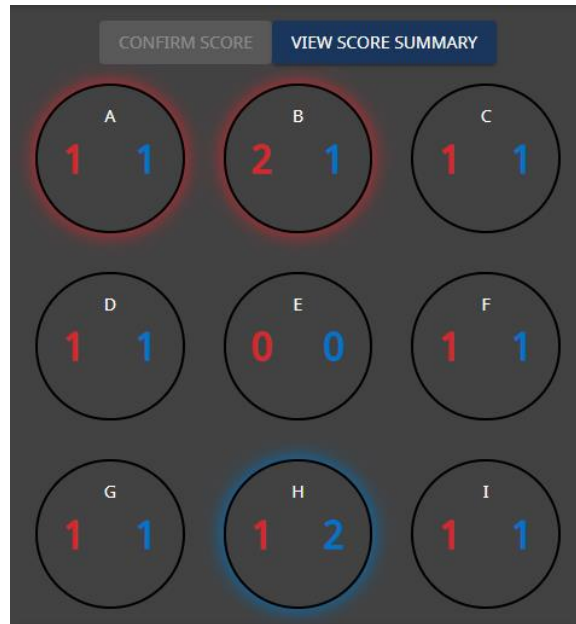
This is a view of a match.

## Step 5: Scoring the Match

Once the match is completed, the scorekeeping referees will record the scored objects in each position. You may be asked to move your robot out of the way if it is blocking the view of a potentially scored object or verify a scored object in the match chat.

On the right-hand side of the screen, you will see a scoring interface that will mirror the scoring interface used by the scorekeepers of the event. Once the score is settled by the volunteers, you will have an opportunity to “Confirm Score” – this affirms that the placement of scoring objects on your field is correct with what the scorekeepers have determined. Any discrepancies should **be immediately put into the match chat** so it can be investigated by event staff. This helps both teams and event staff clearly communicate scoring issues.

A team’s confirmation is final and cannot be undone. The button will turn grey once clicked. Remember that this feature only confirms the objects on your field and not how those objects interact with your partner’s field. Teams do not need to confirm a score in order for an event to proceed. The match can still be ended and finalized without confirmation.



The above image shows a team's game object placement. The "Confirm Score" button above the field diagram is in grey, indicating that this team has either already confirmed their score with event staff or the match is still being scored by referees. The match chat for alerting staff to discrepancies is below the field diagram.

## Step 6: Finalizing the Score

Once all objects are scored and the score is announced the Tournament Operator will select "Finalize Score" which will then send the team back to the event lobby space. Teams should then reset their field in preparation for their next match.

## Step 7: Repeat for Additional Matches

Repeat the previous steps for each Practice and Qualification Match until all of your team's matches are complete.

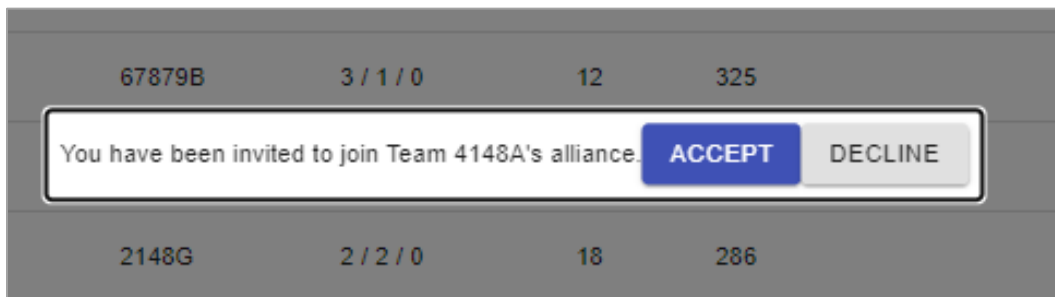
## Step 8: Finals Matches and Alliance Selection

Once the last Qualification Match is completed, the Tournament Operator will start Alliance Selection. Please refer to the Game Manual for this process. All teams in a position to be Alliance Captains will receive prompts in turn asking them to select an Alliance Partner. Teams will receive invitations to whether accept or decline on their own computers and are responsible for answering those invitations **promptly**.

Unlike in-person events, the Live Remote VRC Alliance Selection process does not require facilitation by an Emcee. Teams should make notes on which teams they might want to ask during the event so they can proceed quickly through Alliance Selection. Remember to have a few backup teams you may want to ask to be your alliance partner in case your first choices are not available.

Test 1/26/2021					
Rank	Team	W/L/T	AP	SP	
1	4148A	4 / 0 / 0	21	329	
2	2148F	4 / 0 / 0	12	302	<input type="button" value="CHOOSE PARTNER"/>
3	2148T	4 / 0 / 0	21	344	<input type="button" value="CHOOSE PARTNER"/>
4	4148C	3 / 1 / 0	18	335	<input type="button" value="CHOOSE PARTNER"/>

This is a view of the Alliance Selection screen from the perspective of someone selecting a partner.



This is a view of the Alliance Selection screen from the perspective of someone who has been selected as a partner and is given the choice to Accept or Decline. **This cannot be undone.**

Once Alliance Selection is complete, Elimination Matches will be automatically generated. These matches can be found on the left-hand side of the screen once the Tournament Operator completes the set up and verifies all teams included in finals. This will follow the bracket system outlined in the game manual.

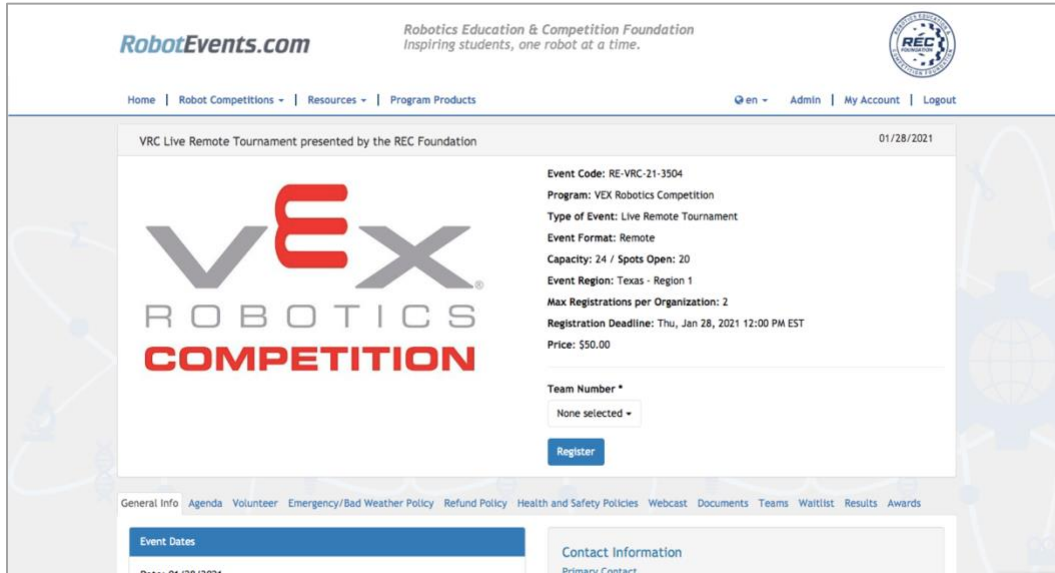
Teams will likely be given a few minutes to strategize with their alliance partner before Elimination Matches begin.

## Step 9: Elimination Matches

Continue onto the Elimination matches and play them using the same procedures as Practice and Qualification Matches.

## Step 10: End of Event

Once all the Elimination Matches are completed and scores are finalized the event will end. When the Tournament Operator ends the event, the team will be sent back to the RobotEvents.com information page of the event they just participated in.



This is what teams currently see after an event has been ended and finalized.

**Congratulations! You have completed a Live Remote Tournament!**

## Section 5: Troubleshooting

[Click here](#) for the LRT Troubleshooting Guide.