VEX AIR DRONE COMPETITION

PICK & DROP

2026–2027

Game Manual

Version 1.1

AIR Full Manual v1.1

Prefix

Changelog

To view each change, use the “Compare with” dropdown in the top toolbar.

Version	Date	Changes
1.1	November 6, 2026	Updates based on early gameplay testing and feedback.
1.0	October 8, 2026	Initial release for the 2026-2027 season

Game Manual Updates

The latest version of this manual is always at AIRmanual.vex.com.

Scheduled updates add relevant Q&A answers to the rules, make rules clearer, and include any major changes. They come out when the *Game Design Committee* decides they are needed, on a Thursday by 5:00 PM CST (11:00 PM GMT). They are announced on the VEX Forum and through VEX Robotics social media. Small fixes for typos and grammar may be released at any time, outside this schedule.

Each update takes effect seven days after it is released, so an event that starts before then uses the previous version. Urgent safety or fairness fixes may take effect right away. Older versions stay available for reference all season. Leagues use the version in effect at the start of each session.

The Q&A System

If you can’t find the answer to a rules question after reading the manual, your *Team’s Adult* representative can ask the *Game Design Committee* in the official Q&A at events.vex.com. Q&A answers are official rulings and take effect as soon as they are posted.

Before posting:

- Use the Q&A only for rules questions.
- Only registered *Teams*, certified *Event Partners*, and certified VEX AIR *Head Referees* can post.

- Search this manual and the existing Q&As first.
- Quote the rule you are asking about from the latest version of the manual.
- Ask one question per post, with a clear title.
- Questions are answered (mostly) in the order they are received.
- The *Game Design Committee* will not overrule a *Head Referee's* decision at an event.

Rules and Q&A answers from earlier seasons, including the 2025-26 Pick & Drop Game Manual (v0.1.1), do not apply this season. If you still need an answer, ask again in this season's Q&A.

Hierarchy of Information

Official rulings come from these sources, in this order:

a. This Game Manual, including all published updates.
b. The official Q&A. If a Q&A answer conflicts with the manual, the Q&A answer applies until a manual update addresses it.
c. Other VEX Robotics and Global Robotics and Science Foundation documents and training materials.

The Code of Conduct, the *Student*-Centered Policy, and the *Student* Eligibility Policy are the final word on their own topics. No other source is official.

Rules Reference Guide

Scoring Rules	
SC1	All scoring statuses for *Scoring Objects*, *Goals*, and *Landed Drones* are evaluated after the *Match* ends
SC2	Scoring status for *Ring Tunnel Passes* is evaluated during the *Match*
SC3	All scoring statuses are evaluated visually by a *Head Referee*
SC4	*Orbit Ball Scored* on the Pole *Goal*
SC5	*Orbit Ball Scored* in the Drop Tower *Goal*
SC6	*Orbit Ball Scored* in the Drop Zone *Goal*
SC7	*Cargo Scored* on the *Cargo* Platform *Goal*

Scoring Rules

SC8	White *Scoring Objects* are wildcards
SC9	*Ring Tunnel Pass* criteria (maximum two per *Match*)
SC10	*Drone Landed* on a *Field Platform*
SC11	*Obstacle Completion Bonus* criteria
SC12	*Goal Bonus* criteria
SC13	One *Scoring System* is in effect for each *Match*

Specific Game Rules

SG1	Starting a *Match*
SG2	Keep *Scoring Objects* in the *Field*
SG3	A *Drone* may carry or control an unlimited number of *Scoring Objects*

Safety Rules

S1	Be safe out there
S2	*Students* must be accompanied by an *Adult*
S3	*Drones* stay inside the *Field*
S4	Wear safety glasses
S5	Hands away when propellers are spinning
S6	*Controllers* are tethered to whoever is flying
S7	Keep at least two feet (60 cm) away from other flying *Drones*

General Rules

G1	Participants must follow the Code of Conduct

General Rules

G2	Participants must follow the *Student*-Centered Policy
G3	Use common sense
G4	*Students* must meet the *Student* Eligibility Policy requirements and have a completed participant release form on file
G5	There is a difference between accidentally and willfully violating a *Drone* rule

General Game Rules

GG1	*Flight Team Members* fly their *Drones*, and stay in the *Flight Station*
GG2	A *Team's Drone* should attend every *Match*
GG3	*Drones* on the *Field* must be ready to play
GG4	*Flight Team Members* must be *Fit to Fly*
GG5	Hands out of the *Field*
GG7	*Match* Replays are allowed, but rare
GG8	*Disqualifications*
GG9	*Drones* hover at the end of the *Match*
GG10	*Downed Drones* wait until all *Drones* are in *Prop Lock*
GG11	Handling the *Drone* mid-*Match* is allowed only under certain circumstances
GG12	*Timeouts* start automatically

Drone Skills Rules

DSC1	Standard rules apply in most cases
DSC2	One *Team*, one *Drone*
DSC3	Scoring *Drone Skills Matches*

Drone Skills Rules

DSC4	*Drone* and *Field* setup
DSC5	Handling the *Drone* is allowed, but the clock runs
DSC6	*Piloting Skills Matches*
DSC7	*Autonomous Skills Matches*
DSC8	*Skills Stop Time*

Inspection Rules

D1	Each *Team* competes with its own *Drone*
D2	*Teams* must use the VEX Robotics AIR Competition *Drone* and official accessories
D3	*Drones* and *Controllers* must be updated to the latest firmware
D4	*Drones* must pass inspection
D5	One Battery at a time
D6	One *Module* at a time
D7	*Drone* LED Status Indicator must remain visible at all times
D8	Officially registered *Team* numbers must be displayed on *Drone*
D9	Officially registered *Team* numbers must be set in the *Controller*
D10	Decorations are allowed
D11	Fly with undamaged propellers, propeller guards, and Landing Feet

Tournament Rules

T1	*Head Referees* have ultimate and final authority on all gameplay and *Drone* ruling decisions during an event
T2	*Head Referees* must be qualified

Tournament Rules

T3	*Flight Team Members* are permitted to immediately appeal the *Head Referee's* ruling
T4	The *Event Partner* has ultimate authority regarding all non-gameplay decisions
T5	Be prepared for minor *Field* variance
T6	*Fields* and *Field Elements* may be repaired at the *Event Partner's* discretion
T7	*Fields* at an event must be consistent with each other
T8	*Qualification Matches* follow the official *Match Schedule*
T9	Every *Team* plays the same number of *Qualification Matches*
T10	*Scoring Systems* rotate by *Round* and are revealed at the start of each *Round*
T11	*Teams* are ranked by their average *Qualification Match* score
T12	Qualification ranking tiebreakers
T13	*Alliance Selection*
T14	Half of the *Teams* at an event advance to the *Finals Matches*
T15	*Finals Matches* decide the Teamwork Champions
T16	Ties in *Finals Matches* lead to limited rematches
T17	Skills *Match* schedule
T18	Skills *Fields* must be consistent with each other
T19	*Drone Skills Matches* are always played under *Scoring System* A
T20	Skills rankings
T21	League events

League Rules

L1	Leagues are *Tournaments* played across multiple sessions

League Rules

L2	League structure
L3	*Drones* are inspected at every session
L4	*Rounds* and *Scoring Systems* continue across sessions
L5	League rankings
L6	*Drone Skills Matches* at leagues
L7	The League Finals session

Section 1 - Introduction

What a VEX AIR Drone Competition Looks Like

At a VEX AIR *Drone* Competition event, called a *Tournament*, *Teams* of *Students* fly *Drones* to score points. An *Event Partner* runs the event, and a *Head Referee* enforces the rules. Most events follow this order:

- **Check-in and inspection.** *Teams* check in and get their *Drone* inspected (Section 5). The *Head Referee* usually holds a short meeting to go over the rules. Before every *Match*, *Teams* run the *Pre-Flight Checklist* (Appendix C).
- **Practice Matches.** Optional *Matches* that don't count, so *Teams* can get used to the *Field*.
- **Qualification Matches.** *Teams* are randomly paired into *Alliances* of two. Both *Drones* fly together for three minutes (3:00) and share one score. *Matches* are played in *Rounds*, and each *Round* uses one *Scoring System* that is revealed when the *Round* starts. *Teams* are ranked by their average score.
- **Drone Skills Matches.** Between *Qualification Matches*, a *Team* can fly alone for ninety seconds (1:30), either with a *Pilot* (Piloting Skills) or with code (Autonomous Skills). Skills *Matches* always use *Scoring System* A.
- **Alliance Selection.** The top-ranked *Teams* pick partners for the Finals. Half of the *Teams* at an event compete in Finals.
- **Finals Matches.** Each *Alliance* flies one *Finals Match*. The highest score wins!
- **Awards.** The event ends with awards for *Match* play, Skills, and judged achievements.

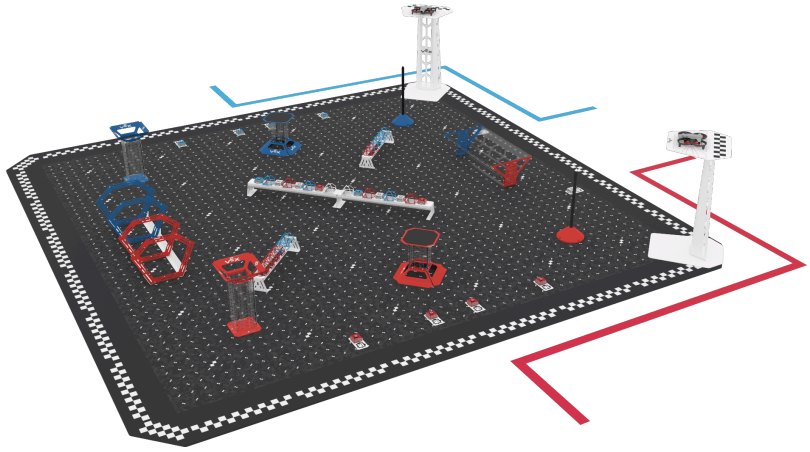

Figure I-1: An angled view of the Pick & Drop *Field* set up for the start of a *Match*. A *Drone* sits on each *Field Platform* at the two corners on the *Flight Station* side, and the blue and red lines mark the *Flight Stations*.

A Teamwork Match, start to finish

- Both *Drones* start on their *Field Platforms*. Up to two *Flight Team Members* per *Team* stand in the *Flight Station*.
- The *Field Control System* starts the *Match*. *Drones* take off, may pick up *Scoring Objects*, drop them into *Goals*, fly through the *Ring Tunnel*, and land on a *Field Platform* before time runs out to earn points.
- The first time all *Drones* are in *Prop Lock*, the *Match* stops for a *Timeout* of up to sixty seconds. *Teams* can recover their *Drones* and change Batteries, Landing Feet, or *Modules*.
- After the *Timeout*, *Drones* can still be retrieved whenever all *Drones* are in *Prop Lock*, but the clock keeps running.
- At 0:00, any *Drone* that is still flying and hasn't started landing holds in a hover. After the *Head Referee* checks which *Drones* are *Landed*, *Pilots* fly the hovering *Drones* back and land them.
- The referees score the *Field*.

About the Game Manual

This manual is the official rulebook for the VEX AIR *Drone* Competition and this season's game, Pick & Drop. Everyone at an event follows it: *Teams*, coaches, referees, *Event Partners*, and volunteers.

It is not a strategy guide, a flying tutorial, or a replacement for referee or *Event Partner* training.

How to Read the Game Manual

The rules work together, so read the whole manual, not just one section. Each rule has a code that tells you its group:

- **S (Safety Rules)** keep everyone safe, at all times.
- **G (General Rules)** cover conduct, eligibility, and fair play.
- **GG (General Game Rules)** explain how every VEX AIR *Match* works.
- **SC (Scoring Rules)** explain how points are earned.
- **SG (Specific Game Rules)** apply to this season's game only.
- **D (Drone Rules)** explain what makes a *Drone* legal and how inspection works.
- **DSC (Drone Skills Rules)** list the changes for *Drone Skills Matches*.
- **T (Tournament Rules)** explain how events run and how *Teams* are ranked.
- **L (League Rules)** list the tournament rule changes specific to leagues.

Capitalized words like *Drone*, *Match*, and *Prop Lock* have special meanings, listed in the Glossary (Appendix B). If a word isn't in the Glossary, use its normal dictionary meaning.

The *Pre-Flight Checklist* and the *Fit to Fly* check, which *Teams* run before every flight, are in Appendix C.

Some rules have **Violation Notes** that explain how the rule is enforced, such as when a *Violation* becomes Major. In the online manual, *Violation* Notes appear as a dropdown below each rule; select it to open the notes. If a rule has no *Violation* Notes, the standard penalties apply (see *Violation*, *Disablement*, and *Disqualification* in the Glossary, Appendix B).

Some places in the manual also have **orange-bordered boxes**. They explain a rule or definition in a different way, where the *Game Design Committee* thought that would help. These boxes support the rules and definitions; they don't replace them.

If two sources of rules seem to disagree, see Hierarchy of Information in the Prefix at the front of this manual. Game Manual Updates and The Q&A System are there too.

Game Design Philosophy - A Letter from the GDC

This is the first season of VEX AIR *Drone* Competition events, and we're excited. We'll be paying close attention all year, and what we learn from *Teams*, *Event Partners*, and referees will shape the seasons

that follow.

Pick & Drop was partly released last year. The early *Teams* told us the flying was fun, but they wanted more strategy and more variety from one *Match* to the next.

So this season, Pick & Drop uses six *Scoring Systems*, with a different one for each *Round*. The *Field*, the *Scoring Objects*, and what counts as *Scored* stay the same; only the point values change. A *Goal* worth chasing in one *Round* might be worth skipping in the next. *Teams* that read the *Scoring System* and adjust will find chances that *Teams* flying the same plan every *Match* will miss.

VEX AIR is also our first competition played entirely in three dimensions. We can't wait to watch *Students* grow in airmanship, adaptability, spatial awareness, and the discipline to fly a plan under pressure.

Good luck, and have a safe flight!

The VEX AIR *Drone* Competition *Game Design Committee*

Section 2 - The Game

Pick & Drop at a Glance

Pick & Drop is a cooperative *Drone* game played by an *Alliance* of two *Teams* on a 12′ x 12′ *Field*. *Drones* pick up *Orbit Balls* and *Cargo* and drop them into seven *Goals*, earning more points when a *Scoring Object's* color matches its *Goal*. *Drones* also score by flying through the *Ring Tunnel* and by landing on a *Field Platform* before the three-minute *Match* ends. Each *Round* uses one of six *Scoring Systems*, so what each *Goal* is worth changes from *Round* to *Round*.

Field Overview

The *Field* includes:

- 20 *Orbit Balls* (9 Red, 9 Blue, 2 White)
- 18 *Cargo* (6 Red, 6 Blue, 6 White)
- 3 *Racks* (1 Long *Rack*, 2 Short *Racks*)
- 2 Drop Tower *Goals* (1 Red, 1 Blue)
- 2 *Cargo* Platform *Goals* (1 Red, 1 Blue)
- 2 Pole *Goals* (1 Red, 1 Blue)
- 1 Drop Zone *Goal*
- 2 *Field Platforms*
- 1 *Ring Tunnel*
- 10 *Cargo Tile Plates*

Note: The illustrations in this manual show the general layout of the game. They are not exact specifications. See Appendix A for details.

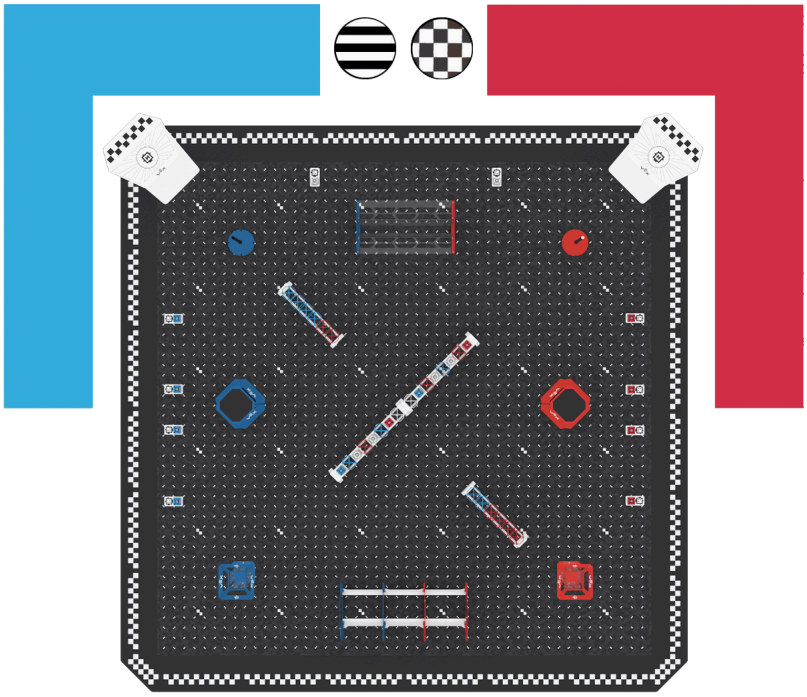

Figure FO-1: Top down image of the *Field* showing recommended locations for where *Head Referee* (black and white stripes), *Scorekeeper Referees* (black and white checkerboard), and *Flight Team Members* (red and blue) should stand.

Scoring Objects

- **Cargo:** a Red, White, or Blue cube that expands when picked up, to about 2.2″ x 2.2″ x 2.75″ (55 mm x 55 mm x 70 mm).
- **Orbit Ball:** a Red, White, or Blue ball made of three interlocking plastic rings, about 4″ across.

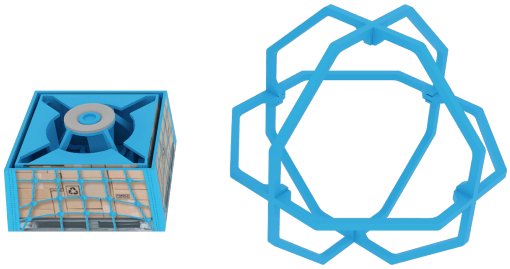

Figure FO-2: A Blue *Cargo* and Blue *Orbit Ball*.

Goals

- **Drop Tower:** a tall *Goal* with a funnel on top. There are two, one Red and one Blue, shown by the color of the funnel and base.
- **Drop Zone:** a wide, short *Goal* with a funnel on top. There is one, and it has no color.

- **Cargo Platform:** a *Goal* with a flat top plate covered in loop tape. There are two, one Red and one Blue, shown by the color of the top plate and base.
- **Pole Goal:** a vertical PVC pole with a cone-shaped cap, standing in a cone-shaped base. There are two, one Red and one Blue, shown by the color of the base.

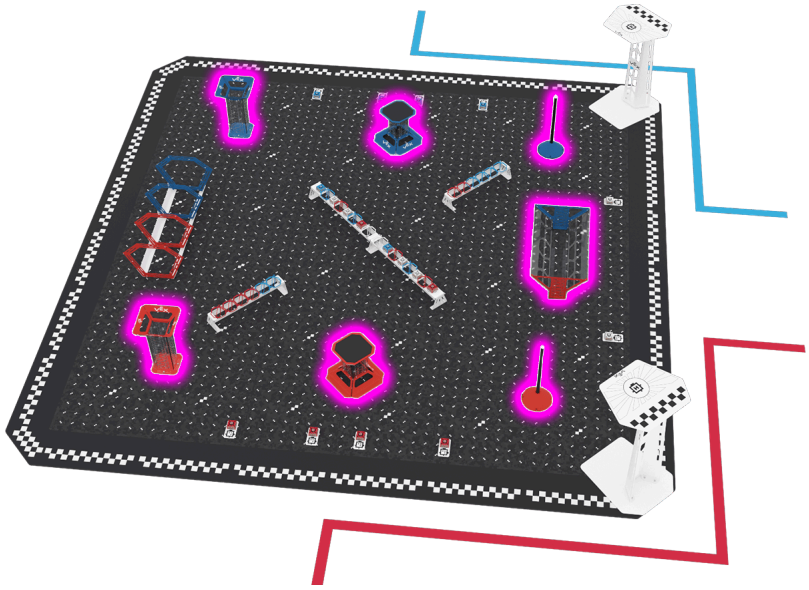

Figure FO-3: Side view of the *Field* with the seven *Goals* highlighted in pink.

Other Field Elements

- **Racks:** hold *Scoring Objects* at the start of the *Match*. The Long *Rack* holds *Orbit Balls* and *Cargo*. Short *Racks* hold only *Orbit Balls*. See Figure FO-4.
- **Ring Tunnel:** four Rings that *Drones* fly through. See Figure FO-5.
- **Field Platforms:** where *Drones* take off at the start of the *Match* and may land at the end. See Figure FO-5.
- **Cargo Tile Plates**: each holds one *Cargo* at the start of the *Match*. See Figure FO-6.

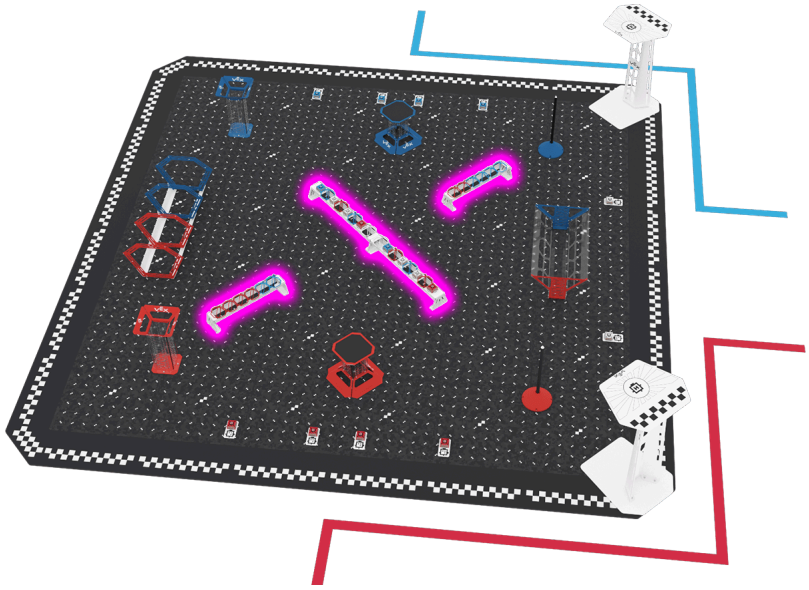

Figure FO-4: A side view of the *Field* showing the location of the two Short *Racks* and one Long *Rack* highlighted in pink.

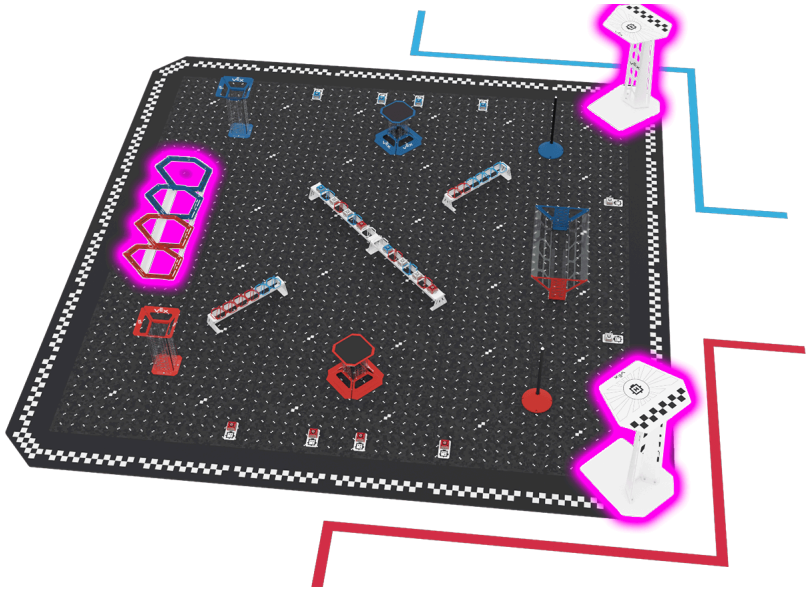

Figure FO-5: A side view of the *Field* showing the location of the two *Field Platforms* and the *Ring Tunnel* highlighted in pink.

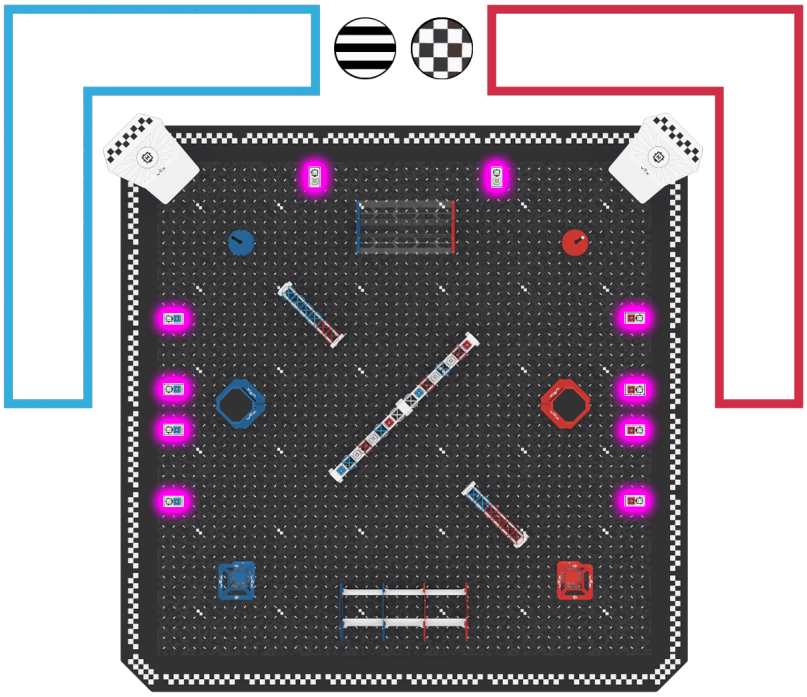

Figure FO-6: A top-down view of the *Field* showing the location of the 10 *Cargo Tile Plates* highlighted in pink.

Section 3 - Scoring & Rules

Scoring

How many points each action is worth depends on the *Scoring System* in effect. There are six, named A to F (Table SC-1). What counts as *Scored* never changes; only the point values do. System A is the baseline, and Systems B to F each reward a different part of the game more. Check the *Scoring System* before each *Match* and adjust your plan.

<SC1> All scoring statuses for Scoring Objects, Goals, and Landed Drones are evaluated after the Match ends. Referees score once everything on the *Field* has stopped moving.

a. Referees try not to touch *Scoring Objects* while scoring. If one must be moved to check another, the *Head Referee* and all *Teams* agree on its status and record it first.
b. If a *Match* ends early, it is scored as the *Field* stands once everything has stopped moving. This applies to a *Match* ended by agreement, by a *Match Abort*, or by a *Head Referee E-Stop*.

<SC2> Scoring status for Ring Tunnel Passes is evaluated during the Match. Referees count each *Ring Tunnel Pass* as it happens, up to two per *Match*. It doesn't matter which *Drone* makes it.

> Note: Every *Match* needs a *Head Referee* and at least one *Scorekeeper Referee*. A recommended setup: the *Head Referee* stands between the two *Field Platforms* and watches the *Match*, the *Scorekeeper Referee* stands beside them and counts *Ring Tunnel Passes*, and the *Scorekeeper Referee* and *Pilots* confirm each Pass with a word or signal as it happens. Events tell *Teams* their process before *Matches* start.

<SC3> All scoring statuses are evaluated visually by a Head Referee.

a. Referees and event staff may not use videos or photos of the *Match*.
b. Only the *Flight Team Members* from that *Match*, not *Adults*, may ask the *Head Referee* about the score.

What Counts as Scored

Rules SC4 to SC12 explain what counts as *Scored*: when a *Scoring Object* is *Scored* in or on a *Goal*, when a *Ring Tunnel Pass* counts, when a *Drone* is *Landed*, and when bonuses are awarded. These criteria are

the same under every *Scoring System*.

<SC4> Orbit Ball Scored on the Pole Goal. An *Orbit Ball* is *Scored* on a Pole *Goal* if:

a. It is not touching a *Drone*.

b. Part of the Pole is inside the *Orbit Ball's* outer edges (Figure SC4-1).

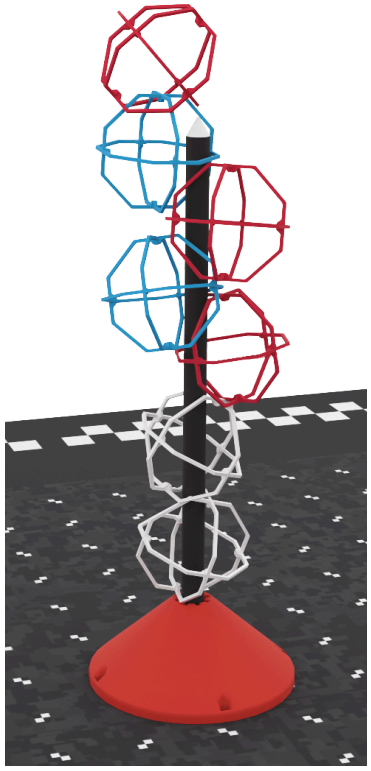

Figure SC4-1: The top Red *Orbit Ball* is not *Scored* because the Pole is not inside it. All other *Orbit Balls* are *Scored*.

<SC5> Orbit Ball Scored in the Drop Tower Goal. An *Orbit Ball* is *Scored* in a Drop Tower *Goal* if:

a. It is not touching a *Drone*.

b. At least part of it is inside the *Goal*, below the top edge of the *Goal's* opening (Figure SC5-1).

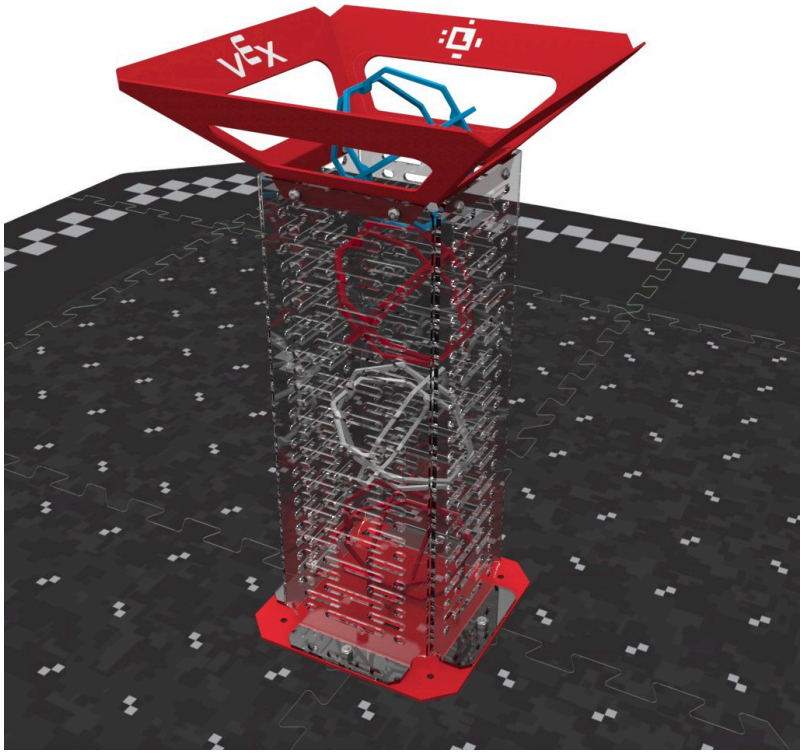

Figure SC5-1: All four *Orbit Balls* are *Scored* because each is at least partly inside the *Goal*.

<SC6> Orbit Ball Scored in the Drop Zone Goal. An *Orbit Ball* is *Scored* in the Drop Zone *Goal* if:

a. It is not touching a *Drone*.

b. At least part of it is inside the *Goal*, below the top edge of the *Goal's* opening (Figure SC6-1).

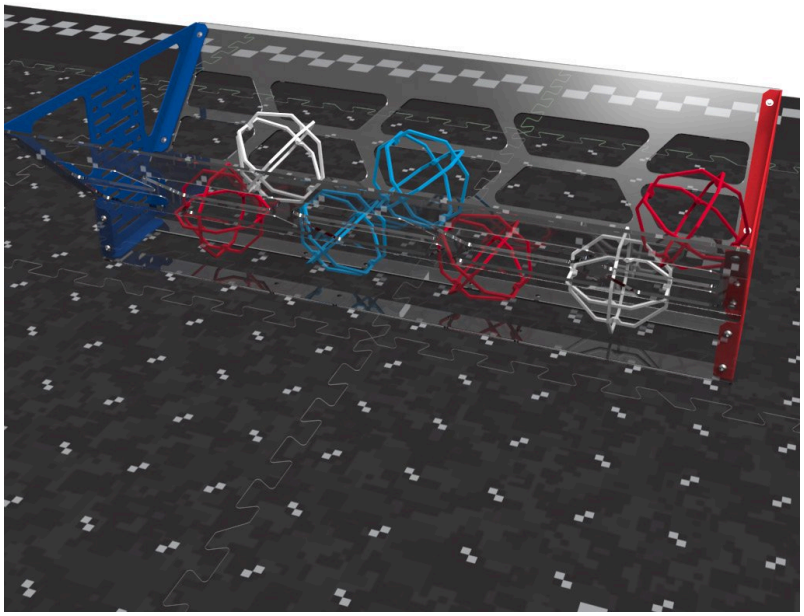

Figure SC6-1: All seven *Orbit Balls* are *Scored* because each is at least partly inside the *Goal*.

Note: For SC5 and SC6, the top edge is the rim of the funnel. An *Orbit Ball* sitting completely above the rim, such as one resting on top of a full *Goal*, is not *Scored*. An *Orbit Ball* that is partly below the rim is.

<SC7> Cargo Scored on the Cargo Platform Goal. *Cargo* is *Scored* on a *Cargo* Platform *Goal* if:

a. It is not touching a *Drone*.

b. It is held up only by the *Cargo* Platform *Goal* and/or other *Cargo* that is *Scored* (Figure SC7-1).

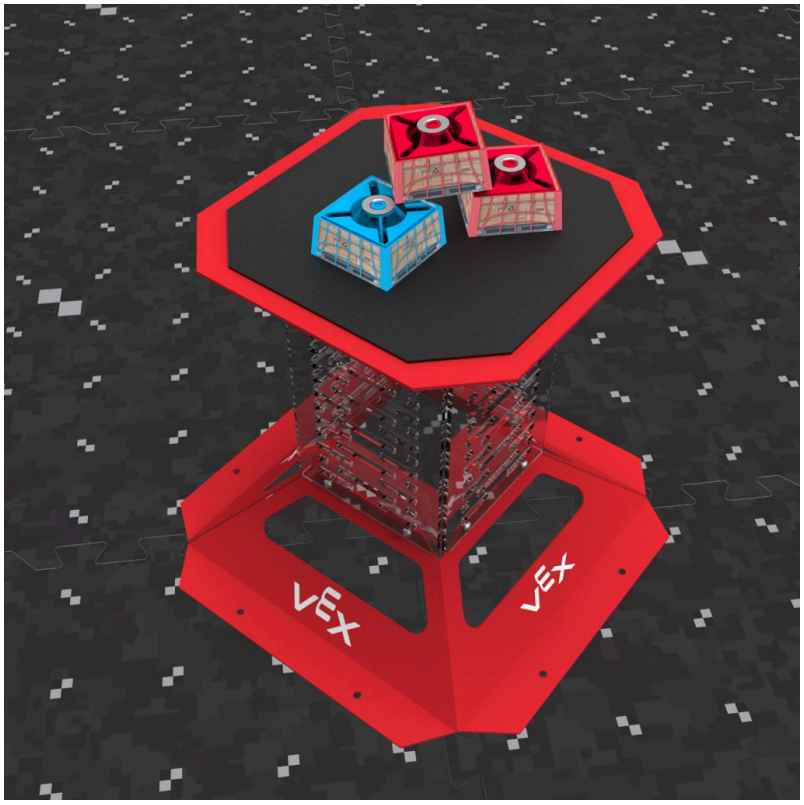

Figure SC7-1: All of this *Cargo* is *Scored* because each piece is held up by the *Goal* or by *Scored Cargo*.

<SC8> White Scoring Objects are wildcards. A White *Scoring Object* counts as matching the color of any *Goal* it is *Scored* in.

<SC9> Ring Tunnel Pass criteria (maximum two per Match). A *Drone* completes a *Ring Tunnel Pass* if:

a. It flies through all four Rings in order, in either direction.

b. It doesn't touch the *Field Tiles* while going through the Rings.

Up to two *Ring Tunnel Passes* count per *Match*. One *Drone* may complete both.

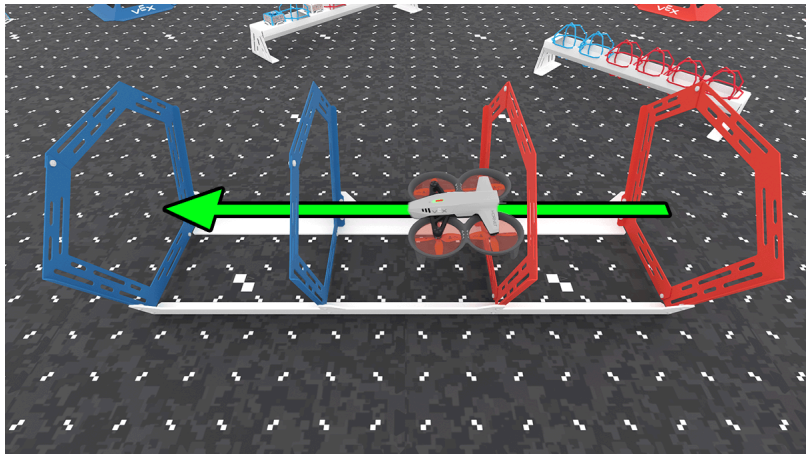

Figure SC9-1: A *Drone* completing a *Ring Tunnel Pass*.

<SC10> Drone Landed on a Field Platform. A *Drone* is *Landed* if:

a. All four *Drone* feet are on the top plate of a *Field Platform* at the end of the *Match*, and no other *Drone* is touching that *Field Platform*.

b. The *Drone* is not touching a *Scoring Object*.

c. The *Drone* landed itself:

i. A *Drone* whose *Pilot* triggered landing from the *Controller* before the *Match* timer reached 0:00 is *Landed* if it comes to rest meeting a and b.

ii. A *Drone* that was still flying at 0:00 is held in a hover and is not *Landed*, even if it is flown back to a *Field Platform* afterward (GG9).

iii. A *Drone* placed on a *Field Platform* by hand is not *Landed*, unless it takes off again and lands itself.

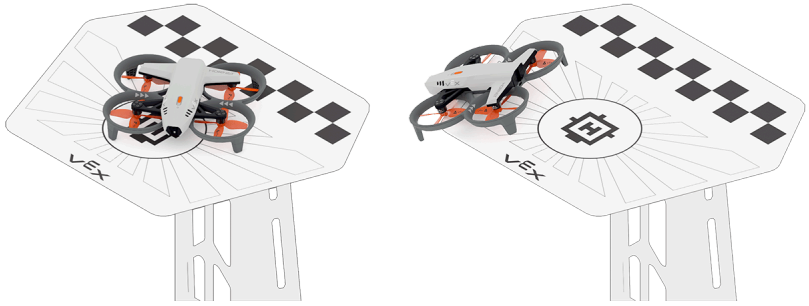

Figure SC10-1: A comparison of a *Drone* on the Platform and considered *Landed* (the left image) and a *Drone* partially on the Platform and not considered *Landed* (the right image)

<SC11> Obstacle Completion Bonus criteria. At the end of the *Match*:

a. One *Obstacle Completion Bonus* is awarded if at least one *Drone* is *Landed* and the *Alliance* completed at least one *Ring Tunnel Pass*.

b. A second *Obstacle Completion Bonus* is awarded if both *Drones* are *Landed* and the *Alliance* completed two *Ring Tunnel Passes*.

c. It doesn't matter which *Drone* completed the *Ring Tunnel Passes*.

<SC12> Goal Bonus criteria. A *Goal Bonus* is awarded for each *Goal* that has at least one *Scored Scoring Object* at the end of the *Match*.

a. Each of the seven *Goals* can earn only one *Goal Bonus* per *Match*.

b. The colors of the *Scoring Object* and the *Goal* don't need to match.

Scoring System

<SC13> One Scoring System is in effect for each Match.

a. What counts as *Scored* (SC4 to SC12) is the same under every *Scoring System*. Only the point values in Table SC-1 change.

b. The *Scoring System* for each *Round* is not published ahead of time. It is revealed when the *Round* starts, and every *Match* in that *Round* uses it (T10).

c. The event software shows the active *Scoring System*, and it is announced before each *Match*.

Table SC-1: *Scoring Systems*

Scoring Action	A	B	C	D	E	F
Orbit Ball Scored in the Drop Zone *Goal*	1	1	5 ▲	1	1	1
Orbit Ball Scored in a matching color Drop Tower *Goal*	4	3 ▼	5 ▲	7 ▲	4	4
Orbit Ball Scored in a non-matching color Drop Tower *Goal*	2	1 ▼	3 ▲	2	2	4 ▲
Orbit Ball Scored on a matching color Pole *Goal*	5	8 ▲	5	5	5	5

Scoring Action	A	B	C	D	E	F
Orbit Ball Scored on a non-matching color Pole *Goal*	3	4 ▲	3	3	3	5 ▲
Cargo Scored on a matching color *Cargo* Platform *Goal*	6	6	5 ▼	6	6	6
Cargo Scored on a non-matching color *Cargo* Platform *Goal*	4	4	3 ▼	4	4	6 ▲
Goal Bonus: each *Goal* with a *Scored Scoring Object* (SC12)	10	10	10	10	7 ▼	10
Ring Tunnel Pass: up to two per *Match* (SC9)	5	5	5	5	10 ▲	5
Drone Landed on a *Field Platform* (SC10)	5	5	5	5	8 ▲	5
Obstacle Completion Bonus (SC11)	5	5	5	5	12 ▲	5

▲ = more points than System A. ▼ = fewer points than System A. Values without a mark are the same as System A.

Specific Game Rules

<SG1> Starting a Match. Before the *Match* starts, each *Drone* must be:

a. On its own *Field Platform*, one *Drone* per Platform. The Red *Team* and the Blue *Team* (as listed in the event software) each stand at their own *Flight Station*, with their own *Drone* on the *Field Platform* in front of them.

b. Powered on and in *Prop Lock*. *Teams* release their *Drones* from *Prop Lock* only when the *Head Referee* tells them to. See the "Before Takeoff" steps in Appendix C.

› **Violation Notes:**

1. The *Match* won't start until all *Drones* meet this rule. A *Drone* that can't be ready in time is removed from the *Field* for that *Match*. This is not a *Disqualification*, but the *Drone* doesn't play.

<SG2> Keep Scoring Objects in the Field. Any *Scoring Object* that leaves the *Field*, on purpose or not, stays out for the rest of the *Match*.

<SG3> A Drone may carry or control an unlimited number of Scoring Objects.

Safety Rules

Safety comes first at all VEX Robotics Competitions. These rules apply at all times, on and off the *Field*.

<S1> Be safe out there. Everyone at an event must follow the Global Robotics and Science Foundation Safety Policy. *Students* must stay off the *Field Tiles* at all times. Only the *Head Referee* or another event staff member may enter the *Field*. If a *Team* acts unsafely, or damages the *Field*, a *Field Element*, or a *Scoring Object*, the *Head Referee* may give a *Disablement* and/or *Disqualification*.

<S2> Students must be accompanied by an Adult. Every *Student* must be supervised by a responsible *Adult* who stays for the whole event in case of an emergency. The *Adult* must follow all rules, including the *Student*-Centered Policy (G2). Breaking this rule can lead to removal from the event.

<S3> Drones stay inside the Field. If a *Drone* approaches the edge of the *Field* during a *Match*, the *Head Referee* will give a warning. If the *Drone* leaves the *Field*, the *Head Referee* triggers a *Match Hover*, *Match Abort*, or *E-Stop* depending on the situation.

a. The *Head Referee* releases the *Match Hover* once each *Pilot* has acknowledged it. Any *Drone* outside the *Field* then flies straight back over the *Field Tiles* and lands.
b. A *Drone* that ends up outside the *Field* receives a *Disablement*, whether or not it was warned, and may not fly again that *Match*. It may be retrieved once the *Head Referee* says it is safe.
c. A *Match* ended by a *Head Referee* triggering a *Match Abort* or *E-Stop* is scored as the *Field* stands when it ends (SC1b). It is not replayed, unless GG7d applies.
d. A *Drone* brought down by a *Match Abort* is not *Landed*, unless it had already landed itself (SC10c).
e. A *Team* may trigger an *E-Stop* on its *Drone* at any time for safety reasons.
f. A *Match Abort* or a *Head Referee E-Stop* ends the *Match* for every *Drone* on the *Field*. No *Timeout* starts, and the *Match* does not restart. A *Team E-Stop* stops only that *Team's Drone*. The *Match* continues, and the *Drone* may fly again once it is recovered.

› **Violation Notes:**

1. A *Team E-Stop* for a safety reason, such as a *Drone* heading toward a person or out of the *Field*, is never a *Violation*. The *Drone* may fly again once it is recovered.

2. If the *Head Referee* decides a *Team E-Stop* was not for a safety reason, the *Drone* receives a *Disablement*. *Teams* get the benefit of the doubt (G3).

<S4> Wear safety glasses. All *Flight Team Members* wear eye protection at the *Field*. Safety glasses with side shields and shatterproof lenses are recommended.

<S5> Hands away when propellers are spinning. If any *Drone* in the *Match* is flying or has spinning propellers, no one may touch any *Drone*, including their own. Wait until all *Drones* are in *Prop Lock* (GG11). Everyone steps clear before any *Drone* is released from *Prop Lock*.

› **Violation Notes:**

1. A *Violation* of S5 may escalate to a *Disablement* or a *Disqualification* at the *Head Referee's* discretion.

<S6> Controllers are tethered to whoever is flying. Every *Controller* has a lanyard attached. Whoever holds the *Controller* wears the lanyard whenever the *Drone* is out of *Prop Lock*, and before the *Drone* is released from *Prop Lock* or takes off. The lanyard from the kit or any other lanyard may be used. See the "Before Takeoff" steps in Appendix C.

a. **Passing the Controller.** A *Controller* may be passed to another *Flight Team Member* only while the *Drone* is in *Prop Lock*, and the new holder puts on the lanyard before the *Drone* is released from *Prop Lock*.
b. **Inspection.** Lanyards are checked at inspection.

› **Violation Notes:**

1. A *Drone* may not fly until whoever holds its *Controller* is wearing the lanyard. If the *Head Referee* sees a *Drone* flying without the lanyard worn, they may tell the *Team* to land and enter *Prop Lock* until it is. Repeated or deliberate *Violations* may be treated as unsafe under S1.

<S7> Keep at least two feet (60 cm) away from other flying Drones. Two feet is about the width of one *Field* Tile. The *Head Referee* warns the *Team* whose *Drone* closed the distance. If both *Drones* closed it, both *Teams* are warned. A *Drone* does not receive a *Disablement* if another *Drone's* S7 *Violation* causes it to leave the *Field* or be *Downed*.

a. Never fly directly above or below another flying *Drone*, even when you are more than two feet away.

b. This rule applies only while both *Drones* are flying. It does not apply to a *Drone* on a *Field Platform* or a *Downed Drone*.

General Rules

These rules point to Global Robotics and Science Foundation policies: the Code of Conduct, the Student-Centered Policy, and the Student Eligibility Policy. Where this manual summarizes them, the policy itself is the final word.

Report a suspected *Violation* of any General Rule to the Judge Advisor, *Head Referee*, or *Event Partner*. After an investigation with the Global Robotics and Science Foundation and VEX Robotics, the *Team* may be removed from *Matches*, lose its *Drone* Skills scores, and/or lose eligibility for judged awards. Each case is reviewed individually.

<G1> Participants must follow the Code of Conduct. Everyone at an event follows the Code of Conduct.

› **Violation Notes:**

1. Any *Violation* of G1 may be considered a *Major Violation* and should be addressed on a case-by-case basis. *Teams* at risk of a G1 *Major Violation* due to multiple disrespectful or uncivil behaviors will usually receive a “final warning”, although the *Head Referee* is not required to provide one.

<G2> Participants must follow the Student-Centered Policy. Everyone at an event follows the *Student*-Centered Policy.

› **Violation Notes:**

1. Potential *Violations* of this rule will be reviewed on a case-by-case basis. By definition, all *Violations* of this rule become *Score Affecting* as soon as a *Drone* which was configured or coded by an *Adult* scores points in a *Match*.

<G3> Use common sense. When reading and applying the various rules in this document, please remember that common sense always applies in the VEX AIR *Drone* Competition.

- If there is an obvious typographical error (such as “per D5” instead of “per G5”), this does not mean that the error should be taken literally until corrected in a future update.

- If no rule prohibits an action, it is generally legal. But if you have to ask whether something breaks S1 or G1, it is probably against the spirit of the competition.
- In general, *Teams* will be given the "benefit of the doubt" in the case of accidental or edge-case rules infractions. However, there is a limit to this allowance, and repeated or strategic infractions will still be penalized.
- This rule also applies to *Drone* rules. If a component's legality cannot be easily/intuitively discerned by the *Drone* rules as written, then *Teams* should expect additional scrutiny during inspection. There is a difference between "creativity" and "lawyering." Basically, if there's not a rule that makes a part legal, it's not allowed.

<G4> Students must meet the Student Eligibility Policy requirements. All *Student* participants must fall within the eligibility requirements set forth in the Student Eligibility Policy for their respective program and have a completed participant release form on file for the event and season.

> **Violation Notes:**
>
> 1. *Teams* believed to be in *Violation* of this rule should be reported to the Judge Advisor, *Head Referee*, and/or *Event Partner* for further investigation in coordination with the Global Robotics and Science Foundation and VEX Robotics and the respective policies. The *Team* may be removed from further *Matches*, have their *Drone Skills Match* scores removed, and/or be removed from consideration for judged awards.

<G5> There is a difference between accidentally and willfully violating a Drone rule. A *Team* that breaks a *Drone* rule, on purpose or not, can't play until its *Drone* passes inspection (D4). Breaking *Drone* rules on purpose to get an advantage goes against the spirit of the competition and will result in *Disqualification*.

> **Violation Notes:**
>
> 1. A *Team* that circumvents a *Drone* rule for a competitive advantage should receive an immediate *Disqualification* for the current *Match*.

General Game Rules

<GG1> Flight Team Members fly their Drones, and stay in the Flight Station. Each *Flight Station* may have up to two *Flight Team Members*. The *Match* will not start while a *Flight Station* has more than two.

Teams may change *Flight Team Members* between *Matches*. They stay there for the whole *Match*, unless they are handling their *Drone* under GG11. Only *Flight Team Members* may be in the *Flight Station* during a *Match*. *Adults* may not, except event staff. During a *Match*, a *Drone* may be flown only by its *Flight Team Members* and/or the *Drone's* own code.

> **Violation Notes:**
>
> 1. A *Major Violation* of this rule doesn't have to be *Score Affecting*, and may also break G1 or G2.

<GG2> A Team's Drone should attend every Match. A *Team's Drone* must come to the *Field* for each of its scheduled *Matches*, even if the *Drone* doesn't work. If the *Drone* isn't at the *Field* when the *Match* starts, the *Team* is a "no-show" and gets zero points. Its partner still plays and scores (see GG12d).

a. *Teams* are expected to attend all of their *Qualification Matches*, *Alliance Selection*, and their *Finals Matches* if selected. Missing them may break G1.

<GG3> Drones on the Field must be ready to play. A *Drone* placed on its *Field Platform* must be ready to go, with a charged Battery and ready for takeoff. See the *Pre-Flight Checklist* in Appendix C.

a. Place your *Drone* promptly. Repeated delays may break G1 and/or get the *Drone* removed from the *Match*. The *Event Partner* and *Head Referee* decide what "promptly" means, based on the schedule and any past delays.

<GG4> Flight Team Members must be Fit to Fly. *Flight Team Members* in the *Flight Station* must be *Fit to Fly*: focused, ready, calm, safe, prepared, and aware (see the Glossary and Appendix C).

a. The *Head Referee* may check each *Flight Team Member* before the *Match*.
b. A *Flight Team Member* who the *Head Referee* determines isn't *Fit to Fly* may not fly in that *Match*. The *Team* may substitute another eligible *Flight Team Member*. If no one is available, the *Drone* may not take off. Repeatedly not being *Fit to Fly* may break S1.

<GG5> Hands out of the Field. *Flight Team Members* may not touch *Scoring Objects* or *Field Elements* on purpose during a *Match*. Raise any concerns about the *Field* setup with the *Head Referee* before the *Match*. Never adjust *Scoring Objects* or *Field Elements* yourself.

<GG7> Match Replays are allowed, but rare. The *Event Partner* and *Head Referee* may replay a *Match* (play it again from the start) only in extreme cases, such as:

a. A *Score Affecting* problem with the *Field* that a *Drone* didn't cause, such as:
    i. *Scoring Objects* not reset properly before the *Match*.

ii. *Field Elements* coming loose or moving out of place, not because of a *Drone*.

b. A *Score Affecting* game rule problem, such as:

i. The *Field* is reset before it is scored.

ii. A *Match* is run before its scheduled time without a *Team*.

c. A *Match* that ends early because of a system fault. A *Match* that ends by agreement under GG12e, by a *Match Abort*, or by a *Head Referee E-Stop* is complete. It is not replayed unless GG7d applies.

d. A *Drone* brought down for a safety reason that was not its *Team's* fault. The *Head Referee* decides whether the *Team* was at fault. The *Event Partner* decides whether to replay the *Match*.

A *Drone* that never becomes airborne through its own fault does not warrant a replay; the *Match* plays as normal, unless the *Event Partner* and *Head Referee* find the venue or *Field* at fault. A replayed *Match* is scored under the *Scoring System* of its original *Round* (see <T10f>).

<GG8> Disqualifications. A *Team* Disqualified in a *Qualification Match* gets zero points for that *Match*. Its partner still gets the *Alliance's* points.

a. In a *Finals Match*, a *Disqualification* applies to the whole *Alliance*, which gets zero points.

b. A *Team* Disqualified in a *Drone Skills Match* gets zero points.

c. A *Disqualification* counts only for that *Match*, unless it comes from a Code of Conduct *Violation* (G1), which may have event-level consequences.

<GG9> Drones hover at the end of the Match. At 0:00, the *Field Control System* holds every flying *Drone* in a hover, unless its *Pilot* has already triggered landing from the *Controller*. After the *Head Referee* checks which *Drones* are *Landed* (SC10), they unlock the hovering *Drones* so *Pilots* can fly them to the nearest safe, clear location on the *Field* or *Field Platform* and land. Don't touch your *Drone* or turn off your *Controller* until the *Head Referee* has scored the *Field* and given the all-clear.

<GG10> Downed Drones wait until all Drones are in Prop Lock. A *Downed Drone* stays where it is until all *Drones* in the *Match* are in *Prop Lock*. The first time that happens, a *Timeout* starts (GG12) and the *Team* may retrieve the *Drone*. If the *Drone* is not safely reachable from outside the *Field*, the *Head Referee* or event staff may retrieve the *Drone* for the *Team* (GG11). After the *Timeout*, the *Drone* may be retrieved whenever all *Drones* are in *Prop Lock* again, but the clock keeps running (GG12a).

Note: A *Drone* with a *Disablement* may be retrieved by the *Head Referee* or other event staff, but it may not fly again that *Match*.

<GG11> Handling the Drone mid-Match is allowed only under certain circumstances. *Flight Team Members* may leave the *Flight Station* to handle their *Drone* only when all *Drones* in the *Match* are in *Prop Lock*, and either a *Timeout* is running (GG12) or the *Head Referee* has confirmed that all *Drones* are locked (GG12a). If the *Drone* is not safely reachable from outside the *Field*, the *Head Referee* or event staff may retrieve the *Drone* for the *Team*.

While handling a *Drone*:

- You may change only its Battery, Landing Feet, and *Module*. Propellers may not be changed during a *Match* (D11).
- Changing the Battery momentarily disconnects the *Drone* from the *Field Control System*. It reconnects on its own when powered back on.
- A *Drone* you handled must be placed on a *Field Platform* before it is released from *Prop Lock*. A *Drone* you didn't handle may restart from where it is.
- *Flight Team Members* return to the *Flight Station*, and the *Head Referee* or event staff leaves the *Field*, before any *Team* releases its *Drone* from *Prop Lock*. No motor starts while anyone is handling a *Drone* (GG12c).

> **Violation Notes:**
>
> 1. Handling a *Drone* while any *Drone* is flying, has spinning propellers, or is out of *Prop Lock*, or releasing a *Drone* or starting motors while anyone is handling a *Drone*, is a safety *Violation* under S1 and S5. It is a *Major Violation*, and the *Head Referee* may also give a *Disablement*. A *Student* stepping onto the *Field Tiles* is also a safety *Violation* under S1.

<GG12> Timeouts start automatically. The first time all *Drones* in the *Match* are in *Prop Lock*, the *Field Control System* starts a *Timeout*.

a. **One Timeout per Match.** If all *Drones* are in *Prop Lock* again later, there is no second *Timeout* and the *Match* doesn't end; the clock keeps running. Once the *Head Referee* confirms all *Drones* are locked, *Teams* may handle their *Drones* (GG11). For example, one *Drone* crashes, its partner lands and enters *Prop Lock*, and the crashed *Drone* is recovered. Play restarts using GG12c.

b. **Up to sixty seconds.** The *Match* clock stops and the event software shows a *Timeout* clock. The *Match* clock restarts when play resumes (GG12c) or after sixty seconds, whichever comes first. If a *Team* is still working when time is up, it can keep going under GG11 and GG12a, but the *Match* clock is running.

c. **Restarting play** (during a *Timeout* or with the clock running):

i. Every *Flight Team Member* returns to the *Flight Station*.

ii. Each *Team* releases its *Drone* from *Prop Lock*. The event software shows each *Drone's* status.

iii. When all *Drones* are released and the *Head Referee* confirms the *Field* is clear, each *Team* starts its program, and motor startup is initiated.

iv. The *Timeout* ends early once every restarting *Drone's* motors are fully powered. After the *Timeout* ends, each *Drone* can take off as soon as its motors are fully powered.

d. **One Drone in the Match.** If only one *Drone* is playing (a no-show under GG2, or a *Drone* that can't fly), the *Timeout* starts the first time that *Drone* enters *Prop Lock*. After that, the *Team* may handle it with the clock running (GG12a) or agree with the *Head Referee* to end the *Match* (GG12e).

e. **Ending a Match early.** Whenever all *Drones* are in *Prop Lock*, the *Flight Team Members* or the *Head Referee* may suggest ending the *Match* early, for example when no *Drone* can fly again. If the *Head Referee* and the *Flight Team Members* of every *Team* agree, event staff end the *Match* from the event software. It is scored as the *Field* stands (SC1b) and is not replayed (GG7c). Without that agreement, the *Match* runs to 0:00.

Section 4 - Drone Skills Challenge

Overview

In a *Drone Skills Match*, one *Team* flies one *Drone* for ninety seconds (1:30), always under *Scoring System* A. In a *Piloting Skills Match*, the *Pilot* flies the *Drone*. In an *Autonomous Skills Match*, the *Drone's* code flies it. A *Team's* Skills ranking uses its best *Match* of each type (T20).

Drone Skills Matches are optional, but they may count toward some awards and global Skills rankings. At *Tournaments*, *Drone Skills Matches* are available only to *Teams* on the *Qualification Match* schedule. A *Team's* Skills scores count only if it plays at least one *Qualification Match* (T17).

Drone Skills Match Rules

<DSC1> Standard rules apply in most cases. All other rules apply to *Drone Skills Matches* unless this section says otherwise. GG, SG, and DSC *Violations* in a Skills *Match* only affect that *Match* and don't count toward repeated *Violations* at the event.

<DSC2> One Team, one Drone. A *Drone Skills Match* is played by one *Team* with one *Drone* and up to two *Flight Team Members*. GG1 applies, except that in *Autonomous Skills Matches*, *Flight Team Members* may move around the outside of the *Field*.

<DSC3> Scoring Drone Skills Matches. Skills *Matches* use the standard Scoring Rules (SC1 to SC12) under *Scoring System* A (T19).

a. Up to two *Ring Tunnel Passes* count (SC9).
b. Up to one *Obstacle Completion Bonus* counts, since there is only one *Drone* (SC11).

<DSC4> Drone and Field setup. The *Field* is set up the same as for Teamwork *Matches*. The *Drone* may start on, and Land on, either *Field Platform* (SC10).

<DSC5> Handling the Drone is allowed, but the clock runs. *Flight Team Members* may handle their *Drone* any time it is in *Prop Lock* (S5). GG11 applies, with the Skills *Drone* as the only *Drone* in the *Match*.

a. The clock never stops, and there are no *Timeouts*. Time spent recovering the *Drone* is time not spent scoring.
b. A handled *Drone* must be placed on a *Field Platform* and take off from there.

c. Any *Scoring Object* the *Drone* is carrying when it is handled is removed for the rest of the *Match*.

<DSC6> Piloting Skills Matches. *Flight Team Members* fly the *Drone* and stay in the *Flight Station*, except when handling the *Drone* under DSC5.

<DSC7> Autonomous Skills Matches. The *Drone* flies only on its own code, using its sensors and pre-programmed commands.

a. Autonomous means no humans. Steering the *Drone*, triggering its sensors by hand, or affecting its flight in any other way is a *Violation*. A *Score Affecting Violation* of this rule scores zero for the *Match*.
b. *Flight Team Members* may move around the outside of the *Field* during the *Match*, but may not step onto the *Field Tiles* (S1) or affect the *Drone's* flight.
c. In the event of a *Match Hover*, *Match Abort*, or *E-Stop*, the *Match* ends immediately. A *Match Hover* ends the *Match* because the *Drone's* code can't resume safely after a hover. The *Match* is scored as the *Field* stands when it ends (SC1b). It is not replayed unless GG7d applies.

<DSC8> Skills Stop Time. A *Team* may end its Skills *Match* early to record a *Skills Stop Time*, which is used as a ranking tiebreaker (T20). It doesn't change the score.

a. Tell the *Scorekeeper Referee* before the *Match*, including which *Flight Team Member* will give the signal. Without this, the *Team's Skills Stop Time* is zero.
b. The *Match* ends when the *Drone* is *Landed* and in *Prop Lock* and that *Flight Team Member* gives the agreed spoken and visual signal.
c. The *Skills Stop Time* is the time left on the *Match* clock at that moment, in whole seconds, as shown in the event software.

Section 5 - The Drone

Overview

All *Drones* must pass inspection before they compete. Inspections usually happen during check-in and practice. Use these rules to check your own *Drone* before you arrive. Before each *Match*, run the *Pre-Flight Checklist* in Appendix C.

Inspection Rules

<D1> Each Team competes with its own Drone. Each *Team* needs its own *Drone* that has passed inspection. A *Team* may bring a second *Drone* (or more) to the event, but it may not be shared with or used by another *Team*. Only one of a *Team's Drones* may be powered on, paired, or connected to the *Field Control System* during a *Match*.

a. A *Team* may switch *Drones* between *Matches* only if the other *Drone* has also passed inspection as that *Team's Drone* (D4, D8, D9).

b. *Teams* may not switch *Drones* during a *Match*.

<D2> Teams must use the VEX Robotics AIR Competition Drone and official accessories.

a. These parts from the VEX AIR Competition *Drone* Kit (737-9000) are legal:
   - VEX AIR Competition *Drone*
   - VEX AIR *Drone Controller*
   - Passive *Module*
   - Motorized *Module*
   - Magnetic *Module*
   - VEX AIR *Drone* Battery (LiPo 1200 mAh)
   - VEX AIR *Drone* Battery (LiPo 900 mAh)
   - VEX AIR Communication Headset
   - 4-Blade Propeller - Orange / Gray
   - Landing Feet

b. Any part not listed above is not considered legal for use in the VEX AIR *Drone* Competition, unless used as a decoration in accordance with D10.

c. Modification of any official VEX AIR part is not legal in the VEX AIR *Drone* Competition.

<D3> Drones and Controllers must be updated to the latest firmware. *Drones* and *Controllers* must run the latest firmware to pass inspection and compete.

<D4> Drones must pass inspection. A *Drone* must pass a full inspection before it competes. A *Drone* found breaking a *Drone* rule at the *Field* is removed from *Matches* or Disqualified until it is fixed.

a. Inspectors or the *Head Referee* may spot-check a *Drone* at any time during the event.

This rule changes at leagues. See L3.

<D5> One Battery at a time. A *Drone* may use only one official VEX AIR *Drone* Battery at a time.

<D6> One Module at a time. A *Drone* may use only one official VEX AIR *Drone Module* at a time.

<D7> Drone LED Status Indicator must remain visible at all times. Don't cover the LED Status Indicator next to the power button.

<D8> Officially registered Team numbers must be displayed on Drone. Register on events.vex.com to get your VEX AIR *Team* Number. Display it clearly on top of the *Drone*, using the *Team* Number stickers from your welcome kit, a marker, or custom stickers.

<D9> Officially registered Team numbers must be set in the Controller. Before each *Match*, the *Team* Number in your *Controller* must match your registered *Team* Number, so the *Field Control System* and the event software can identify your *Drone*.

a. A *Controller* with a missing or wrong *Team* Number can't connect to the *Field Control System* until it is fixed, and the *Team* may be treated as not ready to play (GG3).

<D10> Decorations are allowed. Decorations must not affect how the *Drone* performs or how a *Match* turns out, and must fit the spirit of the competition. They can't cover the LED Status Indicator (D7) or the *Team* Number (D8). Inspectors and *Head Referees* decide what counts as a decoration.

<D11> Fly with undamaged propellers, propeller guards, and Landing Feet. Propellers and propeller guards (nacelles) wear down with normal flying. Damage alone doesn't fail inspection, but *Teams* should fly with undamaged parts whenever they can.

a. Before each *Match*, check every propeller and guard, and replace any propeller that is chipped, cracked, bent, or missing part of a blade. See the *Pre-Flight Checklist* in Appendix C. Spare propellers from the kit are legal (D2). Propellers may not be changed during a *Match* (GG11a).

b. All four Landing Feet must be attached and undamaged to pass inspection and before each *Match*. A missing or broken Landing Foot can be replaced between *Matches*, or while handling the *Drone* during a *Match* (GG11).

c. A *Drone* with damage that could make flight unsafe can't fly until it is fixed. For example, a guard missing enough to expose the propeller, or a guard that touches the propeller. Inspectors and the *Head Referee* decide what is unsafe (S1, D4).

d. Cosmetic damage, such as scuffs, scratches, and marks that don't affect flight, is fine.

Section 6 - The Event

Overview

This section explains how *Tournaments* run and how *Teams* are ranked and advance. A typical *Tournament* has *Practice Matches*, *Qualification Matches* played in *Rounds*, *Alliance Selection*, and *Finals Matches*, with *Drone Skills Matches* running alongside. Leagues are covered in Section 7.

Tournament Rules

<T1> Head Referees have ultimate and final authority on all gameplay and Drone ruling decisions during an event.

a. Only *Flight Team Members*, not *Adults*, may ask about scores or rulings (SC3).
b. Rulings are final once the score is entered. A *Head Referee's* judgment call is never a reason for a replay (GG7).

<T2> Head Referees must be qualified. A VEX AIR *Head Referee* must have this season's VEX AIR *Head Referee* certification, be at least eighteen years old, and have no conflict of interest with any *Team* at the event.

<T3> Flight Team Members are permitted to immediately appeal the Head Referee's ruling. Right after the *Match*, before scores are final, *Flight Team Members* may politely ask for a review. Once the *Head Referee* says the decision is final, the matter is closed. Not accepting a final decision may break G1.

<T4> The Event Partner has ultimate authority regarding all non-gameplay decisions during an event, such as schedules, the venue, volunteers, and logistics. The *Event Partner* can't overrule the *Head Referee* on gameplay or *Drone* rulings.

<T5> Be prepared for minor Field variance. *Fields* may differ slightly from each other and from the official specifications. Raise setup concerns with the *Head Referee* before the *Match* (GG5).

<T6> Fields and Field Elements may be repaired at the Event Partner's discretion. Repairs should bring the *Field* as close to specification as possible and must not affect gameplay.

<T7> Fields at an event must be consistent with each other. If an event has more than one Teamwork *Match Field*, they must all have the same modifications and repairs.

<T8> Qualification Matches follow the official Match Schedule. The *Match Schedule* lists each *Team's Qualification Matches*, partners, and expected start times. The *Event Partner* may adjust it and will announce any changes.

a. The *Match Schedule* doesn't list *Scoring Systems* (T10).

<T9> Every Team plays the same number of Qualification Matches.

a. Every *Team* plays at least four *Qualification Matches*. The *Event Partner* publishes the number before the event, and more *Rounds* are encouraged when time allows.
b. If the schedule requires some *Teams* to play one extra *Match*, that *Match* is marked on the schedule and doesn't count toward ranking. *Teams* should still play it as if it counts (G1).

This rule changes at leagues. See L2.

<T10> Scoring Systems rotate by Round and are revealed at the start of each Round.

a. Every *Match* in a *Round* uses the same *Scoring System* (SC13).
b. The *Scoring System* is chosen at the event and announced by the event software and event staff when the *Round* starts. The order is never published ahead of time.
c. The event software picks the order at random. In any six *Rounds* in a row, each *Scoring System* is used once.
d. Events with fewer than six *Rounds* use some of the *Scoring Systems*, chosen by the event software.
e. The Finals count as one extra *Round*, the Finals *Round*. After *Alliance Selection*, the event software picks one *Scoring System* at random for all *Finals Matches*. Any of the six can be picked, even one already used (T15).
f. A replayed *Match* (GG7) uses the *Scoring System* of its original *Round*, no matter which one is active at the time.

This rule changes at leagues. See L4.

<T11> Teams are ranked by their average Qualification Match score.

a. Every *Qualification Match* score counts; none are dropped, except extra *Matches* under T9b.
b. At events with divisions, *Teams* are ranked within their division.

This rule changes at leagues. See L5.

<T12> Qualification ranking tiebreakers. *Teams* with the same average are ranked by:

a. Highest single *Qualification Match* score.

b. Then, second-highest *Qualification Match* score.

c. Then, a random draw by the event software.

<T13> Alliance Selection. After the last Qualification *Round*, the top-ranked *Teams* form *Alliances* of two *Teams* for the Finals.

a. Each *Team* sends one *Student* representative.

b. In ranking order, each *Alliance Captain* invites one eligible *Team*. A *Team* that accepts joins that *Alliance*. A *Team* that declines can't be invited again, but it can still become an *Alliance Captain*.

c. Each *Team* can be invited only once and can be on only one *Alliance*.

d. Selection continues in ranking order until the published number of *Alliances* is filled (T14).

This rule changes at leagues. See L7.

<T14> Half of the Teams at an event advance to the Finals Matches.

a. There is one *Alliance* for every four *Teams* at the event, rounded down. For example, 25 *Teams* means six *Alliances* in *Finals Matches*.

b. Every event has at least four (4) *Alliances* in the *Finals Matches*.

c. When the *Qualification Match* schedule is approved, the event software sets the number of *Alliances* based on how many *Teams* are on the schedule.

d. Events with fewer than eight *Teams* have as many *Alliances* as they can, so every *Team* advances. With an odd number of *Teams*, the lowest-ranked *Team* doesn't advance.

This rule changes at leagues. See L7b.

<T15> Finals Matches decide the Teamwork Champions. All *Finals Matches* make up one *Round*, the Finals *Round*, and each *Alliance* gets one score.

a. Each *Alliance* flies one *Finals Match*. The lowest-seeded *Alliance* flies first and the top-seeded *Alliance* flies last. There are no brackets or head-to-head *Matches*.

b. All *Finals Matches* use the same *Scoring System*, picked at random after *Alliance Selection* (T10e).

c. A Disqualified *Alliance* scores zero (GG8).

d. The *Alliance* with the highest score is the Teamwork Champion.

<T16> Ties in Finals Matches lead to limited rematches. If two or more *Alliances* tie for the highest score:

a. Each tied *Alliance* plays one more *Finals Match*, under the same *Scoring System*.

b. If they tie again, the higher-seeded *Alliance* (by *Alliance Captain* ranking) wins.

c. Ties for any other Finals place are broken by *Alliance Captain* ranking, with no rematch.

<T17> Skills Match schedule. *Drone Skills Matches* are played on open Skills *Fields*, first come first served or through a sign-up published by the *Event Partner*. *Drone Skills Matches* are available only to *Teams* on the *Qualification Match* schedule. A *Team's* Skills scores count only if it plays at least one *Qualification Match*.

a. Each *Team* may play up to three *Piloting Skills Matches* and three *Autonomous Skills Matches* per event.

This rule changes at leagues. See L6.

<T18> Skills Fields must be consistent with each other. Skills *Fields* don't need the same modifications as Teamwork *Match Fields*, but every Skills *Field* at an event must be set up the same way.

<T19> Drone Skills Matches are always played under Scoring System A. This keeps Skills scores comparable across every event in the season.

<T20> Skills rankings. A *Team's* Skills score is its highest *Piloting Skills Match* score plus its highest *Autonomous Skills Match* score at the event.

a. Ties are broken in this order:
   i. Highest *Autonomous Skills Match* score.
   ii. Second-highest *Autonomous Skills Match* score.
   iii. Second-highest *Piloting Skills Match* score.
   iv. Highest combined *Skills Stop Time* from the two *Matches* used for the Skills score.
   v. Highest *Skills Stop Time* from the best *Autonomous Skills Match*.
   vi. Third-highest *Autonomous Skills Match* score.
   vii. Third-highest *Piloting Skills Match* score.
   viii. If still tied, declare them co-winners.

b. Global Skills rankings use the same combined score, from each *Team's* best qualifying-event results.

This rule changes at leagues. See L6.

<T21> League events. Leagues are *Tournaments* played across multiple sessions. They follow these *Tournament* Rules as adjusted by the League Rules in Section 7 (L1 to L7).

Section 7 - Leagues

Overview

A league is a *Tournament* played over several sessions on different days (L1). This section lists everything that changes in a league. If a League Rule differs from another rule, the League Rule applies at the league. *Matches* are flown and scored the same way as at any *Tournament*.

League Rules

<L1> Leagues are Tournaments played across multiple sessions. A league has several ranking sessions on different days, then a League Finals session with *Alliance Selection* and *Finals Matches*. It is one event, under one *Event Partner*, with one ranking carried through all sessions.

a. Each session uses the Game Manual version in effect when that session starts (see Game Manual Updates).
b. Registration, judging, awards, and Championship qualification follow the Global Robotics and Science Foundation's league guidance.

<L2> League structure. A league has at least three ranking sessions, at least one week apart, followed by a League Finals session.

a. Each ranking session has at least two *Qualification Matches* per *Team*.
b. The League Finals session may also include *Qualification Matches* before *Alliance Selection*. They continue the *Round* order (L4) and count for ranking and participation (L5).
c. T9 applies to the *Teams* at each session. Across the whole league, *Teams* may play different numbers of *Matches*; L5 explains how they are ranked.

<L3> Drones are inspected at every session. A *Drone* passes full inspection (D4) before its first league *Match*, and again at every later session it attends.

<L4> Rounds and Scoring Systems continue across sessions. *Rounds* are numbered straight through all sessions, and T10c applies to the whole league. The *Scoring System* order carries over from session to session and never restarts.

a. A *Match* replayed at a later session (GG7) uses the *Scoring System* of its original *Round*.

<L5> League rankings. *Teams* are ranked by their average *Qualification Match* score (T11a). *Teams* that play in less than sixty percent of the *Qualification Matches* available rank below *Teams* that play in at least sixty percent.

a. "*Matches* available" means all the *Qualification Matches* scheduled per *Team* across every session, whether or not a *Team* attended. For example, three sessions with four *Matches* each means twelve are available, so *Teams* that play eight or more rank above *Teams* that play seven or fewer.
b. Being a no-show (GG2) still counts as participation.
c. Extra *Matches* under T9b don't count for ranking or participation.

<L6> Drone Skills Matches at leagues. At each ranking session, *Drone Skills Matches* are only available to *Teams* who participate in that session's *Qualification Matches* (T17).

a. Each *Team* may play up to three *Piloting Skills Matches* and three *Autonomous Skills Matches* per session, instead of per event.
b. A *Team's* Skills score is its best Piloting plus Autonomous total from a single session, not its best of each from different sessions. That session's *Matches* are used for tiebreakers (T20a) and global rankings (T20b).
c. Example: Session 1 has Piloting 45 and Autonomous 25, a total of 70. Session 2 has Piloting 42 and Autonomous 30, a total of 72. The *Team's* score is 72, and Session 2's *Matches* are used for tiebreakers.

<L7> The League Finals session. *Alliance Selection* and *Finals Matches* happen at the League Finals session under T13 to T16, with these changes:

a. To be an *Alliance Captain* or be invited, a *Team* must be checked in at the League Finals session and have played at least one *Qualification Match* in the league. Otherwise it is skipped.
b. At the League Finals session, the number of *Alliances* is based on the *Teams* that are checked in and have played at least one league *Qualification Match*. The event software sets this number before *Alliance Selection*. The timing in T14c does not apply.

Appendix A - Field Specifications

This appendix will hold the complete *Field* reference:

a. Bill of materials, with official part numbers.

b. *Scoring Object* starting positions on the *Racks* and *Cargo Tile Plates*.

c. *Field* construction, dimensions (12′ x 12′), and setup tolerances (<T5>).

d. Venue guidance, including a recommended minimum ceiling height above the *Field*.

This appendix names the four sides of the *Field*. Figure FO-1 shows the *Flight Station* side at the top.

- **Flight Station side:** the side with both *Field Platforms* and both *Flight Stations*.
- **Blue side:** the side nearest the Blue *Goals*.
- **Red side:** the side nearest the Red *Goals*.
- **Audience side:** the side with the *Ring Tunnel*, opposite the *Flight Stations*.

The two corners on the *Flight Station* side are the **Blue corner** and the **Red corner**.

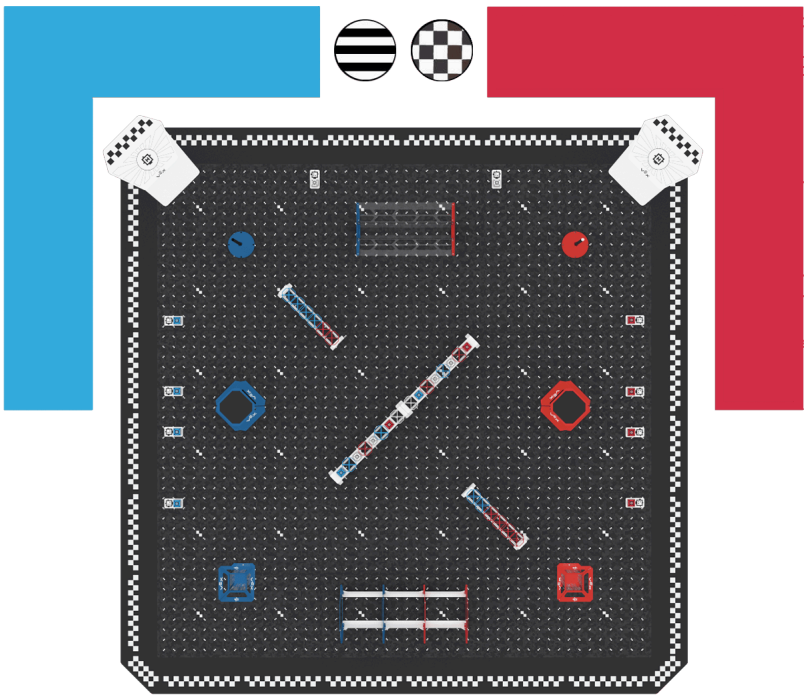

Figure FO-1, from Section 2: where the Head Referee, Scorekeeper Referees and Flight Team Members stand.

Bill of Materials – *coming soon*

More details are coming soon.

Scoring Object Starting Positions

Set up the *Field* the same way before every *Match*. All 38 *Scoring Objects* start on a *Rack* or a *Cargo Tile Plate*. None start on the *Field Tiles*, in a *Goal*, or on a *Drone*.

Table A-1: Where *Scoring Objects* start

	Orbit Balls	***Cargo***
Long *Rack*	8 (3 Red, 3 Blue, 2 White)	8 (2 Red, 2 Blue, 4 White)
Blue-side Short *Rack*	6 (4 Blue, 2 Red)	none
Red-side Short *Rack*	6 (4 Red, 2 Blue)	none
Cargo Tile Plates	none	10 (4 Red, 4 Blue, 2 White)
Total	**20 (9 Red, 9 Blue, 2 White)**	**18 (6 Red, 6 Blue, 6 White)**

Long Rack

The Long *Rack Goal* runs diagonally across the center of the *Field*. It holds 16 *Scoring Objects* total, eight on each side of its center support. Figure A-1 shows the layout of *Scoring Objects* starting with the end nearest the Blue *Cargo* Platform *Goal*.

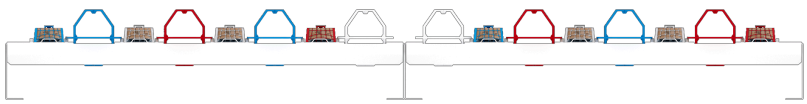

Figure A-1: From left to right the *Scoring Objects* in order are: Blue *Cargo*, Blue *Orbit Ball*, White *Cargo*, Red *Orbit Ball*, White *Cargo*, Blue *Orbit Ball*, Red *Cargo*, two White *Orbit Balls*, Blue *Cargo*, Red *Orbit Ball*, White *Cargo*, Blue *Orbit Ball*, White *Cargo*, Red *Orbit Ball*, Red *Cargo*.

Short Rack

Each Short *Rack* holds six *Orbit Balls* and no *Cargo*.

- **Blue-side Short Rack,** between the Blue Pole *Goal* and the Long *Rack*: starting at the end nearest the Blue Pole *Goal*, four Blue *Orbit Balls*, then two Red *Orbit Balls*. Shown in Figure A-2.
- **Red-side Short Rack,** between the Red *Cargo* Platform *Goal* and the Long *Rack*: starting at the end nearest the Long *Rack*, two Blue *Orbit Balls*, then four Red *Orbit Balls*. Shown in Figure A-3.

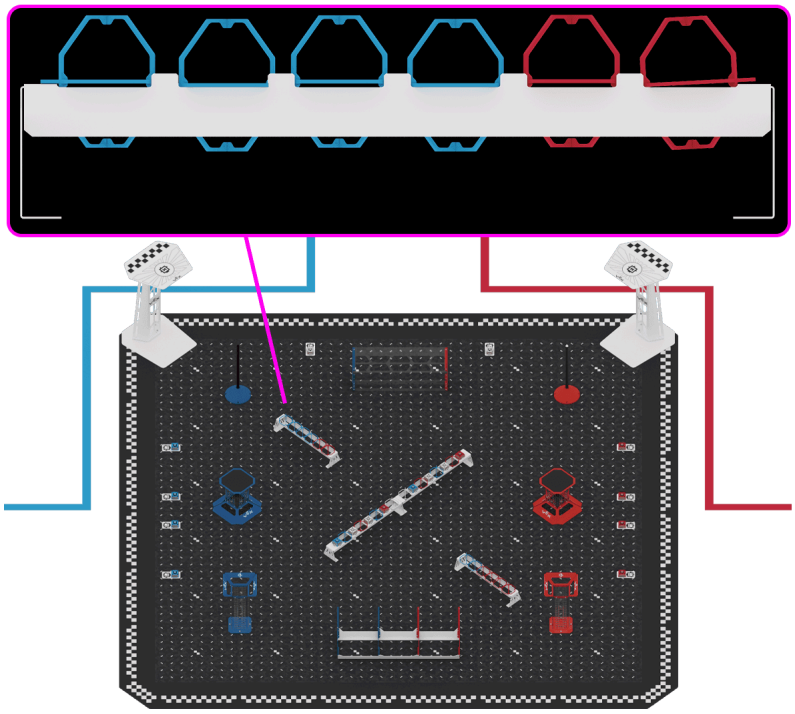

Figure A-2: A close-up of the Blue-side Short *Rack* showing the *Orbit Balls* in order above an image of the full *Field*, with a pink line connecting the close-up to the Blue-side Short *Rack* on the *Field*.

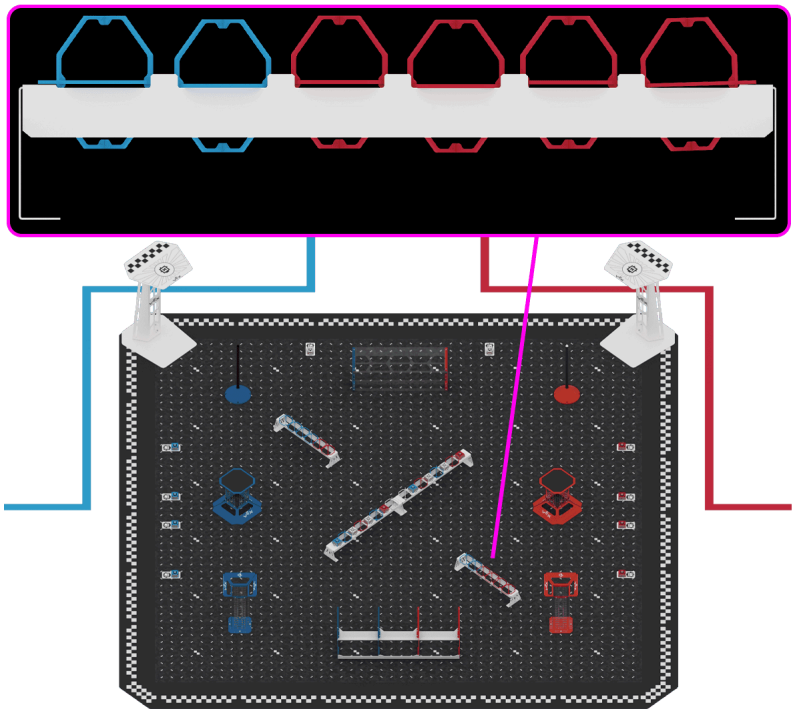

Figure A-3: A close-up of the Red-side Short *Rack* showing the *Orbit Balls* in order above an image of the full *Field*, with a pink line connecting the close-up to the Red-side Short *Rack* on the *Field*.

Cargo Tile Plates

Each *Cargo Tile Plate* holds one *Cargo*. The organization of the *Cargo* is described below and shown in Figure A-4.

- **Blue side:** four plates along the border, each with a Blue *Cargo*.
- **Flight Station side:** two plates, one on each side of the Drop Zone *Goal*, each with a White *Cargo*.
- **Red side:** four plates along the border, each with a Red *Cargo*.

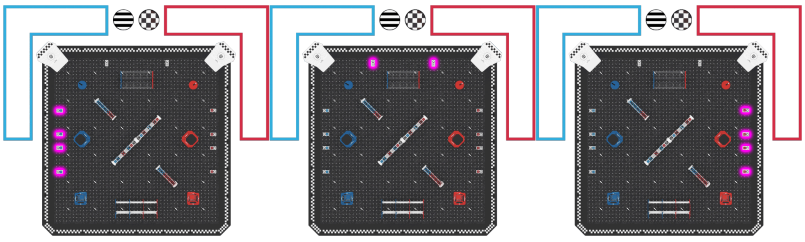

Figure A-4: Three *Field* images side by side showing each set of *Cargo Tile Plates* highlighted in pink. From left to right the Blue side, *Flight Station* side, and Red side are shown.

Field Construction and Dimensions

Full VEX AIR Competition Pick & Drop *Field* build instructions can be found at this link.

A CAD (.STEP) file of the Pick & Drop *Field* can be downloaded using this link.

More details are coming soon.

Venue Guidance – *coming soon*

More details are coming soon.

Appendix B - Glossary

Adult - Anyone who isn't a *Student* or another defined role, such as a *Head Referee*.

Alliance - Two *Teams* playing a *Match* together. Alliances are random in *Qualification Matches* and chosen during *Alliance Selection* for *Finals Matches* (T13).

Alliance Captain - A *Team* that invites another *Team* to join its *Alliance* during *Alliance Selection* (T13).

Alliance Score - The points scored in a *Match*, shared by both *Teams* on the *Alliance*.

Alliance Selection - When *Alliances* for the *Finals Matches* are formed, after the *Qualification Matches* (T13).

Border - The outer edge of the *Field*: twenty-four Border foam tiles and four corner foam tiles.

Cargo - A cube-shaped *Scoring Object*. See Field Overview.

Cargo Tile Plate - A plate on a *Field* Tile that holds one *Cargo* at the start of the *Match*. There are ten.

Controller - The official VEX AIR *Drone* Controller a *Pilot* uses to fly a *Drone*. It must stay paired with the *Field Control System* during a *Match*, and whoever holds it wears its lanyard (S6, D9).

Disablement - The penalty for a safety *Violation*. The *Head Referee* tells the *Team* to land, put the *Drone* in *Prop Lock*, and set their *Controllers* on the ground, and the *Drone* sits out the rest of the *Match*. If the *Team* doesn't comply, event staff can force the *Drone* to land from the event software. A Disablement is not a *Disqualification*.

Disqualification - The penalty for a *Major Violation*. The *Head Referee* tells the *Team* at the end of the *Match*, and the *Team* scores zero for it (GG8). Repeated *Violations* or Disqualifications can get a *Team* Disqualified from the whole event.

Downed - A *Drone* that can't keep flying (crashed, flipped, or failed) and has gone into *Prop Lock* on its own (GG10, GG12).

Drone - An official VEX Robotics AIR Competition Drone: the airframe plus a legal battery, module, motors, and propellers.

Emergency Stop (E-Stop) - A control that immediately shuts off the *Drone's* motors to stop flight during an unsafe or unexpected situation. The *Pilot* can press the *Prop Lock* and Mission buttons together to

trigger an E-Stop. A *Team* E-Stop for a safety reason is never a *Violation*. A *Team* E-Stop for any other reason results in a *Disablement*. See S3.

Event Partner - The volunteer who runs the event, including its volunteers, venue, and materials (T4).

Field - The whole playing area: the *Field Tiles* and the *Border*. A *Drone* has left the Field once it is no longer above the *Field Tiles*. The *Field Platforms* also count as inside the Field.

Field Control System - The event's hardware, software, and network that runs *Matches*. It starts and ends *Matches*, starts *Timeouts*, turns *Drone* motors on and off, and tracks each *Drone's Prop Lock* status. The Field Control System can trigger a *Match Hover*, a *Match Abort*, or an *E-Stop*. It can also put every *Drone* in *Prop Lock*. *Controllers* must stay paired with it, and *Drones* must stay connected to it (D1).

Field Element - The *Field*, *Goals*, *Racks*, *Field Platforms*, and their supporting structures.

Field Platform - Where a *Drone* takes off at the start of the *Match* and may land at the end.

Field Tiles - The flat inside of the *Field*: thirty-six foam tiles, six by six.

Fit to Fly - Ready to fly safely. A *Flight Team Member* who is Fit to Fly is Focused (paying attention, not distracted), Ready (understands the task), Calm (not rushed, frustrated, or overly excited), Safe (following all safety rules), Prepared (has finished the Pre-Flight Checklist), and Aware (the takeoff and landing zones are clear). See GG4 and Appendix C.

Flight Station - The area beside the *Field* where *Flight Team Members* stand during their *Match*, shown by the red and blue lines in Figure FO-1.

Flight Team Member - A *Student* in the *Flight Station* during a *Match*. *Adults* can't be Flight Team Members.

Game Design Committee - The creators of Pick & Drop and authors of this manual. It is the only official source of rules clarifications and Q&A answers.

Goal - A place where *Scoring Objects* are *Scored*. There are four types: Drop Tower, Drop Zone, *Cargo* Platform, and Pole Goal. See Field Overview.

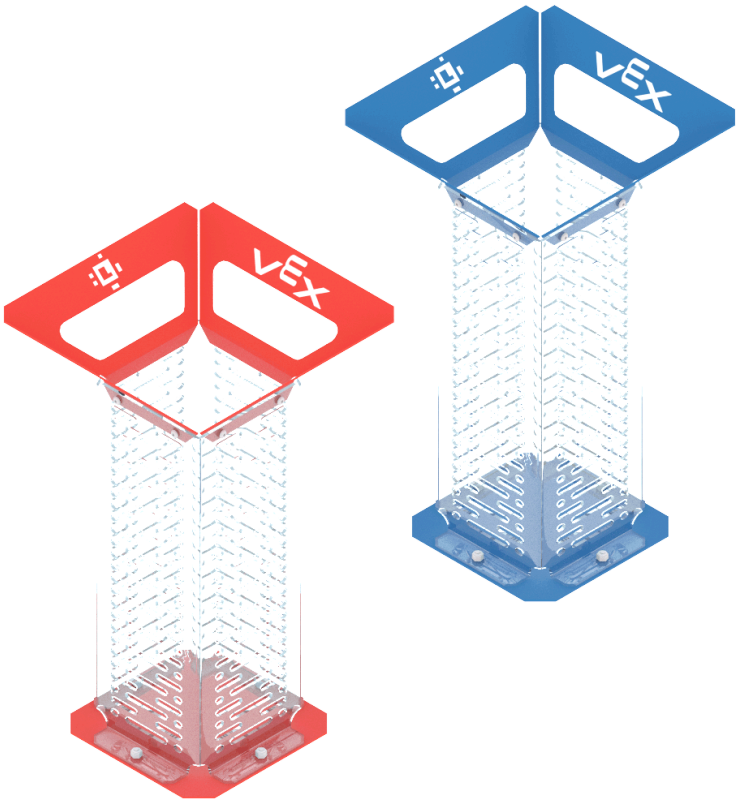

Figure G-1: A Drop Tower *Goal*

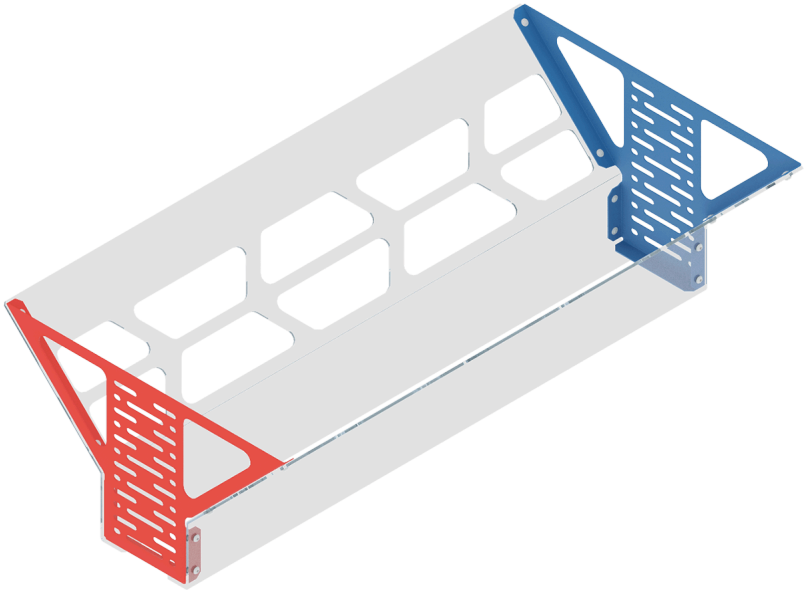

Figure G-2: A Drop Zone *Goal*

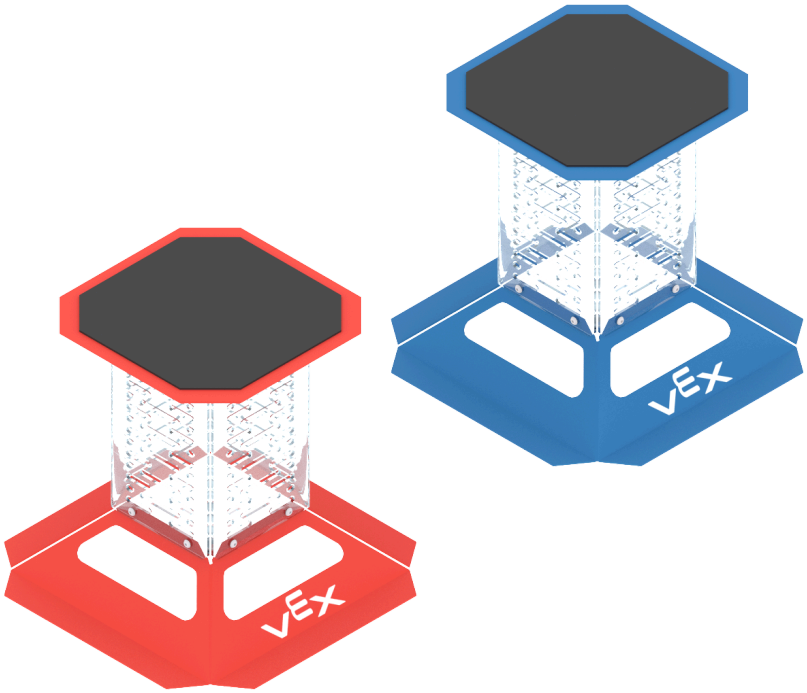

Figure G-3: A *Cargo* Platform *Goal*

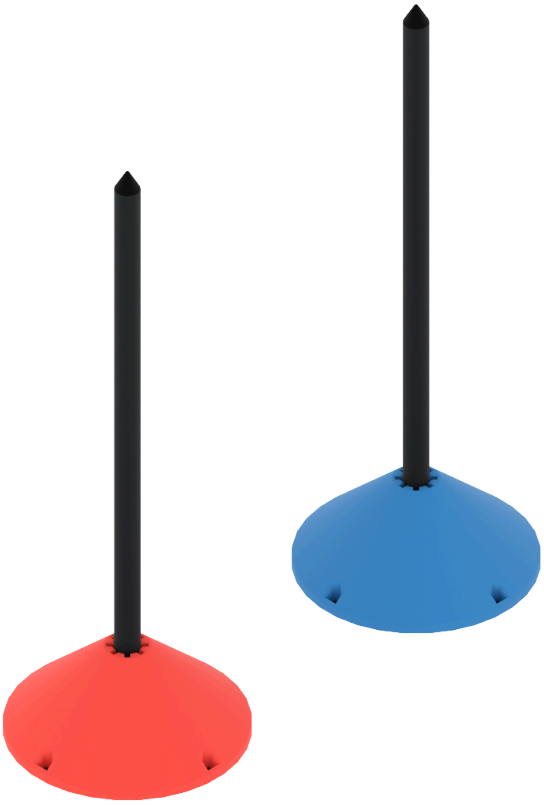

Figure G-4: A Pole *Goal*

Goal Bonus - Points for each *Goal* with at least one *Scored Scoring Object* at the end of the *Match* (SC12).

Head Referee - A certified, impartial volunteer who enforces the rules. Only a Head Referee may discuss rulings or scores with *Teams*. Large events may have more than one (T1, T2).

Landed - A *Drone* that meets SC10.

Major Violation - A *Violation* that leads to a *Disqualification*. *Score Affecting Violations* are Major unless a rule says otherwise. A rule can also make serious, deliberate, or strategic *Violations* Major. Several *Minor Violations* in one *Match* or event can add up to a Major Violation.

Match - A timed period of play. There are six types of Match:

- **Practice Match** - A *Match* with no scores, so *Teams* can get used to the official *Field* and procedures. *Head Referees* should not record or track normal gameplay *Violations* during Practice Matches.
- **Qualification Match** - A *Match* played according to the *Match Schedule*. Qualification Matches decide *Team* rankings for *Alliance Selection* (T8 through T12).
- **Finals Match** - A *Match* played after *Alliance Selection* to decide the Teamwork Champions (T15).
- **Drone Skills Match** - A *Piloting Skills Match* or an *Autonomous Skills Match*. See Section 4.
- **Piloting Skills Match** - A *Drone Skills Match* in which the *Flight Team Members* fly one *Team's Drone* the whole time (DSC6).
- **Autonomous Skills Match** - A *Drone Skills Match* in which the *Drone* flies only under software control (DSC7).

Match Abort - A *Field Control System* command that lands every *Drone* on the *Field* at once and ends the *Match*.

Match Hover - A *Field Control System* command that forces all *Drones* associated with one specific *Field* to hover in place. The *Match* clock is not paused. This is not the automatic hold at 0:00.

Match Schedule - The list of *Qualification Matches*, with *Alliances* and expected start times (T8).

Minor Violation - A *Violation* that does not lead to a *Disqualification*. Accidental, brief, or non-*Score Affecting Violations* are usually Minor. The *Head Referee* usually gives a verbal warning during the *Match*

so the *Team* can fix it before it becomes Major.

Module - An official VEX AIR attachment for the *Drone*: Passive, Motorized, or Magnetic.

Obstacle Completion Bonus - A bonus for completing a *Ring Tunnel Pass* and Landing a *Drone* in the same *Match* (SC11).

Orbit Ball - A ball-shaped *Scoring Object*. See Field Overview.

Pilot - The *Flight Team Member* flying the *Drone*.

Pre-Flight Checklist - The steps a *Team* runs before every flight to confirm the *Drone*, the *Controller*, the people, and the *Field* are ready. See Appendix C.

Propeller Lock (Prop Lock) - A safety feature on the VEX AIR *Drone* that prevents the propellers from spinning until the *Pilot* is ready to fly. When the Propeller Lock is engaged, it prevents the motors and propellers on the *Drone* from turning. All flight commands are ignored, and the LEDs on the *Drone* and *Controller* will blink blue. A *Drone* enters Prop Lock on its own when it is *Downed* or moved while not flying, when the *Field Control System* locks it, or when a *Flight Team Member* presses the *Controller's* Prop Lock button. *Drones* may only be handled while Prop Lock is engaged (S5, GG11).

Rack - A *Field Element* that holds *Scoring Objects* at the start of the *Match*. See Field Overview.

Ring Tunnel - Four Rings that *Drones* fly through. See Field Overview.

Ring Tunnel Pass - Flying through all four Rings in order without touching the *Field Tiles*. Up to two count per *Match* (SC9).

Round - A group of *Matches* played under the same *Scoring System*. In *Qualification Matches*, Round 3 is every *Team's* third *Match*. All *Finals Matches* together make up the Finals Round (T10).

Score Affecting - A *Violation* that raised the *Alliance's* score. The *Head Referee* decides this after the *Match* by looking at the *Drone* actions connected to the *Violation*. Several *Violations* in one *Match* can add up to being Score Affecting.

Scored - A *Scoring Object* that meets the Scoring Rules (SC4 to SC12).

Scorekeeper Referee - An impartial volunteer who counts scores. Scorekeeper Referees don't make rulings and send rules or score questions to the *Head Referee*.

Scoring Object - An *Orbit Ball* or *Cargo*. See Field Overview.

Scoring System - One of six sets of point values, A to F (Table SC-1). What counts as *Scored* stays the same; only the points change (SC13).

Skills Stop Time - The time left when a *Team* ends its *Drone Skills Match* early, used as a tiebreaker (DSC8).

Student - A person who meets the Student Eligibility Policy for their program and level (G4).

Team - One or more *Students*. Teams may come from schools, youth organizations, or groups of neighborhood *Students*.

Timeout - A one-time stop of the *Match* clock, up to sixty seconds, that starts automatically the first time all *Drones* in the *Match* are in *Prop Lock*. *Teams* can't call a Timeout or ask for a break between *Matches*. See GG12.

Tournament - A competition event with scored *Matches*, run by an *Event Partner* (Section 6).

Violation - Breaking a rule. A Violation is either a *Minor Violation* or a *Major Violation*. The penalties are a *Disablement* (for safety Violations) and a *Disqualification* (for *Major Violations*).

Appendix C - Pre-Flight Checklist and Fit to Fly

Before every flight, run two checks. The **Pre-Flight Checklist** confirms that the *Drone*, the *Controller*, the people, and the *Field* are ready. The **Fit to Fly check** confirms that each *Flight Team Member* is ready.

This appendix lists every step and explains what it means.

Use both checks at practice as well as at events. A *Team* that runs them every time will run them quickly, and correctly, when a *Match* is about to start. Work from top to bottom. At an event, inspection has already confirmed some steps, such as firmware, so those need only a glance. Look closely at anything that can change between *Matches*: propellers, Landing Feet, the Battery, and the *Controller's* settings.

Pre-Flight Checklist

The Drone

The *Team* checks the *Drone* before leaving for the *Field* for each *Match*.

- ☐ **Propellers:** Intact and able to spin freely (D11, GG11)

  Replace any propeller that is chipped, cracked, bent, or missing part of a blade. Propellers can't be changed during a *Match*.
- ☐ **Frame:** Intact (D11)

  Scuffs and scratches are fine. Damage that could make flight unsafe is not, such as a propeller guard that touches or exposes its propeller.
- ☐ **Landing Feet:** All four attached (D11)
- ☐ **Module:** Installed and free of damage (D2, D6)
- ☐ **Drone Battery:** Installed, fully charged, and free of damage (D5, GG3)
- ☐ **Firmware:** Up to date (D3)

The Controller

The *Team* checks the *Controller* at the same time as the *Drone*.

- ☐ **Lanyard:** Attached (S6)

- [ ] **Controller Battery:** Charged to at least 30%
- [ ] **Drone and Controller:** Paired (D1)
- [ ] **Team Number:** Set (D9)

  It must match your registered *Team* Number, or the *Controller* can't connect to the *Field Control System*.
- [ ] **Max Z-Height:** Set

  The maximum is always 2.5 m. Some events post a lower Max Z-Height for safety reasons, so check what is posted at each event and set your *Controller* to match.
- [ ] **Movement and Steering Modes:** Set to the *Pilot's* preference

People and Procedures

The *Flight Team Members* check these before stepping into the *Flight Station*.

- [ ] **Flight Team Members:** *Fit to Fly* (GG4)
- [ ] **Prop Lock and Emergency Stop procedures:** Reviewed (S3, S5)

  Prop Lock is the *Prop Lock* button. An *Emergency Stop* is the *Prop Lock* and Mission buttons pressed together. An *E-Stop* for a safety reason is never a *Violation*.
- [ ] **Adults:** In the spectator area (S2, GG1)

  During a *Match*, the *Team's Adults* stay in the spectator area. Only *Flight Team Members* and event staff may be in the *Flight Station*, and the *Head Referee* supervises the *Field*.
- [ ] **Hair and clothing:** Tied back and secured (S1)
- [ ] **Safety glasses:** On (S4)

The Field

At an event, the *Head Referee* and event staff do these steps. *Flight Team Members* should still look, and tell the *Head Referee* before the *Match* if something seems wrong. Never adjust the *Field* yourself (GG5).

- [ ] **Flight area:** Clear of debris, obstacles, and people (S1, GG5)
- [ ] **Doors:** Closed, if possible

Before Takeoff

The *Flight Team Members* do these at the *Field*, as the *Head Referee* directs.

- [ ] **Drone:** In takeoff position (SG1)

On your own *Field Platform*, powered on, and in *Prop Lock*.

- [ ] **Flight Team Members:** In the *Flight Station* (GG1)
- [ ] **Controller lanyard:** Worn by whoever is holding the *Controller* (S6)
- [ ] **Prop Lock:** Released (SG1, S5)

Always the last step. Release your *Drone* only once all other checks are complete and you are at the *Field* ready for the *Match*.

Fit to Fly Check

Flight Team Members in the *Flight Station* must be *Fit to Fly* (GG4). Before the *Match* starts, each *Flight Team Member* asks these six questions. If the answer to any of them is no, pause and fix the issue before you fly.

	Ask yourself	What it means
Focused	Am I paying attention and not distracted?	Your eyes are on the *Drone* and the *Field*, and you are listening for the *Head Referee*. You're not in side conversations.
Ready	Do I know the plan for this *Match*?	You know the *Scoring System* for this *Round*, your *Alliance's* plan for the *Match*, and your own job in the *Flight Station*.
Calm	Am I calm, and not rushed, frustrated, or overly excited?	You have had a moment to settle. If the last *Match* went badly, you hurried to the *Field*, or you're keyed up for a big *Match*, take a breath before you fly.
Safe	Am I following all safety rules and procedures?	Safety glasses are on, your lanyard is ready, hair and clothing are secured, and you know how to trigger an *Emergency Stop*.
Prepared	Have I completed the *Pre-Flight Checklist*?	Every step is done. If you skipped one, go back and finish it before you fly.
Aware	Do I know what's around me, and are the takeoff and landing zones clear?	Your *Field Platform* is clear, no one is reaching into the *Field*, and you know where the other *Drone* is.

If Any Answer Is No

- If you can fix it before the *Match* starts, fix it. Then ask yourself all six questions again.
- If you can't, tell your *Team*. Another eligible *Flight Team Member* may take your place for that *Match*.
- It is always acceptable to say you are not *Fit to Fly*. Saying so is the safe choice, not a penalty.