Non Robotic

REQUIRED

NR1. OPENING
Minimum: 4 square feet **(576 sq in)**
Maximum: none

NR2. STABLE BASE
Can't easily be knocked over.

SUGGESTED

NRS1. 3" Edge
Greatly improves visibility at high speeds

NRS2. Lighting
Greatly improves visibility with low lighting

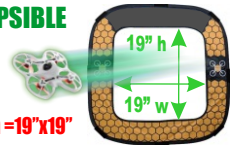
req	suggested	
AREA 576+	EDGE 3"	LIGHT
✓ 600 sq in	✓	✓
✓ 1,017 sq in	!	!
✗ 361 sq in	✓	!

VERSA GATE

HULA HOOP

1,017 sq in =3.14 x (18"x18")

COLLAPSIBLE GATES



361 sq in =19"x19"

Robotic

REQUIRED

RR1. OPENING
Min: 6" dia. circular opening even when oscillating

Maximum: none

At any time during the arm oscillation there is at least one **predictable** 6" sphere that can pass.

RR2. PREDICTABILITY
Warriors must be able to determine what the obstacle opening will look like when they reach it to adjust their flight path.
*Motion based obstacles must be **predictable**.*

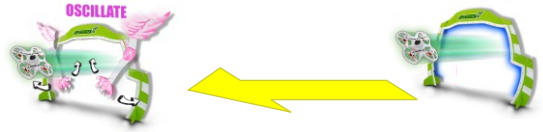
Predictability can be accomplished by:

- *constant motion path algorithm (ei. servo pwm generator)*
- *integrated lighting scene that makes use of light patterns and / or colors to indicate a change of pattern (ei. just like a stop light, yellow says we are going red in a few seconds so get ready to stop)*

Oscillating arm pattern is programmed for constant **predictable** motion like pwm generators (aka servo testers).

Programming **scenes** with both lighting and servo motion deliver **predictable** change of motion pattern so warriors can fairly adjust their flight path.

RR3. AMPLE REACTION TIME
Robotic obstacles placement should enable approaching warriors enough time to judge the best obstacle entry / line.
Warrior vision is restricted with FPV cameras. Pilots can't just turn their heads to see what's coming up next.

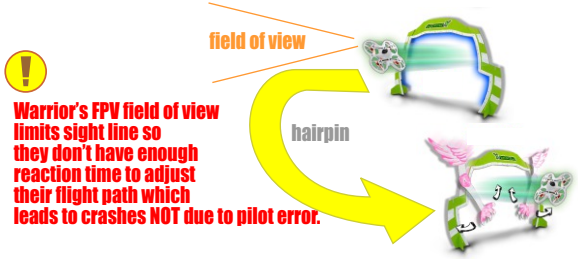


Warriors can spot the next obstacle due to enough space and obstacle alignment to adjust flight path

SUGGESTED

RS1. 3" edge
Greatly improves visibility at high speeds

RS2. Lighting
Greatly improves visibility with low lighting



Warrior's FPV field of view limits sight line so they don't have enough reaction time to adjust their flight path which leads to crashes NOT due to pilot error.

COURSE SPECIFICATIONS: LAYOUT

VARSITY COURSE GUIDELINES

V1. There is no minimum number of obstacles for Varsity.

V2. Target battlefield designs with **20 second orbit times** for experienced Varsity warriors.
20 sec laps = ~ 20 orbits per battle.

GENERAL GUIDELINES

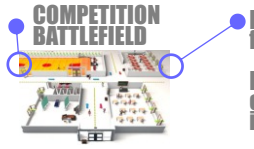
G1. Bigger obstacles are better than smaller. Encourage success and speed with portal size.

BIGGER = FASTER = FUN

G2. Team paddock should have at least one 6 outlet extension.

G3. Avoid chairs in team paddock area. No one sits. Chairs just get in the way. Stack them.

G4. Have a Faraday area for repairs requiring power ups. Usually down the hall and around the corner is far enough to avoid video interference. Test before event.



G4. Warriors start all battles with the drones sitting in front of the teams, not separate start areas.
Why? Every time there is a technical issues (someone on the wrong frequency), warriors won't have to leave their seats. Lot's of flying this way.

G6. If possible maintain at least 10' between warrior team chairs.
Plugging in batteries to drone VTX's can cause brief interference. More space between competing team means less chance of video problems.

more space between teams the better

JUNIOR VARSITY

REQUIRED

JV1. Obstacles
- 3 - 6 gates (not portals)
- Finish Gate (not portal) 3'+ wide

Finish Gate Ideas

Gate vs Portal ?

GATE
- 4 constrained sides
- bottom is the ground

Gates are easier for JV warriors since they can "scoot" on the ground.

JV Battlefield

PORTAL

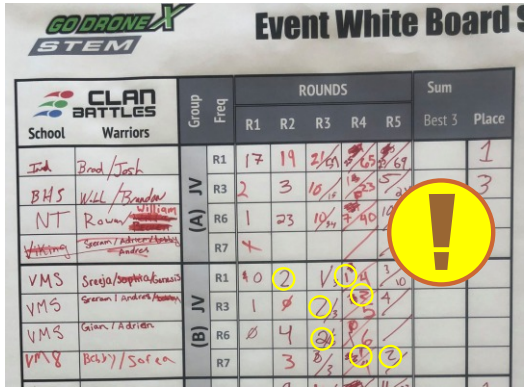
Portals are harder. They require altitude control.

JV Battlefield

JV COURSE GUIDELINES

JV2. JV Battlefield (course) should yield at least **15 complete orbits** (laps) total for all of the 5 battles (races) combined.
*Target at least **3 orbits** for a complete 8 minute battle. Simplicity. Don't worry about JV teams that bang out 20+ orbits in 8 minutes. They can always level up to Varsity next event.*

JV3. JV battlefield designs **ENCOURAGE** success, not failure.
A typical JV warrior has less than 20 total FPV flights and courses should reflect pilots very limited skill sets. We want to encourage JV'ers to come back not discourage them with unflyable courses.



Keep JV courses VERY simple. Target at least 3 laps for even for the least skilled JV team. Encourage success.

JV4. JV battlefield designs should be able to scoot (ride along the ground) like a car. Avoid fligh paths with wires on the floor that JVer's must "step over".

avoid loose wires that scooting JVer's have to step over