

## FRC 2026 Scouting Simulation Insights

In the simulation there are 24 robots each with a unique fire rate function.

**All the robots are set to the same accuracy - OPR did reset between tournaments**

Robot Accuracy	Magazine Hits Error	Fire Rate Hits Error	Volley Avg Hits Error	OPR Error
95%	7.53%	20.34%	14.67%	26.29%
90%	13.56%	20.02%	19.99%	22.14%
85%	20.33%	19.75%	26.25%	26.99%
80%	27.85%	20.35%	23.98%	25.19%
75%	37.48%	20.26%	42.87%	26.58%
70%	46.11%	21.64%	52.97%	25.89%

*25 tournaments with 10 matches per robot*

**Each robot gets a random different accuracy and magazine within the range (did NOT change between tournaments)**

Accuracy Range	Magazine Size Range	Magazine Hit Error	Max Fire Rate Error	Volley Error	OPR Error
50%-100%	50-100	42.50%	30.08%	52.59%	30.03%
70%-95%	70-120	21.21%	21.81%	28.75%	26.15%
85%-98%	80-120	11.02%	21.06%	18.07%	25.65%
50%-75%	100-200	64.85%	27.78%	67.05%	25.89%
40%-70%	125-150	90.04%	28.81%	97.02%	24.62%
30%-90%	50-150	81.98%	42.45%	91.16%	35.99%

*25 tournaments with 10 matches per robot*

**Each robot gets a random different accuracy and magazine within the range per tournament**

Accuracy Range	Magazine Size Range	Magazine Hit Error	Max Fire Rate Error	Volley Error	OPR Error
50%-100%	50-100	43.63%	29.82%	52.06%	27.53%
70%-95%	70-120	25.59%	23.11%	30.65%	27.16%
85%-98%	80-120	11.98%	19.64%	18.22%	26.61%
50%-75%	100-200	65.98%	27.44%	69.93%	25.84%
40%-70%	125-150	91.54%	28.24%	96.38%	26.95%
30%-90%	50-150	87.90%	42.61%	97.92%	31.59%

*25 tournaments with 10 matches per robot*

**All the robots are set to the same accuracy - OPR did NOT reset between tournaments**

Robot Accuracy	Magazine Shot Error	Magazine Hit Error	Max Fire Rare Error	Volley Error	OPR Error
95%	2.42%	7.74%	20.58%	12.9%	13.95%
90%	2.32%	13.7%	19.73%	18.98%	14.02%
85%	2.41%	20.43%	20.05%	25.74%	17.4%
80%	2.21%	27.54%	19.3%	33.61%	14.56%
75%	2.34%	36.36%	20.63%	41.31%	13.17%
70%	2.44%	46.21%	21.31%	51.68%	13.86%

*10 tournaments with 25 matches per robot for each robot accuracy*

**Each robot gets a random different accuracy within the range - OPR did NOT reset between tournaments**

Accuracy Range	Magazine Shot Error	Magazine Hit Error	Max Fire Rate Error	Volley Error	OPR Error
50%-100%	2.48%	42.21%	23.71%	66.65%	14.34%
70%-95%	2.29%	26.23%	21.00%	44.87%	12.37%
85%-98%	2.48%	11.87%	20.43%	24.99%	12.29%
50%-75%	2.37%	66.62%	25.14%	72.63%	14.20%

*5 tournaments with 25 matches per robot for each robot accuracy range*

**Each robot gets a completely random accuracy - OPR DID reset between tournaments**

Accuracy range	Magazine Size Range	Magazine Hit Error	Max Fire Rate Error	Volley Error	OPR Error
1%-100%	120-150	408.45%	173.72%	426.67%	85.44%

*25 tournaments with 10 matches per robot*

**Each robot gets a completely random accuracy - OPR did NOT reset between tournaments**

Accuracy range	Magazine Shot Error	Magazine Hit Error	Max Fire Rate Error	OPR Error
1-100%	2.62%	372.77%	160.64%	32.90%

*15 tournaments with 30 matches per robot for each robot accuracy*

If the robot accuracy is below 90% or the scouter is bad all methods become unreliable other than the OPR but OPR requires a large amount of hit.

**Facts To Notice:**

- **OPR** reliability depends heavily on the number of matches. When OPR did NOT reset between tournaments the error was 12%-14%, however when it did (as it should) and it had only 10 matches per robot the error rate went up to around 23%-28%.
- **Max Fire Rate** is really stable, it stays at around 20% consistently and when spiked it spikes much less than the other methods.
- **The Magazine Method** is reliable only when the robot's accuracy is above 90%.

**Notes:**

- Look if the table OPR reseted after each tournament as some do not and might mislead.
- At the "complete chaos" scenario (1%-100% random accuracy) all the methods fail really badly and the OPR and the Max Fire Rate are the "least worse" options.