

## Robot Strategy

The robot will be able to go around and under the Stage during all periods of the game to optimize cycle times; utilize object detection for ground acquisition of a Note, and April Tag vision assist to score a Note in the Speaker, Amp, and Trap. The robot will be able to mount and dismount the chain and score in the Trap more than once if needed.

## Functional Robot Requirements

<b>Year</b>	<b>2024</b>	<b>Game</b>	<b>Crescendo</b>
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<b>Standard (Task) Written Out</b>	<b>Functional Requirement Parameter(s)</b>	<b>Measurement</b>
<b>Autonomous</b>		
Score preloaded Note into speaker at start of auto from anywhere in the Robot Starting Zone	Time, Accuracy	< 1 s / 100%
Exit Robot Starting Zone.	Cross line	< 1 s / 100%
Go under the stage or around	Time Saved	1-2 s
Utilize object detection for Note acquisition	Time	1-2 s
Ground acquisition of Note (Touch it own it)	Time, Accuracy	< 1 s, 100%
Process a Note by the robot (From acquisition to stow)	Time	< 0.75 s
Align with April Tags for scoring into Speaker	Time, Error	< 1 s / 2 in
Ability to score (outtake) Notes on the move, not stationary	Min Velocity, Accuracy	3 m/s, 90%
Scoring Area 1: Be able to score from at least 60 degrees, in either direction, from the center of the Speaker	Accuracy	90%
Scoring Area 2: Be able to score into speaker from the points along the Wing line not blocked by the stage	Accuracy	90%
Goal: minimum 3 more Notes scored after preloaded Note (4 total)	Time, Accuracy	14 s / 90%
<b>Teleoperated</b>		
Go under the stage or around	Time Saved	1-2 s
Utilize object detection for Note acquisition	Time	1-2 s
Ground acquisition of Note	Time, Accuracy	1 s, 100%
Process a Note by the robot (From acquisition to stow)	Time	< 0.75 s
Align with April Tags for scoring into Speaker, Amp, Trap	Time, Error	1-2 s / 2 in
Ability to score Notes on the move, not stationary	Min Velocity, Accuracy	3 m/s, 90%
Goal: 10 (week 1), 15 (week 4), 20 (week 6 + Houston) cycles during teleoperated	Time, Accuracy	115 -135 s / 90%

<b>Teleoperated - Endgame</b>		
Get Onstage	Time/Accuracy	< 5s / 95%
Score in Trap if Trap does not contain a Note	Time/Accuracy	5s / 90%
While another robot is on the chain, be able to climb.	Time/Accuracy	5s / 95%
Get Offstage (TBD, may not be required if a Note can be scored in the Trap without a robot being Onstage)	Time/Accuracy	< 5s / 95%