

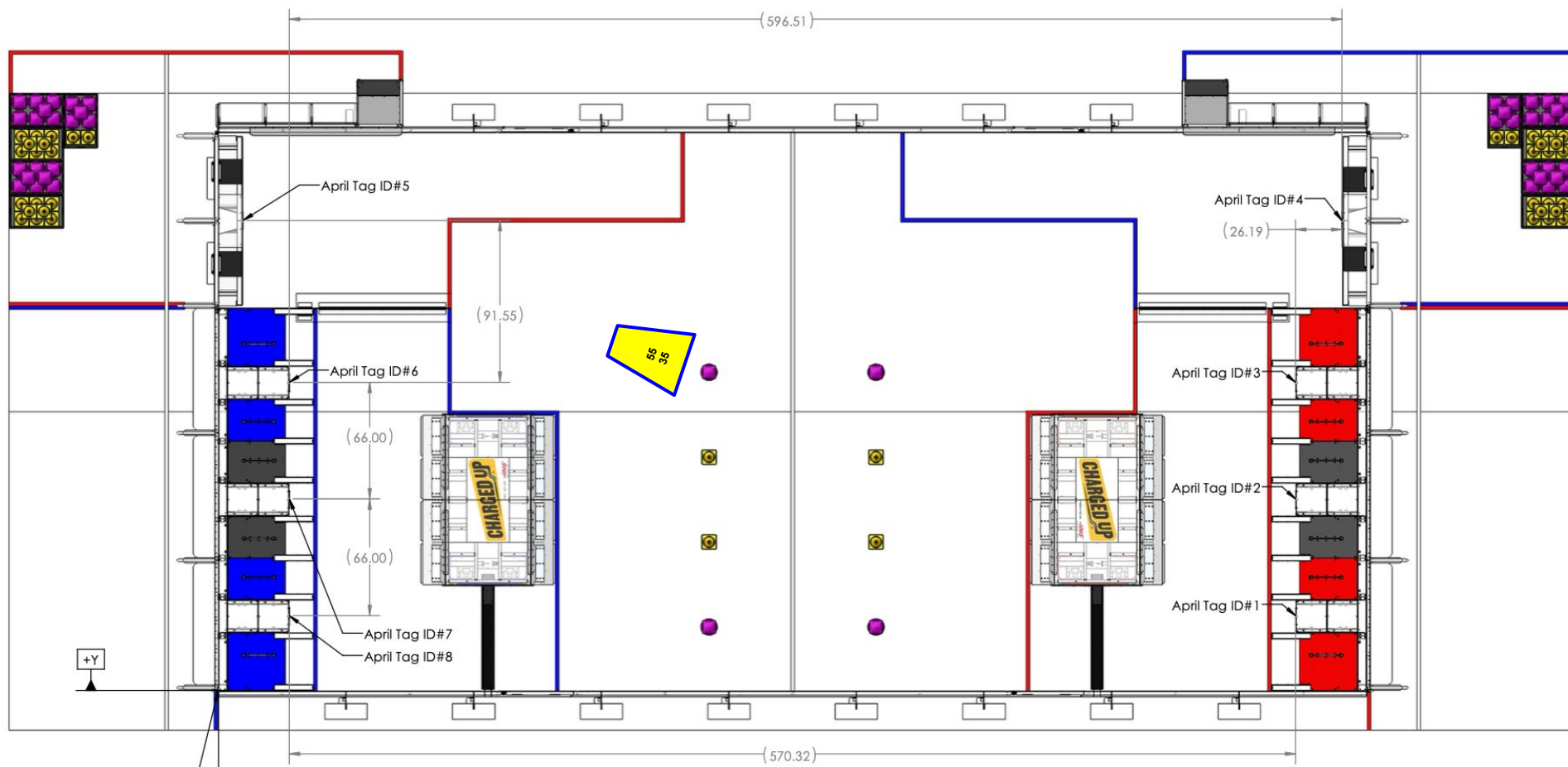
Robotics 2023

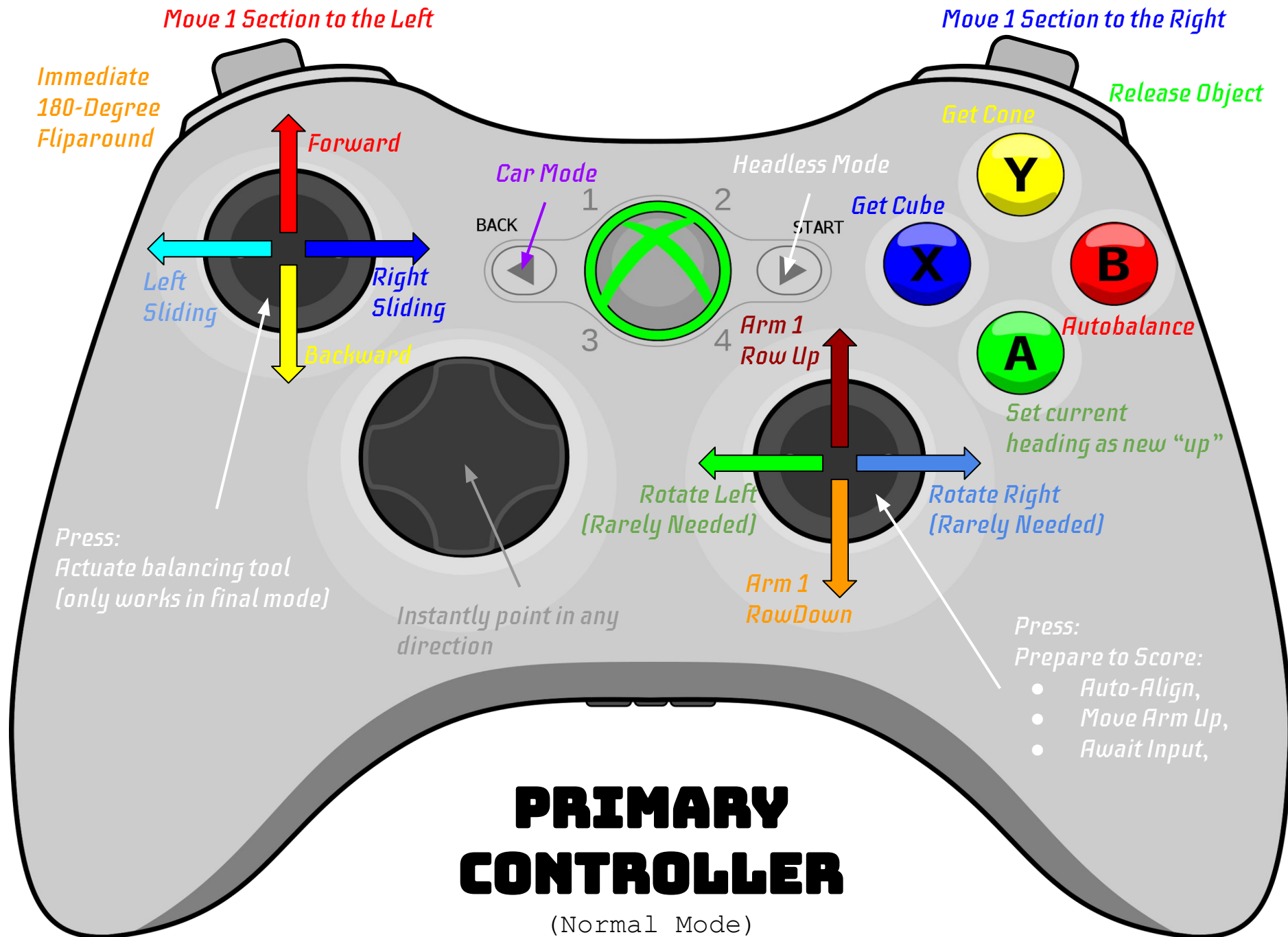
Programming Plan

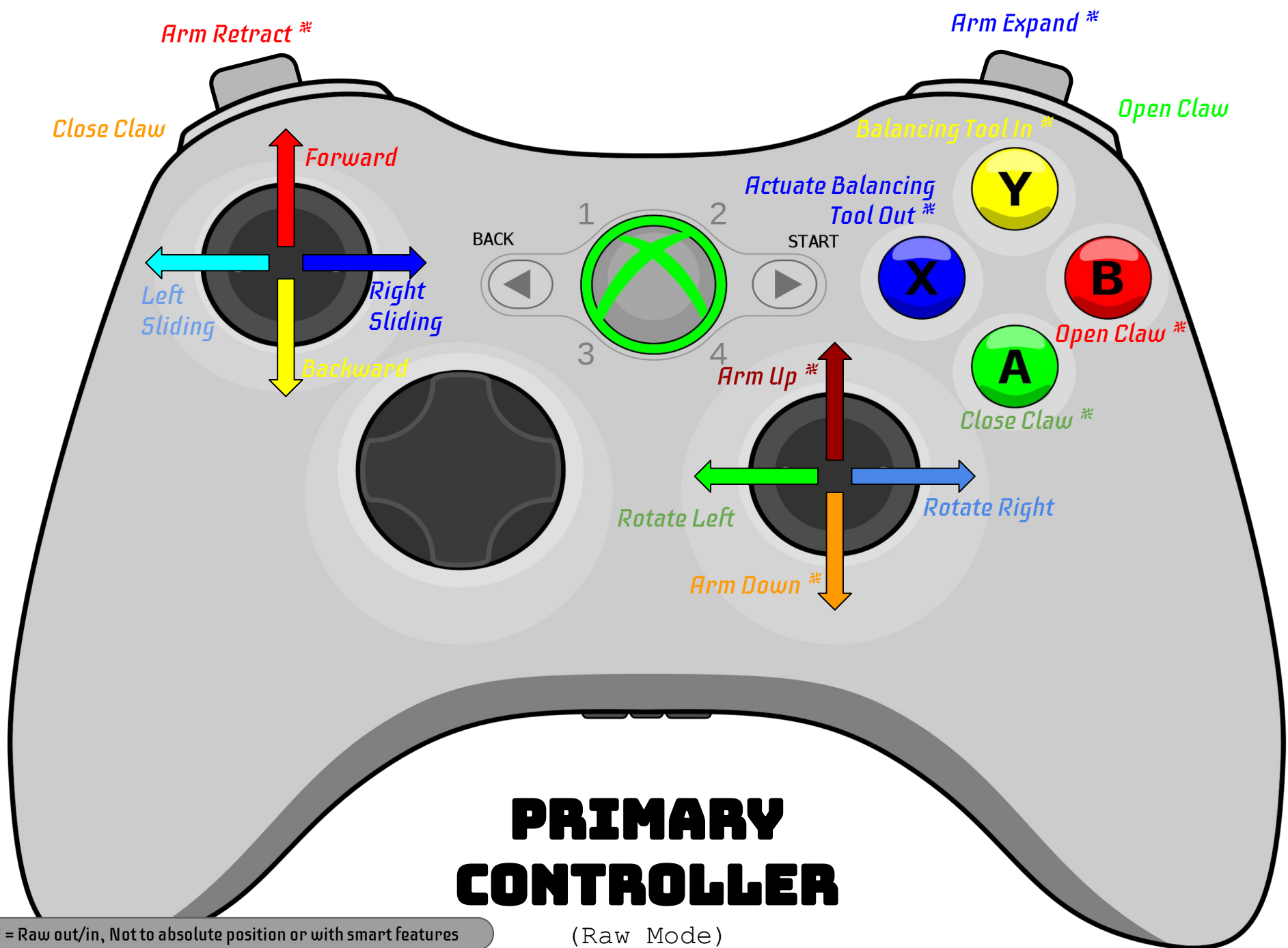
Version 3.0



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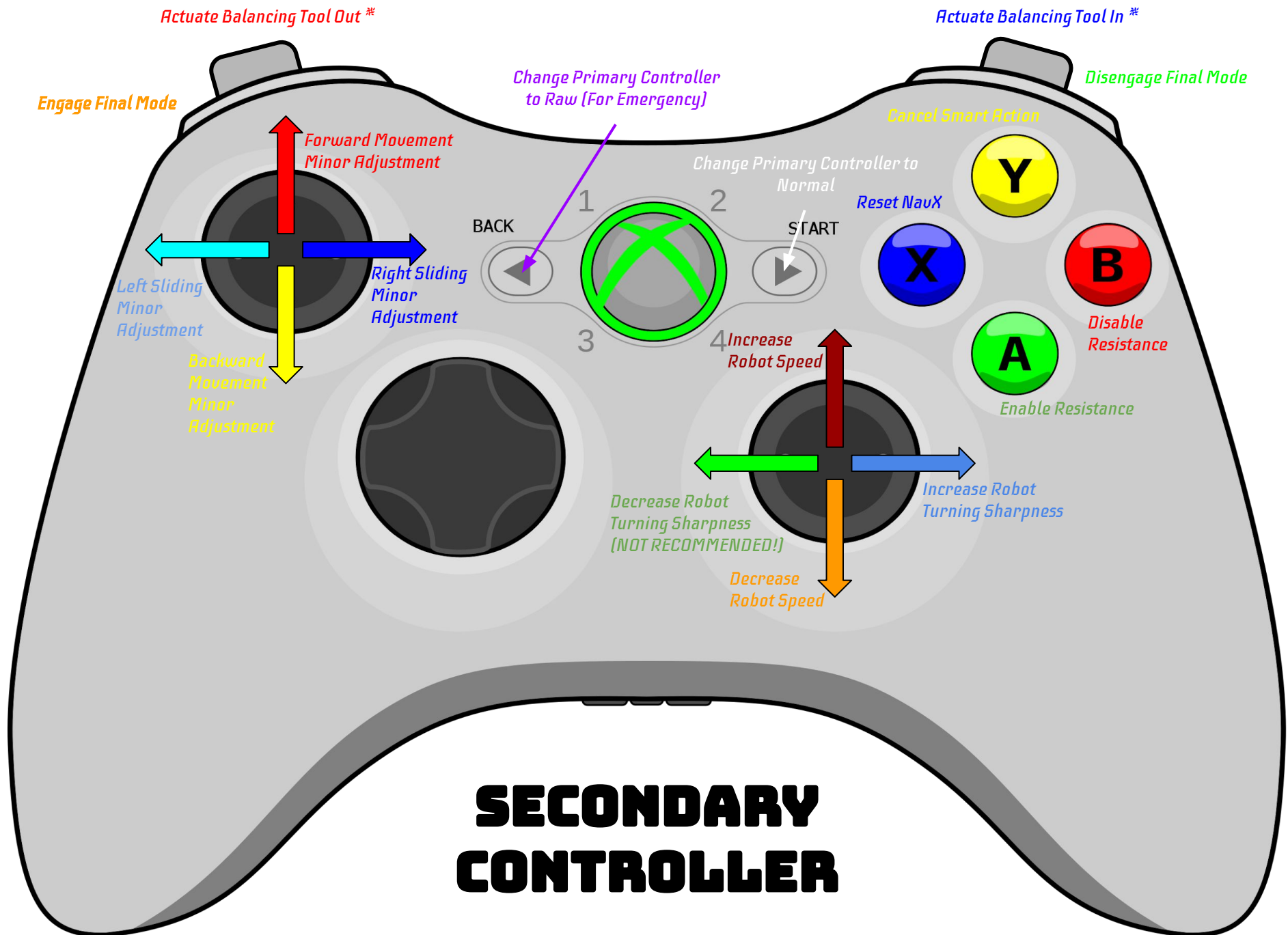




PRIMARY CONTROLLER

* = Raw out/in, Not to absolute position or with smart features

(Raw Mode)



THINGS THAT COULD GO WRONG AND HOW TO SOLVE THEM

Problem	Solution
Wheel on robot is not pointed in the right direction.	The person with the secondary controller can also use the SmartDashboard on the computer. They will see values that say "A offset", "B offset", and so on. These values can be edited to adjust each of the wheels' angles on the robot. "A" is the front-left wheel, and the rest of the wheels continue clockwise around the robot from "A". Later on, replace the CANCoder and/or the rotation magnet that pairs with it, or you will see this issue again. Set the new CANCoder to absolute position with the Phoenix Tuner, restart the robot, find the new rotational offset for this wheel, and then enter it into the actual robot programming where Wesverve is added to robot.java.
Wheel on the robot is spinning in reverse.	Add 180 to the reversed wheel's offset value. See the solution above for more information on adjusting a wheel's offset value.
Robot is rotating left and right over and over again, getting more off angle each time.	The automatic rotational resistance is overworking itself. Turn off automatic rotational resistance by pressing B on the secondary controller.
Robot is spinning very fast in one direction.	The NavX came unplugged or stopped working. You will have to work without the NavX. Change the primary controller to raw mode by pressing the BACK button on the secondary controller. Driving will now be much more difficult as you do not have access to any smart features. Troubleshoot programming later.
Robot keeps getting off course, pointing in the wrong direction.	Have the person with the primary controller use the left/right on the right stick to point the robot in the "down" direction, which is the direction you point in to score. Now, press X on the secondary controller to reset the navx.
Robot is skippy because battery is very low.	Drive the robot much slower. Do not accelerate or decelerate quickly. If this is not enough, try using raw mode by pressing BACK on the secondary controller. Use your remaining power to get to the charging station, and DO NOT try to move the robotic arm any higher than it already is. In this situation, if another robot plays defense against you as you are going to the charging station, play dead. Eventually, the robot will leave you alone. Be in no hurry.

AUTONOMI SYSTEM

SELECTION 1: STARTING POINT

1. POINT Q
2. POINT W
3. POINT E
4. POINT I
5. POINT O
6. POINT P

SELECTION 2: WHAT TO GET FROM WHERE AND TO WHERE

Enter a string of text containing the following characters:

- v = Get cone
- o = Get cube
- □ = Put on floor
- 1 = Put on shelf 1
- 2 = Put on shelf 2
- a, s, d, f, = Where to search for object

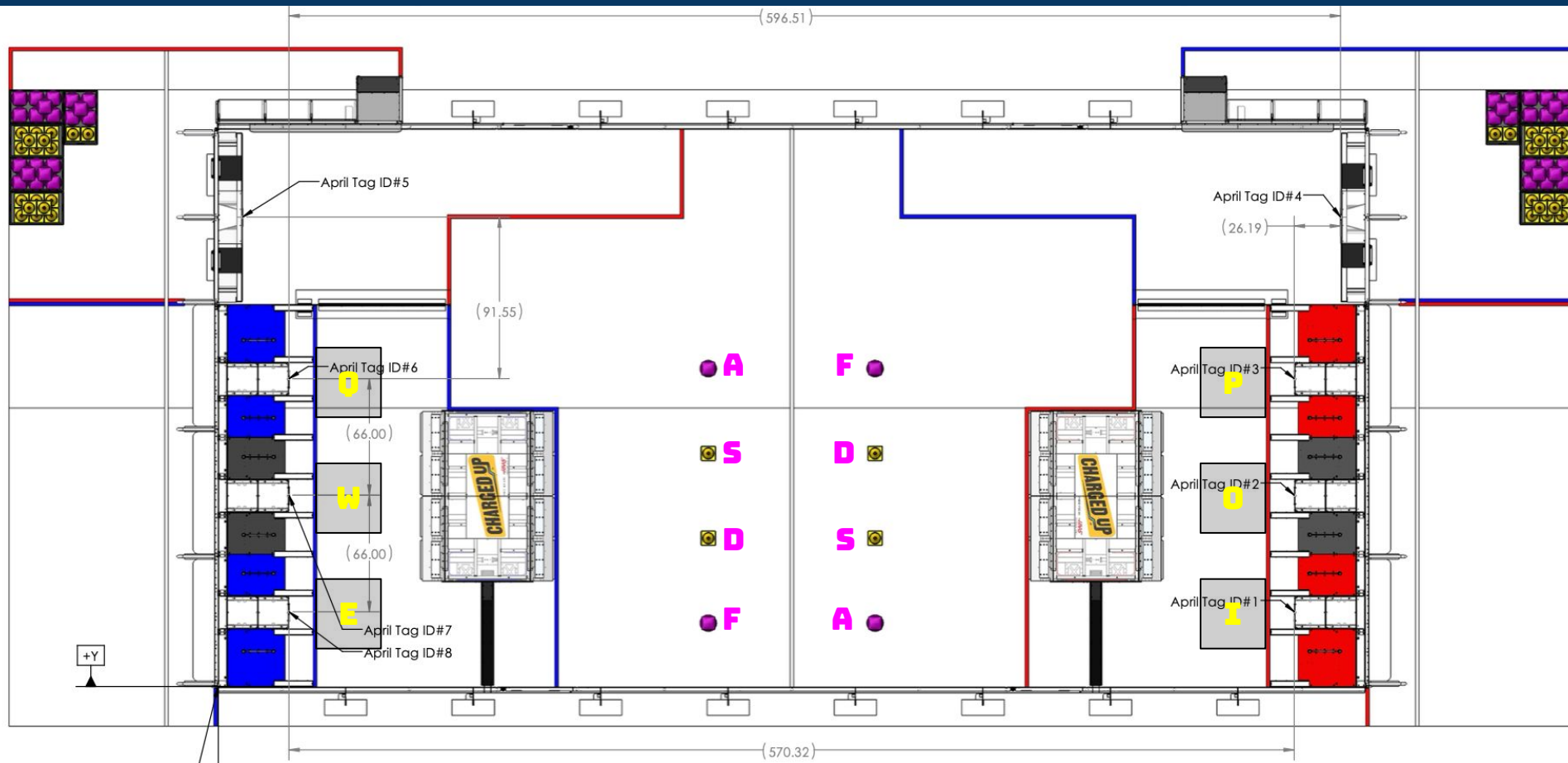
Example: "av2so2do□" = Cone from A to shelf 2, then cube from S to shelf 2, then cube from D to floor.

SELECTION 3: BALANCE AT END

0. NO

1. YES

Robot will interrupt its ordered execution if time is running out (12/15s) and this option is enabled. If this option is disabled, robot will continue to run commands from selection 2 until autonomous ends.



EXAMPLE AUTONOMOUS 1

SELECTION 1: STARTING POINT

1. POINT Q
2. POINT W
3. POINT E
4. POINT I
5. POINT O
6. POINT P

SELECTION 2: WHAT TO GET FROM WHERE AND TO WHERE

Enter string text containing the following icons:

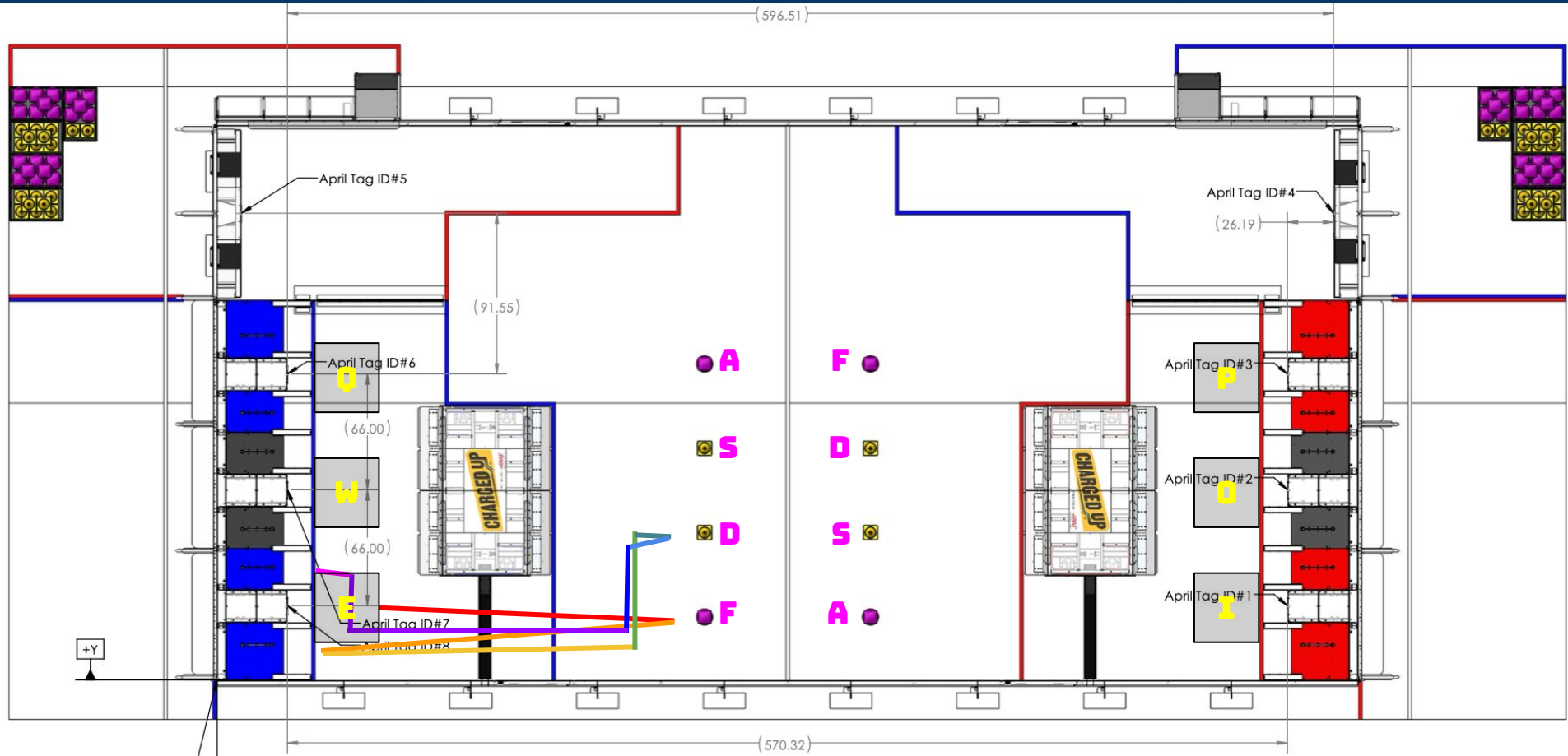
- v = Get cone
- o = Get cube
- □ = Put on floor
- 1 = Put on shelf 1
- 2 = Put on shelf 2
- a, s, d, f, = Where to search for object

fo2dv2

SELECTION 3: BALANCE AT END

0. NO

1. YES



EXAMPLE AUTONOMOUS 2

SELECTION 1: STARTING POINT

1. POINT Q
2. POINT W
3. POINT E
4. POINT I
5. POINT O
6. POINT P

SELECTION 2: WHAT TO GET FROM WHERE AND TO WHERE

Enter string text containing the following icons:

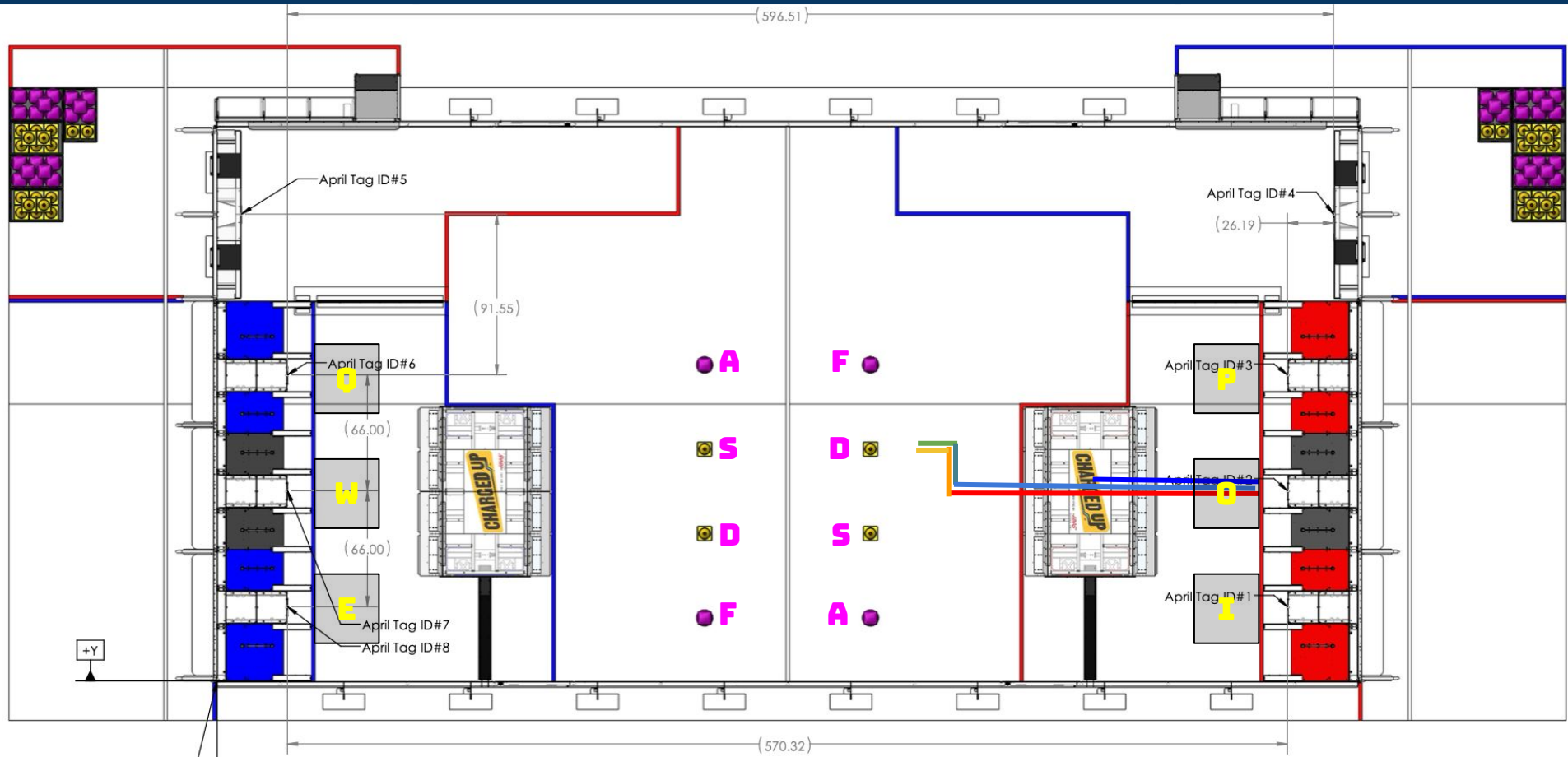
- v = Get cone
- o = Get cube
- □ = Put on floor
- 1 = Put on shelf 1
- 2 = Put on shelf 2
- a, s, d, f, = Where to search for object

dv0

SELECTION 3: BALANCE AT END

0. NO

1. YES



EXAMPLE AUTONOMOUS 3 - BLUE PREFERENCE

SELECTION 1: STARTING POINT

1. POINT Q
2. POINT W
3. POINT E
4. POINT I
5. POINT O
6. POINT P

SELECTION 2: WHAT TO GET FROM WHERE AND TO WHERE

Enter string text containing the following icons:

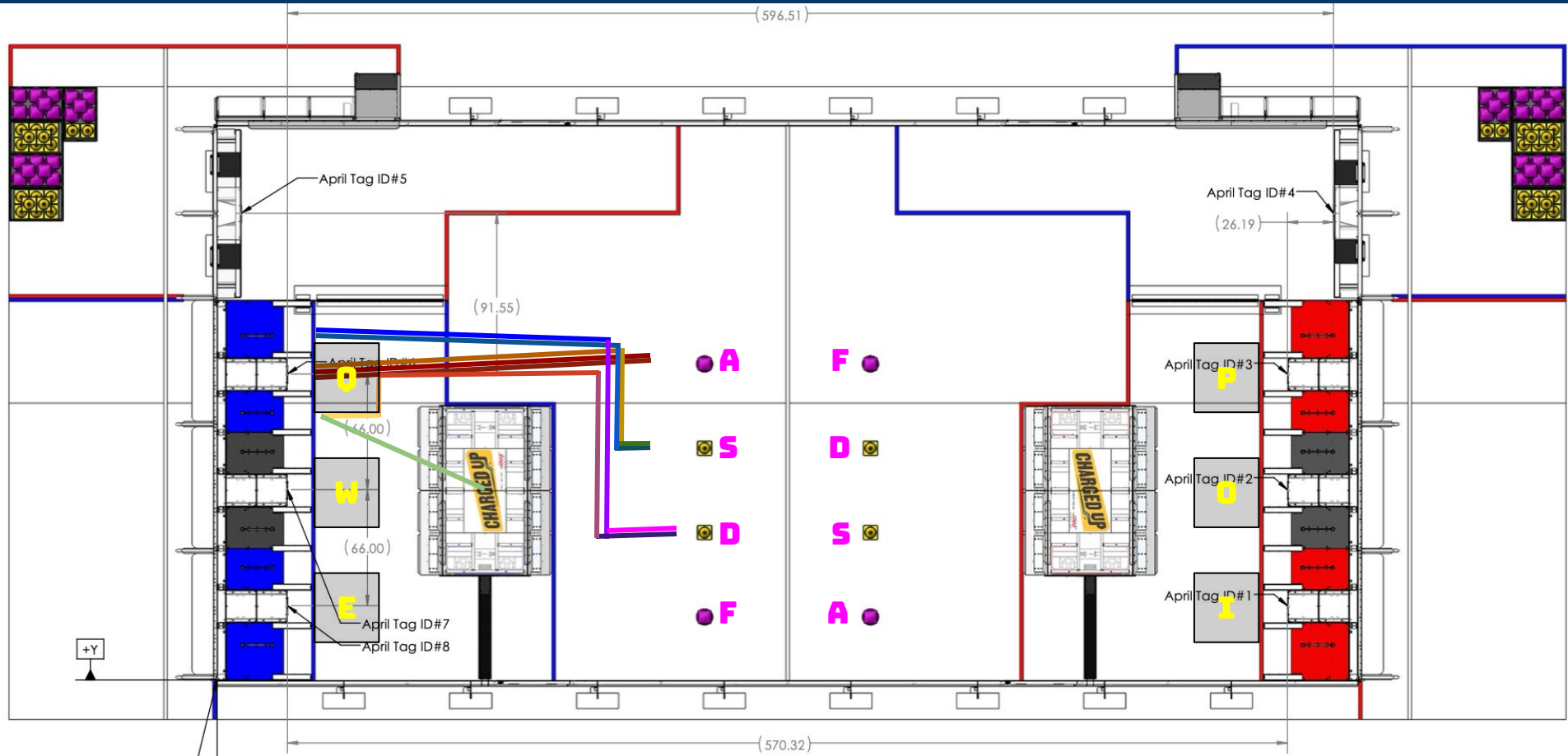
- v = Get cone
- o = Get cube
- □ = Put on floor
- 1 = Put on shelf 1
- 2 = Put on shelf 2
- a, s, d, f, = Where to search for object

av2sv2do2

SELECTION 3: BALANCE AT END

0. NO

1. YES



EXAMPLE AUTONOMOUS 4 - RED PREFERENCE

SELECTION 1: STARTING POINT

1. POINT Q
2. POINT W
3. POINT E
4. POINT I
5. POINT O
6. POINT P

SELECTION 2: WHAT TO GET FROM WHERE AND TO WHERE

Enter string text containing the following icons:

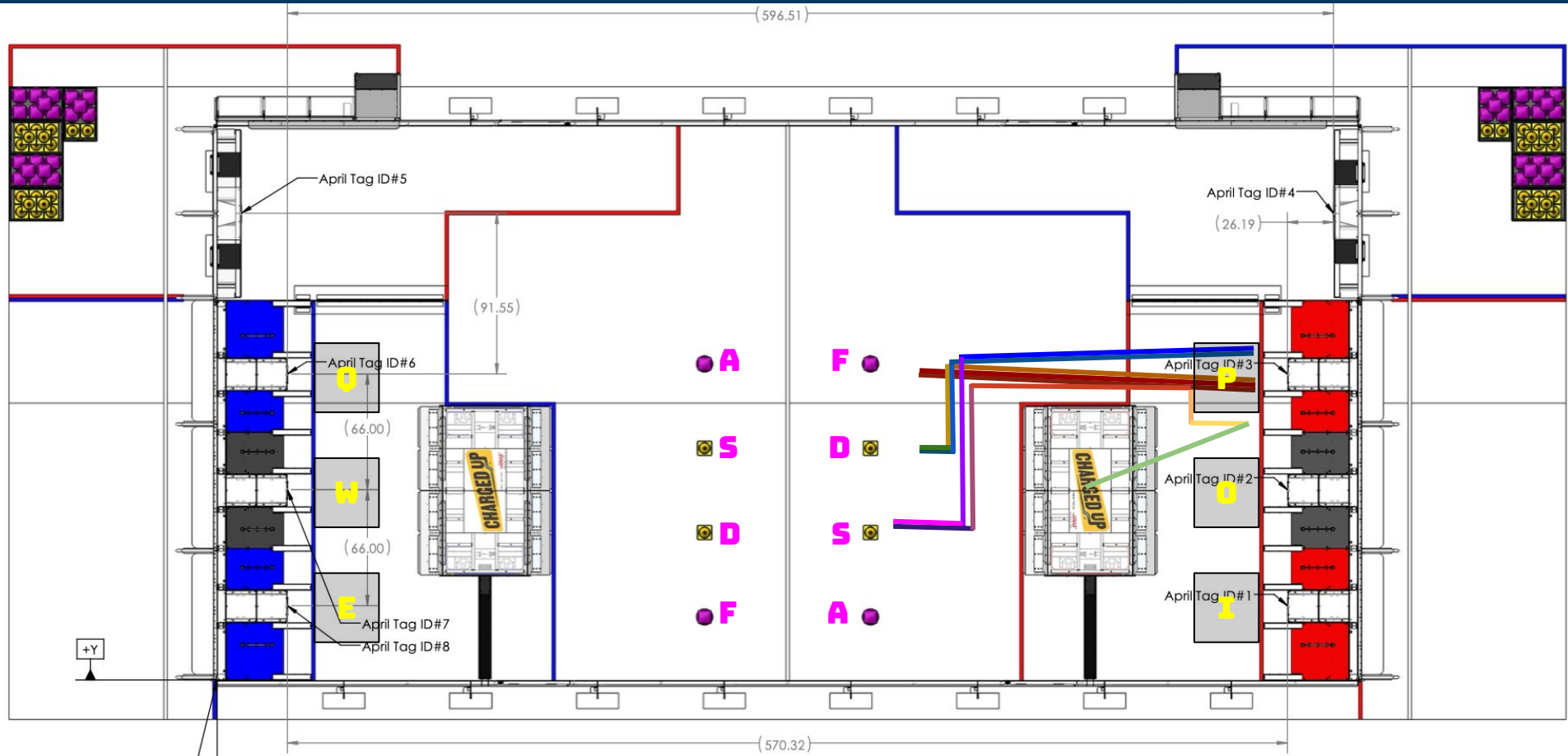
- v = Get cone
- o = Get cube
- □ = Put on floor
- 1 = Put on shelf 1
- 2 = Put on shelf 2
- a, s, d, f, = Where to search for object

fv2dv2so2

SELECTION 3: BALANCE AT END

0. NO

1. YES



GENERAL STRATEGY

Award	Awarded for...	AUTO	TELEOP
MOBILITY	each ROBOT whose BUMPERS have completely left its COMMUNITY at any point during AUTO	3	
GAME PIECES	scored on a bottom ROW	3	2
	scored on a middle ROW	4	3
	scored on a top ROW	6	5
LINK	3 adjacent NODES in a ROW contain scored GAME PIECES.		5
DOCKED and not ENGAGED	Each ROBOT (1 ROBOT max in AUTO)	8	6
DOCKED and ENGAGED	Each ROBOT (1 ROBOT max in AUTO)	12	10
PARK	Each ROBOT whose BUMPERS are completely contained within its COMMUNITY but does not meet the criteria for DOCKED.		2

TELEOP

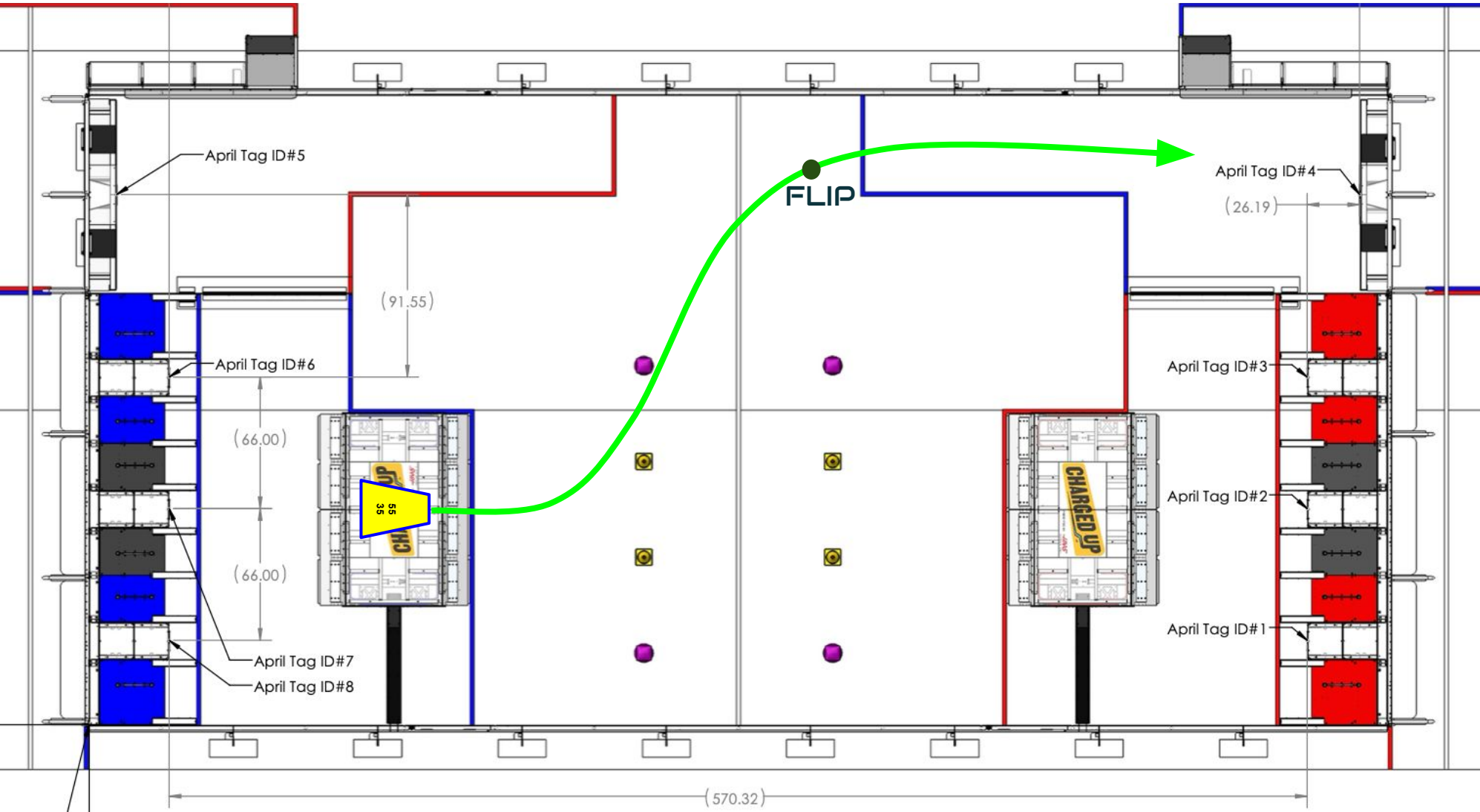
During teleop, your goal will be to do the following **AS FAST AS POSSIBLE**: Go across field to loading zone → Collect object by pointing relatively toward it and pressing X to get a cube and Y to get a cone → Go back to community → Auto-align by pressing top right button → Move right stick up or down to choose from the three levels → Press right stick down to release.

AUTONOMOUS

Notice that game pieces scored in autonomous are worth more than those scored during teleop. Because of this, it is very important to our alliance that our capable robot scores as many pieces as possible during the first 15 seconds of the match. Most other robots will not be able to do this. Our robot does have a self-balancing feature as well, so balancing at the end is also a good idea if none of the other teams will do it. Be a leader when discussing autonomous plans, but don't be too proud or people won't like us. In a typical 15-second autonomous, our robot should have the ability to score four game pieces or score three game pieces and balance at the end with an additional game piece in grasp. The robot can start from anywhere, but it will be best to start in front of the grid that is closest to the barrier. Be pressed up against it so that scoring the preloaded game piece can be as quick as possible. ALWAYS START FACING TOWARD AND PRESSING AGAINST THE GRID YOU WILL BE SCORING IN. The robot will always start by scoring its preloaded game piece, whether cube or cone, in the top row DIRECTLY IN FRONT OF IT. This action will be performed blindly in order to gain points more quickly, so align the robot accurately when placing it on the field.

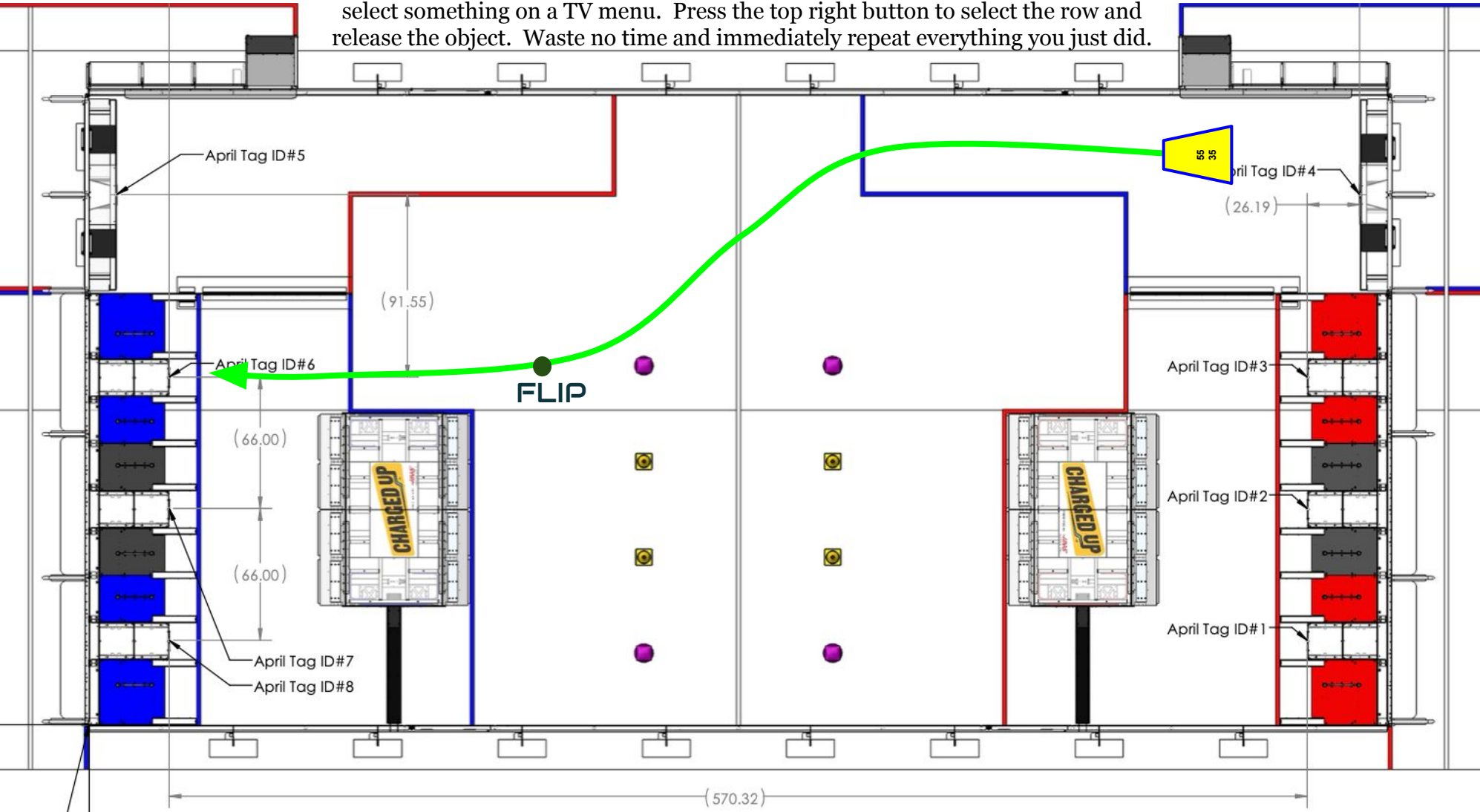
GENERAL STRATEGY - SPECIFIC INTENTION OF DRIVING FUNCTIONS AND SMART-FEATURES - PART 1

At full speed, charge to the loading zone. Other robots will be trying to stop you as their path intercepts yours. Slip around them as your robot is very maneuverable. Take a tricky path if necessary. Around the point labeled “FLIP” on the map below, press the top left button to immediately turn the robot 180 degrees while driving. Unlike other robots, you this should not decrease the amount of time it takes you to get where you need to go. “FLIP” is so far down the line because you will want to travel shortest-side first when bolting across the field.



GENERAL STRATEGY - SPECIFIC INTENTION OF DRIVING FUNCTIONS AND SMART-FEATURES - PART 2

In the loading zone, press X to get a cube in view and Y to get a cone. After you have your object, charge at full speed to your community. Once again, press the top left button down to flip somewhere around the flip point. Once you are in front of where you want to load, press the right stick down to automatically align with the grid, press up against the it, and prepare to release the cone or cube. Now all you have to do is decide whether it should go on the top, bottom, or middle row. Most likely, you will want the top. Move the right stick up or down, just as you would to select something on a TV menu. Press the top right button to select the row and release the object. Waste no time and immediately repeat everything you just did.



GENERAL STRATEGY - SPECIFIC INTENTION OF DRIVING FUNCTIONS AND SMART-FEATURES - PART 3

When the whistle blows near the end of the match, try to score two more game pieces. Then, the person with the secondary controller will have to engage final mode by pressing the top left button on their controller. Final mode will make the robot drive slower so that you can be more accurate. Drive onto the edge of the charging station. When you are near where you should be, actuate the balancing tool by pressing the left stick down. Now, slide over the edge by moving to the right and rotating slightly to the right. This should leave plenty of room for the other two robots on your team. Now, hold down "B" on the primary controller. The robotic arm should move out or in automatically to balance you on the charging station. PLEASE NOTE: If there are less than 3.5 seconds left and two robots are already balanced and you are not on the charging station, do not attempt to get on; two balanced robots will get more points than three non-balanced robots.

