

CYPHER CONTROL
A FIRST® Robotics Competition prototype game
presented by FENIX 4947



FIRST® GAME CHANGERSSM
Game Design Challenge



1. GAME OVERVIEW

In a world where information is power, privacy is hanging by a thread, and this thread is a good old Ethernet cable. The servers are about to release all the information, and you must keep your personal information secret to avoid being cloned and used as a bargaining chip, but your journey is filled with obstacles.

Your faction must retrieve information in the database and make them secure on your server in order to safeguard your personal information as your opponents are attempting to do the same. A race for the information is now starting in the arena. You first have to power your FACTION SERVER with your POWER CABLE. Then, using TRANSFER CABLES, you will safely transfer the data from the DATABASE to your FACTION SERVER, while stabilizing the dataflow. Finally, you will hide away in your BACKDOOR and return on the Internet with your data.

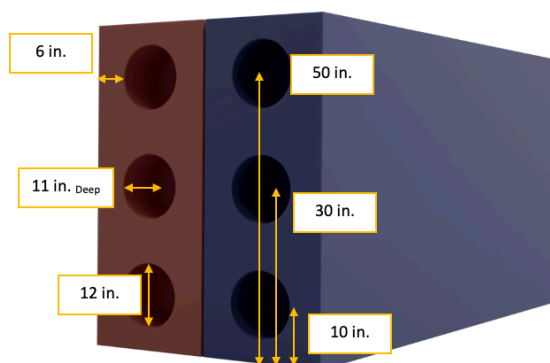
The game starts with an autonomous period of 15 seconds during which you must completely cross the FACTION LINE (5 points) without crossing the SERVER LINE, and connect the POWER CABLE (30 pts in AUTO or 15 points during TELEOP). Then, we enter TELEOP period for a duration of 135 seconds. During this phase, the goal is to connect 5 TRANSFER CABLE (45 points), which you can obtain in your faction's resupply station. You will also need to beat your opponent in the number of STABILISATION CORE installed: this advantage will give you 1 point per second, for as long as you have the advantage. The STABILISATION CORES can be found in one of the two distribution stations for each faction. They can be placed in the 9 cylindrical receptacles, which can be found under the BACKDOOR or on your faction's DATABASE. Once they have been placed, they can also be removed by the opposing team to control the advantage. Finally, the robots from each faction must hang themselves on their ZIPLINE (45 points), slide over to reach the BACKDOOR and do not touch the ZIPLINE anymore (30 additional points). If one or more robots in the faction have reached the BACKDOOR, the faction earns a RANKING POINT.

Good luck to every team and let's get connected!

2. ARENA

1.1 FIELD

The CYPHER CONTROL challenge is played on a 30 feet wide per 74 feet long arena. Two walls called FACTION WALL can be found at each end of the arena. Near those walls, there is an elevated platform, standing at 36 inches high. This platform, 269 inches wide and 45 inches deep, is called the BACKDOOR and can be accessed by the ZIPLINE, which is an H beam that connects the BACKDOOR and the DATABASE, at a height of 78 inches. Each faction also has a 216 inches long by 24 inches wide and 60 inches high server. The DATABASE found in the middle of the arena is 216 inches long, 24 inches wide and 60 inches high.



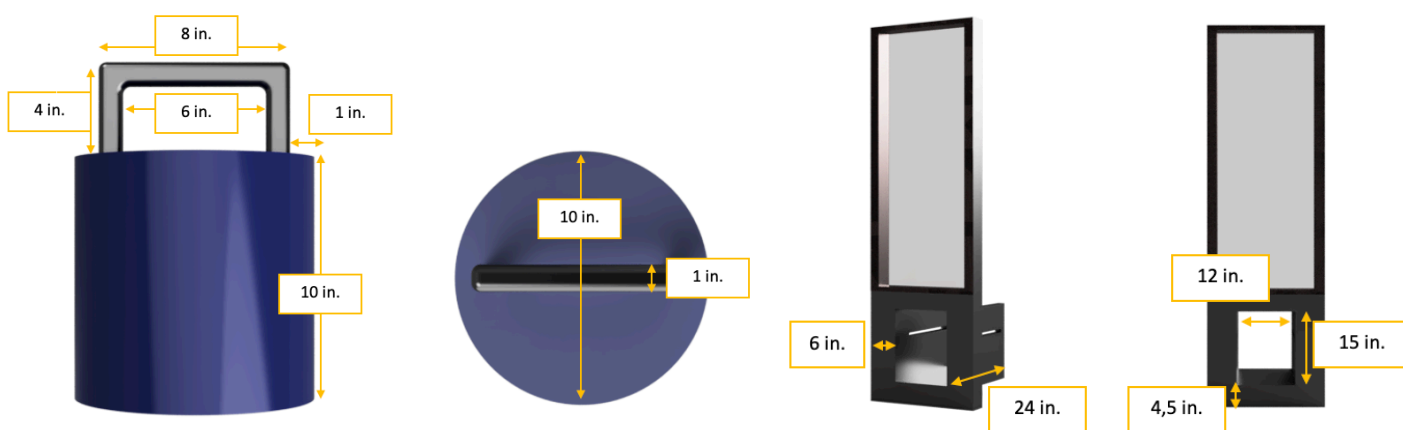
The DATABASE has 12 holes of 6 inches radius, 11 inches deep, and are placed at 10, 30 and 50 inches high. Those holes are the receptacles used for the STABILISATION CORES. Three additional receptacles can be found under each BACKDOOR, 10 inches from the ground. Each faction has two STABILISATION CORE DISTRIBUTION STATIONS, all placed at the same height. This allows the human player to give STABILISATION CORES to robots. One station is under the BACKDOOR while the other is on the lateral wall.

1.2 ZONES AND MARKINGS

The faction lines are placed at 45 inches from the faction walls, while the server lines are at 113 inches. The zone delimited by the SERVER LINES, called SERVER ZONE, is specific to each faction: any and all contact with a robot from the opposing team in this zone will result in a tech foul for the faction at fault. The same rule applies in the RECUPERATION ZONE and under the BACKDOOR. This way, the robots are free to collect and connect the TRANSFER CABLES, but contact is allowed in all other zones in the arena.

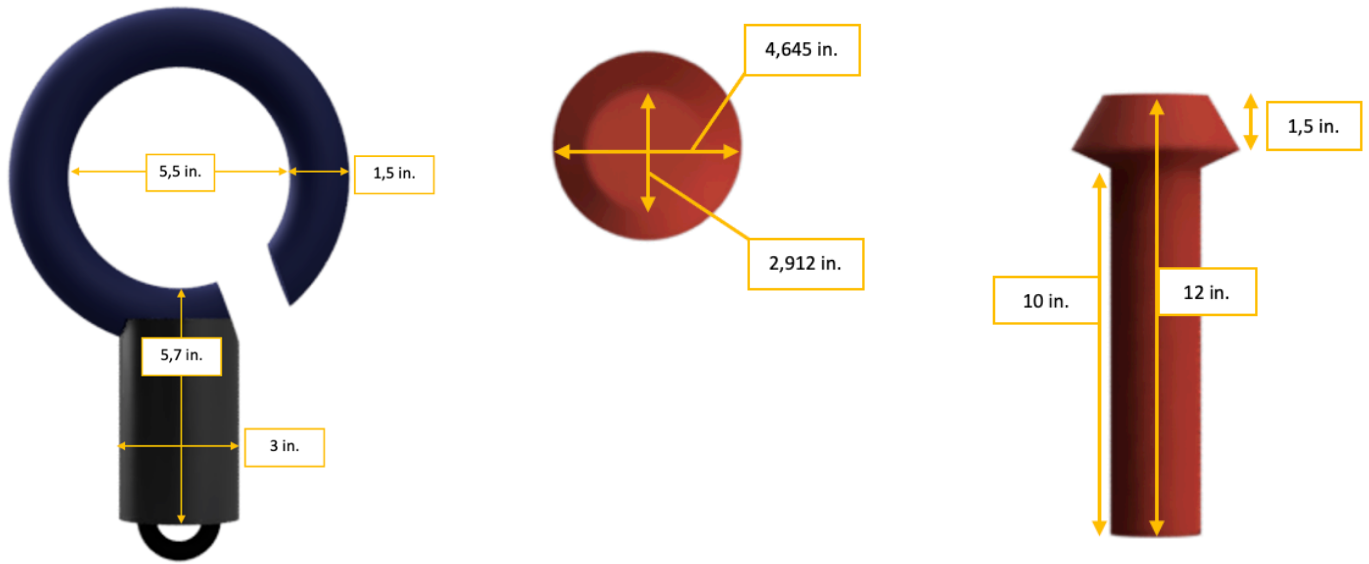
1.3 STABILISATION CORES

The STABILISATION CORES, 9 per faction, are aluminum cylinders of 10 inches in diameter and 10 inches long, with a handle at one end. The handle is 8 inches long, and protrudes from the cylinder by 4 inches. The robots must gather the STABILISATION CORES at the STABILISATION CORES DISTRIBUTION STATION of its faction.



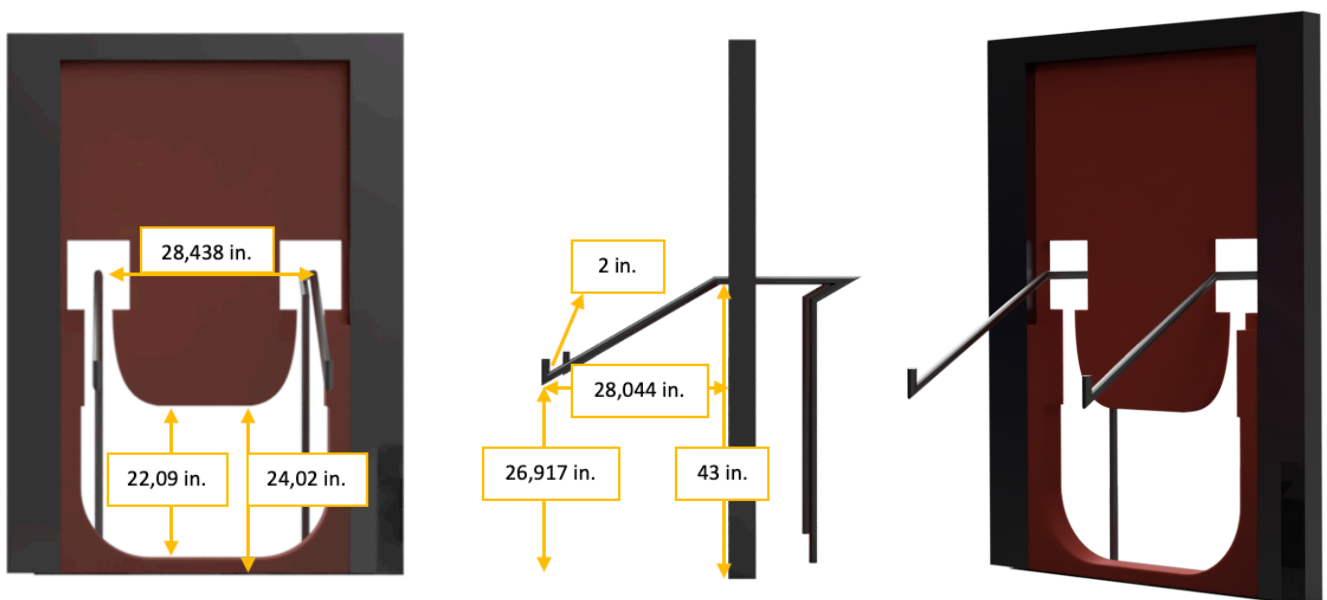
1.4 TRANSFER CABLE

The grade 30 steel chain is 156 inches long. Each link is 0.27 inches wide, 0.90 inches long and 0.16 inches thick. This chain is called TRANSFER CABLE and is the game main element. Each faction has 5 TRANSFER CABLE, which are used to connect the DATABASE to the FACTION SERVER. There is a connection buckle at each extremities.



The connection buckle is used to attach the chain TRANSFER CABLE to the CONNECTION POLE. The CONNECTION POLES are 2,912 inches diameter rods that are 10 inches high at the top of the DATABASE and the FACTION SERVER. Those rods are capped with screw-like half-spheres that prevent the chains from coming out too easily.

The POWER CABLE is also made from the same chain, and measures 210 inches long. However, this cable only has one connection buckle, and the other end of the cable is fixed directly to the FACTION WALL. The POWER CABLE is a fundamental game element, as without it, none of the TRANSFER CABLE connection gives any point. The robots must gather the TRANSFER CABLES at the RECUPERATION STATION of its faction. The chains are a visual representation of the TRANSFER CABLE. This technique used to transfer data reduces the chances of intrusion.



3. SCORING

FACTIONS are rewarded for accomplishing various actions through the course of a MATCH, including ROBOT movement during AUTO, connecting TRANSFER CABLE to transfer data and stabilizing the dataflow. Rewards are granted via either MATCH points or RANKING POINT. Such actions, their criteria for completion, and their point values are listed in Table below.

Award	Awarded for...	AUTO	TELEOP	Qual.
FACTION LINE	COMPLETELY CROSS	5 pts	-	If all three robots have crossed the faction line and the power cable is connected. 1 Ranking point.
POWER CABLE	CONNECT POWER CABLE	30 pts	15 pts	
TRANSFER CABLE	CONNECT TRANSFER CABLE	45 pts (per cable)	45 pts (per cable)	-
STABILISATION CORE	STABILISATION CORE installed advantage	-	1 pt/sec if advantage	-
ENDGAME Points	HANG ZIP LINE	-	45 points	-
	PARK on the BACKDOOR (Do not touch de ZIPLINE anymore)	-	30 points	If one or more robots in the faction have reached the BACKDOOR, the faction earns 1 ranking point

4. MATCH PLAY

4.1 SETUP

At the start of the match, robots need to be touching the FACTION WALL under the BACKDOOR (35 inches). The entire robot has to be inside its perimeter. One of the faction robots can start the match with a POWER CABLE that has been charged beforehand.

The human players must place the STABILISATION CORES (9) in the DISTRIBUTION STATION at their convenience. Note that once the match has begun, it will not be possible for human players to move the STABILISATION CORES from one station to the other.

4.2 AUTONOMOUS PERIOD

During the fifteen (15) first seconds of the match, all the robots operate without any DRIVE TEAM control or input. This is called the autonomous (AUTO) period. In AUTO, robots exit from under the BACKDOOR by completely crossing the FACTION LINE without entering the SERVER ZONE. One robot can also connect the POWER CABLE. As soon as AUTO starts, robots can extend from their perimeter by 18 inches. There is no restriction for the robot's height.

4.3 TELEOPERATED PERIOD

The second phase of each MATCH is called the Teleoperated Period (TELEOP) and consists of the remaining two minutes and fifteen seconds (2:15). During this phase, DRIVERS remotely operate ROBOTS to retrieve the TRANSFER CABLES and connect them, thus connecting the DATABASE to their FACTION SERVER. The robots can also install STABILISATION CORES in the STABILISATION CORE RECEPTACLES of their faction's color, or remove them from their opponents in order to gain the advantage. Then, at the end, the robots will need to suspend themselves on the ZIPLINE and slide on the beam to reach the BACKDOOR and maximize the number of points gained.

