IEEE Southeastcon 2018

IEEE USF: Hardware Competition Rules

Manifest:

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Terminology

Pirate: Robot
Ship: Raised portion of the field
Island: The lower portion of the field not painted blue
Doubloons: Points
Gangplank: Ramp from the ship to the island
Treasure Map: The string of 3 binary bits transmitted by the infrared sensor
Destination A / Lowering the bridge: Push button that lowers the bridge
Destination B / Location of treasure key: Pressure plate
Destination C / Raising the bridge: Push button that raises the bridge
Treasure Chest: The conduit box filled with loose weights
Pirate Flag: The flag raised by the captain's wheel and provided with the field

Avast, Me Hearties!

A pirate begins the journey by reading a treasure map and lowering a gangplank onto the island. The pirate then crosses a narrow gangplank being careful not to fall into the shark infested waters. Once on the island, the map shows the path to the key; then the treasure chest can be claimed! While on the island, the pirate can raise their pirate flag to claim it for the crew. The pirate picks up the treasure chest, returns to the ship, and sets sail on the high seas.

Overview

The major tasks to complete are: reading the treasure map, lowering the gangplank, recovering the key, loading the treasure chest, raising the pirate flag, returning to the ship, and raising the gangplank. The route taken while completing these tasks depends on randomly selected treasure map coordinates. Pirates have the option of completing all the tasks listed in the coordinates in order, or forgo some tasks in the interest of strategy. The end goal is to collect the maximum number of doubloons in the least amount of time.

The Treasure Map

At the start of a round, the robot receives coordinates for the route that must be taken to the three major destinations. The coordinates are sent as an infrared (IR) signal in an 8 bit message using a protocol based on NEC. The last 3 bits contain the coordinates. At the beginning of each round a code will be randomly generated that teams must be displayed on the robot in order to earn doubloons. Each binary bit represents one of the three destinations (Figure 1). Only destinations listed by the coordinates will earn doubloons. All combinations of destination routes are symmetrical, making all possible combinations equal in length.
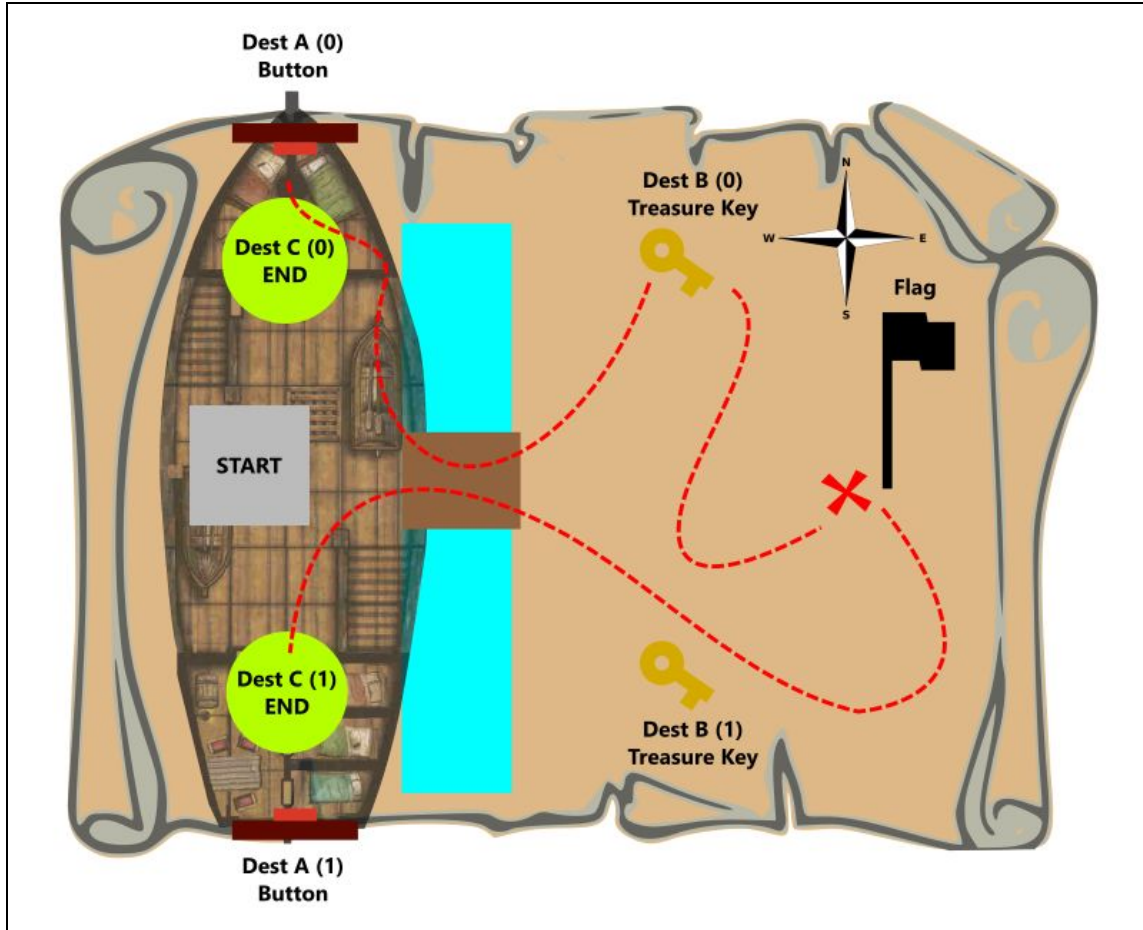
Figure 1: SoutheastCon18 Treasure Map

The Route

The robot starts over an infrared LED (Figure 2) where it receives an 8-bit signal. In order to earn Doubloons for properly reading the signal it must be displayed on the robot as a decimal number corresponding to the route number displayed in Table 1. This display may be either a 7-segment display or LCD screen and must be in a clearly visible position. See Table 10 for accepted display examples.

Before the round starts, the IR LED emits a positioning signal to ensure teams are aligned properly to receive the map signal. This alignment signal is sent as logical 1s for all of the 8 bits. This signal will repeat on a loop until the round begins.

The timer starts after a 3, 2, 1, GO countdown from a judge, after which the signal changes from the positioning signal to a randomly generated route signal transmitted from the IR LED. Teams must activate their robots manually when the judge says GO to begin the round. The robot must be placed in the correct starting position and turned on before the transmission occurs. The message will be sent continuously every 200 milliseconds for the first 30 seconds of the round.

There are two possible locations: North (0) and South (1), for each destination (Figure 1). The route taken depends on the coordinates the robot receives (see Table 1). The robot

must go to each destination in alphabetical order: A-B-C. For example: if Destination B is activated before completing Destination A, the doubloons from Destination A can no longer be earned, and Destination C is active and ready.

At Destination A, the robot presses a limit switch to "lower the gangplank" and cross the water by using the gangplank to get to the island. Successful completion of Destination A, determined by the green indicator LED turning on, indicates a robot may cross the gangplank for the full point value.

At Destination B, the robot will find the key to unlock the treasure chest by depressing a lever to activate a limit switch. The green indicator LED above the lever (on the 2x4 behind the lever) will confirm successful pad activation.

For maximum doubloons the robot must retrieve the treasure chest and raise the pirate flag. The robot can earn doubloons by moving the treasure chest out of an orange outline that is the exact dimensions of the chest itself. More Doubloons will be awarded for picking up the chest and storing it on the robot (see Table 10 for scoring details). If a robot manages to pick up the chest and finish the round with both the robot and the chest on the ship, additional doubloons are awarded. The treasure chest is located at the same position for every match: inside of the orange outline with the flat, secured steel blank side facing up.

Additionally, the robot may rotate a wheel in the clockwise direction to raise the pirate flag. Rotating the wheel 2.75 times earns a small number of doubloons, while 4.75 times results in the maximum number of doubloons. The RGB LED built into the rotary encoder begins the match illuminated red. Any value between 2.75 to 4.74 turns and the LED illuminates yellow to indicate partial Doubloons. Any value between 4.75 turns and 5.24 turns results in full doubloon value and a green LED. If the wheel is turned 5.25 turns it resets back to zero turns, changing the LED back to red and awarding zero doubloons. Once the LED turns back to red, this effectively resets the turns and needs to turn it 2.75 times for partial doubloons and 4.75 for full doubloons. Doubloons are awarded for the last position left on the flag at the end of the match. The treasure chest and pirate flag are optional stages to earn extra doubloons. However, the pirate flag may be raised at any point during the match.

At Destination C, the robot presses a limit switch to signal the end of the round. Destination C utilizes the same buttons as Destination A. Initially the arcade button is configured as Destination A. The arcade button changes to Destination C 45 seconds after the start of the match or 20 seconds after Destination A(0) or A(1) is pressed. If less than 20 seconds remain of the initial 45 seconds, the remaining time is used instead of 20 seconds. Once Destination B is pressed the arcade button immediately changes to Destination C. The is no deduction of doubloons if the incorrect button is pressed for a Destination. However, the round ends on the first press of Destination C(0) or C(1) even if the wrong Destination C is activated.

A green LED is located above each major destination (A,B,C). For Destination A/C the indicator LEDs are located at 1.5" and 4.5" from the left on the top edge of the plywood in a 3D printed mount from the CAD files. When viewing the button the Destination A LED is located on the left, and Destination C LED is located on the right. The indicator LED is illuminated if the correct station was activated. If the wrong station was pressed the LED will not illuminate. The LEDs themselves may be used by robots to indicate that the correct button was pressed; there is a diffuser over the LEDs to better distinguish them.

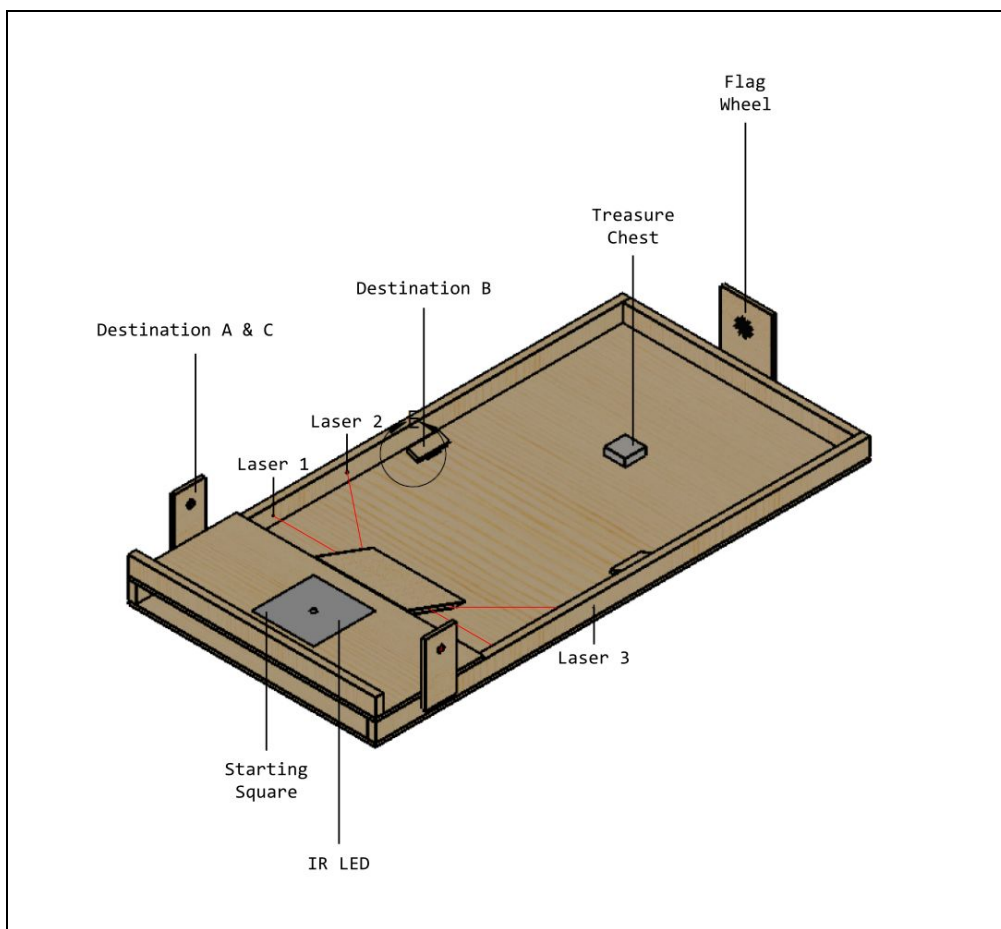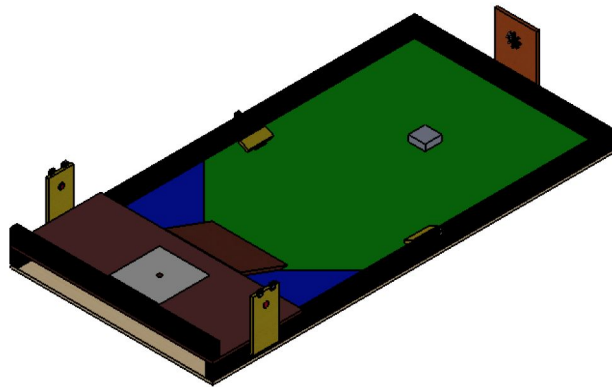| Table 1: Coordinate Locations on Treasure Map				
Route	Code (Right=LSB)	Destination A Location	Destination B Location	Destination C Location
1	0 0 0	A (0)	B (0)	C(0)
2	0 0 1	A (0)	B (0)	C(1)
3	0 1 0	A (0)	B (1)	C(0)
4	0 1 1	A (0)	B (1)	C(1)
5	1 0 0	A (1)	B (0)	C(0)
6	1 0 1	A (1)	B (0)	C(1)
7	1 1 0	A (1)	B (1)	C(0)
8	1 1 1	A (1)	B (1)	C(1)

Figure 2: SoutheastCon18 Playing Field

Destination A & C: Button, Destination B: Treasure Key**, Destination C: Button

*The laser hits a LDR mounted on the bridge

**The treasure key is a lever

***The robot needs to turn the wheel to raise the flag

Playing Rules

The objective is to collect doubloons (see Table 10 for doubloons breakdown) by completing objectives. Scores can be influenced by how a team wants to play the game. The more tasks a team completes, the more doubloons they collect (see Table 10 for scoring details).

- Robot must be autonomous - No wired or wireless communications during competition other than IR receiver mounted on the bottom of the robot to receive coordinate location.
- Robot must remain a single unit and can not be modular.
- Robots may be no larger than 12"x12"x12" at the start of the match.
- Robots may not extend outside of 20"x20"x20" during a match. Robots may end a match at these dimensions.
- Each team competes in two rounds on Saturday, April 21st before a final round during the Banquet.
- The scoring for each round is cumulative, with the score from the second round being added to the score of the first round.
- The final round with the top four scoring teams will be held on Saturday, April 21st during the awards banquet.
- The treasure chest will be set in the same position covering the entirety of the orange square in the centerline of the island at the beginning of each round. The chest will be oriented so that the flat steel blank screwed into the chest is facing upwards.
- The captain's wheel will be oriented so that two of the eight spokes are perpendicular and two are parallel to the surface of the island.
- The treasure chest and captain's wheel will be set visually.
- Robots must be present at the Starting sequester location beginning from 30 minutes to 15 minutes before the beginning of a round.
- If a team has not reported for sequestering prior to the 15 minute limit, that team will not be allowed to compete in that round, and may only earn doubloons collected outside of round (eg. team shirts, logo and flag).
- Flags will be collected during the sequester time of the first match and returned to their respective teams at the end of the second match, with the exception of the teams competing in the final. The flags of the four teams competing in the final will be returned at the end of the finals. At the beginning of each match the team flag will be placed into a holder on the outside of the field.
- Only 2 team members are allowed within the designated playing area at a time. Violations will result in a 250 doubloon deduction for the round.
- The team members in the playing area (robot handlers) must wear the team shirt to earn shirt Doubloons.
- Team shirts and flags used for hardware competition must display the same team logo to earn doubloons credit.
- No two teams may occupy a playing field at the same time.
- Judges will initiate the start of a round.
- Rounds will begin with a judge counting "3, 2, 1, GO" teams must manually start their robot when the judge says GO.

- When the wrong destination is pressed, the indicator LED will not activate.
- Teams can only receive Doubloons for successfully activating a destination once.
- A laser will be used to detect and credit doubloons when a robot has crossed the gang plank.
- Teams must not drop the treasure chest more than 6 inches from the top of the ¾" plywood field base that the robot's base is currently on, or intentionally launch the chest.
- Damaging the field will result in a 200 point deduction or disqualification depending on the severity.
- Robots cannot contact the water at any point during the match. Lasers will detect the robot crossing the water edge. A round can also be ended if a judge sees the robot contact the water, but the robot corrects before crossing over the laser beam. Any doubloons earned up to that point will be kept.
- Any teams found to be deliberately exploiting the field's automatic scoring system, firing projectiles, interfering with the microcontrollers, the IR sensor, etc. will be removed from the competition.
- Team members are allowed to end the round at any time by having a team member make contact with their robot before interacting with Destination C. Doubloons for time will be counted towards the team's' overall score.
- A round ends when the robot presses the Destination C button (whether it is the correct button or not), the time reaches the four minute limit, the robot crosses into the water, or when a team member makes physical contact with the robot.
- A team making contact during play or tampering with another team's robot will result in the offending teams' disqualification and zero doubloons earned for that round.
- At the end of a round teams must place robots in the End sequester location.
- Robots will be released from sequestering within 15 minutes of all teams completing Rounds 1 and 2 to resolve any appeals.
- Teams will have a 15 minute window after their final score is displayed to file an appeal with the judges if they believe a scoring error exists.
- **Teams should use caution in filing appeals. Unsubstantiated appeals will cause a 200 point deduction from the Team filing the appeal if, after review, the Judges determine that the original scoring was correct.**
- **Judges decisions are <u>final</u>.**
- **Violations of IEEE code of ethics and code of conduct will not be tolerated and will result in point deduction, disqualification, or ejection from the event based on the severity of the violation.**
- **When addressing judges with questions teams are expected to act within the IEEE code of conduct.**

Doubloon earning locations
- Start Pad (when display shows correct path)
- Time - Each team starts with 240 doubloons and loses one per second until the end of the round
- Button (Destination A) - "lowers gangplank"
- Crossing Bridge
- Key (Destination B)
- Treasure chest
- Pirate flag being raised
- Button (Destination C) - Return to Ship and raise the gangplank

Doubloons earned outside of round
- Team Shirts - To earn doubloons, Hardware Team handlers must wear Team Shirts throughout hardware competition.
- Team Flag - To earn doubloons, teams must provide a flag to be placed on the ship section of the field during a team's run; must include school logo/colors (only if the team is affiliated with a school).
- Team Logo - To earn doubloons, the same logo must be displayed on the team flag, team shirts, and robot.

Robot Specifications

The robot must not be greater than 12"x12"x12" at the beginning of a match. It cannot extend to more than 20"x20"x20" during a match. The robot must not include any form of wireless communication, cannot fly, and cannot make use of projectiles.

Team Logo Specifications

In order to earn full credit for the team logo it must be displayed on the team flag, team shirts, and visible on the robot. If the team is from a school the team logo must incorporate a version of their school logo/mascot. Otherwise if not affiliated with a school no creative design specifications are required. Any imagery that violates the IEEE code of ethics or conduct is not permitted.

Team Flag Specifications

The team flag must display the team logo, must be no larger than 8"x12" (excluding flagpole), and may be any shape within those dimensions. The team flag must be constructed from laminated paper, fabric, or cardstock. Flags constructed of other material such as: unlaminated paper, tissue cloth, etc. will not be accepted for Doubloons credit. Flags must be attached to a flagpole no longer than 2 feet and no wider than 1 inch in diameter. The team flag is separate from the flag raised by the captain's wheel stage, which is provided.

Field Specifications

The field will be 8'x4' area.
1 count: Plywood Sheet 4' x 8' ¾ thickness
1 count: Plywood Sheet 4' x 4' ¾ thickness
4 count: 8' 2x4
2" and 3" Decking screws
3D printed components will be constructed using PLA with 15% infill, all components except 2 LED holders with be colored Black. The 2 LED holders mounted over Destination B will be colored White.

Paint Specifications (on D, treasure chest is covering the orange paint)

<table>
<tr><th colspan="5">Table 2: Specific Paints and Locations</th></tr>
<tr><th>Colour</th><th>Specific Name</th><th>ID Number</th><th>Brand</th><th>Location, Figure 3</th></tr>
<tr><td>Green</td><td>Hills of Ireland</td><td>M390-7^D</td><td>BEHR</td><td>A</td></tr>
<tr><td>Brown</td><td>Burnt Toffee</td><td>S230-6^D</td><td>BEHR</td><td>B</td></tr>
<tr><td>Blue</td><td>Azure Afternoon</td><td>89BG 37/353</td><td>Glidden</td><td>C</td></tr>
<tr><td>Orange</td><td>Jack O Lantern</td><td>89YR 36/694</td><td>Glidden</td><td>D</td></tr>
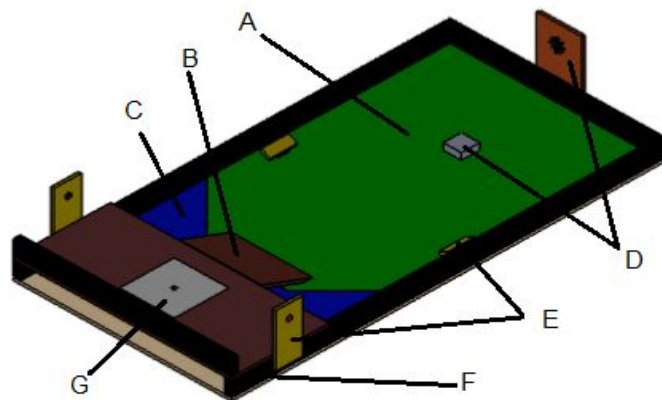<tr><td>Yellow</td><td>English Daisy</td><td>P290-6^D</td><td>BEHR</td><td>E</td></tr>
<tr><td>Black</td><td>Black^D</td><td>TC-45</td><td>BEHR</td><td>F</td></tr>
<tr><td>White</td><td>Gloss White</td><td>39DP14</td><td>Rust-Oleum</td><td>G</td></tr>
</table>

Initial Signal

Coordinates are sent as an IR signal with a carrier frequency of 38kHz in the following format: The message starts with an initial burst of 9ms, a space of 4.5ms, 8 bits that contain the message, and an ending burst. The first 5 bits of the message will be sent as logical 0s, and the last 3 bits will define the coordinates to follow based on logical 1s and 0s as detailed in the possible routes listed in table 1. The coordinates start from the left-most bit with A as the first one, followed by B and C. The message will be sent continuously every 200 milliseconds for the first 30 seconds of the round.

The positioning signal will send logical 1s for all 8 bits and should not be recognized as a map signal by robots. The purpose of this signal is to allow teams to align their robots to the output of the IR LEDs and ensure the robot will be able to properly receive the coordinate signal.

NOTE: The format is similar to the NEC protocol, however this was just taken as a reference to determine the duration of the pulses for the logical 1s and 0s.
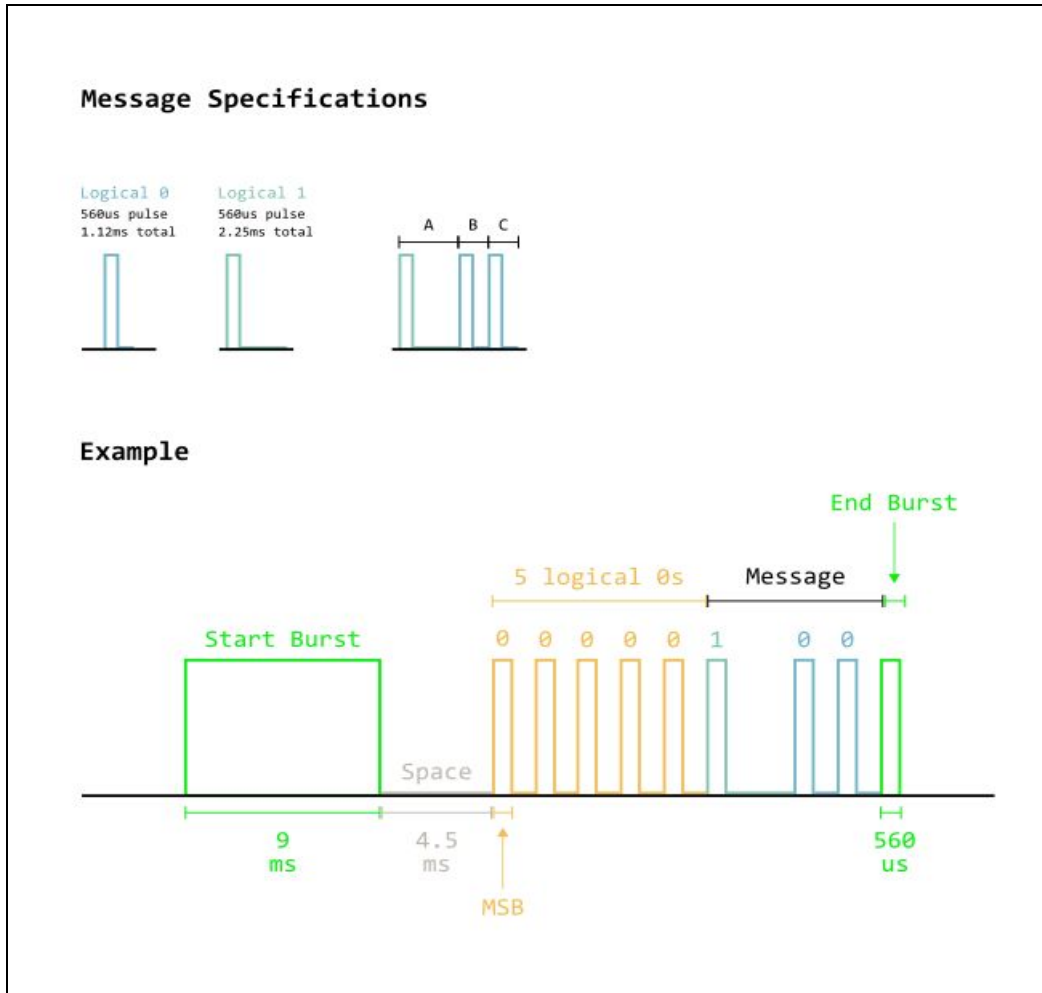
Figure 4: IR Signal Spec Description

Table 3: Initial Signal Parts	
Part Description	**Part Number/Details**
LED - Infrared 950nm (Initial Signal) (x4)	Model#: COM-09349 ROHS https://www.sparkfun.com/products/9349

Destination A and C

      Destination A and C utilize the same button. This button is a round, arcade style button on a 6" x 12" piece of ¾" plywood. This piece of plywood is centered 12" from the outside Western edge of the field with 9" above the top of the ship. The button is centered 6" above the top of the ship and on the centerline of the short side of the 6" x 12" plywood piece. The green indicator LEDs are located at 1.5" and 4.5" on the top edge of the plywood piece. The indicator LEDs for Destination A will always be on the left when viewing the button.
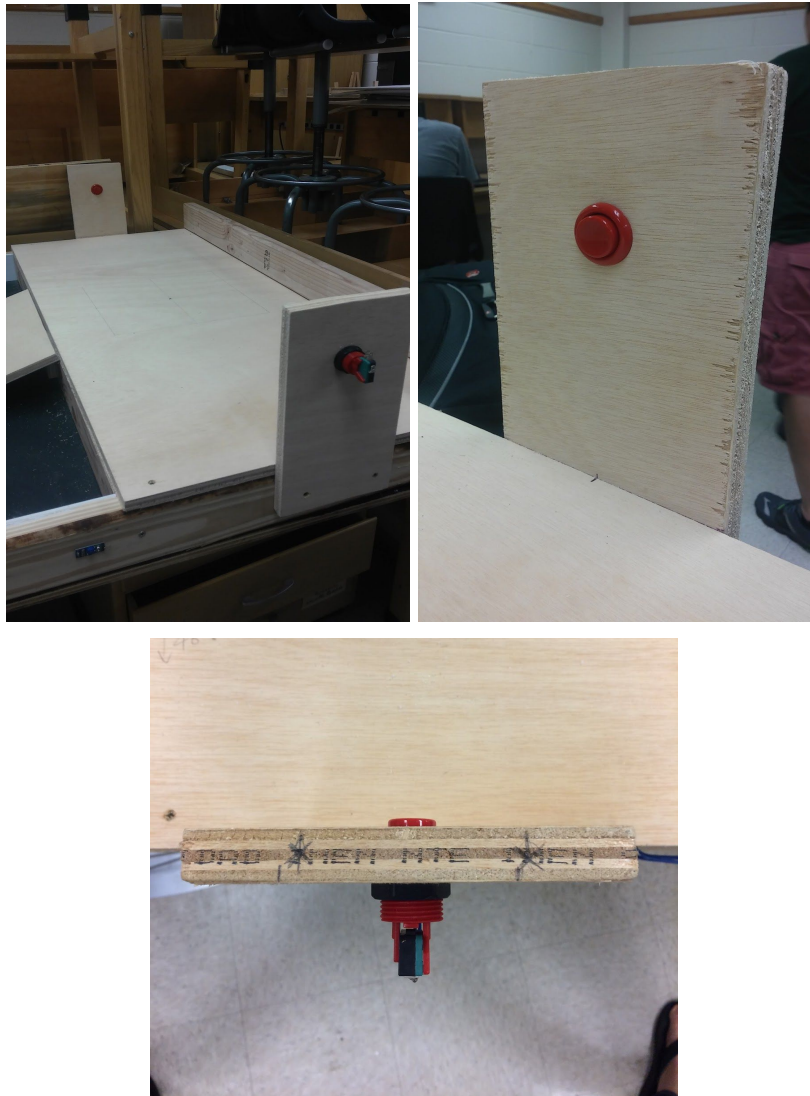

Figure 5: Destination A and C

Table 4: Destination A/C Parts	
Part Description	**Part Number/Details**
Destination A/B Button	Model#: 1568-1476-ND https://www.digikey.com/products/en?keywords=1568-1476-ND

The Water:

The area of water is located on the main playing board, east of the ship. The water zone is displayed in Figure 6. Lasers will be positioned as seen in Figure 2 to detect when a robot has crossed into the water.
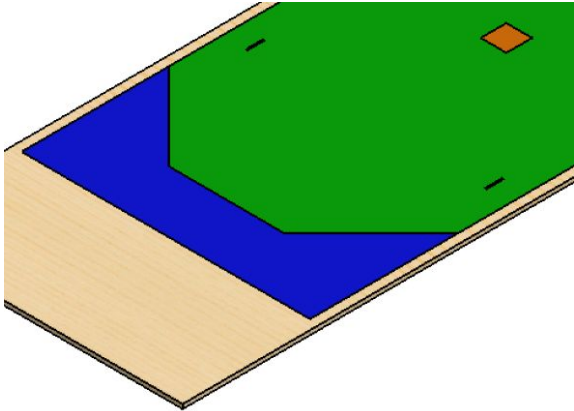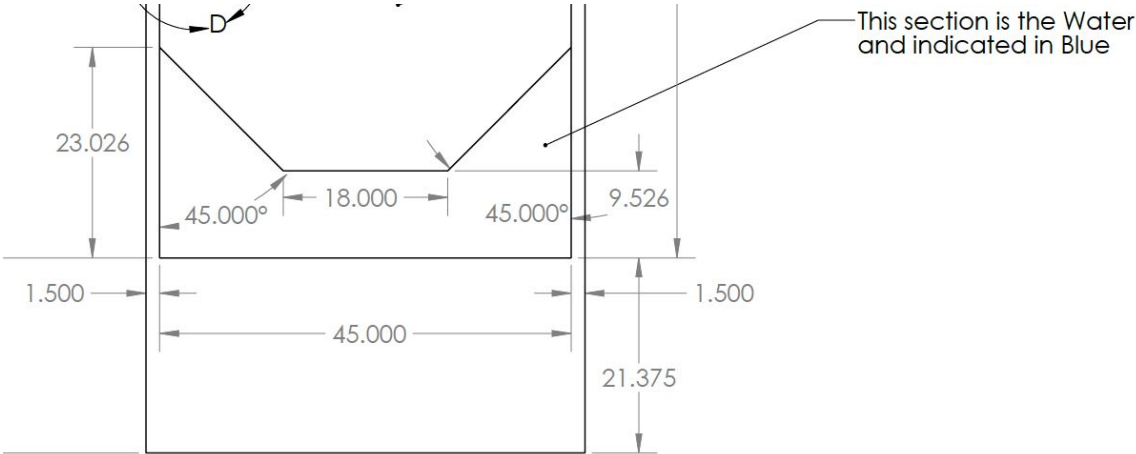

Figure 6: Playing Field "Water area" (Gangplank not shown)

Table 5: The Water Materials	
Part Description	**Part Number/Details**
Light Detection Signal Switch (x4)	Wangdd22 - LYSB01E6W0HPU-ELECTRNCS https://www.amazon.com/gp/product/B01E6W0HPU/ref=oh_aui_detailpage_o01_s00?ie=UTF8&psc=1
Mini Lasers (x4)	Ketofa WYHP https://www.amazon.com/gp/product/B00R73MC1S/ref=oh_aui_detailpage_o01_s00?ie=UTF8&psc=1

Destination B

Destination B is a 6" x 2.25" rectangle made from ¾" plywood that rests on top of a limit switch. The hinge is centered on the 6" x 2.25" plywood piece on the long side as shown in Figure 7. The ¾" plywood+hinge assembly is centered 42" from the East outermost part of the field. From the inside edge of the 2x4, the plywood portion of the assembly is 4" away, and the hinge portion of the assembly is 3" away (see Figure 7).

The limit switch is mounted on the 2" side of a 2" x 1.625" piece of ¾" plywood; this piece is centered at 42" from the East outermost part of the field flush against the 2x4 so that the hinged ¾" plywood rests on the switch. The switch will activate when approximately 0.5 lb of weight is applied to the top edge of the 6" x 2.25" plywood piece. The attached screws shown in Figure 7 are used to protect the switch from any sudden forces applied to it. The screws are mounted 0.5" from the corners of the plywood and raised approximately 0.3" from each surface. It is recommended that the screws be raised to just barely allow the button to be fully activated but not fully compressed.

| Table 6: Destination B Parts	
Part Description	**Part Number/Details**
Everbilt 2-1/2 in. Zinc Plated Narrow Utility Hinges	Model#: 15399 http://www.homedepot.com/p/Everbilt-2-1-2-in-Zinc-Plated-Narrow-Utility-Hinges-2-Pack-15399/202033983
Limit Switch (2 needed)	Model #: E13-00E https://www.digikey.com/product-detail/en/zf-electronics/E13-00E/CH102-ND/90930?WT.srch=1&gclid=CjwKCAjwyIHPBRAIEiwAHPS-GA8MNF6NQMDsHg1W77MDArnaoglG_03ZF8ylkL-y_mPWNUEwmYf04BoCm5YQAvD_BwE
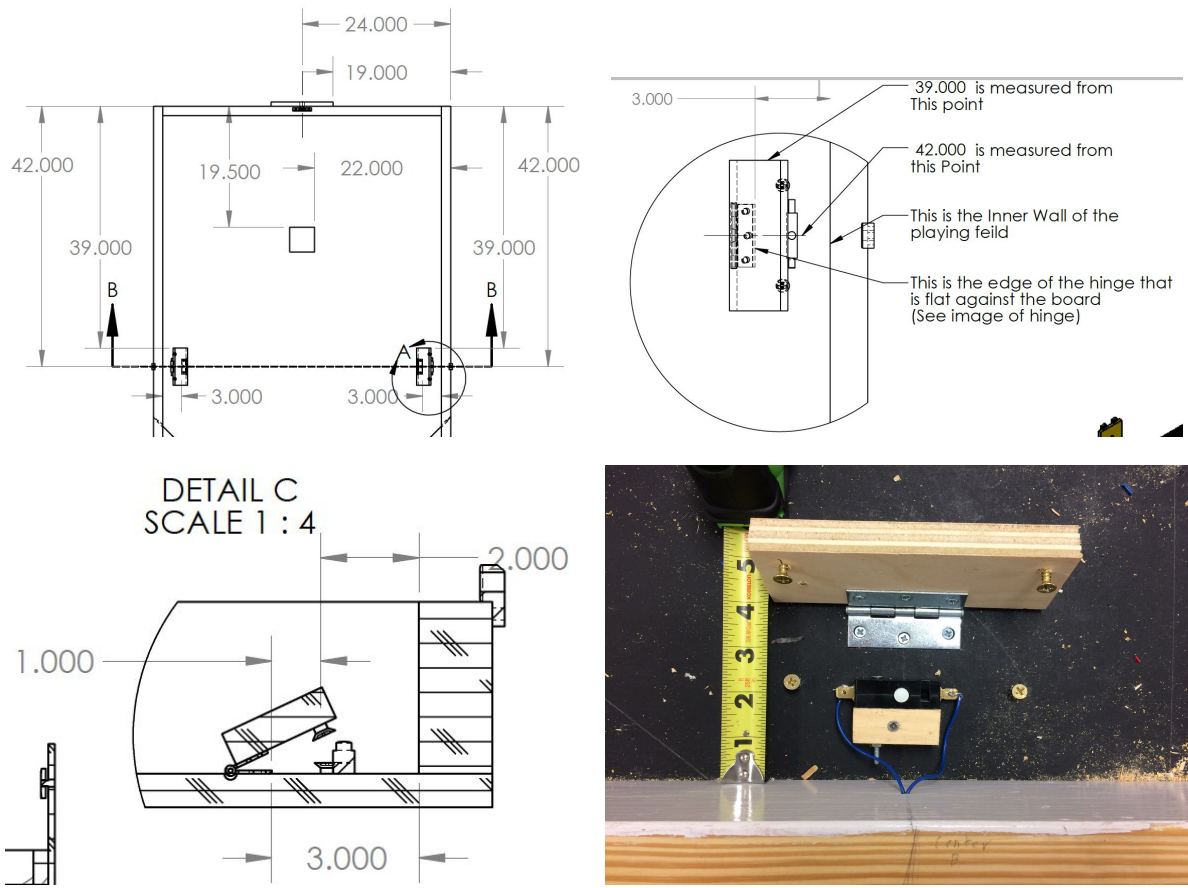
Figure 7: Destination B

Note: Measurements are correct, but scale is not.

Green Indicator LED

A green-colored LED will be located above each objective of Destination A, B, and C. The LED will light up only if the correct objective is pressed based on the initial signal received at the start of the round. If the wrong objective is activated, the LED will not illuminate, signifying that the wrong objective was pressed. The indicator LED for Destination B is mounted on the top of the northern and southern 2x4s centered at 42". The indicator LEDs holders for Destination A/C will be printed using Black colored PLA, and Destination B will be printed using White PLA.

Table 7: Indicator LED Parts	
Part Description	**Part Number/Details**
Indicator LED	Model #: C503B-GCN-CY0C0791 https://www.digikey.com/products/en?keywords=C503B-GCN-CY0C0791
5mm LED Diffuser	Model #: CLB_300_CTP https://www.digikey.com/products/en?keywords=CLB_300_CTP

Pirate Flag Destination

The pirate flag will be raised via a 3D printed pirate ship wheel attached to a rotary encoder. The 3D printed wheel will slip over the clear knob supplied with the rotary encoder; the light from the LED will remain visible through the clear knob. The encoder will be located on a 10" x 15" piece of ¾" plywood.The rotary encoder is located 10.25" from the plywood surface when mounted on the edge of the field. This piece is centered 24" from the Northern edge of the field, mounted on the outside of the 2x4 with 10.875" of the board above the Eastern 2x4. The rotary encoder is centered 7" from the top of the 2x4 and on the centerline of the short side of the 10" x 15" plywood piece.
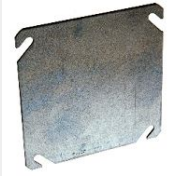
Table 8: Pirate Flag Destination Parts	
Part Description	**Part Number/Details**
Rotary Encoder - Illuminated (RGB)	Model #: COM-10982 ROHS https://www.sparkfun.com/products/10982

Treasure Chest

The treasure chest is a 4" x 4" x 2⅛" electrical conduit box filled with eight, 4 ounce pyramid fishing sinkers. These weights are loose inside the box. The chest is sealed with a 4" square blank cover. For each round the chest is located 18" from the edge of the chest to the inside of the eastern wall, and 20.5" from the Northern and Southern inside edges.

Figure 8: Treasure Chest

Table 9: The Treasure Chest Materials	
Part Description	**Part Number/Details**
4 in. 30.3 cu. in. Steel Square Electrical Box	Model#: 521711-25R http://www.gordonelectricsupply.com/index~text~5999644~path~product~part~5999644~ds~dept~process~search?gclid=CjwKCAjwyIHPBRAIEiwAHPS-GMFsh-uDUNxt3RlvMUrYkbi1qOmVKBM3uRzLgSZ6E7sAl9_yp1vnpRoC-YMQAvD_BwE
4 in. Square Blank Cover, Flat	Model#: 8752 http://www.homedepot.com/p/4-in-Square-Blank-Cover-Flat-8752/100542712
8x 4oz. Pyramid sinker weights	Model#: PYR-4 https://www.amazon.com/South-Bend-PYR-4-Pyramid-Sinker/dp/B003OAOKIQ/ref=sr_1_1?ie=UTF8&qid=1507318744&sr=8-1&keywords=4+ounce+pyramid+sinker

Scoring

Teams earn doubloons based on completing tasks and actions as specified in the Playing rules, Table 8, and Table 10.

Two Qualifying Rounds: Round 1, and Round 2

1. All qualifying rounds are scored by the same criteria.
2. There are two identical competition fields and four practice fields. Teams will compete at the same time on separate fields.
3. Rounds are 4 minutes long; rounds start when a judge counts down "3, 2, 1, GO" and initiates the field to send the first IR signal containing the route. A round ends when any Destination C button is pressed, when a team member contacts the robot, the timer runs out, or the robot crosses into the water.
4. Each team will have a randomly generated set of coordinates sent to their robots via the IR LED each round.

Elimination round: Round 3

1. The top 4 teams with the highest **combined** score from the qualifying rounds will proceed to the final round.
2. The top 4 teams will start at a base score of zero entering the final round. No Doubloons earned from the qualifying rounds will be counted in the final round. For the teams who do not qualify, their final standings will only be the combined scores from the qualifying rounds.
3. The final standings for the top 4 teams will show their score from the final round in parentheses, followed by the combined score from the qualifying round. Example final scores (final round score if applicable, combined qualifying score):
   1) (1200) 1400
   2) (1100) 1400
   3) (900) 1400
   4) (500) 1500
   5) 1300
   6) 1200
   7) 1200
4. The team with the highest score from the final round is the competition winner.
5. Finals will occur during the banquet on Saturday, April 21st.

Table 10: Scoring (per round)		
Action	**Doubloons**	**Notes**
Time remaining	240 to 0	Doubloons will be issued based on the number of seconds the team has remaining after completing the round. Formula: Doubloons earned = 240 - Completion time (seconds).
Display Correct Code	200	Correct decimal code displayed on LCD or 7-segment display. A period must be displayed after the number. Teams are displaying the **route number** (see Table 1), not the binary number. Examples: Received Binary: 000 Displayed Decimal: 1. Received Binary: 011 Displayed Decimal: 4.
Activate the Correct Destination A	50	Press the correct button on Destination A
Cross gangplank from ship	100	Crossing the gangplank and the indicator LED from Destination A is green (the correct button was pressed)
Cross gangplank from ship without active Destination A	50	Crossing the gangplank while the indicator LED is not on.
Activate Destination B	200	Maneuver robot onto the correct lever.
Move Treasure Chest	100	Move the treasure chest so that at least ¼" of the orange square under the chest is visible. The ¼" will be measured from the edge of the orange square to the furthest moved point of the chest. If the chest is picked up after moving it, only the 200 Doubloons for picking up the chest will be awarded.

Pick up and store Treasure Chest in/on robot	200	Successfully picking up and storing the treasure chest in or on the robot. The chest must be lifted so that no part is in contact with the ¾" plywood surface, high enough for a judge to determine it is no longer in contact with the field, and must remain lifted for at least 5 seconds. If the chest is dropped after the 5 second period the 200 Doubloons is still honored.
Finish on ship with treasure chest	300	Finish on the ship with the treasure chest and robot completely within the confines of the ship.
Fully Raised Flag Position	200	Raise the flag to the top of the flagpole by turning the captain's wheel clockwise. Teams may turn the wheel as many times as they like. The final flag position and lit LED color as the robot releases contact will be awarded the corresponding Doubloons. 4.75 to 5.24 turns: 200 Doubloons 5.25 => 0 to 2.74 turns: 0 Doubloons
Partially Raised Flag Position	100	Raise the flag to halfway up flagpole by turning the captain's wheel clockwise. Teams may turn the wheel as many times as they like. The final flag position and the lit LED color as the robot releases contact will be awarded the corresponding Doubloons. 2.75 to 4.74 turns: 100 Doubloons 0 to 2.74 turns: 0 Doubloons
Activate the Correct Destination C	100	Finish in the correct location by pressing the correct button.
Team Shirts	50	To earn doubloons, Hardware Team handlers must wear Team Shirts throughout hardware competition. 50 doubloons will be issued for every round.
Team Flag	50	To earn doubloons, team must provide a Team Flag with their team logo. Teams should have at least one flag which will be turned in at robot check in.

Team Logo	50	To earn doubloons, must match Team Flag and be visibly identifiable on the robot. 50 doubloons will be issued for each round played.