

CENTERS STAGESM

PRESENTED BY



RTX

FIRST Tech Challenge 2023/24

香港區賽事比賽發佈會



流程

- ① FIRST Tech Challenge (FTC)
簡介
- ② 器材介紹
 - 控制系統
 - 硬件
 - 軟件
- ③ 2023/24主題介紹: Centerstage
- ④ 獎項
- ⑤ 日程及 注意事項

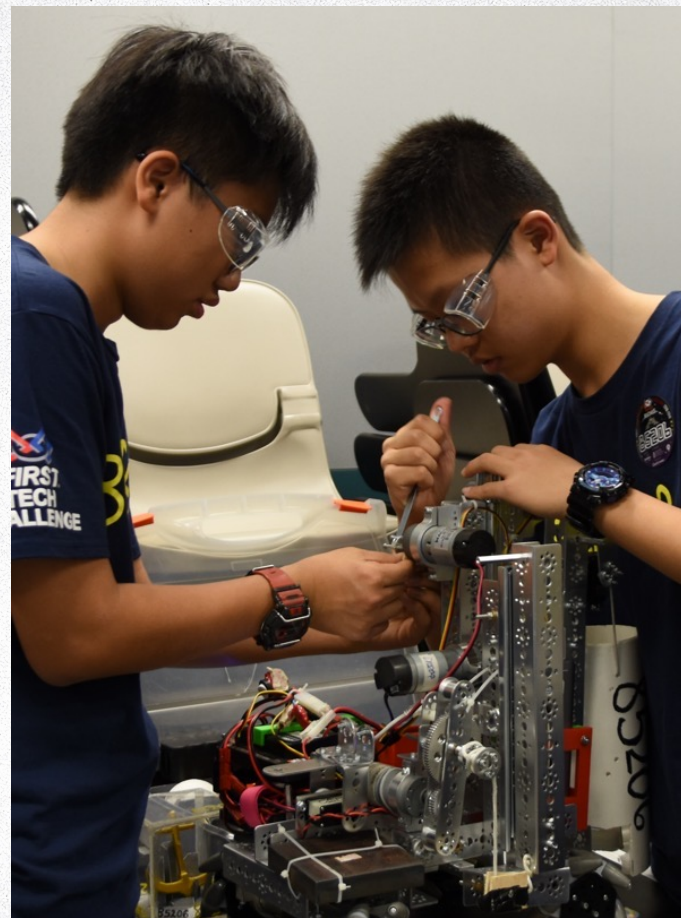
背景

FIRST 競賽平台中的第三個賽事

- 每年有不同的機械人任務
- 考驗隊伍經營、對外宣傳、機械人設計等
- 記錄整個賽季

對象：中學生

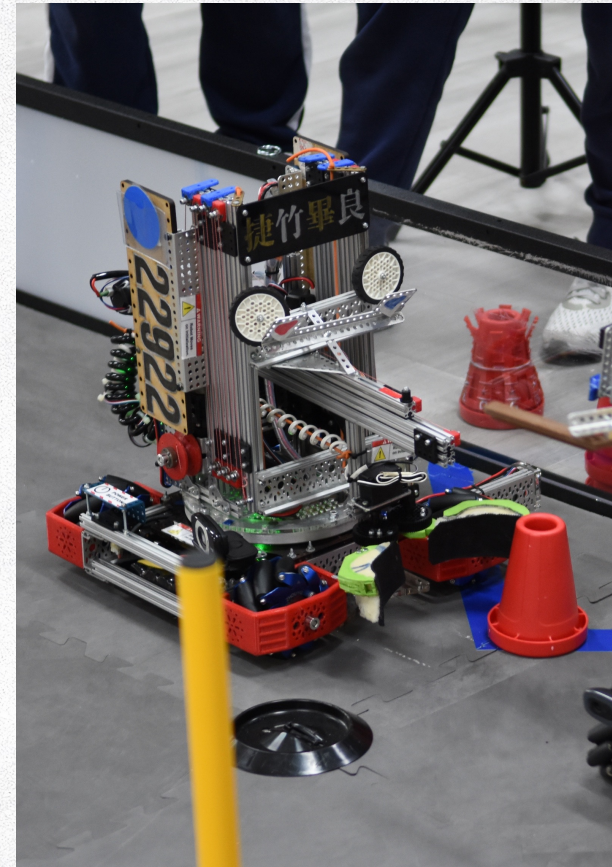
- 3-15個學生組成一隊
- 教練帶領學生完成賽季中的不同挑戰



背景

一個讓學生實踐科學、工程及數學等知識的比賽

- ▣ 原型(Prototype)測試設計的可行性
- ▣ 以不同原材料配合其他機械人套件及硬件完成機械人
- ▣ 學習編寫手動操作及自動化的機械人程式
- ▣ 工程設計流程
- ▣ 策略及解難能力訓練
- ▣ 於社區或社群推廣及分享



賽制

機械人競賽

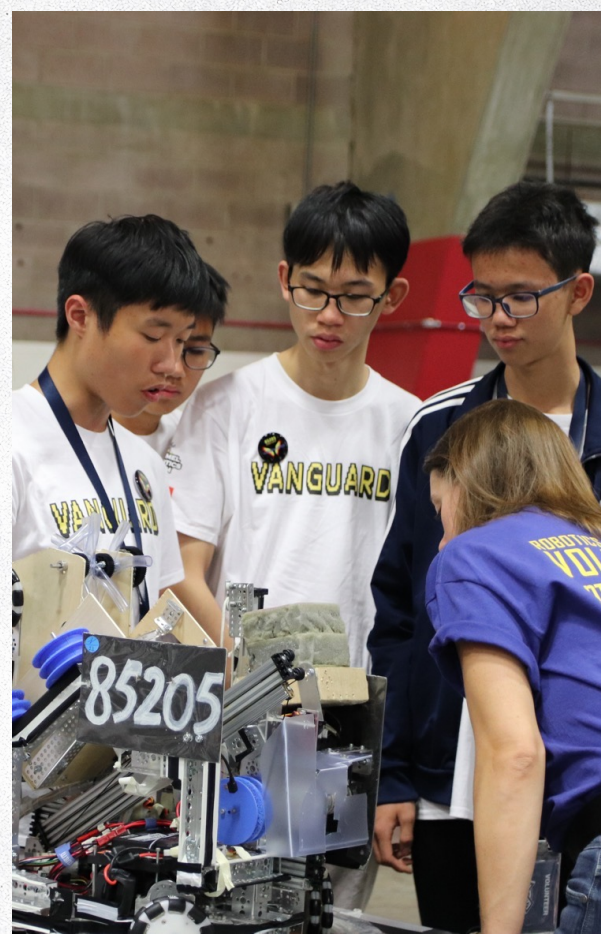
- 資格賽
- 盟友選擇
- 淘汰賽

評審環節

- 工程選輯
- 展示如何經營隊伍及推廣FIRST活動
- 展示機械人及程式設計

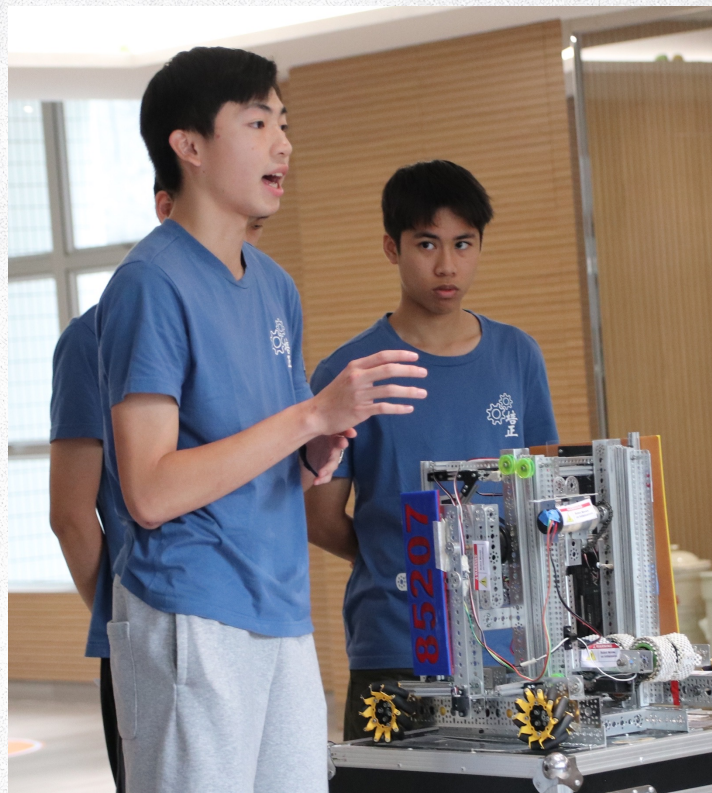
評審環節

- 10-15分鐘時間
- 共2-3位評審，過程中不限匯報方法
- 評審有機會於中途發問
- 機械人、工程選輯、其他所需物資



評審環節

- 工程選輯 (Engineering Portfolio)
 - ▣ 評核啟迪獎 (Inspire Award) 的必須項目
 - ▣ 記錄隊伍的工作、機械人設計等的項目



工程選輯

- 記錄隊伍的機械人設計、研究及活動推廣等
- 讓評審更了解隊伍整個賽季的經歷及團隊本身
- 沒有既定格式，但必需是印刷本
- 可參考大會評審要求，完成工程選輯

FTC 比賽器材

CENTERSTAGE™

PRESENTED BY  RTX


**FIRST
TECH
CHALLENGE**
HONG KONG

控制系統

機械人部份 (Robot Controller)

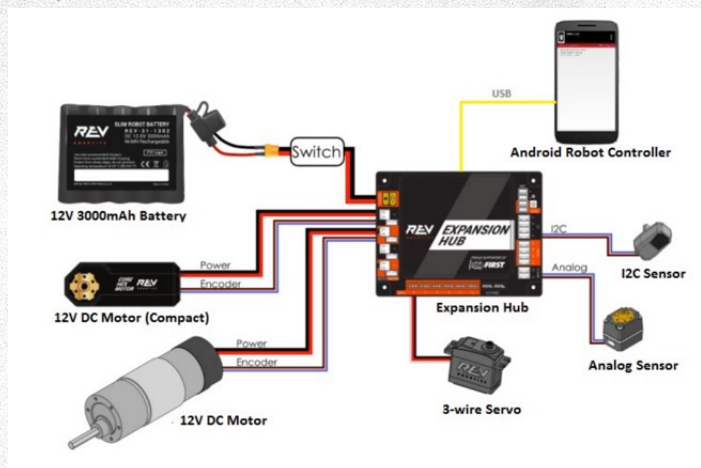
- 一個Android手機 / 一個REV主控制器 (Control Hub)
- 配合REV延伸控制器 (Expansion Hub) 連接機械人的電子零件



控制台部份 (Driver Station)

- 一個Android手機 / 一個REV Driver Hub
- 連接最多兩個手制

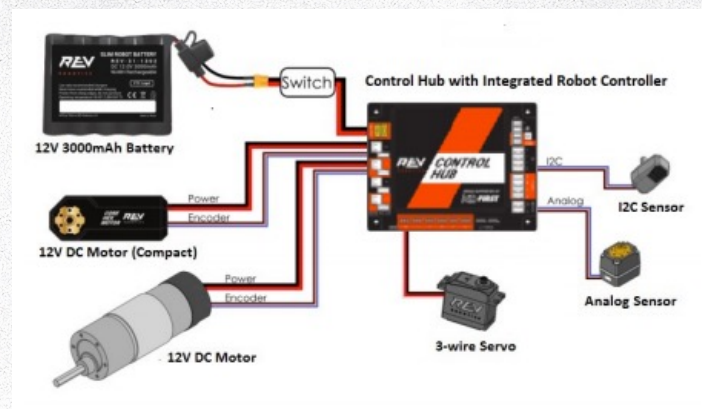




使用Android裝置的配置

一個Android裝置連接

最多兩個REV Exapnsion Hub



使用REV Control Hub的配置

一個REV Control Hub連接

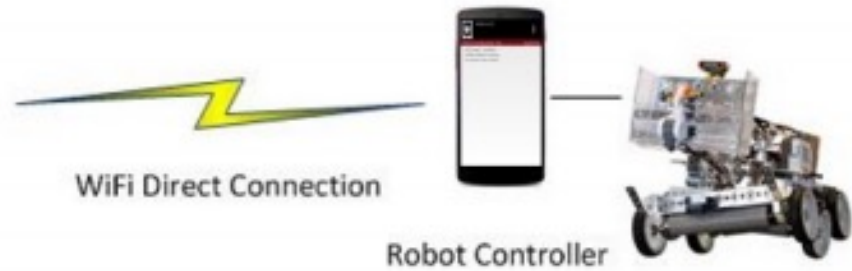
最多一個REV Expansion Hub

REV Driver Hub



功能與Android手機相似

- 直接以USB連接兩個手制
- Android 運作系統
- 直接以REV Hardware Client更新
- 如學校以往使用沒有列在賽規中的Android電話，建議在新賽季使用此Driver Hub
- 獲得較佳支援



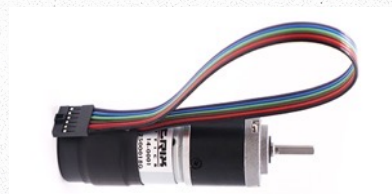
指定DC馬達品牌及數量

<RE09> DC Motors – A maximum of eight (8) DC motors are allowed in any combination. The only allowed motors are:

- TETRIX 12V DC Motor
- AndyMark NeveRest series 12V DC Motors
- Modern Robotics/MATRIX 12V DC Motors
- REV Robotics HD Hex 12V DC Motor
- REV Robotics Core Hex 12V DC Motor

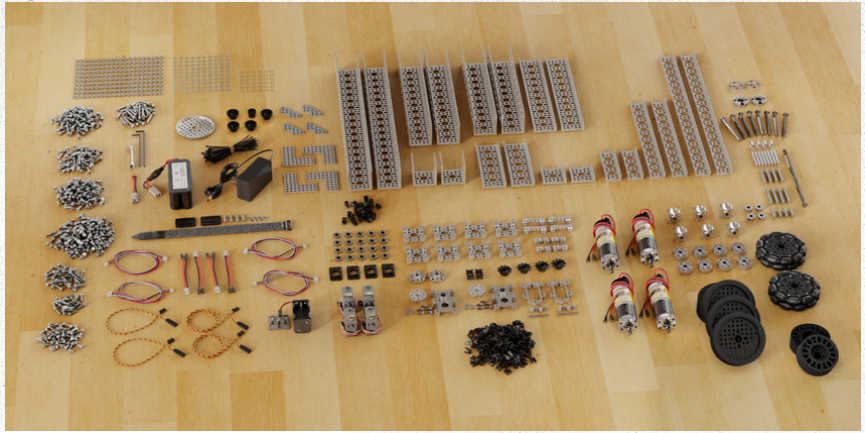


FTC Legal



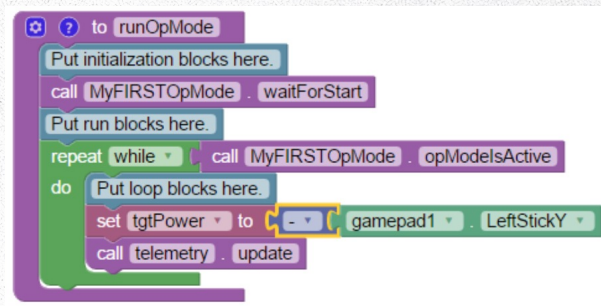
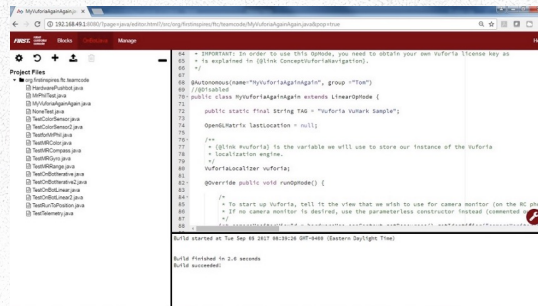
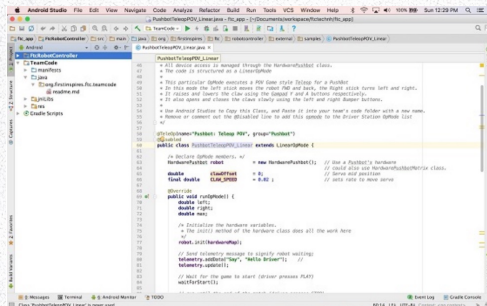
製作物料不限，但需要以原材料或商用現成品製作

- 現成機械人套裝
- 板材，擠壓型材，金屬、塑膠、木材，橡膠等
- 已加工的材料，如:沖孔薄板和花鋼板、注塑成型製品、3D打印零件、電纜、繩子、線、細線等，各種彈簧，包括壓縮、拉伸、扭曲、醫用橡皮管等



軟件

- Android Studio
- OnBot Java Programming Tool
- Blocks Programming Tool (App Inventor)



建議配置: (新隊伍 及 需要更新器材的隊伍)

- 一個REV主控制器 (Control Hub)
- 一個REV Expansion Hub
- 一個REV Driver Hub
- 兩個手制
- 2-3套FTC 基礎套裝
- 按需求購置指定品牌的DC馬達

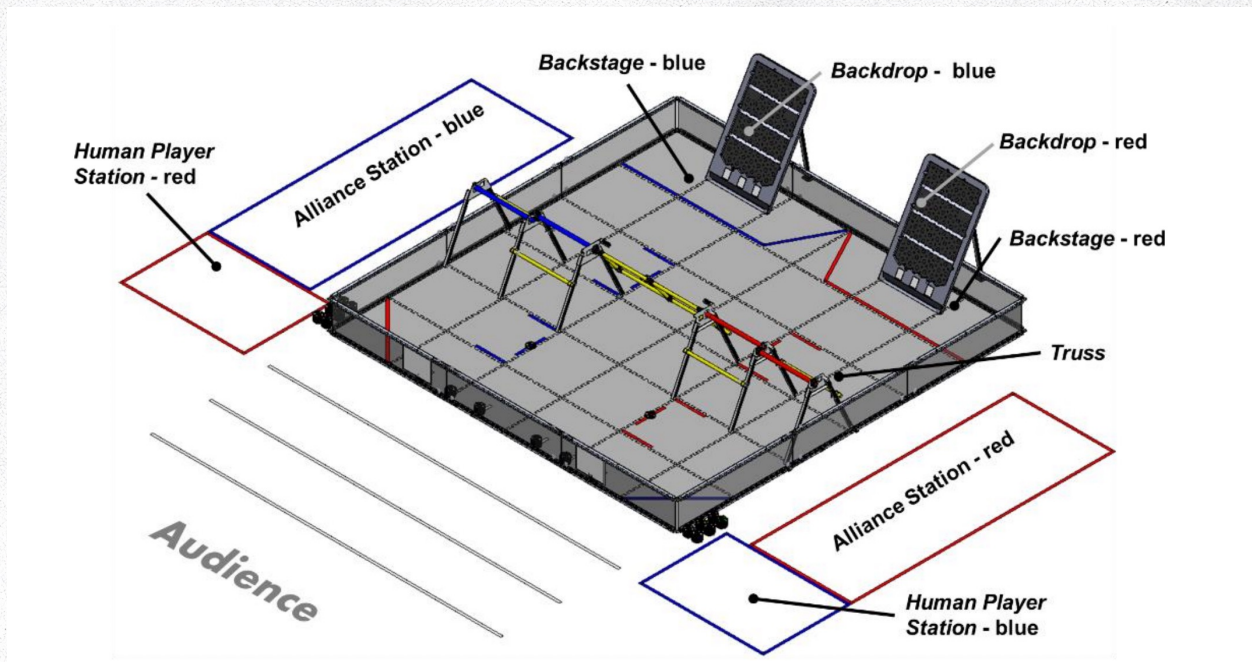
Centerstage 任務介紹

CENTERSTAGE™

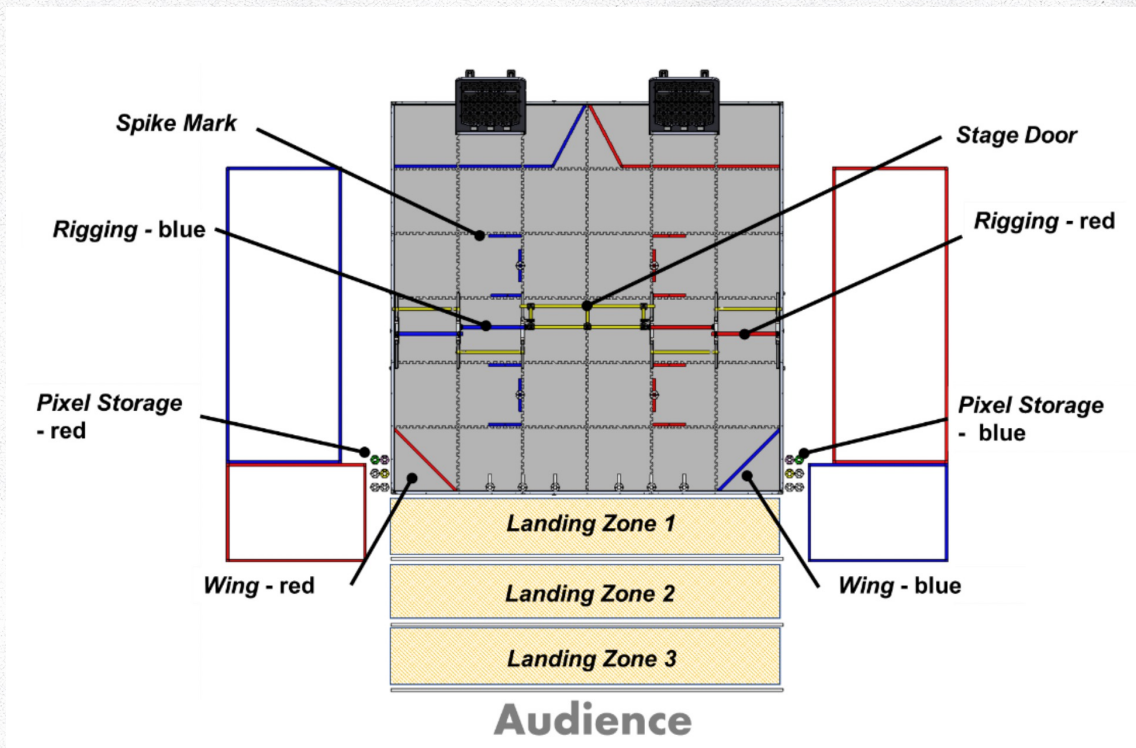
PRESENTED BY  RTX


**FIRST
TECH
CHALLENGE**
HONG KONG

場地概覽



場地概覽



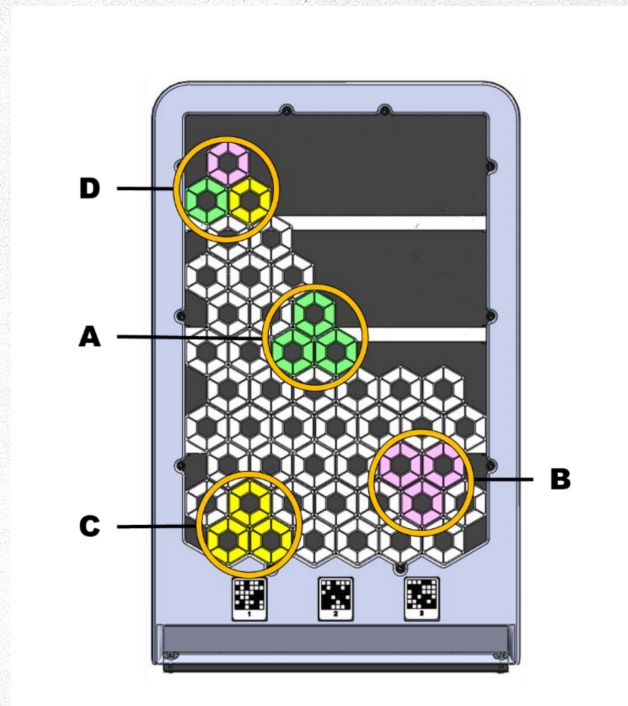
自動階段 (首30秒時間, 機械人需用預設程式運行)

1. Navigating: 機械人停泊(park)左相應聯盟的 *Backstage* [每個機械人5分]
2. Randomization Tasks:
 - a. 把紫色 *Pixel* 放在 *Spike Mark*:
 - i. 以白色 *Pixel* 作隨機物品 [10]
 - ii. 以 *Team Prop* 作隨機物品 [20]
 - b. 把黃色 *Pixel* 放在 *Backdrop* 上:
 - i. 以白色 *Pixel* 作隨機物品 [10]
 - ii. 以 *Team Prop* 作隨機物品 [20]
3. Pixels:
 - a. 放在 *Backdrop* 凹陷的得分位置 [5分一個]
 - b. 放在相應 *Alliance Backstage* 位置 [3分一個]

*在自動時間得分的 *Pixel*, 只要在手動時間完結時仍在得分位置上, 可在手動時間重覆得分

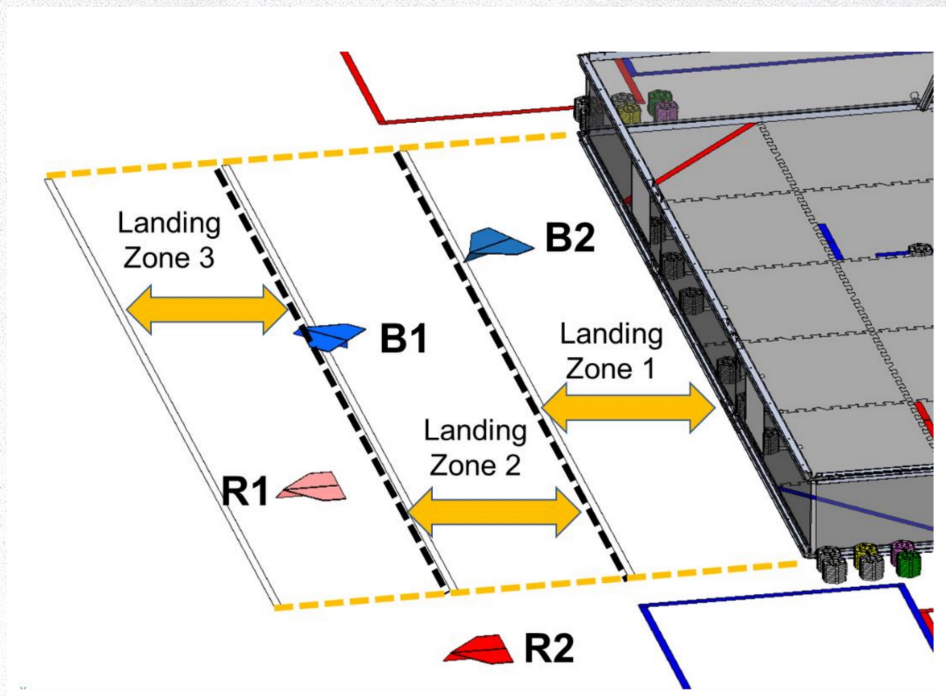
手動階段 (2分鐘時間, 由人手操作機械人得分)

1. Pixel:
 - a. 放在 *Backdrop* 凹陷的得分位置 [3分一個]
 - b. 放在相應 *Alliance Backstage* 位置 [1分一個]
2. Artist Bonus: 做出 *Mosaics* 圖案 [10分一個]
3. Set Bonus: *Backdrop* 上的得分 *Pixel* 延伸至打橫的 *Set Line* [每延伸至一次10分, 最高分數為30分]



完結時間(手動階段最後30秒)

1. Robot Location:
 - a. 懸掛在 *Riggings* (每個 *Rigging* 只能計算一台機械人得分) [每個20分]
 - b. 停泊在 *Backstage* (每個 *Rigging* 只能計算一台機械人得分) [每個5分]
2. Drone Launching: (發射出去的紙飛機必需在 *Truss / Stage Door* 上經過)
 - a. 停在 Zone 1 [30]
 - b. 停在 Zone 2 [20]
 - c. 停在 Zone 3 [10]



獎項及海外交流

CENTERSTAGE™

PRESENTED BY  RTX


**FIRST
TECH
CHALLENGE**
HONG KONG

啟迪獎

(Inspire Award)

- 冠軍 (Winner)
- 準冠軍(Finalist)

機械人競賽獎

(Alliance Award)

- 冠軍聯盟 (Winning Alliance)
- 亞軍聯盟 (Finalist Alliance)

*或會按隊伍數量，增加分項冠軍及其他獎項

啟迪獎評審準則

- 隊伍需在各方面（如機械設計、隊伍經營、向外推廣等）表現出色
- 機械人競賽部份的分數或會反映機械人的表現，但並不會在評審啟迪獎時有較高的比重
- 隊伍需要展示FIRST專業精神(Gracious Professionalism)
- 隊伍需是FIRST大使，向外宣傳FIRST活動
- 隊伍需要是正面及包容的，而每位成員都有為隊伍的成功付出
- 隊伍必需呈交工程選輯（Engineering Portfolio）
- 隊伍在見評審時需展示出專業及投入



PRESENTED BY  Raytheon
Technologies



Appendix C: Judge Summary Sheet

CONFIDENTIAL - NOT TO BE SHARED WITH TEAMS

Team Name:	Not Demonstrated	Beginning	Developing	Accomplished	Exemplary	Comments
Team #:						
For All Awards						
Team shows respect and <i>Gracious Professionalism</i> [®] to everyone they meet at a <i>FIRST</i> Tech Challenge event (required).						
Think Award – Engineering portfolio required						
Engineering portfolio must have examples of engineering content that includes entries describing underlying science, mathematics, and game strategies (required)						
Engineering portfolio must show that the team has a clear understanding of the engineering design process, with images, pictures or drawings and details documenting all stages of robot design (required)						
Engineering portfolio must show examples of the team's journey, experience and lessons learned throughout the season (required)						
Connect Award – Engineering Portfolio Required						
Portfolio includes a team plan that covers the team's goals for the development of team member skills, and the steps the team has taken or will take to reach those goals. Examples of what the plan could include are timelines, outreach to science, engineering, and math communities, and training courses.						
Portfolio must include a summary of how the team acquired new mentors or acquired new knowledge and expertise from a mentor. Working with Mentors from <i>FIRST</i> 's Mentor Matching site is an acceptable way to learn from Mentors.						
Team actively engages with the engineering community to help them understand <i>FIRST</i> , the <i>FIRST</i> Tech Challenge, and the team itself (required)						

https://www.firstinspires.org/sites/default/files/uploads/resource_library/ftc/judge-manual.pdf



海外交流賽事

- 香港賽區每年會因應隊伍數量，獲得美國世界賽(World Championship)名額
- 除了世界賽以外，亦有其他地區的邀請賽
- 大會將邀請成績優異的隊伍，組成代表團出席世界其他地區的賽事



PRESENTED BY  Raytheon
Technologies



Asia Pacific Open Championship 2023



CENTERS STAGE

PRESENTED BY  Raytheon Technologies

 FIRST TECH CHALLENGE

日程 及 注意事項

CENTERSTAGE™

PRESENTED BY  RTX


**FIRST
TECH
CHALLENGE**
HONG KONG

重要資訊: 比賽相關資訊

- 比賽日期 (暫定): 2024年2月3-4日
- 地點: 待定
- 截止報名日期: 2023年12月23日
- 確認參賽名單日期: 2024年1月13日

重要資訊: 隊伍工作坊

- 隊伍工作坊
- 日期: 2023年11月-1月期間
- 地點: 待定

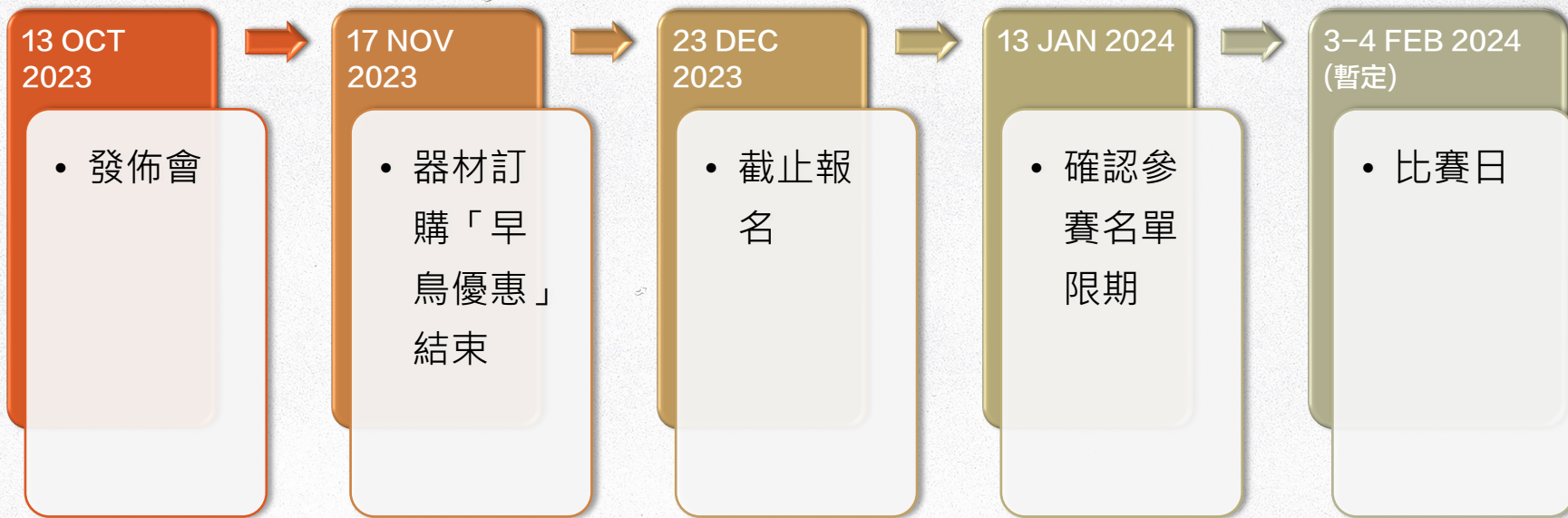
*如個別學校需要技術支援, 可向 ftchk@summitinspiration.com.hk 查詢

重要資訊: 報名費

- 報名費用包括 行政費 及 任務套件費
- 行政費
 - 每隊 \$1200 (3-7人)
 - 每隊\$2000 (8-15人)
- 任務套件費:
 - 每間學校/機構需選擇其中一個任務套件選項
 - 選項1) 半個套裝 (Partial Game Set)
 - 選項2) 整個套裝 (Full Game Set)

- 例子1: 一間學校派出1支6人隊伍, 選擇半個任務套裝:
 - 報名費: $\$1200 + \$4800 = \$6000$
- 例子2: 一間學校派出1支15人隊伍, 選擇半個任務套裝:
 - 報名費: $\$2000 + \$4800 = \$6800$
- 例子3: 一間學校派出2支6人隊伍, 選擇整個任務套裝:
 - 報名費: $\$1200 * 2 + \$6450 = \$8850$

重要資訊: 日程



報名方法



填寫網上表格 (稍後將放上網站及電郵通知各位出席老師)

填寫器材訂購表格

收到大會確認電郵 (回條)

簽名及蓋印回條確認，再以電郵遞交
ftchk@summitinspiration.com.hk

郵寄相關報名費到 SUMMIT Inspiration Limited

遞交隊伍成員資料

相關連結

<https://www.firstinspires.org/resource-library/ftc/game-and-season-info>



(286)

Game & Season Materials

Oct. 11 2023 | 0 KB

Content Type: FIRST Tech Challenge

Tags: Awards, Events, Game/Challenge

CENTERSTAGESM presented by RTX Resources

FIRST Tech Challenge 2023-2024 Game & Season Materials

See also: [Programming Resources](#) and [Robot Building Resources](#)

Game Manuals

- [CENTERSTAGE Game Manual Part 1 -Traditional Events - updated 10/4/23](#)
- [CENTERSTAGE Game Manual Part 1 - Remote Events- updated 10/4/23](#)
- [CENTERSTAGE Game Manual Part 2 - Traditional - updated 10/11/23](#)
- [CENTERSTAGE Game Manual Part 2 - Remote - updated 10/11/23](#)
- [Translated Game Manuals](#)
- [Game One Page](#)

Playing Field Materials and Manuals

- [Purchase Playing Fields and Elements from AndyMark](#)
- [AndyMark Field Assembly and Setup Guide](#)
- [Field Reset Guide](#)
- [AprilTag Images - US](#)
- [AprilTag Images - A4](#)
- [AprilTag Backdrop](#)

相關連結

<https://www.firstinspires.org/resource-library/ftc/robot-building-resources>



(248)

Robot Building Resources

Oct. 5 2021 | 10 KB

Content Type: FIRST Tech Challenge

Tags: Robot Build/Assembly, Robot Kit, Team, Technical

This section contains resources for FIRST Tech Challenge teams specific to designing and building the robot.

Build Guides

- [Basic Bot Guide - REV](#)
- [Game Specific Basic Bot Guide - REV](#)
- [Basic Bot Guide - TETRIX](#)
- [Game Specific Basic Bot Guide - TETRIX](#)
- [Hardware Video Tutorials](#)
- [Rev Electronics Video Tutorials](#)
- [Power button labels](#)
- [Robot moves labels](#)

Design Resources

- [3D Printing for FIRST Teams Blog Series by PTC](#)
- [PTC Software and Training Resources](#)
- [SOLIDWORKS Resources](#)
- [XYZ Design Brief](#)

Programming Resources

- [Programming Resources Page](#)
- [Software Development Kit Download and Resources](#)

Technology Resources

- [Robot Reliability Checklist](#)

Wiring Resources

- [Robot Wiring Guide](#)
- [Robot Wiring Video](#)

Stay Connected

- [Email](#) | [Blog](#) | [Facebook](#) | [Forum](#) | [Twitter](#) | [YouTube](#)

相關連結

<https://www.firstinspires.org/resource-library/ftc/technology-information-and-resources>



Programming Resources

Nov. 5 2021 | 10 KB

Content Type: FIRST Tech Challenge

Tags: Robot Build/Assembly, Robot Kit, Team, Technical

The FIRST Tech Challenge software requires that the minimal version used to run the program is 5.2. This includes the apps and software development tools.

Robot Controller and Driver Station App - Rules <RS05> or <RS06> may require initial installation of the software, or updates throughout the season. Teams receiving the Driver Hub or Control Hub for the first time should install the most recent version of the software.

If using Windows 10 or greater, to install the most current version the software, please visit the following link: <https://docs.revrobotics.com/control-hub/managing-the-control-system/rev-hardware-client>

For all other platforms, the required versions of both Android applications can be found here: <https://github.com/FIRST-Tech-Challenge/FtcRobotController/tags>

Programming Resources

Blocks Programming Tool - A user friendly, graphical tool for programming a competition robot. The Blocks Programming tool is the fastest and easiest way to get started with programming.

- [Blocks Programming Manual](#)
- [Blocks Programming Autonomous Mode](#)
- [Blocks Video Tutorials](#)
- [Computational Thinking Video Playlist](#)

OnBot Java Programming Tool - An easy-to-use, browser-based Java development tool. OnBot Java lets users program in Java without the need for installing Android Studio.

- [OnBot Java Guide](#)

Android Studio Download and Resources - Android Studio is an integrated development tool that lets teams create Java (text-based) programs for their competition robots. Android Studio offers great flexibility when writing a program for a competition robot.

- [Android Studio Guide](#)
- [Android Studio Project Download and Resources](#)
- [Java Video Tutorials](#)

網站

香港賽會網站: <https://www.summitinspiration.com.hk/centerstage>

美國大會: <https://www.firstinspires.org/robotics/ftc>

電郵查詢: ftchk@summitinspiration.com.hk

FTC Hong Kong Facebook專頁: <https://www.facebook.com/FTCHongKong>