TELLO COMPETITION OVERVIEW

MODULE 6

LOGISTICS

FALL 2022 SEASON SCHEDULE

Date	Milestone
Aug 15 – Nov 19	Registration
Nov 19	Demo deadline
Nov 19	Registration fee due
Week of Nov 28	Finalist presentations*
Dec 5	Results announced

Table 1. Fall 2022 Season Schedule

*Top 5 teams will give finalist presentations, but all teams must submit presentation slides

COMPETITION LAYOUT

- **Virtual Competition:**
  - Missions must be recorded and submitted to judges
  - Presentation slides must be submitted (top 5 teams will present virtually to judge panel)
- **3 Levels:**
  - Beginner, intermediate, and advanced
  - Teams may choose to compete in any level
  - 2nd and 3rd place prizes are awarded for advanced competitors

REQUIREMENTS

- **Hardware:**
  - Must:
    - Use Tello drone
    - Attach “poppers” to Tello (5”-10” in length)
  - Must not:
    - Modify drone except for popper attachments
- **Software:**
  - Must:
    - Use Python
    - List all libraries used
  - Must not:
    - Pay for any libraries
- **Prize Eligibility:**
  - Must:
    - Pay registration fee
    - Score greater than zero points
    - Submit and give presentation

Figure 1. Drone with Poppers

TASK DETAILS

MISSION: BEGINNER

- **Tasks:**
  - Pop balloons with given ArUCo tag numbers
  - Program must read in provided list of tag numbers
- **Start:**
  - Drone starts 10 ft from wall of balloons
- **Penalties:**
  - Contact with obstacles (walls, tables, etc.) is deemed a landing

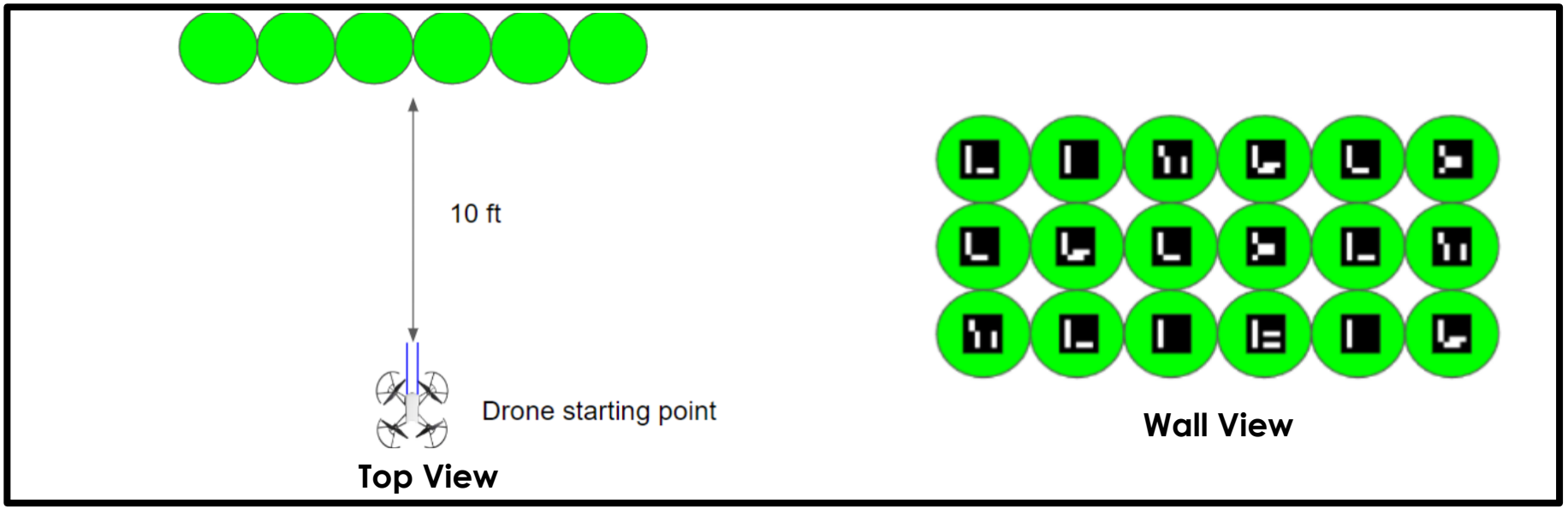

Figure 2: Beginner Field

MISSION: INTERMEDIATE

- **Tasks:**
  - Pop balloons with given ArUCo tag numbers
  - Program must read in provided list of tag numbers
- **Start:**
  - Drone starts in the middle of the playing field
  - Up to ten balloons will be placed randomly in the arena
- **Penalties:**
  - Contact with obstacles (walls, tables, etc.) is deemed a landing

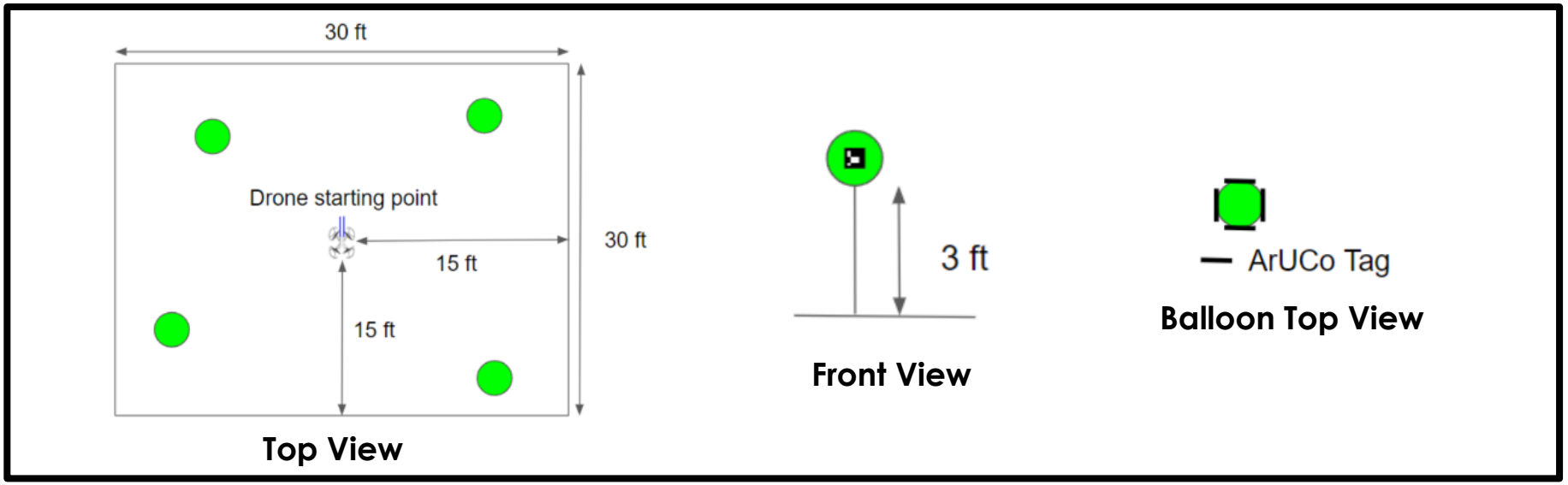

Figure 3: Intermediate Field

MISSION: ADVANCED

- **Tasks:**
  - Pop balloons with given colors and report their ArUCo tag numbers
  - Program must read in provided list of colors
- **Start:**
  - Drone starts in the middle of the playing field
  - Up to ten balloons will be placed randomly in the arena
- **Penalties:**
  - Contact with obstacles (walls, tables, etc.) is deemed a landing

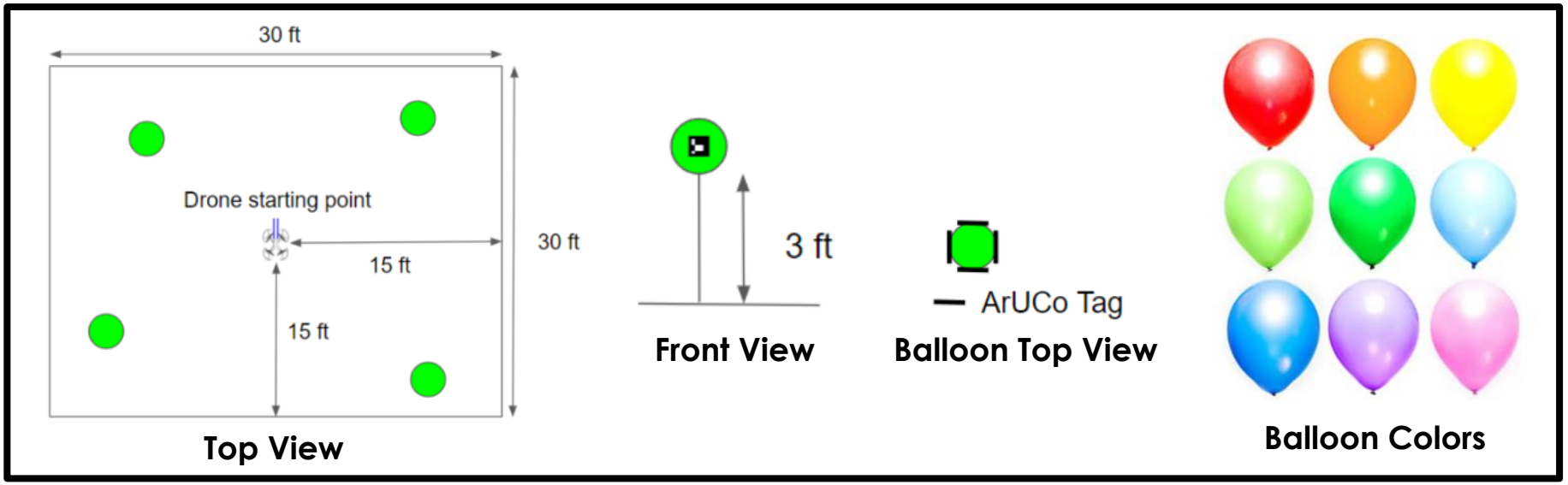

Figure 4: Advanced Field

PRESENTATION

- **Overview:**
  - Top 5 teams will present to judging panel
  - Presentation is 10 minutes, followed by 5 minutes of questions
- **Contents:**
  - Team introduction:
    - Names
    - Picture of team
  - Team approach:
    - Division of labor
    - Learning
  - Software design approach:
    - General flow diagram describing software flow
    - Algorithm design
    - Built-in robustness
  - Testing:
    - # of attempts
    - Metrics from attempts
  - Lessons learned

JUDGING & SCORING

SCORING: FLIGHT

- **Use the following equation to calculate scoring:**

$$S = \min\left(0, \frac{300}{t}\left(\frac{b_p}{b_t}\right) - P\right)$$

S = score
t = flight time in seconds
b_p = correct balloons popped
b_t = total # of balloons that need to be popped
P = penalty

# of Incorrect Balloons Popped	Penalty Score (P)
1	10
2	20
3-5	100
>5	300

Table 2. Penalties

SCORING: PRESENTATION

- **Use the following equation to calculate scoring:**

$$S = Content + Presentation$$

S = score
Content = scoring of content (see slide 10)
Presentation = scoring of delivery (see below list)

Presentation Requirements:
i. Presentation flow
ii. Presentation mannerisms
iii. Presentation clarity

PRIZES

Rank	Mission Level	Prize Money
1st	Beginner	$500
1st	Intermediate	$1000
1st	Advanced*	$2000
2nd	Advanced*	$1000
3rd	Advanced*	$500

Table 3. Prizes

*Must be 3 or more teams participating. Prizes are halved if 10 or fewer teams participate. Full prizes are awarded when over 10 teams participate.

SOURCES

SOURCES

- **See website and rule book for further details:**
  https://www.aeroroboticscomp.com/fall2022