



Category C: Radio Control Flight
(In collaboration with DSO, Science Centre
& Singapore Polytechnic)



Competition Category C



- Challenge
- General Rules & Regulations
- Awards



AFMC 2010

Cat C Challenge



- To design and build a small radio-controlled **fixed wing plane** or **kite plane** to fly and perform as many “Figure of 8” routine as possible in the flying circuit.





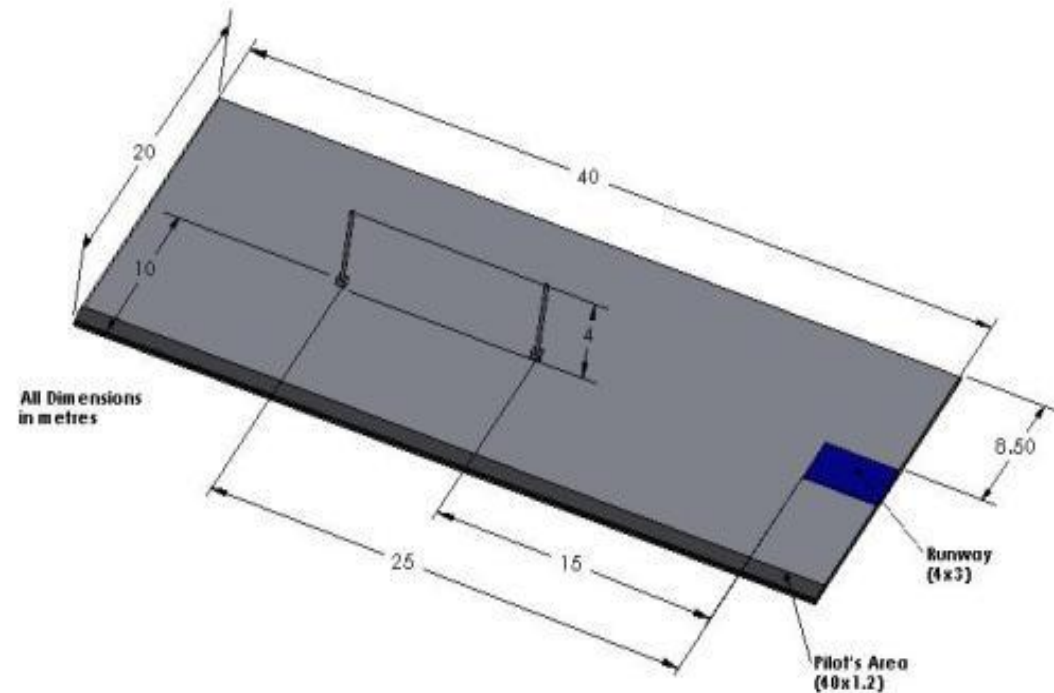
Mission

Basic Mission

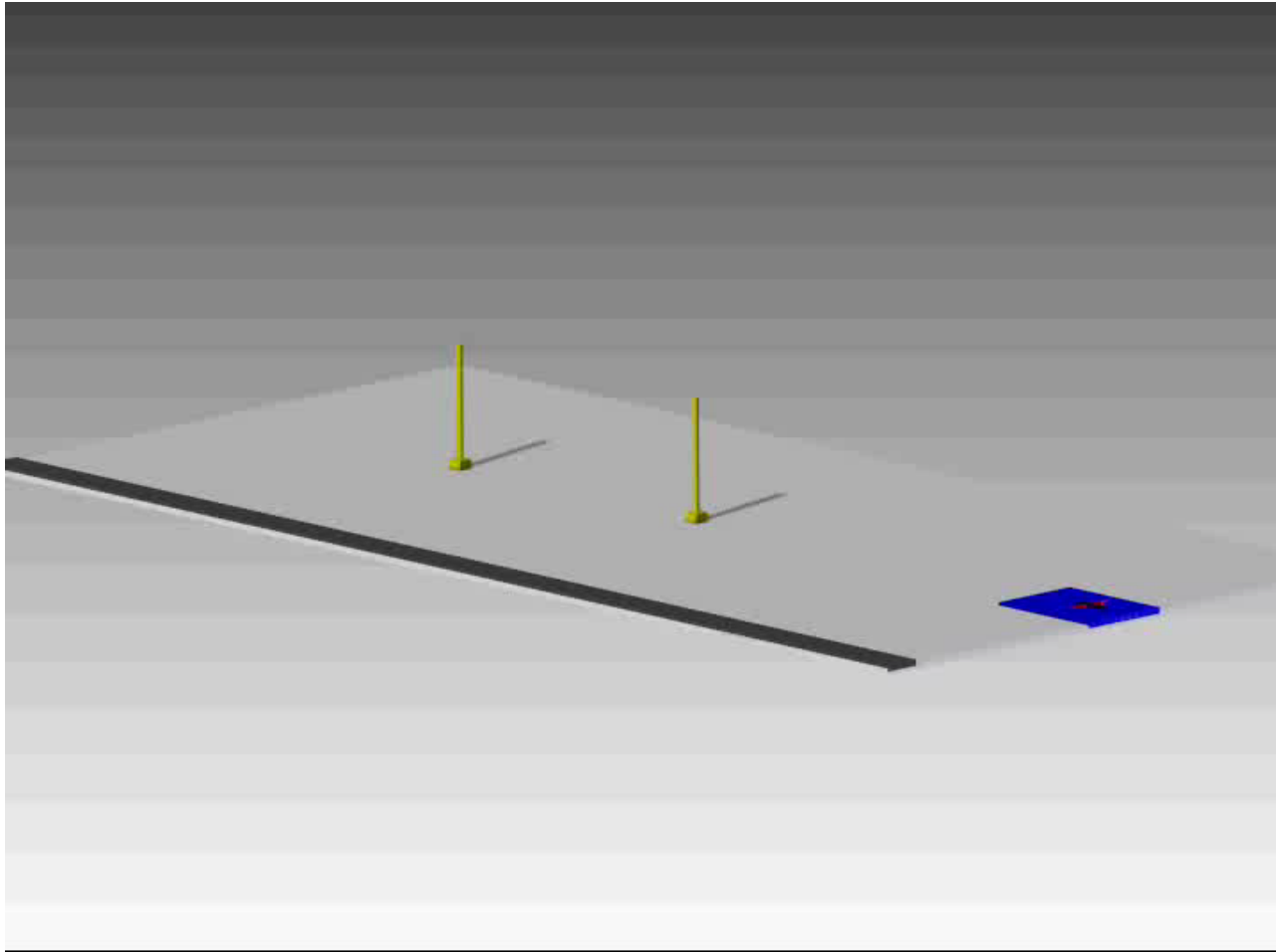
- Proper Take-off from runway
- Proper Landing on runway

Detail Mission

- Proper Take-Off from runway
- Number of Fig-8s completed
- Proper Landing on runway



'Fly-through' the Mission



Rules and Regulations



- Each team comprises of two to five students
- Team members must be from the same school
- Graduated students or students graduating in Year 2009 (e.g. JC2) cannot register as the competition is held in March 2010.
- Complete off-the-shelf flying kits are not allowed but COTS components are permitted.



Rules and Regulations



- Flying machines must be radio controlled by off-the-shelf radio systems.
- Only electric flying machines are allowed. Both brush and brushless motors are allowed. No modification to the motors is allowed.
- No internal combustion or gasoline engines will be allowed.



Rules and Regulations



R/C Radio

- Only the following frequency ranges are allowed (IDA): 29.700 – 30.000MHz
- Team must register their R/C frequency with SAFMC officials prior to the challenge week
- Report 15 minutes before the allocation time, all radio transmitters must be surrendered and they will be safe kept with the officials.



Rules and Regulations



Physical

- No Vertical Takeoff Landing (VTOL) flying machine is allowed. All flying machine must conduct rolling takeoff at designated runway area on the flying field.
- Minimum Dimensions: Length (400 mm) x Width (500 mm)
- Maximum Dimension : Height (500 mm)
- Maximum all-up weight (AUW) of 500 grams.



Rules and Regulations



Battery

- There is no limit on the number of batteries used, in series or parallel.
- Only Lithium Polymer (Li-Po), Nickel Metal Hydride (Ni-MH) or Nickel Cadmium (Ni-Cd) batteries is allowed.





Rules and Regulations

Speed Controller

- Only Electronic Speed Controller is allowed.

Servo

- Only standard R/C servos are allowed. There is no limit on the number of servos used.



Rules and Regulations



Flying Mission

- Each team will be given a total of **ONE (1)** minute to setup their flying machine inside the flying circuit.
- For the **Basic Mission**, a total of **TWO (2)** attempts will be given to the team. The team is given **TWO (2)** minutes to complete each attempt.
- For the **Detail Mission**, a total of **TWO (2)** attempts will be given to the team. The team is given **THREE (3)** minutes to complete each attempt.



Rules and Regulations



- Teams are strongly encouraged to bring their fixed wing plane or kite plane during presentation. Teams are to submit **TWO (2)** photos of sized 4R during the presentation. Teams will **NOT** be allowed to make major changes to their flying machine after the presentation
- Each participating team will be allowed to bring up to two **IDENTICAL** fixed wing plane or kite plane into the competition hall
- For a complete list, please refer to the Challenge Booklet and www.safmc.com.sg



The Championship Award




Individual Category	Weightage
Performance	50%
Aesthetic	0%
Creativity	10%
Theory of Flight	20%
Presentation	15%
Microsoft Flight Logbook	5%
Total	100%

The **Championship Award** for the Cat C will be given to the Team with the best score in all sections.



Best Performance (Flying Circuit)



Flying Tasks	Allocated Points
Basic Mission:	
Proper take-off from the runway area	5 points
Proper landing on the runway area	5 points
Detail Mission:	
Proper take-off from the runway area	5 points
Fly around structure 1 (S1)	10 points
Fly around structure 2 (S2)	10 points
Proper landing on the runway area	5 points
No of complete "8 shapes" routine flight	1 point per cycle (a maximum of 10 cycles)
Touch penalty	Deduct 5 points
Score 	Total of allocated points and penalty (Lowest score is zero)



The Most Creativity Award



- For the team that shows the most innovative and original design in their flying machine

Criteria	Areas of Consideration
Creativity (10%)	<p>Uniqueness in Appearance</p> <ul style="list-style-type: none">-Originality in the design of flying machine-Being the only one of its kind in design-Visually different or distinct or appealing <p>Function</p> <ul style="list-style-type: none">-Proper working-Fly safe <p>Design Process</p> <ul style="list-style-type: none">-Has the team brainstormed other ideas?-What inspired your design? <p>Integration</p> <ul style="list-style-type: none">-Unique joining techniques



The Theory of Flight Award



- For the team that best demonstrates a sound understanding and appropriate application of aerodynamic design principles, as shown by their flying machine

Criteria	Areas of Consideration
Theory of Flight (20%)	<p>Aerodynamics</p> <ul style="list-style-type: none">-Understanding overall science of flight-Wing Design Consideration <p>Control & Stability</p> <ul style="list-style-type: none">-Mechanism to operate an flying machine surfaces for level flight <p>Flight</p> <ul style="list-style-type: none">-Airworthiness check <p>Design and Integration</p> <ul style="list-style-type: none">- Knowledge of structural design



The Best Presentation Award (10 min)



- For the team that exhibit creativity, fluency, confidence and flair in the presentation of their teams work, and which demonstrates that WOW factor during the interview sessions

Criteria	Areas of Consideration
Presentation (15%)	Creativity -WOW Presentation Fluency -Time management and Presentation sequence -Power Point Design Confidence -Technical Knowledge -Savyness Flair -Showmanship



The Microsoft Flight Logbook Award



- For the team that best captured its learning journey (using photos, videos, blogs, etc.) during the competition with Microsoft Live@edu.



Material and electronics cost (for example)



Parts	Price (\$)
STICK KIT	31
IPS 50 A GEAR	31
ICS 50 ESC	26
Propeller 10 inch	2
Std servo	26
4 ch TX. mode 2, Xtal	92
6 ch RX , Xtal	45
RX XATL	8
1300mah LIPO 2S	39
LIPO charger 2S	33
SAFTY SPINNER	4
Total	337
Exclude Tx	245



Vendor support (Examples)



- AFS (Aeromodelling Federation of Singapore)
E-MAIL: SEC@AFS.ORG.SG
- Flight Science Gov Laboratories
Mr. Khaw (HP: 97845589)
flightscience.gov.sg@gmail.com





• **Good Luck.....**

