Filling out the Helicopter Checklist

NFFS SO Education Committee, Fall 2025

This presentation is designed to assist those serving as Event Supervisors for the Science Olympiad Helicopter event (either B or C division) in filling out the helicopter checklist, which is posted here. Intended mainly for an ES with little or no previous experience in this event, it builds on many years of observations by experienced supervisors who have extensive knowledge of indoor flying events.

HELICOPTER B/C

Team Checklist – 2026

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A		HELI B		← CHECK-IN (UP TO 2 HELICOPTERS)	
Construction Parameters:					
T	F	T	F	3.a.	If kits are used, they do not contain any pre-glued joints or pre-covered surfaces.
T	F	T	F	3.b.	The uppermost part of the helicopter (the part that would touch a flat ceiling first during flight) is a flat balsa wood disc, large enough to cover a dime, and the face of the disc is the part that contacts the ceiling if the helicopter goes that high.
T	F	T	F	3.c.	Boron filaments are not used in the construction of the helicopter or boxes.
T	F	T	F	3.d.	The helicopter in its flight configuration fits fully into a lidless, team-provided Measurement box with external dimensions fitting 32.0 cm x 24.0 cm x 47.0 cm, including any external protuberances on the box.
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area occurs after removing the helicopter from its box and throughout the flight itself.

This checklist is published on the Science Olympiad "Scoresheets" page. It is used to check student helicopters for compliance with the rules, and also provides spaces to record flight log status and flight times. These data can ultimately be entered into either the Helicopter scoring spreadsheet (link above) or the Scilympiad scoring platform, depending on which will be used in the tournament where you will be supervising. The completed checklists will often be retained by the tournament organizer, or might be returned to the teams after an invitational tournament.

The following slides will guide you through the process of completing the checklist. Annotations will appear in red text.

HELICOPTER B/C

Team Checklist – 2026

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

Fill in team info, or use label

Some tournaments require names*

HELI A	HELI B	← CHECK-IN (UP TO 2 HELICOPTERS)

Construction Parameters:

Questions below should be answered for one or two helicopters, depending on how many the team submits. However, only a helicopter that has been checked in may be flown during the competition.

* Regardless of whether the tournament director requires that student names be recorded, rule 4g states "*The Event Supervisor will review with teams their data recorded at the end of their Event Time.*" , so this is a good place to obtain a student signature or initial to satisfy this rule.

HELICOPTER B/C

Team Checklist – 2026

Rank: _____
Tier: _____
Final Score: _____

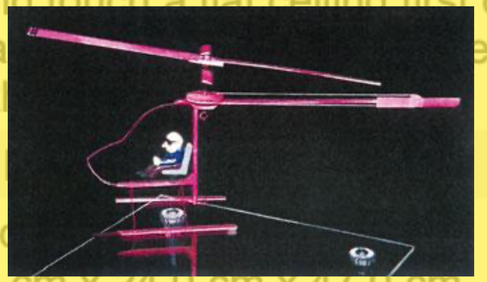
Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A	HELI B	← CHECK-IN (UP TO 2 HELICOPTERS)		
Construction Parameters:				
T	F	T	F	3.a. If kits are used, they do not contain any pre-glued joints or pre-covered surfaces.
T	F	T	F	3.b. The uppermost part of the helicopter (the part that would touch a flat ceiling first during flight) is a flat balsa wood disc, large enough to cover a … e disc is … ng if the helicopter goes t…
T				… in the construction of the …
T				…figura… …to a li… …al dim… …32.0 cm x 24.0 cm x 47.0 cm, …erance…
T				…ngth, … …rea occurs … …g the …rough… …self.
T				3.f. No other lifting surfaces, except for up to three fixed pitch r… …
T	F	T	F	3.g. Total mass of the helicopter, excluding the rubber motor(s), …re.

None of the current kits contain pre-glued joints or pre-covered surfaces. As a result, you can mostly ignore this line item. The only exception would be if a team submits some sort of ready made helicopter, like those shown here.







HELICOPTER B/C

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Student Names: _____

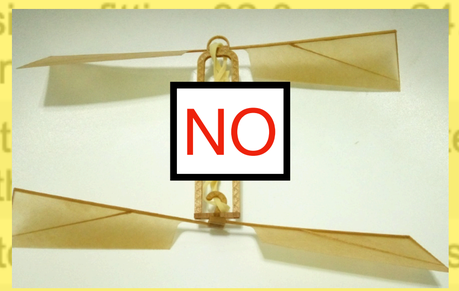
HELI A	HELI B	← CHECK-IN (UP TO 2 HELICOPTERS)

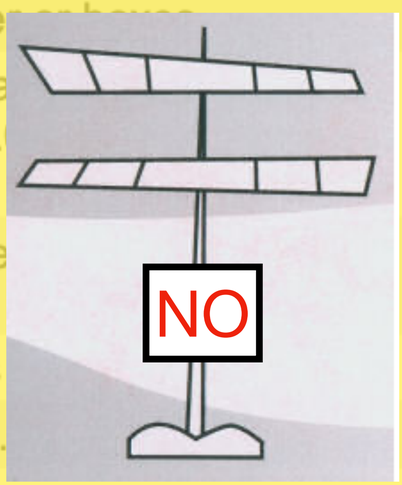
Construction Parameters:

T	F	T	F	3.a.	If kits are used, they do not contain any pre-glued joints or pre-covered surfaces.
T	F	T	F	3.b.	The uppermost part of the helicopter (the part that would touch a flat ceiling first during flight) is a flat balsa wood disc, large enough to cover a dime, and the face of the disc is the part that contacts the ceiling if the helicopter goes that high.

No need to actually measure the disc, if it looks about as large as a dime, and is located at the very top of the helicopter, it is fine. The most common violation is probably as shown to the far right, where the disc was not installed on the pole at the top of the helicopter, or has fallen off at some point.







HELICOPTER B/C

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Student Names: _____

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Construction Parameters:				
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T	F	T	F	3.c. Boron filaments are not used in the construction of the helicopter or boxes.
T	F	T	F	3.d. The helicopter in its flight configuration fits fully into a lidless, team-provided Measurement box with external dimensions fitting 32.0 cm x 24.0 cm x 47.0 cm,

You can ignore this one. Anyone who knows what boron filaments would be used for would realize that it would be foolish to use them on a Science Olympiad helicopter, so you will never see this at a tournament.

HELICOPTER B/C

Team Checklist – 2026

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A	HELI B		← CHECK-IN (UP TO 2 HELICOPTERS)
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T F	T F	3.d.	The helicopter in its flight configuration fits fully into a lidless, team-provided Measurement box with external dimensions fitting 32.0 cm x 24.0 cm x 47.0 cm, including any external protuberances on the box.
T F	T F	3.e.	No change in chord, span, length, or total lifting area occurs after removing the helicopter from its box and throughout the flight itself.
T F	T F	3.f.	The helicopter is not intentionally separated into more than one piece during flight.

Per the rules, teams need only one measurement box, even if they have two helicopters. Measurement of the box is detailed in a separate resource.

The helicopter must fit totally into the box in flying configuration (assembled), and must not change its shape when removed. In other words, it must not be "stuffed" into a box that is slightly too small.

HELICOPTER B/C

Team Checklist – 2026

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Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A	HELI B	← CHECK-IN (UP TO 2 HELICOPTERS)			
Construction Parameters:					
T	F	T	F	3.a.	If kits are used, they do not contain any pre-glued joints or pre-covered surfaces.
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T	F	T	F	3.c.	Boron filaments are not used in the construction of the helicopter or boxes.
T	F	T	F	3.d.	No change in shape, span, length, or total lifting area occurs after removing the helicopter from its box and throughout the flight itself.
T	F	T	F	3.f.	No other lifting surfaces, except for up to three fixed pitch rotors are used.
T	F	T	F	3.g.	Total mass of the helicopter, excluding the rubber motor(s), is 4.0 g or more.

It is unlikely that you will encounter a helicopter that does not meet this requirement. It does prohibit the use of an airplane or glider, since the wings would be additional lifting surfaces that are not rotors.

HELICOPTER B/C

Team Checklist – 2026

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A	HELI B	← CHECK-IN (UP TO 2 HELICOPTERS)		
Construction Parameters:				
T F	T F	3.a.	If kits are used, they do not contain any pre-glued joints or pre-covered surfaces.	
T F	T F	3.b.	The uppermost part of the helicopter (the part that would touch a flat ceiling first during flight) is a flat balsa wood disc, large enough to cover a dime, and the face of the disc is	
T F				
T F				
T F				
T F				
T F				
T F	T F	3.g.	Total mass of the helicopter, excluding the rubber motor(s), is 4.0 g or more.	

This one is easy. Be sure to use a cardboard tube or similar so that no part of the helicopter touches the table, and make sure there is not a rubber motor installed. Remember that only students should touch the helicopters!

If a team has a helicopter that is under the 4.0 g minimum, they should be allowed to add ballast, usually clay, glue, or tape, to increase its mass. As ES, it is ok for you to provide clay for this purpose.

If a helicopter inspects as T to 3a-3g, answer T on line 1/3. below. If there is one or more F, answer F. This places that helicopter's flights into tier 2 of the scoring. (Note: if there are two helicopters, but only one meets construction parameters, then the timers need to be aware of this, and must indicate which one was flown. If both pass, then it doesn't matter which one is used for the flights.

1. T F	3. T F	**HELICOPTER MEETS ALL CONSTRUCTION PARAMETERS ABOVE**
2. T F	4. T F	**HELICOPTER OPERATES WITH ONLY TWO-BLADED ROTORS (1.1x MULTIPLIER.)**

THE COMPETITION

Competition Parameters:

T F 3.h. Participants are able to answer questions on design, constr… the device per the Building Policy foun…

…flights a… …r of the eve… …or trim flights during …minute …

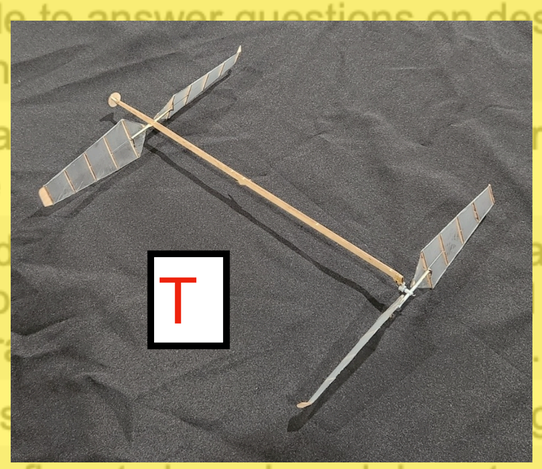
…ermitted… …articipants … …terials, assistance, …cation o… …off compet… …e, or compete. If …will be ra… …

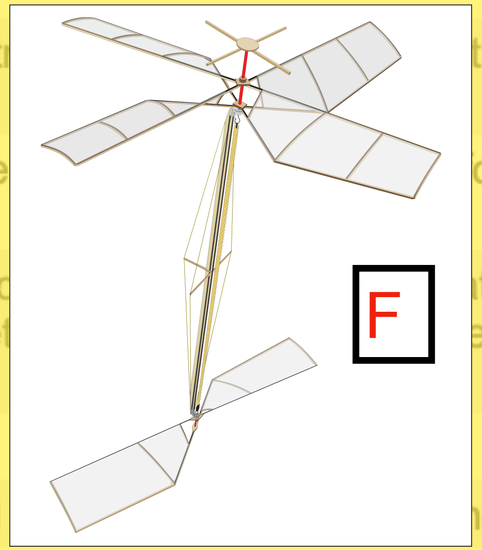
T F 4.e.ix. Participants do not s… …ght.

T F 4.e.x. Students are on the floor to launch and do not use artificial … …eight.

5. T F **HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE**

If a helicopter has all rotors with only two blades, answer T on line 2/4.





THE COMPETITION

Competition Parameters:

T F 3.h. Participants are able to answer questions on design, construction, and operation of the device per the Building Policy found on www.soinc.org.

T F 4.b.i.3 No practice flights are flown in the final half-hour of the event's last period. (Except for trim flights during

T F ls, assistance, compete. If

T F

T F 4.e.x. Students are on the floor to launch and do not use artificial aids to increase launch height.

5. T F HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE

This rule is likely intended to detect students who are flying a helicopter that they did not build themselves. If you are not experienced in the indoor flying area, you will probably not be comfortable in questioning the students, so it is recommended that you skip this item (answer T)

FLIGHT LOG

6. Is the Flight Log complete, partial, or not present?
Complete (1.2x bonus multiplier)

Partial (1.1x bonus multiplier)

Not present

5.a. Flight Logs includes 6 or more parameters (motor size before wind-up; number of turns on launch or torque at launch; flight time; and 3 more chosen by the team) with data for 10 or more test flights prior to the competition.

5.b. All numeric data includes units. Torque units may be arbitrary.

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
7. A B	11. A B	Which helicopter from above was used?
8. ____:_____.___	12. ____:_____.___	Timer 1
9. ____:_____.___	13. ____:_____.___	Timer 2

← Flight Times (minutes:seconds)

Questions 4b-4e are answered during the flights, so your timers should be aware of them.

T F Building Policy found on www.soinc.org.

T F 4.b.i.3 No practice flights are flown in the final half-hour of the event's last period. (Except for trim flights during a team's 10-minute Flight Period)

4.b.ii Except as permitted by the Event Supervisor, participants do not receive outside materials, assistance, or communication once they enter the cordoned off competition area to trim, practice, or compete. If

For an inexperienced event supervisor, the easiest way to deal with this is to allow only practice flights that are done during the team's 10 minute Flight Period.

T F 4.e.x. Students are on the floor to launch and do not use artificial aids to increase launch height.

5. T F HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE

FLIGHT LOG

6. Is the Flight Log complete, partial, or not present?
Complete (1.2x bonus multiplier)
Partial (1.1x bonus multiplier)
Not present

5.a. Flight Logs includes 6 or more parameters (motor size before wind-up; number of turns on launch or torque at launch; flight time; and 3 more chosen by the team) with data for 10 or more test flights prior to the competition.
5.b. All numeric data includes units. Torque units may be arbitrary.

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
7. A B	11. A B	Which helicopter from above was used?
8. ____:_____.___	12. ____:_____.___	Timer 1
9. ____:_____.___	13. ____:_____.___	Timer 2

← **Flight Times** *(minutes:seconds)*

Only the competing students should be in the inspection and flying area. Others, including students, parents, and coaches, are permitted to offer words of encouragement, but should not lend any material or verbal assistance to the competing students.

T	F	4.b.ii	Except as permitted by the Event Supervisor, participants do not receive outside materials, assistance, or communication once they enter the cordoned off competition area to trim, practice, or compete. If false, team will be ranked below all other teams.
T	F	4.e.ix.	Participants do not steer the helicopter during flight.
T	F	4.e.x.	Students are on the floor to launch and do not use artificial aids to increase launch height.

No steering means that students are not permitted to push their helicopter away from a wall or other obstruction. No stepladders or the like are permitted.

THE COMPETITION

Competition Parameters:

T	F	3.h.	Participants are able to answer questions on design, construction, and operation of the device per the Building Policy found on www.soinc.org.
T	F	4.b.i.3	No practice flights are flown in the final half-hour of the event's last period. (Except for trim flights during a team's 10-minute Flight Period)
		4.b.ii	Except as permitted by the Event Supervisor, participants do not receive outside materials, assistance,

Timers should answer T if all competition parameters are met for both official flights.

T	F	4.e.ix.	Participants do not steer the helicopter during flight.
T	F	4.e.x.	Students are on the floor to launch and do not use artificial aids to increase launch height.

5. T F HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE

FLIGHT LOG

6. Is the Flight Log complete, partial, or not present?

Complete (1.2x bonus multiplier)

Partial (1.1x bonus multiplier)

Not present

5.a. Flight Logs includes 6 or more parameters (motor size before wind-up; number of turns on launch or torque at launch; flight time; and 3 more chosen by the team) with data for 10 or more test flights prior to the competition.

5.b. All numeric data includes units. Torque units may be arbitrary.

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
7. A B	11. A B	Which helicopter from above was used?
8. ____:_____.___	12. ____:_____.___	Timer 1
9. ____:_____.___	13. ____:_____.___	Timer 2

← Flight Times (minutes:seconds)

THE COMPETITION

Competition Parameters:

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T	F	4.e.x.	Students are on the floor to launch and do not use artificial aids to increase launch height.

5. T F HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE

There is a separate resource that discusses how to evaluate the flight log. If all requirements are met, it is complete. If one or more things are incorrect or missing, it is partial. "Not present" is what it sounds like, no log was presented.

FLIGHT LOG

6. Is the Flight Log complete, partial, or not present?

Complete (1.2x bonus multiplier)

Partial (1.1x bonus multiplier)

Not present

5.a. *Flight Logs includes 6 or more parameters (motor size before wind-up; number of turns on launch or torque at launch; flight time; and 3 more chosen by the team) with data for 10 or more test flights prior to the competition.*

5.b. *All numeric data includes units. Torque units may be arbitrary.*

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
7. A B	11. A B	Which helicopter from above was used?
8. ____:_____.___	12. ____:_____.___	Timer 1
9. ____:_____.___	13. ____:_____.___	Timer 2

← Flight Times (minutes:seconds)

T	F	3.h.	Participants are able to answer questions on design, construction, and operation of the device per the Building Policy found on www.soinc.org.
T	F	4.b.i.3	No practice flights are flown in the final half-hour of the event's last period. (Except for trim flights during a team's 10-minute Flight Period)
T	F	4.b.ii	Except as permitted by the Event Supervisor, participants do not receive outside materials, assistance, or communication once they enter the cordoned off competition area to trim, practice, or compete. If false, team will be ranked below all other teams.
T	F	4.e.ix.	Participants do not steer the helicopter during flight.
T	F	4.e.x.	Students are on the floor to launch and do not use artificial aids to increase launch height.

Designating which helicopter was used for each official flight is only important if one satisfied construction parameters, and one did not, as indicated by items 1 and 3. In that case, make sure your timers note A or B for each flight.

If both helicopters passed construction inspection, it doesn't matter which one is used, so you can mark A for both flights.

5. *5.b. All numeric data includes units. Torque units may be arbitrary.*

6.

Not present

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
7. A B	11. A B	Which helicopter from above was used?
8. ____:_____.___	12. ____:_____.___	Timer 1
9. ____:_____.___	13. ____:_____.___	Timer 2
10. ____:_____.___	14. ____:_____.___	Timer 3

← Flight Times *(minutes:seconds)*

15. T F General Rule: The team is disqualified. (Notify the team and their coach as soon as possible.)

T F 4.b.i.3 No practice flights are flown in the final half-hour of the event's last period. (Except for trim flights during a team's 10-minute Flight Period)

T F 4.b.ii Except as permitted by the Event Supervisor, participants do not receive outside materials, assistance, or communication once they enter the cordoned off competition area to trim, practice, or compete. If false, team will be ranked below all other teams.

T F 4.e.ix. Participants do not steer the helicopter during flight.

T

5. T

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6. Is C

P

N

1ST

The rules suggest that 3 timers are optimal, and that the mean (middle) time counts toward a flight's score. If you only have 2 timers due to limited personnel, use the longer time, unless that timer knows that they started timing late, or encountered some other timing error.

Although times are scored per the flight time in seconds, the times should be recorded as minutes:seconds. For example, 1 minute and 23.45 seconds would be 1:23.45. Times entered using this format into either the SO scoring spreadsheet or the Scilympiad platform will be converted to seconds by the software.

7. A B 11. A B Which helicopter from above was used?

8. ____:_____.___	**12.** ____:_____.___	**Timer 1**
9. ____:_____.___	**13.** ____:_____.___	**Timer 2**
10. ____:_____.___	**14.** ____:_____.___	**Timer 3**

← **Flight Times** *(minutes:seconds)*

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5. T F HELICOPTER MEETS ALL COMPETITION PARAMETERS ABOVE

FLIGHT LOG

6. Is the Flight Log complete, partial, or not present?

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Not present

5.a. Flight Logs includes 6 or more parameters (motor size before wind-up; number of turns on launch or torque at launch; flight time; and 3 more chosen by the team) with data for 10 or more test flights prior to the competition.

5.b. All numeric data includes units. Torque units may be arbitrary.

1ST FLIGHT 2ND FLIGHT ← OFFICIAL FLIGHTS (IN 10 MIN.)

Disqualifications are very rare, and should be considered only for the most egregious of behavior, such as purposely damaging another team's helicopter, or interfering with their flights.

(minutes:seconds)

10. : . 14. : . Timer 3

15. T F General Rule: The team is disqualified. (Notify the team and their coach as soon as possible.)

Rank and final score can be written here after these are calculated by the scoring spreadsheet or Scilympiad. Both platforms will also indicate tier.

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

Regardless of whether the tournament director requires that student names be recorded, rule 4g states "*The Event Supervisor will review with teams their data recorded at the end of their Event Time.*" , so this is a good place to obtain a student signature or initial to satisfy this rule.

HELI A		HELI B		← CHECK-IN (UP TO 2 HELICOPTERS)	
Construction Parameters:					
T					
T					uring disc is
T	F	T	F	3.c.	Boron filaments are not used in the construction of the helicopter or boxes.
T	F	T	F	3.d.	The helicopter in its flight configuration fits fully into a lidless, team-provided Measurement box with external dimensions fitting 32.0 cm x 24.0 cm x 47.0 cm, including any external protuberances on the box.
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T	F	T	F	3.f.	No other lifting surfaces, except for up to three fixed pitch rotors are used.
T	F	T	F	3.g.	Total mass of the helicopter, excluding the rubber motor(s), is 4.0 g or more.