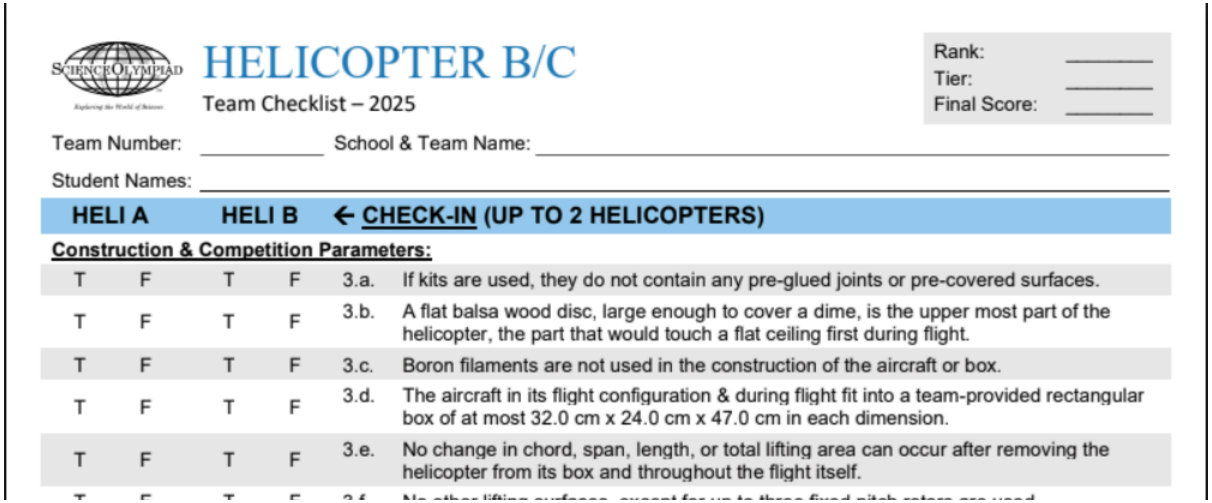
Filling out the Helicopter Checklist

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.

At this time this was drafted, the 2026 checklist had not yet been posted, so these instructions pertain to the 2025 version, which will be similar, though not identical. This resource will be revised when the new checklist is available.



HELICOPTER B/C

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

HELI A		HELI B		← CHECK-IN (UP TO 2 HELICOPTERS)	
Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first during flight.
T	F	T	F	3.c.	Boron filaments are not used in the construction of the aircraft or box.
T	F	T	F	3.d.	The aircraft in its flight configuration & during flight fit into a team-provided rectangular box of at most 32.0 cm x 24.0 cm x 47.0 cm in each dimension.
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area can occur 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 – 2025

Rank: _____
Tier: _____

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 & Competition 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.

T	F	T	F	3.d.	box of at most 32.0 cm x 24.0 cm x 47.0 cm in each dimension.
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area can occur after removing the helicopter from its box and throughout the flight itself.
					are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

* Regardless of whether the tournament director requires that student names be recorded, rule 5g states "*The Event Supervisor will verify with the team the data being recorded on their scoresheet.*" , so this is a good place to obtain a student signature or initial to satisfy this rule.

HELICOPTER B/C

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

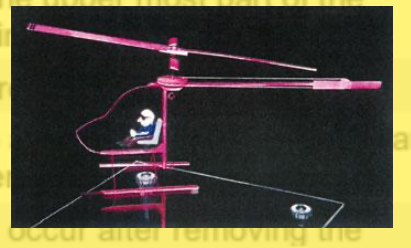
Student Names: _____

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

Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first duri
T	F	T	F		n the construction of the air
T	F	T	F		ation & during flight fit into ar
T	F	T	F		cm x 4 dime
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T	F	T	F		t for u pitch roto
T	F	T	F		uding r(s), is 4.(
T	F	T	F		participants. Commercially avai ropellers are not used in whole or part. Commercial rotor thrust bearing
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must b r check-in.

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

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

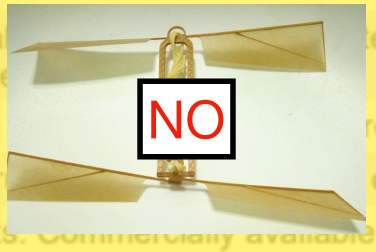
HELI A **HELI B** ← **CHECK-IN (UP TO 2 HELICOPTERS)**

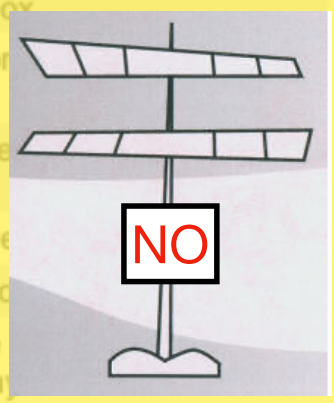
Construction & Competition Parameters:

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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first during flight.

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

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first during flight.
T	F	T	F	3.c.	Boron filaments are not used in the construction of the aircraft or box.
T	F	T	F	3.d.	The aircraft in its flight configuration & during flight fit into a team-provided rectangular box of at most 32.0 cm x 24.0 cm x 47.0 cm in each dimension.
T					ving the
T					
T					.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

You can ignore this one. Anyone who knows what boron filaments would be used for would realized 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 – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition Parameters:

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. (Needs link)

T	F	T	F	3.d.	The aircraft in its flight configuration & during flight fit into a team-provided rectangular box of at most 32.0 cm x 24.0 cm x 47.0 cm in each dimension.
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area can occur after removing the helicopter from its box and throughout the flight itself.

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 – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the
T	F	T	F		ngular
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area can occur 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 aircraft, excluding the rubber motor(s), is 4.00 g or more.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

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

HELICOPTER B/C

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition Parameters:

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 4.00 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.

T	F	T	F	3.g.	Total mass of the aircraft, excluding the rubber motor(s), is 4.00 g or more.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

HELICOPTER B/C

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is th… helicopter, the part that would touch a flat ceiling first duri…
T					…n of the air…
T					…ght fit into … each dime…
T	F	T	F		…area can … 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…
T	F	T	F	3.g.	Total mass of the aircraft, excluding the rubber motor(s), is 4.00 g or more.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

The most common violation of this rule is probably a helicopter that uses one or more plastic propellers like the one shown here.



HELICOPTER B/C

Team Checklist – 2025

Rank: _____
Tier: _____
Final Score: _____

Team Number: _____ School & Team Name: _____

Student Names: _____

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

Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first during flight.
T	F	T	F	3.g.	Total mass of the aircraft, excluding the rubber motor(s), is 4.00 g or more.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.

This precludes any sort of electrical power. Motors must be removed to mass the helicopter, per a previous slide. Perhaps less obvious is the fact that this item disallows just dropping a helicopter and allowing it to fall to the ground, say in a situation where something is broken and the rotors do not spin, or the rubber cannot be mounted for some reason.

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

T F T F 3.l. Aircraft are labeled so the Event Supervisor can easily identify to which team it belongs.

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)

1. T F 2. T F DEVICE MEETS ALL CONSTRUCTION AND COMPETITION PARAMETERS ABOVE.

FLIGHT-DESIGN LOG

3. Is the Flight Log complete, incomplete, or not present?

Complete (20% bonus) **Partial** (10% bonus) **Not present**

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
4. A B	8. A B	Which helicopter from above was used?
5. ____:_____.___	9. ____:_____.___	Timer 1
6. ____:_____.___	10. ____:_____.___	Timer 2 ← Flight Times (minutes:seconds)
7. ____:_____.___	11. ____:_____.___	Timer 3

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

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

T F T F 3.l. Aircraft are labeled so the Event Supervisor can easily identify to which team it belongs.

T F T F 5.b. Participants do not receive outside assistance, materials, or communication once they enter the cordoned off competition area to practice, to trim, for inspection, or to

This can be easily satisfied by simply writing the team name on the fuselage, but it is surprising how many teams fail to do so. As this is a construction rule, the penalty is quite severe, and will score them in Tier 2.

Consequently, it is recommended that you allow students to label their helicopter at check-in, particularly if you are supervising at an invitational or lower level tournament. However, if you allow this, it is also recommended that you stress to the students the importance of reading the rules, as the failure to do so may result in a tier 2 penalty at a future competition.

1. T

FLI

3. Is

1ST

4.

5. ____:_____.___ 9. ____:_____.___ Timer 1

6. ____:_____.___ 10. ____:_____.___ Timer 2 ← Flight Times *(minutes:seconds)*

7. ____:_____.___ 11. ____:_____.___ Timer 3

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

Only the competing students should be in the inspection and flying area.

T F T F 3.l. Aircraft are labeled so the Event Supervisor can easily identify to which team it belongs.

T	F	T	F	5.b.	Participants do not receive outside assistance, materials, or communication once they enter the cordoned off competition area to practice, to trim, for inspection, or to compete.
T	F	T	F	5.e.ix.	Participants do not steer the helicopter during flight.
T	F	T	F	5.e.x.	Students are on the floor to launch and do not use aids to increase launch height.

1. T F 2. T F DEVICE MEETS ALL CONSTRUCTION AND COMPETITION PARAMETERS ABOVE.

FLIGHT-DESIGN LOG

No outside coaching is permitted. 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.

5. ____:_____.___	9. ____:_____.___	Timer 1
6. ____:_____.___	10. ____:_____.___	Timer 2
7. ____:_____.___	11. ____:_____.___	Timer 3

← Flight Times *(minutes:seconds)*

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

T	F	T	F	3.k.	Students are able to answer questions regarding the design, construction, and operation of the device per the Building Policy found on www.soinc.org
T	F	T	F	3.l.	Aircraft are labeled so the Event Supervisor can easily identify to which team it belongs.
T	F	T	F	5.b.	Participants do not receive outside assistance, materials, or communication once they enter the cordoned off competition area to practice, to trim, for inspection, or to compete.
T	F	T	F	5.e.ix.	Participants do not steer the helicopter during flight.
T	F	T	F	5.e.x.	Students are on the floor to launch and do not use aids to increase launch height.
1. T	**F**	**2. T**	**F**		**DEVICE MEETS ALL CONSTRUCTION AND COMPETITION PARAMETERS ABOVE.**

FLIGHT-DESIGN LOG

The three items pertaining to rule 5 can generally only be determined when the helicopters are flown, so you should make sure that your timers are aware of them. As for line item 1., it is recommended that you answer T unless a helicopter has violated one of the construction rules. The T can be changed to a F later if the timers indicate that a rule 5 violation has occurred.

6. ____:_____.___ 10. ____:_____.___ Timer 2 ← Flight Times *(minutes:seconds)*

7. ____:_____.___ 11. ____:_____.___ Timer 3

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

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

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.

T	F	T	F	5.e.ix. Participants do not steer the helicopter during flight.
T	F	T	F	5.e.x. Students are on the floor to launch and do not use aids to increase launch height.
1. T	F	2. T	F	DEVICE MEETS ALL CONSTRUCTION AND COMPETITION PARAMETERS ABOVE.

FLIGHT-DESIGN LOG

3. Is the Flight Log complete, incomplete, or not present?

Complete (20% bonus) **Partial** (10% bonus) **Not present**

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)	
4. A B	8. A B	Which helicopter from above was used?	
5. ____:_____.___	9. ____:_____.___	Timer 1	← Flight Times *(minutes:seconds)*
6. ____:_____.___	10. ____:_____.___	Timer 2	
7. ____:_____.___	11. ____:_____.___	Timer 3	
12. T F	General Rule: The team is disqualified. (Notify the team and their coach as soon as possible.)		

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

Line item 4 indicates which helicopter was flown, if the team has two. If only one helicopter was inspected, or if both passed inspection (T on line item 1.), it is recommended that you circle "A" for both flights.

In the rare case that one helicopter passed and the other did not (a tier 2 violation), it is most likely that the students will opt to fly the former rather than the latter. However, this is something to make the timers aware of if it does happen.

FLIGHT-DESIGN LOG

3. Is the Flight Log complete, incomplete, or not present?
Complete (20% bonus) Partial (10% bonus) Not present

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
4. A B	8. A B	Which helicopter from above was used?
5. ____:_____.___	9. ____:_____.___	Timer 1
6. ____:_____.___	10. ____:_____.___	Timer 2 ← Flight Times (minutes:seconds)
7. ____:_____.___	11. ____:_____.___	Timer 3

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

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

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 had a similar problem.

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.

Complete (20% bonus) Partial (10% bonus) Not present

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

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

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

T	F	T	F	3.k.	Students are able to answer questions regarding the design, construction, and operation of the device per the Building Policy found on www.soinc.org
T	F	T	F	3.l.	Aircraft are labeled so the Event Supervisor can easily identify to which team it belongs.
T	F	T	F	5.b.	Participants do not receive outside assistance, materials, or communication once they enter the cordoned off competition area to practice, to trim, for inspection, or to compete.
T	F	T	F	5.e.ix.	Participants do not steer the helicopter during flight.
T	F	T	F	5.e.x.	Students are on the floor to launch and do not use aids to increase launch height.

1. T F **2. T F** **DEVICE MEETS ALL CONSTRUCTION AND COMPETITION PARAMETERS ABOVE.**

FLIGHT-DESIGN LOG

3. Is the Flight Log complete, incomplete, or not present?

Complete (20% bonus) **Partial** (10% bonus) **Not present**

1ST FLIGHT	2ND FLIGHT	← OFFICIAL FLIGHTS (IN 10 MIN.)
4. A B	8. A B	Which helicopter from above was used?
5.		
6.		
7. ____:_____.___	11. ____:_____.___	Timer 3

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

12. 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: _____

HELI A		HELI B		← CHECK-IN (UP TO 2 HELICOPTERS)	
Construction & Competition 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.	A flat balsa wood disc, large enough to cover a dime, is the upper most part of the helicopter, the part that would touch a flat ceiling first during flight.
T	F	T	F	3.c.	Boron filaments are not used in the construction of the aircraft or box.
T	F	T	F	3.d.	The aircraft in its flight configuration & during flight fit into a team-provided rectangular box of at most 32.0 cm x 24.0 cm x 47.0 cm in each dimension.
T	F	T	F	3.e.	No change in chord, span, length, or total lifting area can occur 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 aircraft, excluding the rubber motor(s), is 4.00 g or more.
T	F	T	F	3.h.	Rotors are constructed by the participants. Commercially available rotors or propellers are not used in whole or part. Commercial rotor thrust bearings may be used.
T	F	T	F	3.i.	The helicopter is powered by rubber motor(s). Motor(s) must be removable for check-in.