Timing Helicopter Flights

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 organizing their timing team(s). 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.

We will start with an explanation of timing related rules, and follow that with a day-of-tournament checklist that you can use as a reference.

e. Flight Period:

i. The 10-minute Flight Period begins when the Event Supervisor returns the motor(s) to the team.

When the timers are ready to time the next team, they should retrieve that team's checklist and impounded motors from the queue in the inspection area. Call that team to the flying area, explain that their 10 minute flight window will start when the motors are returned, and return them, starting a 10 minute interval timer as you do so. (You can also alert the next team in the queue that they are "on deck".)

Some teams may have a table and/or winding gear that they want to set up prior to starting their window. If the facilities permit, you can allow on-deck teams to set up prior to flying. If space is too limited for this, please allow teams a reasonable amount of time to set up their equipment.

e. Flight Period:

i. The 10-minute Flight Period begins when the Event Supervisor returns the motor(s) to the team.

ii. Any flight beginning within the 10-minute Flight Period will be permitted to fly to completion.

iii. Participants may make adjustments/repairs/trim flights during their official Flight Period.

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If a “official” flight is released before the 10 minute window ends, it should be timed and the result counted toward the team’s score.

v.

vi. Teams may make up to a total of 2 official flights using 1 or 2 helicopters.

vii. Time aloft for each flight starts when the helicopter leaves the participant’s hand and stops when any part of the helicopter touches the floor, the lifting surfaces no longer support the weight of the helicopter (such as the helicopter landing on a girder or basketball hoop) or the Event Supervisors otherwise determine the flight to be over.

viii. Event Supervisors are strongly encouraged to utilize three (3) timers on all flights. The median flight time in seconds to the precision of the device used is the official time aloft.

ix. Participants must not steer the helicopter during flight.

x. Students must be on the floor to launch and must not use artificial aids to increase launch height.

xi. In the unlikely event of a collision with another helicopter, a team may elect a re-flight. The decision to re-fly may be made after the helicopter lands. Timers are allowed to delay a launch to avoid a possible collision. The 10-minute Flight Period does not apply to such a flight.

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i. The 10-minute Flight Period begins when the Event Supervisor returns the motor(s) to the team.

ii. Any flight beginning within the 10-minute Flight Period will be permitted to fly to completion.

iii. Participants may make adjustments/repairs/trim flights during their official Flight Period.

iv. Before each launch, participants must indicate to the Timers whether a flight is an official flight or a trim flight. A flight is considered official if a team fails to notify the Timer(s) of the flight's status.

v. Teams must not be given extra time to recover or repair their helicopter.

vi. Teams may make up to a total of 2 official flights using 1 or 2 helicopters.

vii. Time aloft for each flight starts when the helicopter leaves the participant's hand and stops when

They may make repairs if they have the necessary materials and supplies with them, but may not leave the competition area to get them. While repairs are made, the 10 minute timer keeps running.

Trim flights are made to check some aspect of how the flight is adjusted or wound, but do not count toward the official score.

Recovery refers to helicopters that become stuck on obstructions in the flight venue. (Do we need to say something about exceptions to the no time for recovery if the ES is assigned a particularly nasty flight area?)

Part iv is pretty self-explanatory. A team is finished flying upon the culmination of their second official flight, or the end of the 10 minute window, **unless the window ends during an official flight, per part ii**.

iv. Before each launch, participants must indicate to the Timers whether a flight is an official flight or a trim flight. A flight is considered official if a team fails to notify the Timer(s) of the flight's status.

vi. Teams may make up to a total of 2 official flights using 1 or 2 helicopters.

There is no limit to the number of trim flights that may be made, but **a trim flight may not be retroactively declared as official** if the flight window ends with only one official flight.

If two helicopters were checked in, they may be used interchangeably for both trim and official flights. The only reason to distinguish between different helicopters is if one meets construction rules and the other does not.

Periodically remind the team as to how much of their 10 minutes is remaining, particularly near the end. Teams will often ask for this information

e. Flight Period:

Some teams will want to countdown: “3-2-1 launch” or similar. Ok if they do this, but as the rules say, start timing when it leaves their hand.

Touching the wall does not stop the flight.

v. Teams must not be given extra time to recover or repair their helicopter.
vi. Teams may make up to a total of 2 official flights using 1 or 2 helicopters.
vii. Time aloft for each flight starts when the helicopter leaves the participant’s hand and stops when any part of the helicopter touches the floor, the lifting surfaces no longer support the weight of the helicopter (such as the helicopter landing on a girder or basketball hoop) or the Event Supervisors otherwise determine the flight to be over.
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ix. Participants must not steer the helicopter during flight.
x. Students must be on the floor to launch and must not use artificial aids to increase launch height.
xi. In the unlikely event of a collision with another helicopter, a team may elect a re-flight. The decision to re-fly may be made after the helicopter lands. Timers are allowed to delay a launch to avoid a possible collision. The 10-minute Flight Period does not apply to such a flight.

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i. The 10-minute Flight Period begins when the Event Supervisor returns the motor(s) to the team.

ii. Any flight beginning within the 10-minute Flight Period will be permitted to fly to completion

Yes, three timers is ideal, but you may not be assigned enough volunteers to do this. If you are shorthanded, and have only two timers, use the longer of the two times. If you do have three timers, but one of them knows that their time is incorrect (started or ended timing too early or too late, etc.), you can use the longer of the two remaining times.

any part of the helicopter touches the floor, the lifting surfaces no longer support the weight of the helicopter (such as the helicopter landing on a girder or basketball hoop) or the Event Supervisors otherwise determine the flight to be over.

viii. Event Supervisors are strongly encouraged to utilize three (3) timers on all flights. The median flight time in seconds to the precision of the device used is the official time aloft.

ix. Participants must not steer the helicopter during flight.

x. Students must be on the floor to launch and must not use artificial aids to increase launch height.

Flight times are recorded in the spots at the bottom of the checklist. The only time that it matters which helicopter was flown (if they have two) is if one passed inspection but the other had a construction violation.

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   i. The 10-minute Flight Period begins when the Event Supervisor returns the motor(s) to the team.
   ii. Any flight beginning within the 10-minute Flight Period will be permitted to fly to completion.

Steering happens if the students make contact with the helicopter to change its position or direction of flight after it is released. This is not permitted.

(Choosing a particular launch position within the flying venue is permitted, as long as the person who releases the helicopter has their feet on the ground, per part x.

   otherwise determine the flight to be over.
   viii. Event Supervisors are strongly encouraged to utilize three (3) timers on all flights. The median flight time in seconds to the precision of the device used is the official time aloft.
   ix. Participants must not steer the helicopter during flight.
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   v. Teams must not be given extra time to recover or repair their helicopter.
   vi. Teams may make up to a total of 2 official flights using 1 or 2 helicopters.

This would only happen if a large number of teams causes there to be two teams flying with overlapping flight windows. As the rule says, if there is a collision, we encourage you to allow a re-flight if either helicopter was making an official flight when the collision occurred.

   ix. Participants must not steer the helicopter during flight.
   x. Students must be on the floor to launch and must not use artificial aids to increase launch height.
   xi. In the unlikely event of a collision with another helicopter, a team may elect a re-flight. The decision to re-fly may be made after the helicopter lands. Timers are allowed to delay a launch to avoid a possible collision. The 10-minute Flight Period does not apply to such a flight.

g. The Event Supervisor will verify with the team the data being recorded on their scoresheet.
h. Teams filing an appeal must leave their helicopter(s), Measurement Box(es), motor(s), and Flight Log in the event area.

When a team is finished flying, either because their second official flight has ended, the 10 minute window has expired, or they declare that they are finished, either the ES or one of the timers should share the results on other checklist with the students, and ask one of them to sign the sheet to confirm this. A good place for this is the line labeled “Student Names” near the top.

In the fairly uncommon case of a penalty that the students wish to appeal, part h. dictates that all of their materials must stay with you until a written appeal is resolved.

Helicopter Timing Procedure:

1. Return impounded motors to team X, start 10 minute window timer, notify next team that they are on-deck.

2. Before each flight, ask if official or trim. Time to completion if launched before 10 minute window expires.

3. Record times for official flights only on checklist, to precision of timing device. (eg. Usually 0.01 s for digital stopwatch)

4. Periodically, remind teams of time remaining in their 10 minute window.

5. A team's flying is over at the culmination of their second official flight, expiration of the 10 minute window, or by declaration of the students.

6. Before they leave, show students the information on their checklist, and ask them to sign at the top to acknowledge that they have seen it.

7. Return completed and signed checklist to ES for data entry.