

Burnaby Lake Flyers Association

Local Helicopter “Blades” Program

Last revised: 2011-10-12

Contents

1. Purpose.....	2
2. Other Documents Included by Reference	2
3. New Pilots.....	2
3.1 Initial Contact and Rules/Advice	2
4. Other Helicopter Advice.....	4
5. Certification of Helicopter Pilots and Instructors.....	5
5.1 Beginner Heli Pilots Qualifying for Burnaby Lake Flyers “BLF Heli1” Proficiency Level	5
5.2 BLF Heli1 Test and Priveledges.....	5
5.3 BLF Heli2 Test and Priveledges.....	5
5.4 Instructors	6
5.5 Existing Heli Pilots.....	6
5.6 Visiting Heli Pilots	6
6. Helicopter Manoeuvring Area and Procedures.....	7
6.1 Introduction to Helicopter Field Procedures.....	7
6.2 Field Layout When In 3D Field Mode	7
6.3 Aircraft/Heli Pilot Cooperation.....	9
7. Pre-Instruction Waiver	10
8. Burnaby Lake Flyers (BLF) “Heli1” Proficiency Test Report.....	11

1. Purpose

- The purpose of the Burnaby Lake Flyers (BLF) heli program/qualification is to promote safety for both RC models and people at the flying field, and to enable safe and efficient cooperation between RC electric aircraft and electric helicopters.
- This document thus sets out certain procedures and qualifications for helicopter pilots. Beginner helicopter pilots are not allowed to fly at the Burnaby Lake Flyer's flying site without being supervised by a certified Burnaby heli instructor or club executive member.
- It also specifies (by reference to the Model Aeronautics Association of Canada (MAAC) "Blades" program and the Hoods-Up Flyer's "Wings" program) certain knowledge, exercises, procedures, and proficiency levels (BLF Heli1 and BLF Heli2) that must be followed in order to fly helicopters at the Burnaby Lake Flyers field.

2. Other Documents Included by Reference

- This document does not attempt to reproduce information published elsewhere by Burnaby Lake Flyers and Model Aeronautics Association of Canada (MAAC).
- In particular, all local rules and field procedures for aircraft are to be respected by RC helicopter pilots. In particular :
 - Compulsory membership in MAAC (one reason of which is to obtain liability insurance for yourself and thus indirectly for the Burnaby municipality).
 - The compulsory use of the frequency board (your card displayed proves you are a member of the club).
 - Requirement to respect the field schedule and schedule rules from the Burnaby municipality as published at: <http://www.hoods-up.com/index.php?id=field-schedule>
 - Compulsory public warning sign deployment.
- The documents to refer to are:
 - Club rules: <http://www.hoods-up.com/index.php?id=rules>
 - The MAAC "Blades" program, which this document uses by reference. From the MAAC home page, choose Committees > RC > RC Heli > View Committee Documents > MAAC Heli Blade Program, or go directly to http://www.maac.ca/docs/2010/rc_heli_blades_prgm_w7.pdf
 - Those parts of the Burnaby Flyers aircraft "Wings" program that are not aircraft specific. It is downloadable from: <http://www.hoods-up.com/index.php?id=wings-program>
 - And by inference the MAAC aircraft "Wings" program downloadable from the MAAC home page by choosing Library > Forms and Documents > Documents > Wings Program, or directly via http://www.maac.ca/docs/2006/doc_wings_program_e.pdf

3. New Pilots

3.1 Initial Contact and Rules/Advice

New helicopter pilots should become thoroughly familiar with the Burnaby Lake Flyers web site content at <http://www.hoods-up.com>.

You must first join the Model Aeronautics Association of Canada (MAAC). You cannot fly at our field without MAAC membership.

You should then contact a member of the club executive and/or show up at the field on a day when other pilots are around, and ask if there is an executive in attendance. Tell the executive that you want to join the club, or if you are already a member, that you want to start flying helis. The executive will point you to this document, and try to put you in contact with a helicopter instructor in the club.

You must not attempt to fly a helicopter at the BLF field alone without both being a member of the club, and having been tested/certified to the Burnaby Lakes Flyers "BLF Heli1" level (which is similar to the MAAC "Blades" Intermediate level). For reasons of safety, Burnaby Lake Flyers does not recognize a level like the lower MAAC "Blades" Beginner Level.

Thence, please read this document completely. In particular:

- Read all the above mentioned reference material.
- Contact an instructor to get advice on other instructional items to read, what helicopter might be best to buy, and perhaps get help on assembling your helicopter (though the latter is generally your responsibility). It is suggested, but not required, that you buy a transmitter that allows connecting to your instructor's brand's transmitter via a "trainer cord" (sometimes called 'buddy cord' or 'buddy boxing'. The trainer cord socket also allows you to use that transmitter on computer RC flight simulators without buying another trainer box.
- You should equip your helicopter with wide-stance training landing gear ("training gear"). Consult your instructor and a local model shop. Also this Google Search brought up several links that will have pictures, etc.
<http://www.google.ca/search?q=%22RC+Helicopter%22+%22training+gear%22&hl=en&num=10&lr=&ft=i&cr=&safe=images&tbs=>
- It is advised also to buy a model helicopter training simulator for your home computer. Though these may cost \$20 -\$200, they will save you at least their cost in prevented crash damage of your model. You can consider buying a lesser expensive one that does not come with a transmitter-like case, as long as your brand of simulator can be used with your trainer-cord-capable transmitter.
- Learn from your instructor, and the above referred-to documentation, the local field heli *and aircraft* procedures.
- Try to agree with an instructor on days that you will mutually be able to show up and undergo instruction.
- Do not attempt to fly your helicopter without having an instructor first inspect the build and set-up of your helicopter and transmitter. Both are important and relative complex.
 - Initially, make sure that your transmitter normal mode shuts off the motor when the left stick is lowered.
 - If possible on your transmitter (typically the throttle hold switch setting) make sure there is an additional way to prevent the motor from starting.

After training under a Burnaby Lake Flyers heli instructor, progressing roughly according to the MAAC Blades program, get tested/certified to the Burnaby Lake Flyers "BLF Heli1" level as described further below, before doing any unsupervised flying (including even simply hover practice).

Be sure a signed copy of your "BLF Heli1" proficiency test report is forwarded by your instructor to the club executive.

You should get a second copy (or photograph it with your cell/camera) to have in your possession at all times while at the flying field.

Having achieved the BLF Heli1 accreditation, it is strongly recommended that you continue to work with an instructor or other heli pilot while progressing towards the BLF Heli2 proficiency tests and privileges.

4. Other Helicopter Advice

Before start up:

- Helicopters should generally not, and those with 5S LiPo batteries should never be connected to their flight batteries in the pit area behind the line of pilot flight stations.
- Before moving your Throttle Hold switch to off, be sure your transmitter Mode Switch (if your transmitter is so equipped) is in the normal mode, and the throttle stick is down/off.

Some hints:

- Spend your first dozen or two flights “tail in”. That is, with the tail toward you and the nose of the helicopter facing away from you.
- Initially you will want to keep the heli pretty low, say 1 foot of altitude. In case of the heli wandering, this allows you to lower the collective/throttle stick and immediately land and shut the motor off before endangering others.
- However, if you don’t keep your heli *at least* 1 foot off the ground after your first few flights, you risk the heli tripping on its own landing gear during lateral motion.
 - That said, if there is any danger to others, you must drop your heli to the ground to prevent it getting near anyone. You will have a number of crashes with your heli as you learn, just from unskilled hands. A crash of your heli to prevent injury to others or other aircraft will be the least of your challenges.
- Highly visible heli colouring is extremely important for orientation. We highly recommend a florescent body colour (very good is florescent “red-orange”). We also highly recommend removing small black horizontal and vertical rear stabilizers. They should be replaced with simple RC plywood ones that are large, solid, and florescent (except for the bottom of the horizontal stabilizer which should be black). Another possibility for the horizontal stabilizer is white on top and black on the bottom.

5. Certification of Helicopter Pilots and Instructors

Burnaby Lake Flyers currently recognizes only two levels of certification. They are called Burnaby Lake Flyers “BLF Heli1” and “BLF Heli2” levels.

5.1 Beginner Heli Pilots Qualifying for Burnaby Lake Flyers “BLF Heli1” Proficiency Level

For beginners to qualify to fly without an instructor’s supervision at the Burnaby Lake Flyers site, you must:

- pre-attest in writing that you have read this document, and
- sign an instructor waiver, and
- pass a Burnaby Lake Flyers “BLF Heli1” flight proficiency test.

Extended landing gear (“training gear”) is not permitted for the test.

No add-on autopilot equipment that will level the helicopter with reference to the ground is permitted for the test, except under the following conditions:

- Many small coaxial helicopters or 4-rotor quadcopters have an auto-leveling feature. Though these may be used for training and the test, the pilot will then only be qualified to fly auto-leveling helicopters at our field.
- If a flybarless helicopter is used, any auto-leveling feature (these are rare) of its stabilizing electronics must be turned off.

(Note: Auto-leveling systems are not recommended in general for training. They wrongly teach students to hold cyclic deflected to do continuous forward or sideways flight, or a banked turn. Later when the student abandons the autopilot, he or she then tends to tip the helicopter right over by holding the cyclic deflected.)

The flight proficiency examiner(s) must be:

- a club heli instructor or
- a club executive member.

5.2 BLF Heli1 Test and Priveledges

- To pass the Burnaby Lake Flyers “BLF Heli1” proficiency test you must be able to perform the manoeuvres described in the first half of the attached Section 8 “Burnaby Lake Flyers (BLF) “Heli1” Proficiency Test Report” form.
- You can thence fly in the Heli area only, but need not be supervised any more.
- It’s suggested that you keep below 10 meters of altitude when practicing alone in the Heli area, so that any unintended excursions will likely be confined to 45 degree downward cone area from that low altitude.

5.3 BLF Heli2 Test and Priveledges

- To pass the BLF Heli2 proficiency test, you must have previously demonstrated the BLF Heli1 manoeuvres mentioned above. Plus you must pass the BLF Heli2 procedures described in the attached Section 8 titled “Burnaby Lake Flyers (BLF) Heli Proficiency Test Report”.
- You can thence fly without restriction in the heli area when the field is in 3D mode.

- You can fly in the abbreviated aircraft circuit area when there are no other airplanes flying.

5.4 Instructors

Instructors are appointed by the club.

Burnaby Lake Flyers is not instituting an extensive helicopter program leading from beginner to qualification of extreme aerobatic pilots. Therefore Club instructors must simply be knowledgeable, competent RC helicopter pilots that are recognized by the club and recorded in the club records. Their purpose is to:

- advise students on the trade-offs in choices of helicopters and transmitters (including brands needed for buddy box capable transmitter),
- teach new helicopter pilots about procedures, rules, reading resources, and safety,
- check student's helicopter assembly and initial heli/transmitter setup,
- supervise students during training flights, possibly including use of a trainer/buddy cord system, on basic control and manoeuvring, and
- conduct proficiency tests of the "BLF Heli1" and "BLF Heli2" manoeuvres.

As a result, heli instructors should be knowledgeable on club rules, heli and transmitter (and buddy box) setup, competent circuit flight, and recovery from mildly unusual flight attitudes.

The club will appoint heli instructors based on criteria they feel is appropriate for the above listed purposes. This will include a verbal evaluation regarding Burnaby Lake Flyers aircraft/heli field procedures and safety, and a flight test to at least the BLF Heli2 level that is witnessed by two key persons:

- a club heli instructor and a club executive member, or
- two club instructors, or
- two club executives, or
- one club executive member and one MAAC expert/representative appointed by the club executive.

The club will keep a list of appointed helicopter instructors.

5.5 Existing Heli Pilots

Competent heli pilots already within the club wanting to be certified for solo flying must attest in writing that they have read this entire document and the referenced documents, and must pass the Burnaby Lake Flyers "BLF Heli1" or "BLF Heli2" flight test.

5.6 Visiting Heli Pilots

Heli pilots visiting from other clubs, perhaps for a club event, must be advised of club heli field procedures and demonstrate the BLF Heli1 or Heli2 proficiency manoeuvres, depending on whether they just want to do simple hovering, or more, respectively.

In the interest of expediency at a busy club event/contest, this test may be administered by a single responsible person listed below:

- A club heli instructor.
- A club executive member.
- A person appointed by an executive member or club heli instructor.

6. Helicopter Manoeuvring Area and Procedures

Helicopters can fly in significantly different ways than aircraft. They can hover and back up, and they often spend considerable time hovering. Hovering, if done at the aircraft pilot positions, ties up the main aircraft runway area. In addition, helicopters can do so-called “3-dimensional” (3D) manoeuvres in ways even more extreme than 3D-capable aircraft.

The purpose of this section is to describe the field procedures and areas to be used when helicopters are flying at the Burnaby Lake Flyer’s field. When helicopters are flying, the aircraft circuit should be abbreviated to the north, to separate helicopters and aircraft flying styles.

6.1 Introduction to Helicopter Field Procedures

Burnaby Lake Flyers has two field modes, called “Circuit” and “3D”. Which mode the field is in is depicted by a field sign between the aircraft and heli areas that shows (on both sides) either “C” or “3D”.

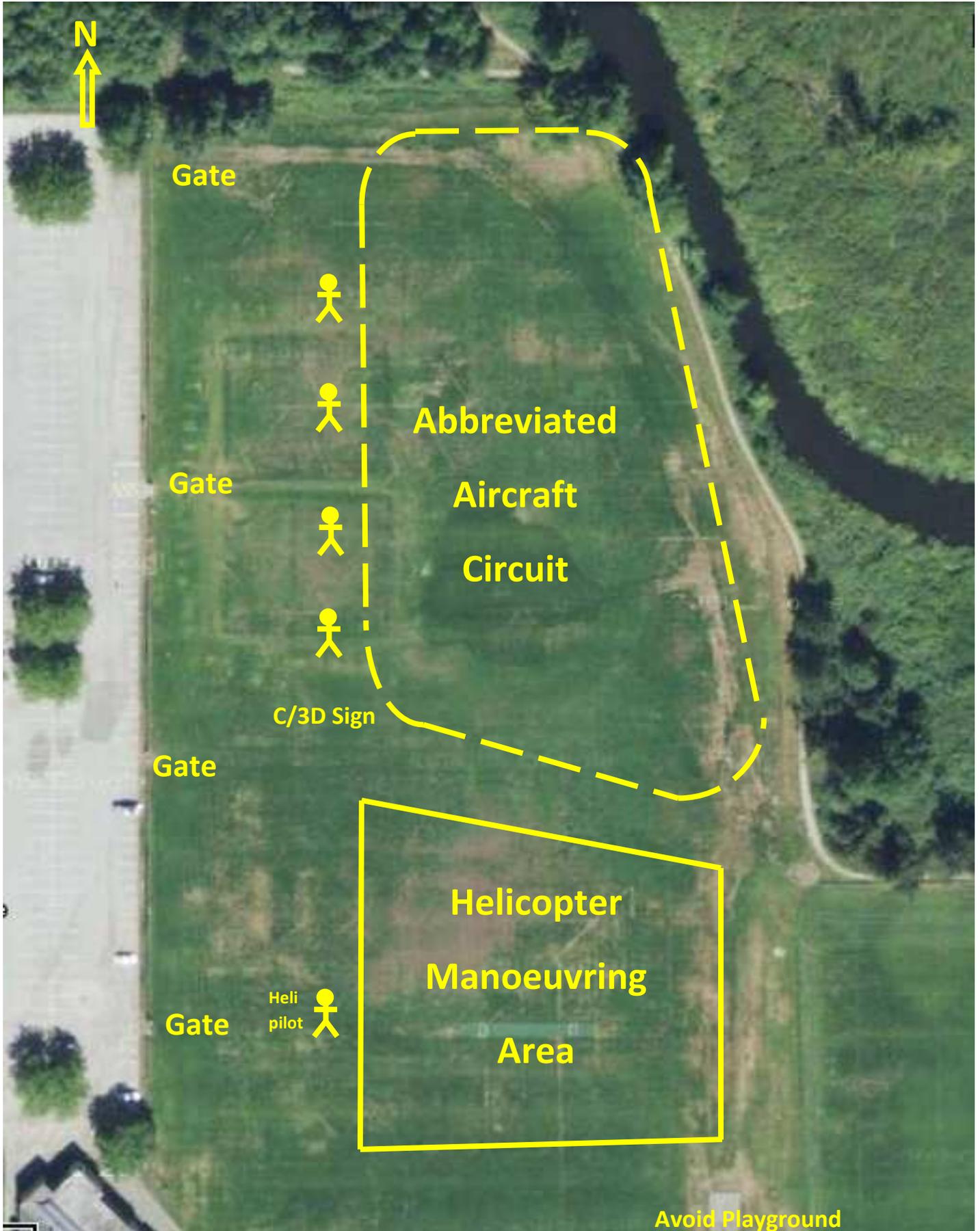
- In circuit (“C”) mode, a normal large rectangular aircraft pattern is in effect. No helicopter flying is allowed, except in the rare case that there are no aircraft in the circuit and the heli pilot has gotten the general agreement from other aircraft pilots.
- In “3D” mode, the field is broken into two parts, as shown in the diagram further below.
 - In the North part is an abbreviated aircraft circuit. Only aircraft are allowed in this area
 - No helicopters are allowed in this abbreviated north circuit (unless, as previously mentioned, no aircraft are using the circuit and the heli pilot has gotten the general agreement of the aircraft pilots present).
 - In the South part, and only when the mode sign is set to 3D, helicopters are allowed to fly. All manoeuvres are permitted for those holding BLF Heli2 qualifications. Heli pilots must ensure they stay within the bounds of the helicopter area.

To switch field modes, a pilot (heli or aircraft) should consult the opposite group before yelling in a very loud voice for example “Switching to 3D field mode; please move the aircraft circuit to the north”. More information on cooperation is provided below the diagram in the next section.

6.2 Field Layout When In 3D Field Mode

When helicopters will be doing hovering, novice heli training, and 3D manoeuvres, they shall do so from the southern part of the flying field as shown in the area designated “Helicopter Manoeuvring Area” below.

This area is large enough for hover testing of all sorts, hover training to various target points, hover training doing small horizontal figure 8’s, and 3D manoeuvres.



6.3 Aircraft/Heli Pilot Cooperation

As mentioned above, to switch to/from 3D field mode a pilot (heli or aircraft) should get general consensus from opposite group.

At the instant of field mode change, the pilot flipping the field mode sign should yell in a very loud voice "Switching to 3D field mode; please move the circuit to the north".

- Aircraft pilots should move their circuit to the abbreviated one shown in the diagram above. (Note the whole concept of the Helicopter Manoeuvring Area and procedures needs to be added to the written club aircraft rules and procedures.) In particular, southbound aircraft take offs should start from the very, very north end of the field so that the abbreviated circuit can be respected and still clear the trees at the south east corner. Don't be lazy; walk or taxi your aircraft well to the north to start your takeoff.
- Southbound aircraft landings should come in low over the north trees, so as to absolutely be down before rolling under the helicopter manoeuvring area. If it doesn't look like this is possible, a go-around to the east should be initiated *early* so that a turn made to the east can be made to avoid the heli area.
- Northbound aircraft take offs should start from as far south as is necessary, but not from within the Helicopter Manoeuvring Area when it is in use.
- Northbound aircraft landings should be made from the southeast so as to avoid the Helicopter Manoeuvring Area when it is in use.

Aircraft pilots should announce their intentions as normal, in particular always directing a loud announcement southward. However, aircraft pilots should be aware that due to the noise of a loud heli hovering close to the heli pilot, he may not hear announcements from the aircraft pilot stations.

Note: If there are no airplanes in the circuit, and a heli is flying in the aircraft circuit area with consensus agreement from the aircraft pilots, the heli pilot should:

- Please fly from the south-most aircraft pilot station shown.
- Please do not land or take off the heli from anywhere near the pilot flightline. Call "On the field", walk at least 15 meters out, walk back and then take the helicopter up. When landing, please land 15 meters out, then walk to retrieve your helicopter.

7. Pre-Instruction Waiver

The student hereby acknowledges that he is a novice RC model heli pilot, and that first flights of a newly-built or newly-modified helicopter is most safely conducted by a more experienced RC heli pilot.

That said, the Burnaby Lake Flyers model club and its instructors accept no liability regarding any resultant crashes and expenses when a student allows an instructor to do the flying. The instructors are volunteers who may be simply offering to do the first, or a post-modification flight to reduce the likelihood of difficulties. For example, to trim or do other set up of the helicopter or the transmitter to make it easier for the student to then control his/her helicopter. The instructor cannot accept any liability for the mis-assembly of the helicopter, the quality of the helicopter in general, nor not being able to recover successfully from all flight eventualities.

Further, the training of RC model helicopter pilots, for safety of persons and of the helicopter generally, takes place at extremely low altitudes (several centimeters to several meters). And even though the instructor may have a connection to the transmitter being used by the student ("buddy cord/box system"), the instructor may not be able to successfully recover from a student mistake with so little altitude. The result may be a crash due to the student's own flying, or the instructor's unsuccessful attempt to recover from a mistake by the student. The liability and cost of such a crash or injury rests solely with the student. The purpose of the Burnaby Lake Flyers heli program is simply to increase safety by the training of students as best as possible in a volunteer organization. In fact, the instructor may have to dump/purposely crash a helicopter that has become out of control and is heading into a dangerous situation.

The student hereby acknowledges the above limitations and waives responsibility for all eventualities from the instructor and the Burnaby Lake Flyers.

Student name (print): _____

Student signature: _____ Date: _____

Witness name (print): _____

Witness signature: _____ Date: _____

8. Burnaby Lake Flyers (BLF) "Heli1" Proficiency Test Report

Candidate Pilot's Name: _____ Member of BLF (Y/N)?: _____

Pilot's email and phone number(s): _____

Type of helicopter: _____ Is it self-levelling (see below)? Yes/No: _____

Self-Leveling: Using a self-levelling heli or quad-copter will only be qualify you to fly a self-leveling heli or quad. A "self-levelling heli" is one which has coaxial rotors, or has a self-leveling autopilot (like an FMA "Co-Pilot" or most quad-copters). In contrast, most flybarless collective pitch helis are electronically stabilized but not self-levelling.

Notes: The use of training landing gear is not permitted. The flight examiner will, while you are flying, verbally request each new manoeuvre, and indicate when it's ok to end it.

BLF Heli1 Manoeuvres	Pass/Fail	Comments (optional)
Lift into tail-in hover and hold for 30 seconds.		
Hover nose 90 degrees right for 30 seconds. Return to tail-in hover.		
Hover nose 90 degrees left for 30 seconds. Return to tail-in hover.		
Fly two complete horizontal figure-8s holding a steady altitude and in a manner turning always away from the pilot. Return to tail-in hover. Land and Disarm.		

The Examiner may ask the candidate to repeat a maneuver, either to see if you can do it consistently, or to see if you can correct a weakness. Generally you will only be given one extra try; after than you must wait a week before re-taking the whole test. The Examiner's judgement is considered final.

BLF Heli2 Manoeuvres	Pass/Fail	Comments (optional)
Demonstrate nose-in hover for 30 seconds.		
Demonstrate two complete horizontal figure 8s turning toward the pilot.		
Do a couple of large high circuits to the right.		
Do a couple of large high circuits to the left. Land and Disarm.		

Primary Examiner name (print): _____ Type of Witness (instructor/executive): _____

Witness #1 signature: _____ Date: _____

Second Examiner (optional):

Witness #2 name (print): _____ Type of Witness (instructor/executive): _____

Witness #2 signature: _____ Date: _____