

# **St. John's R/C Flyers Club Handbook**



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## **INTRODUCTION**

This handbook has been prepared for the members of the St. John's R/C Flyers to serve as a guide and a reference manual for club operations. The information contained within these pages has been gathered from the minutes of club meetings and from documents published by the Model Aeronautics Association of Canada.

This handbook should prove especially valuable to new members who will now have all relevant club information available to them in one document. We hope this handbook will be of value to all members and your comments regarding changes and/or additions are welcomed. In order to keep revisions to the manual to a minimum, this document contains links to information that may change from time to time and is maintained on the club website. For the benefit of those reading a paper copy of this guide, the links are shown with the full address.

To view the current executive, go to: <http://www.sjrcf.com/contacts.htm>

## **History of the St. John's R/C Flyers**

The St. John's R/C Flyers was originally formed as the Newfoundland R/C Model Association and the first meeting was held on September 24, 1975. The original club objectives (as recorded in the minutes of the first meeting) were "to help and encourage members to build and fly model aircraft thereby enhancing enjoyment of the hobby". The purpose of the club today is basically the same as it was then - to bring together those interested in model aviation so as to better enjoy the hobby, learn from each other and to secure a flying site.

A few months later in June 1976 the club changed its name to The R/C Model Association of Newfoundland (R/CMAN). The reason for the name change at this early point in the club's history is unclear. The club minutes seem to suggest that the abbreviation R/CMAN just looked better!

The first club field was on Kelsey's Hill on the North side of Kenmount Road. The Kelsey family owned this property and they gave permission for the club to use their land free of charge. Although small and rather hilly, this site was enjoyed for several years until the size of the club grew to the point where a larger site became necessary.

In 1977 The R/C Model Association of Nfld. applied for and became a chartered club of the Model Aeronautics Association of Canada (MAAC). This meant that all members were required to be MAAC members and that the club was authorized to collect dues on behalf of MAAC. The club made this move because it felt that it was important for all members to have the liability insurance that is part of MAAC membership and to give the club a sense of being part of a larger national group of enthusiasts.

In 1980 the club again changed its name to "Avalon Radio Modelers". This was done because other groups of R/C modelers were forming clubs in the province and it was felt that the word "Newfoundland" in our name implied that we were representing the province as a whole when, in fact, this was not so. With the word "Avalon" now a part of our name, we felt we had a name that indicated the region of the province we were representing whenever we attended provincial events. The name "Avalon Radio Modelers" lasted until 1992 when it was decided to change to "The St. John's R/C Flyers". The reasoning was that club members attending modeling activities in other parts of Canada were being asked, "Where's Avalon"? The name was changed to let everyone know where we came from. Coincident with the name change a new club crest was designed and printed depicting the aviation history of Newfoundland.

In 1996 Mike Whitelaw redesigned the club crest to the current, more modern design we have today.

In 1997 the club was incorporated. This protects the club's name and helps in any negotiations that we may have in the future over land and other important issues. We are also registered as a non-profit organization.

Throughout the years numerous flying sites were won and lost - Kelseys, Goulds, Crown Land on the TCH, Fowler's Road and Foxtrap. The club presently leases a flying site on the Bauline Line and holds additional flying activities at Bell Island and Harbour Grace.

## **MAAC Affiliation**

St. John's R/C Flyers requires that all flying club members also be members of the Model Aeronautics Association of Canada (MAAC). As a chartered club, The St. John's R/C Flyers is authorized to act as an agent of MAAC by accepting membership fees and dispatching it to MAAC headquarters. In such a case the member is protected by MAAC's liability insurance coverage from the time of membership fee payment to the officers of the chartered club. This eliminates any delay in awaiting a membership card.

## **Meetings**

The St. John's R/C Flyers holds monthly meetings at a designated meeting place on the second Wednesday of each month from October through May. The club's President (<http://www.sjruf.com/contacts.htm>) may call additional meetings at any time to deal with matters deemed by the executive to be of sufficient importance to require a vote by the general membership.

## **Executive Structure**

The executive of The St. John's R/C Flyers is composed of three club officers - President, Secretary and Treasurer. For a list of the current executive, go to: <http://www.sjrjf.com/contacts.htm>

### **President**

- Oversees all activities of the club
- Chairs the club's monthly meetings
- Holds executive meetings to plan and coordinate club activities

### **Treasurer**

- Collects club and MAAC dues
- Keeps records of all club transactions
- Submits all collected MAAC dues to MAAC headquarters
- Presents a current financial report at each monthly meeting
- Prepares a year-end report for presentation at the club's annual general meeting in January of each year

### **Secretary**

- Records the minutes of each meeting of the club
- Reads the prepared minutes at each meeting and notes errors and/or omissions
- Records other information (e.g. students receiving their wings) as required

**The executive reserves the right to appoint members or establish committees to assist in ongoing club activities such as fun-flys, displays, acquiring a new flying site or any other event that the executive feels that extra help will be required. These people will report directly to the club executive.**

## **Election of Officers**

The election of the executive positions takes place during the club's Annual General Meeting in January of each year. At this meeting, the executive steps down and a designated club member conducts the election. Members are then asked for nominations for the three executive positions. At the time of nomination, a member has the opportunity to accept or decline. A secret ballot is then held to determine the winners. Votes are counted and verified by two volunteers from the general membership. There is no limit on the number of terms a member can hold an executive position and any club member can run for office.

## Membership

All *flying* club members must be a current member of MAAC.

The annual fees for membership in The St. John's R/C Flyers is similar to the structure for MAAC.

Dues for open membership is \$45.00/year.

Junior membership is available to those 18 years of age and under at one half the open membership rate (\$22.50).

The rights of membership terminate on December 31st of each year unless dues for the following year have been paid.

**New members** or **former members** (returning after an absence of 5 years or more) enrolling after September 1<sup>st</sup> shall pay 50% of the applicable dues for the remainder of the current year

Persons joining after November 1<sup>st</sup> are credited for membership in the following year and must pay the applicable fees for that year.

Prospective members are welcome to attend up to **three** club meetings prior to formally joining the club. As well, a club instructor will check out and test-fly a prospective member's airplane at the flying field. If the test flight is successful the student will receive one introductory flight at the field. Any further test flights or flight instruction beyond the first flight will only take place when the prospective member has joined the club and MAAC.

## **Jeff Molloy Memorial Trophy**

At the general meeting on October 11, 2000 the membership voted to have a trophy made in memory of Jeff Molloy, a young member who passed away too soon in September 2000. It will be named the "Jeff Molloy Memorial Trophy". The trophy will be given out to the "Member of the Year" as voted by the club membership during the November meeting of each year. In the event of a tie vote, the club executive will vote again to break the tie. The award will be given out at the annual Christmas dinner. In addition to the trophy, the recipient will be given a one-year membership in the club as well as a plaque that he or she may keep. The trophy will remain the property of The St John's R/C Flyers and will be returned to the club executive at the November meeting of the following year. The cost of the trophy and the first 5 plaques was split between the club and The Model Aeronautics Association of Canada.

The member of the year award is open for all club members. It is not intended to be a popularity contest nor is it to acknowledge the best flyer or the member with the most planes.

The recipient will be the person that the majority of club members feel has contributed the most to the club during the past year.

For a list of Recipients, go to: <http://www.sjrctf.com/moty.htm>

# **St. John's R/C Flyers Operating Rules**

**The MAAC safety rules and the MAAC Guidelines for Field Operations are applicable during all club flying activities.**

## **GENERAL RULES AND GUIDELINES**

The following rules and guidelines are applicable to ALL flying activities of the St. John's R/C Flyers. Additional rules may be established during fun-flies, contests or demonstrations.

### **RADIO SYSTEM OPERATION**

1. Do not switch on your radio transmitter for any reason within two km of the flying site unless you have:
  - Checked that your frequency is clear and attached your frequency pin to the matching channel designation on the frequency board.
  - In the absence of a frequency board, checked with all other flyers at the field that your frequency is clear.
2. Always switch off your radio transmitter, collapse the antenna (if applicable) and remove your pin from the board as soon as you complete your flight.
3. Whenever the transmitter impound is in operation, all transmitters are to remain in the impound unless you have a frequency pin on the frequency board.
4. Members will operate radio systems in accordance with manufacturers recommendations and MAAC Safety Code.

## **FLYING SAFETY:**

1. Follow the MAAC Safety Code. <http://www.maac.ca/getDoc.php?docid=210>
2. Flyers of Giant Scale Aircraft must follow MAAC Giant Scale Safety Code. [http://www.maac.ca/docs/2006/giant\\_scale\\_safetycode\\_11.06.pdf](http://www.maac.ca/docs/2006/giant_scale_safetycode_11.06.pdf)
3. Do not fly over the pits at any time. If your airplane accidentally strays towards the pits, shout, "**HEADS UP!**" to warn others.
4. If your engine quits while flying, call out "**DEAD STICK!**" and other flyers will give you landing priority.
5. Abort any takeoff when the airplane veers off course by immediately cutting the throttle.
6. During most club activities, no more than four aircraft are permitted in the air at the same time.
7. Flying alone is a very dangerous activity. If you must fly alone, be at least twice as careful as you would be otherwise.
8. Be sure of ice conditions when flying on a frozen lake or river. Again, it is best not to fly alone. Always have a buddy near by just in case

## **PIT AREA:**

1. Pit operations to be conducted in accordance with MAAC Safety Code (refer to link above).
2. Make sure that no one is standing in your propeller arc and that your plane remains mostly horizontal when the engine is running.
3. Do your engine run-up at the edge of the runway and not in the pits.
4. When starting your engine be sure to direct the propeller blast away from other flyers, airplanes and equipment.
5. Do not taxi your airplane in and out of the pits.
6. When you've finish flying, always leave the pits in a tidy condition.
7. Members are responsible for their guests, children, pets, etc. Ensure they don't wander onto the runway.

## **SITE SPECIFIC RULES AND GUIDELINES**

The St. John's R/C Flyers is currently leasing a field on the Bauline Line from Mr. Cyril Churchill. This field is for the exclusive use of club members and their guests. A **guest** is recognized as anyone who is invited to the field by a current club member or someone who is visiting from outside the local area and wishes to use the field. All guests must have either MAAC or AMA insurance. **Local flyers that are not club members may only use the field as a guest twice per year.** All regular users of the field must be a member of the St. John's R/C Flyers as well as MAAC.

We also fly at the Bell Island Airstrip and the Harbour Grace Airfield. The following guidelines are site specific. The general rules and guidelines for all sites follow.

## **BAULINE**

1. Pilot stations are clearly marked. All flying should occur North of the pilot stations. The housing subdivision should always be at your back
2. Cars should be parked in the designated area away from the pits.
3. All aircraft must be started in the provided starting station unless the size or configuration of the aircraft dictates otherwise.

## **HARBOUR GRACE**

1. The Harbour Grace location is an active runway. Always be on the lookout for full size aircraft and land your model immediately if it looks like a full size aircraft is setting up for an approach or for a low pass over the field.
2. The new highway running along the south side of the runway is now open. The pit and pilot stations are now located on the south side with all flying occurring on the north side towards Lady Lake.
3. The Harbour Grace airstrip is a recognized historic site. Keep it clean.

## **BELL ISLAND**

1. The Bell Island strip is active. Always be on the lookout for approaching or low flying full size aircraft. Land your model immediately whenever full size aircraft are in the vicinity.
2. A **mandatory** call to the St. John's Airport tower at **724-1055** advising that we will be flying at the field is required. If the tower knows we are in the area they will advise any approaching planes to take the appropriate precautions when operating near the Bell Island airstrip.
3. Keep **all** flying to the north side of the runway.

## **Indoor Flying**

1. The St. John's R/C Flyers will be following the indoor guidelines as outlined in the MAAC Safety Code.

## **Helicopter Operations**

When helicopters are operated in conjunction with RC airplanes, the helicopters must be operated within the established circuit at the field. Extended hovering or hovering training must not be done on the active runway unless there are no other aircraft in the air.

## WINGS PROGRAM

This training program has been designed to provide a basic standard of flight instruction and safety. We believe that consistency in the maneuvers being taught and attaining a high level of flying skill, while at the same time keeping interest high, is of prime importance. **This program exceeds the minimum requirements recommended by MAAC for a student to get their “A” level wings.** An outline of the MAAC Wings Program has been added to this manual. For the complete guide, refer to the MAAC website at <http://www.maac.ca/getDoc.php?docid=105> or the SJRCF website at <http://www.sjrcf.com/guides.htm>

This program is divided into **five flight levels** following the initial pre-flight approval.

**Level I:** Is devoted to pre-flight and post-flight procedures including airworthiness, engine starting and tuning, radio range check, and use of the controls and first flight check by the instructor.

**Level II:** Gets the student into the air and concentrates on straight and level flight, shallow turns, racetrack patterns, and slow taxiing.

**Level III:** Sharpens the student skills of Level II maneuvers, steepens the turns to medium-bank turns, high-speed taxiing, slow flight and stall recovery at altitude and at traffic pattern altitudes, and adds loop and roll maneuvers.

**Level IV:** Adds the take-off, and the procedural approach with “No Touchdown”.

**Level V:** Deals with the actual landing, and discussion and practice of forced and crosswind landings.

## PRE-FLIGHT APPROVAL

The choice of aircraft for the beginner is most important. The high-wing tricycle gear design, such as the Sig Kadet LT40 or the Hobbico Nexstar are just a couple of the many suitable trainer aircraft available today. The student should feel free to discuss this with any qualified member, preferably before buying a plane.

Prior to showing up at the field to begin flight training, the student should present his/her aircraft for the initial pre-flight check to any qualified club instructor. This check is to include:

1. CG in proper location.
2. Flying surfaces warp-free.
3. Radio, tank and engine properly installed
4. All controlled surfaces, including nose wheel, aligned and working properly.

### For Glow Power

Start and tune engine. (Due to location of this pre-flight check, this may not be possible; however, this can be done at Level I.)

Manufacturer's recommendation regarding engine break-in should be followed. Any break-in period should be done prior to first training session. **You should note that glow fuel powered engines produce an oily exhaust (the engine lubricant). This residue will stain pressure treated decks and kill grass. Be careful when running up your engine at home.**

### For Electric Power

(details to follow)

The Pre-Flight Approval should be completed at the home of either the qualified instructor or the student. This makes any necessary changes easier and eliminates the waste of flying time at the field.

Following completion of the pre-flight checks, the student is ready for flight instruction and should come to the field at designated times for instruction. Please do not forget to bring your "**PROGRESS CARD**" to the field at all times. Without the card, instructors will not know the 'Level' the student is currently doing.

Students are responsible for acquiring training equipment (trainer box & cord). These can be obtained locally or through the SJRCF Trainer Equipment Program.

**STUDENTS MUST PRESENT PROOF OF CLUB MEMBERSHIP AND MAAC MEMBERSHIP CARDS (or proof of MAAC purchase) TO BE ABLE TO FLY AND RECEIVE INSTRUCTION AT OUR FLYING FIELD.**

PROGRESS CARD			
Student:	Date Complete	Instructor	Comments
Level I			
Level II			
Level III			
Level IV			
Level V			
Wings Test			

## Training Guidelines

**LEVEL I:** The student should present his/her approved aircraft to the instructor at the field ready for flight instruction as follows:

1. The student will learn and demonstrate correct range checking procedures and use of controls for their radio. (per manufacture's recommendations.)
2. The student will learn and demonstrate how to start and tune their engine, following all Club and Manufacturer's Safety Rules, for a reliable idle and to assure full power at all flight attitudes.
3. The instructor should flight-check the aircraft for airworthiness and be certain the student is aware of all MAAC and LOCAL CLUB RULES.
4. The student will learn and demonstrate post-flight check and cleanup.

**LEVEL II:** During this level the student should complete all pre-flight checks. They should start and tune the engine, range check the radio, check flight controls, and slow-taxi to the end of the runway in preparation for take-off. The instructor should do all take-offs and landings during this level and assist the student when necessary.

1. The student will learn and demonstrate the ability to slow-taxi their aircraft away from and towards themselves.
2. The student will learn and demonstrate the ability to control the aircraft in straight and level flight with minimal input from the instructor as to attitude and altitude. Ground track should be roughly parallel to the runway.
3. The student will learn and demonstrate a 15- 20 degree banked turn with minimal input from the instructor as to altitude and bank-angle.
4. The student will learn and demonstrate the ability to control the aircraft in a figure 8 pattern. This maneuver should be executed in such a manner as that the turns are made in the direction away from the pit area.

5. The student will learn and demonstrate an Oval Race-Track fight pattern clockwise and counterclockwise, with flight parallel to the runway.

**LEVEL III:** During this level the student should complete all preflight checks. They should start and tune the engine, range check the radio, check flight controls, and slow-taxi to the end of the runway in preparation for take-off. The instructor should do all take-offs and landings during this level and assist the student when necessary.

1. The student will learn and demonstrate the ability to control the aircraft during High-Speed taxi on the runway. No weaving should be observed.
2. The student will increase the angle of bank to 30 degrees for turns, Oval Race-Track, and Figure 8 patterns. Further, the figure 8 will be done as 2 Full Circles intersecting directly in front of the student.
3. The student will learn and demonstrate the Loop and Roll Maneuvers.
4. The student will learn and demonstrate proficiency in slow flight, and be able to recognize the behavior of the aircraft in a stall condition. The student will demonstrate the ability to recover from such conditions in both straight and turning stalls.

**LEVEL IV:** During this level the student should complete all preflight checks. They should start and tune the engine, range check the radio, check flight controls, and slow-taxi to the end of the runway in preparation for take-off.

1. The student will learn and demonstrate proficiency in the Take-Off, showing the ability to maintain runway heading with a 20 - 40 degree climb-out.
2. The student will learn and demonstrate the Procedural Landing Approach for the current flying site. This procedure will be done at altitude. The aircraft should arrive over the end of the runway, on the correct heading with wings level, and continue a straight track up the runway.

**LEVEL V:** During this level the student should complete all pre-flight checks. He/she should start and tune the engine, range check the radio, check flight controls, and slow-taxi to the end of the runway in preparation for take-off.

1. The student will learn and demonstrate the ability to land the aircraft and bring it to a full stop on the runway. If the aircraft is still running the student is to taxi to the end of the runway and prepare for take-off.
2. The student will then demonstrate the ability to execute a touch-and-go landing with particular focus on a smooth transition from landing to take-off.
3. The student should be briefed on the procedure to follow in case of a Dead-stick landing and how to handle a Crosswind Landing. Practice of these procedures is recommended only at altitude and at a flying site with a larger margin of error available because of the high probability of damage to the aircraft.

## **Wings Test**

Wings test must be conducted by two SJRCF instructors. The student will complete all pre-flight checks start and tune his/her engine, range check the radio, check flight controls, and slow-taxi to the end of the runway for take-off.

The student will then take-off, using proper take-off and climb-out procedures, and perform the following maneuvers on two successive attempts:

1. Maintain straight and level flight parallel to the runway.
2. Figure 8
3. Loop
4. Roll
5. Slow flight indicating to instructor when aircraft is about to stall.
6. Demonstrate recovery from stall in straight flight.
7. Demonstrate Procedural Approach with 'No Touchdown'.
8. Land the Aircraft under power.
9. After the 2<sup>nd</sup> successful landing the student is to taxi the plane back to the pit entrance and shut off the engine.

**If conditions permit the Instructor may have the student do the 2<sup>nd</sup> landing “Dead Stick”.**

**The Solo flight will be carried out with no assistance from the instructor as to aircraft control. The instructor will stand by the student in case of an emergency and to “Call” the maneuvers.**

## **CLUB INSTRUCTORS**

The SJRCF has delegated the responsibility of appointing new instructors to the current active instructors. For a current list of instructors, go to:

<http://www.sjrcf.com/contacts.htm>

## **ADVANCED TRAINING**

The SJRCF has declared that instructors will be deemed to be qualified examiners. All advanced training will be carried out as outlined in the MAAC wings program at: <http://www.maac.ca/getDoc.php?docid=105>

## **HELICOPTER TRAINING**

Members are encouraged to follow the Blades Program (included in handbook). It is also recommended new helicopter pilots seek assistance of skilled heli pilots within the club.

# R/C Model Helicopter Blades Program

## BASIC PROFICIENCY AND TRAINING PROGRAM

*"The initial foundation of any structure will determine how well that structure will stand.  
Having said that, it's important to build a strong foundation." - Dean Parsons*

By: Dean Parsons  
Email: [skater@thezone.net](mailto:skater@thezone.net)  
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## **PURPOSE OF THE PROGRAM**

1. To provide a solid foundation in learning to fly RC model helicopters.
2. To minimize safety hazards and accidents by encouraging model helicopter pilots in building strong and proficient flying habits.
3. To make radio control model helicopter flying a more meaningful and satisfying experience.

## **PRE-FLIGHT CHECK**

1. Ensure nuts, bolts and screws are tightly secured.
2. Head Assy. - Check all links are able to rotate freely without play.
3. Tail Assy. - Check for and remove any play in bell crank(s) and pushrods.
4. Engine Assy. - Check for engine alignment, engine mounting, tight muffler bolts.
5. Ensure servo travel direction.
6. Check that all control components are traveling in the correct direction for operation. Make sure the gyro compensates the correct direction, check that it's mounted securely in a low vibration area on the model ensuring no contact with any moving parts.
7. Do a range check to ensure no radio interference. Take note of the distance at which your radio and receiver fail to interact. Ensure this distance does not change considerably from one range check to the next. If so, this may indicate that you are having radio problems and should not operate under these conditions.

## **STARTING THE MODEL**

1. Fuel the model.
2. Check for frequency clearance.
3. Be sure you're using the correct model memory.
4. Set the throttle to idle or starting position. Assuming your throttle linkage geometry is setup correctly you will have your throttle stick at full low end and throttle trim at mid point.
5. Turn on transmitter, turn on receiver
6. Attach glow igniter
7. With one hand, hold a main blade grip firmly. Start the model with the appropriate starting tools with the opposite hand. Note you should keep the transmitter close by for easy access of control over the model while starting.

## **POST-FLIGHT CHECK**

1. Clean the model with cloth and at the same time look over all the control components for damage or wear. Tighten any loose nuts/bolts and add oil to appropriate parts (ie: main and tail rotor shafts).
2. Burn the fuel out of the engine. Disconnect or clamp the fuel line going to the engine's carburetor. Start the model in the usual way described above until the engine refuses to start.
3. Store model, tools and equipment in safe place until the next flying day.

## **FLYING PROFICIENCY LEVELS**

There are four flying proficiency levels as indicated below. After successful examination at each level, beginning at Level "A", a candidate will advance to the next proficiency level. Upon completion of Level "D" the pilot would be labeled as a proficient remote control model helicopter pilot.

Proficiency Levels are as follows:

- **"A" - Basic Control**
- **"B" - Hovering Tail in**
- **"C" - Hovering Nose in**
- **"D" - Forward Flight**
- **"E" - Putting It All Together**



## **LEVEL A - BASIC CONTROL**

This LEVEL allows the pilot to get a feel of the model's controls and how it reacts to transmitter inputs. Experiment and interact with the model's controls to become comfortable with its movements. Use the fore/aft, rudder and cyclic controls in turn, and watch the model as you give inputs. It's important to give slow and small inputs at first. In this LEVEL try to keep the tail pointed at you at all times. The moment the model's tail is not pointed towards you, adjust with the rudder controls or reduce pitch and power to return the model to the ground and initial position. It's also important to point the tail of the helicopter into the wind when you place the model in the "initial position". This may allow the wind to blow the model away from you as opposed towards you if the model becomes out of control.

### **Light On The Skids**

Increase pitch and power such that the helicopter is "light on its skids". "Light on the skids" is the situation where the model is floating just above the ground, almost taking off and almost landing. The altitude of the model in this stage is approx. 1 inch, just enough so the model is off the ground, and just enough such that the controls are fully functional. The helicopter will feel like it's "floating". At an altitude of about 1 inch means that the model is still in something called "ground-effect". The ground-effect condition is when the model is so close to the ground that wind flowing down though the main rotor disk creates a sort of cushion of air around the model. This allows the model to hover with a little less pitch and power at these low altitudes. As a pilot progresses through these stages they will find and experience that it will take a little more pitch and power to hover out of the ground-effect condition.

### **Short Hops**

When you have a good foundation of the controls you should try to lift the helicopter a little higher off the ground, but for only very short duration. These "short hops" will get you working towards an environment that is out of "ground-effect". Again, keep the same tail-in pattern when doing short hops. When you increase altitude of the hops you should also increase the duration of the hops. You will notice that when you move out of "ground-effect" you will need to add a little more pitch and power to maintain a hover.

**When the pilot is able to sustain a hover in the tail-in pattern over the initial position for roughly a tank of fuel they should start practicing the LEVEL B components.**

## **LEVEL B - TAIL-IN HOVERING**

### **45 left and 45 right**

While sustaining a hover in the tail-in position, yaw the model by using left or right rudder inputs. Yaw the model to one side such that you're hovering at a 45 degree angle to yourself. Hold this position for a period of time, then return to the tail-in hovering pattern. Next repeat, by giving the opposite yaw input and hovering at a 45 degree angle to yourself in the opposite direction.

### **90 left and 90 right**

While sustaining a hover in the tail-in position, yaw the model by using left or right rudder inputs. Yaw the model to one side such that you're hovering at a 90 degree angle to yourself. Hold this position for a period of time, then return to the tail-in hovering pattern. Next repeat, by giving the opposite yaw input and hovering at a 90 degree angle to yourself in the opposite direction.

Note that it's important to practice the transition between the tail-in, 45 left and 45 right patterns.

**When the pilot is able to sustain a hover in the tail-in, 45 left and 45 right patterns over the initial position for roughly a tank of fuel they should start practicing the LEVEL C components.**

## **LEVEL C - NOSE IN HOVERING**

### **45 left and 45 right**

While sustaining a hover in the nose-in position, yaw the model by using left or right rudder inputs. Yaw the model to one side such that you're hovering at a 45 degree angle to yourself. Hold this position for a period of time, then return to the nose-in hovering pattern. Next repeat, by giving the opposite yaw input and hovering at a 45 degree angle to yourself in the opposite direction.

### **90 left and 90 right**

While sustaining a hover in the nose-in position, yaw the model by using left or right rudder inputs. Yaw the model to one side such that you're hovering at a 90-degree angle to yourself. Hold this position for a period of time, and then return to the nose-in hovering pattern. Next repeat, by giving the opposite yaw input and hovering at a 90 degree angle to yourself in the opposite direction.

Note that it's important to practice the transition between the nose-in, 45 left and 45 right patterns.

**When the pilot is able to sustain a hover in the nose-in, 45 left and 45 right patterns over the initial position for roughly a tank of fuel they should start practicing the LEVEL D components.**

## **LEVEL D- FORWARD FLIGHT**

The goal of this LEVEL is to take off from the initial position, enter forward flight and then return and land safely in the initial position.

### **Hovering Laterally**

From the tail-in pattern, hover over the initial position, input small and slow forward cyclic control to move the model forward 15 feet, stop in a hover. Travel back to the initial position and come to a hover. Next travel 15 feet left of the home position, stop into a hover, then back to the initial point. Repeat this for the right side.

### **Turning**

From the tail-in pattern yaw the model left or right 90 degrees and sustain a hover as practiced from the previous LEVELs. Proceed to travel in a straight line approx. 15 feet. Turn the model 180 degrees and travel back to the initial position, turn 90 away from the pilot ( bringing the model back to the tail-in position ) and repeat for the opposite side.

Similarly, travel from the initial position in the tail-in pattern straight out approx. 15 feet and sustain a hover. Turn the model 180 and travel back to the initial position, return to the tail-in position by yawing 180 degrees and landing in the initial position. Complete for both left and right sides of travel.

Similarly, travel from the initial position in the tail-in pattern out on a 45 degree angle approx. 15 feet and sustain a hover. Turn the model 180 and travel back to the initial position, return to the tail-in position and land in the initial position. Complete for both left and right sides of travel.

It's important to maintain a constant altitude and travel in a straight line.

**When the pilot is able to do lateral flying as described above he/she should practice the components of LEVEL E.**

## **LEVEL E - Putting it all together**

A pilot who has successfully completed the previous LEVELs should work to complete LEVEL, E. This LEVEL brings all the previous LEVELs together to complete a pilot proficiency test.

To complete this LEVEL the pilot must use their current foundation to achieve the following:

1. Perform pre-flight checks.
2. Start the model.
3. From the initial position (from any orientation) lift into and sustain a hover for a period of time.
4. Take off into the wind, complete a full circuit, returning to the initial position and landing in the initial position (in any orientation).
5. From the initial position (from any orientation) lift into and sustain a hover for a period of time.
6. Complete two figure eights, one from a left handed turn and one from a right handed turn.
7. Perform post-flight checks

## MISC

### DIRECTIONS OF CONTROLS

*Note: Orientation should be considered to be from the pilot seat.*

#### Mode 3:

##### Left stick

**up:** increase throttle/collective

**down:** decrease throttle/collective

**left:** left rudder ( nose turns left )

**right:** right rudder ( nose turns right )

##### Right stick:

**up:** forward cyclic ( forward elevator )

**down:** back cyclic ( backward elevator )

**left:** left cyclic ( left aileron )

**right:** right cyclic ( right aileron )

## **GLOSSARY OF TERMS**

**Altitude** - Distance of the model from the ground.

**Ascending** - Increasing altitude.

**Descending** - Decreasing altitude.

**Ground-effect** - The ground-effect condition is when the model is so close to the ground that the disturbance flowing down through the main rotor disk creates a cushion of air under the model.

**Initial Position** - The position and location of the model before take off. Usually for when training the initial position is with the model tail into the wind and tail pointed towards the pilot. The distance from the pilot and the initial position should be approx. 20feet.

**Nose in** - The orientation of the model relative to the pilot when the model's nose is facing the pilot.

**Pitch** - The angle at which main or tail rotor blades are set. The pitch on the main and tail blades change on collective pitch models. The change in pitch on the main blades allows the helicopter to ascend or decent, in addition the pitch on the tail blades allows the helicopter to yaw left or right.

**Tail-in** - The orientation of the model relative to the pilot when the model's tail is facing towards the pilot.

**Range Check** - A method of testing the range of the transmitter and receiver relationship. Usually done by turned both receiver and transmitter on, walking away from the receiver with the transmitter in hand ensuring the antenna is collapsed. The paces taken from the receiver until the communication is broken are usually noted each range check. If the paces differ by a large amount from one range check to the next, this may be an indication of radio problems.

**Short Hops** - When the model ascends for a short period of time then descends and lands. This technique allows a beginner pilot to get used to pitch and throttle inputs of the model.

**Yaw** - The rotation of the model around the main rotor shaft, ie: tail rotor inputs.