Kamloops Model Airplane Society

This Flight Training Manual is the property of

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A member of the Kamloops Model Airplane Society

Club Orientation:

So you want to know more about model aviation and how to fly radio control. Here are some basics.

Welcome to **Kamloops Model Airplane Society (KMAS)**

KMAS is a volunteer organization of like-minded flyers in association with others across Canada operating under the authority of **Transport Canada** and the **Model Aeronautics Association of Canada (MAAC).**

The Who's who in Model aviation:

The Model Aeronautics Association of Canada (MAAC) www.maac.ca

This is the official governing body for Model Aviation in Canada, acting as liaison to government agencies such as **Transport Canada,** that sets the rules on everything in aviation in Canada. Also **Industry Canada** (formerly Department of Communications) with regard to radio frequencies and their use in radio controlled models. MAAC in turn sets safety guidelines for all member clubs. MAAC provides specific group Liability Insurance for all activities arising out of model flying for each member, each club and for all flying field owners plus sanctioned events. Also included is Group Accident insurance for each member. All MAAC members receive a bi-monthly magazine **Model Aviation Canada**.

MAAC also provides direct connection to The **Academy of Model Aviation (AMA)** in the US enabling cross border flying.

Kamloops Model Airplane Society (KMAS): www.kmasrc.ca

KMAS is a Society originally formed in 1995. KMAS is a Charter member of MAAC. You must maintain your membership in MAAC to enjoy flying privileges at KMAS.

We recommend that you visit the club website and familiarize yourself with its many features including current weather conditions at the field and hopefully soon, a web cam.

Membership in KMAS has its privileges; as a member you are entitled to a 10% discount on merchandise at Interior Craft & Hobbies, plus they will waive postage costs on items that you order through them from Horizon Hobbies. All you need do is show your membership card. Note that KMAS also has club caps, shirts and jackets for sale.

Your instructors are volunteers; they do not get paid for teaching you to fly, nor is there any cost to you for their services. Their goal is to help you learn to fly safely and well, and to get your Wings.

You:

As a member you are given membership cards for KMAS and MAAC. Our field is available 365 days per year for your use. A key is provided to you for gate entry. Maintenance of the club facilities is the responsibility of all members. When there are enough volunteers, no job is too big for any one person. The club functions well when every member understands that it does not run on hot air; it requires your support. ***What is your specific interest?***

Welcome to Tolko Field

The complete **MAAC Safety Code** is available on the MAAC website under Documents at www.maac.ca

There are currently 23 safety documents that cover all aspects or disciplines in model aviation. We encourage you to familiarize yourself with each section that follows your specific interest.

Warning: ***Key conditions in our insurance policy rely on everybody following these Rules. Insurance coverage can be denied if you do not follow these Rules.***

Safety Code Rules change from time to time; while MAAC and KMAS circulate updates regularly it is entirely your responsibility to remain current, so please be sure to familiarize yourself with the most current Rules.

MAAC SAFETY CODE (MAAC Safety Document #MSD 3 - ALL MODEL AIRCRAFT)

1 All members shall review and comply with the MAAC safety Code, the specific rules of any special interest category, and any rules established for the specific Flying site/or event.

2 The Safety Code and its attachments may be amended from time to time. All members shall review these documents for any such change. Notification of all changes approved by the Board of Directors will be posted on the MAAC website as well as recorded in Model Aviation Canada in a pertinent location so identified and will include the effective date of the change.

3 No member shall operate a model aircraft in a careless, reckless or otherwise dangerous manner that may pose a hazard to persons or property.

4 No member shall operate a model aircraft while under the influence of alcohol or judgement impairing drugs.

5 No member shall operate a model aircraft in Canada weighing more than 35 kilograms (77.2 pounds) including fuel and payload unless he or she has a Special Flight Operations Certificate (SFOC) from Transport Canada and has arranged for his/her own insurance coverage.

Members are further cautioned that any model weighing more than the above limit is considered by Transport Canada to be an **Unmanned Aerial vehicle (UAV)** and may be subject to Air Regulations not normally applicable to model aircraft as defined.

6 No member shall operate a model aircraft at a location where prohibited by law.

7 No member shall create a hazard by carrying in or dropping from a model any object that may endanger persons or property.

8 No member shall allow projectiles to be launched from the ground with the intent of damaging or destroying a model aircraft.

9 No member shall fly a model aircraft at a location or in a manner that is likely to be hazardous to full–scale aircraft. For further information contact the MAAC Safety Committee.

KMAS FIELD RULES

____ Current MAAC insurance is mandatory to fly.

____ Some basic information about radio frequencies used. 2.4 Ghz and 72 Mhz

____ Every 72 Mhz transmitter only shall be placed in the impound stand upon arrival at the field. 2.4 Ghz transmitters can remain with the pilot.

____ No 72 Mhz transmitter shall be switched on without the appropriate MAAC recommended frequency pin (with pilot name and channel number) first being attached to the frequency board. When the transmitter is turned off, the pin is to be removed from the frequency board by the pilot and the transmitter returned to the impound stand.

____ No taxiing in the pit area. Engines off when clear of runway after landing.

____ There will be absolutely **NO FLYING**:

1. Over any general area where field workers or equipment are active.
2. Behind the flight line no matter how far away from the runway. No flying over the pits or car parking.

Note: The presence of active field workers could easily require that no flying take place at all!

____ Maximum of five aircraft flying at a time. Three or more at the same time require spotters for all aircraft

____ Flight time is limited to 15 minutes (recommended) per flight.

____ All aircraft shall be flown in a safe manner with consideration to others at the field.

____ Aircraft shall be flown in a fashion so as to minimize the noise footprint as perceived in adjacent areas.

____ Pilots shall announce their intention to land or take off.

____ Landing aircraft shall have the “right of way”.

____ Smoking is not permitted anywhere beyond the spectator fence and is strongly discouraged elsewhere.

____ Unaccompanied spectators (any observer who is not a club member unless invited) and animals must stay out of the pit area.

____ No breaking in engines in the pit area while other members are flying.

____ Pets must be under control at all times.

____ Importance of MAAC and KMAS safety rules.

____ Enforcement of MAAC and KMAS safety rules

____ No Fly areas

____ Startups / Safety

CHECK LIST:

We recommend that all pilots get into the habit of using a checklist; just like full-scale pilots.

Before each flying session:

____ Radio range check.

____ Field workers.

Before each flight:

Pre-Start

____ Frequency Board – 72 MHz users must put their peg In place

____ Receiver Battery - Voltage check

____ Radio Transmitter - On and checked for interference

____ Radio Receiver - On

____ Aircraft Controls - Transmitter operation check (direction and range of motion)

____ Throttle set

Start

____ Aircraft secure

____ All Clear - Ahead (prop) and Behind

____ Run Up - Mixture set (extended engine testing to take place in testing area)

____ Idle - Reliable

Pre-Takeoff

____ Radio Antenna - Out

____ Engine - Full power performance OK

____ Controls - Free and Correct

____ Rate Switches - Set

____ Trims - Set for Take-off

____ Timer - On

____ Field Workers - Checked

____ Wind Sock - Checked

____ Runway - Clear

____ Announce intention to take off to other pilots on flight line.

At the completion of this session the new member will be aware of all MAAC and CLUB safety rules and field procedures. The member shall be conversant with the pre-flight checklist and understand flight patterns at the field.

Upon completion of each lesson your instructor will sign off.

Often questions come to mind that you think about later. Your instructor will be happy to answer any questions you may have. Use the Notes pages in this booklet after each session to record your questions.

KMAS Flight Training Program
Introduction

All club members are eligible for flight instruction by any of our volunteer flight instructors.

1. The club's instructors volunteer their time. Instruction is offered on a 'first come' basis. You are responsible for letting your instructor(s) know when you are ready to fly.

2. Normally, an instructor will already have been assigned and connected with you. If you haven't yet connected with an instructor, contact the Chief Flying Instructor or a member of the executive.

3. Instructors telephone numbers are posted on the club website. Feel free to call an instructor to arrange a session.

The lessons as outlined in this Handbook have been designed to provide guidance for both students and instructors. In order to have a basic understanding of what to expect in each flight training session, students should read each relevant lesson and ask any questions before flying. The better prepared a student pilot is before the flying lesson, the more productive the time in the air will be.

This Member's Handbook should always be brought to the flying field during training to be used as a reference for the lessons. Check off each section as instruction elements are completed after the lesson. This will help each successive instructor in understanding the level of the student prior to getting airborne and result in a much more productive flying lesson.

Please do not fly your model aircraft alone until you have successfully completed the training program and/or the Flight Evaluation Test.

When a student has completed all the flying lessons and has passed the Flight Evaluation Test with two instructors, the student's primary instructor will complete the Flight Evaluation Report (last page of the Member's Handbook), sign it, and either the student or instructor will give it to a member of the Club Executive.

Any new club member who considers him/herself a qualified solo flyer must demonstrate so by performing the Flight Evaluation Test. Upon a successful completion and the Flight Evaluation Report is sent in, the new member will be issued a full membership card.

Notes:

Intentionally left blank

Lesson 1: Aircraft and Flight Control Familiarization

Purpose:
To teach the student how to properly pre-flight the aircraft and to understand basic flight control principles

Instruction Elements: *(check off each section when completed)*

____ Review MAAC and club safety rules / field etiquette, including transmitter impound procedures

____ Instructor will aid the student with his/her model aircraft inspection and "maiden flight" preparation

____ Complete inspection of radio installation.

____ Complete inspection of all linkages and control surfaces for proper throw, direction, hinge security and freedom of movement

____ Instructor and student will discuss the need for and check and confirm operation of radio failsafe operation

____ Complete inspection of model aircraft structure and confirm center of gravity location

____ Complete inspection of engine, propeller mounting and fuel system installation

____ *On the ground*, (to help prepare for the next lesson) the instructor will familiarize the student with the aircraft's control surfaces and movements using the transmitter. Describe what control affect they have on the aircraft in flight. (Changing aircraft attitude with pitch, roll, yaw, and controlling level speed with throttle)

____ Complete radio range check and confirm battery charge levels.

____ Practice safe engine starting and adjustment of carburetor fuel/air mixtures to attain reliable engine performance throughout the throttle range. Set the high speed mixture setting slightly rich of top rpm. Set the low speed mixture setting to allow a reliable, smooth acceleration of rpm without hesitations. A reliable idle should be adjusted low enough so that the model will not roll forward on level grass.

____ Instructor will perform the "maiden flight" of the student's aircraft to become familiar with its performance and to flight trim the model in preparation for the student's training flights

____ Complete the readjustment of control throws and neutralize control trims mechanically if required

____ Instructor synchronizes the training system (buddy box) and reviews the "you have control, I have control" principle

____ Instructor to review some basic instructing principles

- Instructor should determine which style of gimbal control is more comfortable (using the thumb on the control stick crown or using thumb and finger with a neck strap) for the student
- Instructor should demonstrate most maneuvers first then the student will practice them
- Instructor should take control of model before attempting long explanations because it can be difficult for a student to listen well while trying to control the model aircraft simultaneously
- Instruction Element boxes should be checked off after every lesson

Evaluation:

The student should understand the club's flying field procedures and etiquette (i.e. radio impound, pit procedures, radio range checks, etc.) and club safety rules. (S)He should be able to conduct a pre-flight inspection of his/her model and identify any deficiencies that could cause a malfunction or safety hazard. (S)He should be able to start and adjust the model's engine safely. The student should have a basic understanding of how to make the correct control inputs to achieve a desired change in the model's attitude when flying.

Notes:

Lesson 2: Basic Flight Maneuvers

Purpose:
To teach the student basic flight control including turns and the maintaining of level flight

Instruction Elements: *(check off each section when completed)*

____ Student should be able to conduct a proper pre-flight check and start/adjust his/her model engine safely. Student should have a basic understanding of flight control principles

____ Instructor will perform the take-off and subsequent landing emphasizing good field etiquette

*Before every take-off, 4 safety items should be confirmed in a pre-taxi check (T.A.C.T.)

Throttle…….ensure the engine has been cleared with full power and transitions/idles reliably
Antenna……ensure the transmitter antenna is fully extended or oriented properly
Controls……ensure all flight controls move correctly (no reversals or servo failures)
Trims……...ensure all flight control trims are in their correct positions (centered)

____ **Instructor demonstrates then student will practice maintaining level altitude** with elevator control at about a half throttle cruising speed. The aircraft should already be trimmed for the set cruising speed.

____ **Instructor demonstrates then student will practice maintaining level turns**
**Three steps to start and finish a turn*
1) roll to about a 30 degree bank angle with aileron input
2) maintain bank angle with aileron and level altitude with slight up elevator input as required
3) level out the wings with opposite aileron input

____ **Note**: **opposite aileron input is required when the aircraft is flying towards the pilot**
(hint: to raise the low wing, apply corrective aileron input in the direction of the low wing)

____ **Review disorientation dangers**:
- Silhouette factor when the model is flying near a low sun makes orientation very difficult
- Applying incorrect aileron input when leveling wings after a steep turn can cause an overroll which may lead to a spiral dive. hint: try to remember the last turn direction to aid in leveling wings
- Allowing the model to fly too far away from pilot can quickly result in loss of control

____ **Practice straight ahead climbs**: Adding power with throttle and raising nose attitude

____ **Practice straight ahead descents/glides**: Reducing throttle (partially and to idle)

____ **Practice combining turns with gentle climbs and descents**

Evaluation:
The student is ready for the next lesson when (s)he can make turns to the left and right while maintaining a safe altitude without instructor intervention. The student should understand how to control roll when the model is flying towards the pilot (opposite aileron inputs). The student should be able to add or reduce throttle as required to regain a safe altitude and have an understanding of the disorientation dangers while flying.

Notes:

Lesson 3: Accuracy Maneuvers (Set and Hold Headings)

Purpose:

To prepare the student pilot for the Approach and Landing phase of flight training by developing more accurate control of aircraft heading. To develop accurate flight trimming skills at various throttle (speed) settings while maintaining heading and altitude

Instruction Elements: *(check off each section when completed)*

____ Review maintaining straight and level flight and entering/exiting level turns

____ **Practice turning accuracy** with the goal of rolling out on a desired set heading after a turn. Focus on judging *when to* begin applying opposite aileron to level the wings. The steeper the bank angle is in a turn, the earlier opposite aileron will be required to accurately roll out onto a desired heading. *The more gradual and less steep a turn is the more accurate and less aggressive the exiting of the turn will need to be*

____ **Review the 5 legs of the rectangular traffic pattern (circuit). *Upwind take-off leg, crosswind leg, downwind leg, base leg, and final approach leg.*** Practice accurately rolling out on each leg of the traffic pattern on the required heading and suitable altitude. Fly the upwind leg (take-off & landing direction over the runway length) at the same pattern altitude tracking along the centerline of the runway (this is practice for landing approach accuracy). Make small heading changes to maintain the track along the runway centerline. As other traffic permits, practice flying the traffic pattern in both directions with left and right hand turns respectively

____ **Instructor demonstrates then student practices a "Figure 8" pattern** within the bounds of the rectangular traffic pattern as other flying traffic permits. Practice accurately setting and maintaining each heading of the "figure 8" while maintaining altitude

____ **Practice free form turns.** The student can be given specific directions to fly (i.e. "180 degrees left" or "45 degrees right") to further practice flying in uncommon directions and attitudes

____ **Practice re-trimming for roll and pitch**. Instructor moves the aileron trim (on the student's transmitter) to an out of trim position and has the student maintain wings level while readjusting the aileron trim to achieve neutral rolling forces. Instructor then moves the elevator trim out of position and has the student maintain altitude while readjusting the pitch trim to achieve neutral pitching forces

____ **Different throttle setting will result in a different airspeed while in straight and level flight**. Practice flight at a faster cruising speed followed by flight at a slower cruising speed. Full throttle/high speed flight will cause the model aircraft to naturally climb. Down elevator trim adjustment will be required to neutralize the pitch force if sustained cruising at the higher speed is desired. Low throttle/slow speed flight will cause the aircraft to naturally descend. Up elevator trim adjustment will be required to neutralize the pitch force if sustained cruising at the slower speed is desired. An aircraft should always be flown in a trimmed state when at the desired airspeed so as to minimize corrective applications of elevator and aileron. This will allow the pilot to fly much more smoothly and accurately while maintaining straight and level flight

Evaluation:

The student is ready for the next lesson when (s)he can consistently roll out of turns (from both directions) on a specific heading and maintain the set heading with accuracy. The student should be able to trim the model aircraft accurately for straight and level flight at various cruising speeds. A rectangular traffic pattern should be flown accurately with a consistent track maintained (using heading adjustments) over the centerline of the runway on the upwind leg

Notes:

Lesson 4 – Slow Flight, Stalls and Unusual Attitudes

Purpose: To teach the student how to control the aircraft in unusual circumstances

Instruction Elements: *(check off each section when completed)*

____ Instructor should demonstrate and the student practice, slow speed characteristics and an approaching stall & stall recovery. Also demonstrate a spiral dive.

____ **At a medium altitude, reduce power to approx one quarter or just enough to maintain altitude.** Trim the aircraft for level flight and practice gentle turns both left and right.

____ **Starting from slow, level flight,** practice a descending slow glide while performing a 90 degree turn, then maintain the new heading (as in a turn from base to final). Practice a full throttle climb back up to a safe altitude to recover.

____ **Instructor demonstrates then student practices: Straight ahead, power off stalls.**
From a high altitude, set up for slow flight as before but continue to reduce power to an idle while maintaining altitude by increasing up elevator as the aircraft slows. **At some point the aircraft should noticeably pitch nose down. This is the point of aerodynamic stall. Recover from the stall by releasing up elevator and applying full power.** As soon as the aircraft starts to accelerate, slowly raise the nose with elevator and perform a climb back to a safe altitude.

____ **Instructor demonstrates then student practices: Straight ahead, power on stalls**
From a high altitude, reduce power to approx one third to one half and slowly add up elevator until the aircraft is climbing and noticeably slowing. Continue to allow the aircraft to slow while maintaining wings level until it stalls. **The aircraft should dramatically pitch nose down and may be accompanied by a yaw and roll.** As before, **this is the point of aerodynamic stall. Recover from the stall by releasing up elevator and once the aircraft is flying again, roll wings level and apply full power.** As soon as the aircraft starts to accelerate, slowing raise the nose with elevator and perform a climb back to a safe altitude

____ **Instructor demonstrates then student practices: Spiral dive**
From a high altitude, set power to approx one half, or a comfortable cruise. With aileron, roll the aircraft into a fairly steep bank, 60 degrees or so, but do not initially apply any up elevator. Once the aircrafts nose has pitched down, apply up elevator to start a turn. **Notice that all the up elevator does is tighten the turn.** Recover by cutting throttle to idle, rolling wings level, and with up elevator, pull out of the ensuing dive.
This is the most common result of pilot disorientation. Opposite aileron to what is needed is commanded causing the aircraft to roll in an unexpected manner. The usual instinctive reaction is to pull lots of up elevator which only makes a bad situation worse. Always try to keep in the back of your mind what you did last so that you can instinctively correct with opposite control if necessary.

____ From a sufficiently high altitude, the instructor will put the aircraft into several unusual attitudes. The student will then recover the aircraft back to straight and level flight.

Evaluation:
The student is ready for the next lesson when he/she can transition smoothly into and out of slow flight as well as safely execute and recover from power off and power on stalls, spiral dives and recover from unusual attitudes.

Notes:

Lesson 5: Taxi and Take-Off

Purpose: (Lesson 6 can be combined with Lesson 5 if student & instructor are comfortable enough)
To teach the student how to taxi and takeoff safely from any runway direction

Instruction Elements: *(check off each section when completed)*

____ Ensure the ground tracking of the nose wheel steering is as straight as possible with the rudder stick and trim centered. Readjust if required (recheck after each hard landing on the nose wheel)

____ Review taxiing rules (no taxiing in or near the pit area, only out from the runway edge. Remember the importance of the pre-taxi safety checks. T.A.C.T. (Throttle, Antenna, Controls, Trim)

____ **Practice taxiing around the runway when other model aircraft are well clear.** Notice the sensitivity of steering as the taxi speed increases, very small inputs of rudder/steering are required. More throttle is required to *start* from a stop than to *maintain* a walking pace taxi speed. Close throttle to idle if speed is increasing to a run. Practice taxiing the model in a direction approaching the pilot. Focus on the required reversal of the rudder/steering input

____ **Practice 'into-wind' high speed taxi runs:** Taxi the model to the take-off position facing the wind and power up to about a half throttle "high speed taxi" to practice runway centerline tracking as in a take-off. Be prepared to quickly throttle back to idle once the model has passed about half the length of the runway. This also simulates a rejected take-off attempt. (This practice maneuver can also be accomplished with a high-wing trainer's wing removed to avoid a lift-off)

____ Normal propeller induced left turning tendencies will usually pull the aircraft to the left as increased power is applied during a take-off roll and climb. Be prepared to apply corrective rudder input to counter any turn away from the runway centerline track. The key is to move the rudder stick with small movements and to possibly apply constant rudder stick pressure in the appropriate direction rather than pulsing type movements (if there is a crosswind or excessive left turning tendencies)

____ **Instructor demonstrates then student practices take-offs:** Always take note of the wind direction before preparing to take-off. Taxi the model to the take-off position at the beginning of the runway facing into the wind. For the first few take-offs some students find it easier to stand on the runway with the instructor, directly behind the model (if it is safe to do so with respect to coordinating with any other flyers). Gradually apply full throttle and focus on using the rudder (left stick) to make small but quick inputs to maintain the take-off track along the runway centerline. Anticipate holding some rudder input as required to counter any left-turning tendencies or crosswind. During the take-off roll add some back pressure to the elevator to gently raise the nose attitude. The aircraft will lift off smoothly once it reaches flying speed. Release some of the up elevator and reduce some of the rudder input which was off-setting any left turning tendencies on the ground. (Most aircraft still have some left turning tendencies in the air under a full power nose up climb so some right rudder correction should still be held during the climb out if required)

____ After take-off, try to maintain a track over the extended runway centerline until about half the altitude of a normal traffic pattern before turning towards the downwind. **The first turn is always away from the pits.** Once reaching the pattern altitude, another turn onto the downwind leg will establish the aircraft in the landing pattern. Lower the nose for level flight and reduce the throttle for a normal cruising speed (about half throttle)

____ Remember that if the take-off roll becomes directionally unstable or confusion/panic occurs, **abort the take-off immediately** by quickly throttling back to idle and continue using the rudder / nosewheel steering to remain on the runway centerline. The ability to make a quick decision to abort a takeoff is as important as making the timely decision to abort a landing

Evaluation:

The student is ready for the next lesson when (s)he can repeat the takeoff safely with adequate directional control while maintaining the runway centerline (and can recognize when to abort take-offs). The take-off is accomplished straight ahead with adequate airspeed and the first turn made away from the flight line

Notes:

Lesson 6: Approach and Landing

Purpose: To teach the student how to setup consistent approaches (from both traffic pattern directions) and to land safely

Instruction Elements: *(check off each section when completed)*

____ Instructor should demonstrate a descending / slowing approach and a safe landing from the traffic pattern.
Also review an idle power glide, slow speed characteristics and an approaching stall & recovery

____ **From a high altitude, practice idle power gliding descents using a (landing approach speed) while trying to maintain a set heading**. Practice a descending slow glide while performing a 90 degree turn, then maintain the new heading (as in a turn from base to final). Practice a full throttle climb back up to a safe altitude to recover

____ **Instructor demonstrates then student practices approaches and "go-arounds":**
- Instructor should demonstrate the landing approach by slowing and descending the aircraft on the base leg and final leg then assessing *with the student* before committing to a landing about the quality of the final approach. Demonstrate that if the approach appears too high/fast or too low/slow, a decision to abort and "go-around" must be made quickly to avoid landing long or short and possibly damaging the model. - Practice the slowing / descending approach with the aircraft lined up on the final leg along the centre of the runway and beyond the marked "flight line". Use the previously practiced skill of maintaining a heading on final which will keep the aircraft tracking the centerline of the runway. A consistently well flown low speed approach with elevator and throttle adjustments for height/airspeed control and aileron adjustments for centerline tracking will result in a well placed touchdown and low speed, "flared" landing.
- Before student tries his first landing, practice making several approaches at the correct descent rate and airspeed that will place the aircraft near the ground in the first half of the landing runway. Don't land yet; practice a "go-around" (aborted landing) with full throttle and a straight ahead initial climb back to pattern altitude. It is very important for the safety of the model and people near the flight line that a timely "go-around" is performed before the aircraft is too low & slow (if the approach is not ideal or stable).
- The base turn before final approach will require the throttle to be closed to idle or to partial throttle depending on how well the student's trainer aircraft inherently slows down (with or without landing flaps) and how much headwind will be present on final approach. If the trainer has little drag and does not slow down quickly with partial throttle reduction, and/or there is little headwind on the final leg, anticipate requiring a throttle closed descent from the base leg turn. If the model has too much airspeed remaining on short final the landing may be too long, high, and/or result in bouncing as the aircraft has too much energy in the form of airspeed or height as it crosses the landing threshold. If there is a strong headwind or the base turn was from a lower altitude than normal, anticipate that some power above idle will be required on the final approach leg to maintain a suitable descent rate and airspeed to reach the landing area of the runway

____ **Instructor demonstrates then student practices landings:**
- If the student can consistently control the aircraft heading through the base leg and final leg while smoothly slowing and descending towards a point in the first half of the runway, then a safe landing is accomplished by simply allowing the model to continue to drift down for a "flared" touchdown.
- As the aircraft approaches a couple of feet from the ground, ensure idle power is set with the throttle stick fully aft, keep the wings level (or make very small adjustments to maintain the centerline track) and "flare" by applying increasing back pressure on the elevator stick to allow the model to 'fly as long as possible as low as possible' which should result in a smooth, nose-up attitude landing. Touching down with nearly full up elevator in many trainers is normal and indicative of a slow, properly executed, flared landing which can be compared to a gentle stall onto the main wheels

____ After touchdown the rudder / nose wheel steering is the primary directional control. Maintain the runway centerline with small rudder / nose wheel inputs using the left stick. Beware of the sensitivity of the movements and of the input reversal as the model is rolling towards the pilot. High speed rudder steering will be practiced in the next lesson during the take-off training

Evaluation:

The student is ready for the next lesson when he/she can consistently setup up a stable approach to land and execute a safe landing flare to touchdown. Student must develop good judgment in making a timely decision to abort a landing attempt by “going around” if the aircraft is not in a safe position or at a proper airspeed to land

Notes:

Lesson 7: Solo Flight

Purpose:
Confidence building exercise. The student is to perform a solo flight demonstrating the knowledge and skill objectives of the previous six lessons to the instructor.

Instruction Elements: *(check off each section when completed)*

____ Pre-flight discussion to answer questions and resolve any problems that concern the student about the lesson.

____ Student performs a flight, under the instructor's supervision, starting with a thorough pre-flight and ending with the transmitter back in the impound.

____ Instructor monitors student's performance, but assists only when necessary.

Evaluation:
The lesson is complete and the student signed off for solo flight ONLY after (s)he has demonstrated a practical knowledge of all course objectives AND has observed all safety and field operating rules, and has successfully flown his/her model unassisted.

Notes:

Lesson 8: Supplemental Maneuvers

Purpose:
To teach the student how to perform cross-wind take-offs and landings, to turn without ailerons using the rudder only, and how to handle different engine-failure scenarios

Instruction Elements: *(check off each section when completed)*

____ **Cross-wind take-off:** Always check the windsock to determine the wind direction before every take-off. If there is a crosswind anticipate the need for greater rudder correction to maintain the runway centerline while accelerating. The wing may also tend to roll with the wind, therefore aileron correction into the crosswind may need to be applied to keep the wings level during the take-off run. Once airborne be ready to adjust the aileron input to maintain the wings level as a roll may quickly occur in the direction of the cross-wind correction. The rudder should also be centered or as required, a small amount of right rudder held to offset the full power nose high left turning tendency

____ **Cross-wind landing:** The aircraft's heading must be pointing slightly towards the crosswind on final approach for the ground track to remain on the runway centerline. This is called a 'crab'. The stronger the crosswind component, the more the aircraft will need to be "crabbed" into the wind to maintain the runway centerline. The advanced landing technique of flaring in a 'sideslip' with rudder held to keep the nose straight and aileron correction into the wind will ideally result in the upwind mainwheel touching down first as the aircraft continues to track the runway centerline. After touchdown, adequate rudder inputs will be required to maintain the centerline tracking with possibly some aileron input into the wind to keep the wings level. A 'sideslip landing' maneuver can be challenging with a model aircraft. Alternatively, simply fly the model onto the ground from the crabbing attitude then quickly use the rudder to straighten the nose for centerline tracking

____ **Turning in flight using the rudder only:** Many model aircraft and trainers used to be built and flown without ailerons installed. Turns were accomplished with the rudder only. It is a good confidence building exercise to experience rudder only turns with modern trainers. It is most effective if the aircraft has adequate dihedral in the wings (as most trainers do). To create a roll without using the ailerons, simply add and hold a small amount of rudder input in the direction of the desired turn. Once the required bank angle is reached (about 30 degrees) readjust the amount of rudder to maintain the turn. Elevator correction is required to maintain the altitude during the turn. To roll back to set the new heading, apply a small amount of opposite rudder input until the wings are level again

____ **Engine failure**: Model aircraft engines can sometimes stop in flight due to fuel mixture or gloplug problems. How to handle the engine failure or "dead stick" approach and landing depends on where the aircraft is and how much energy it has (airspeed and altitude). You can confirm that your model engine has quit by smoothly applying full throttle and *hoping* for a full thrust response. If your model's single-engine has quit, it is important to gently lower the nose and maintain a glide at about the same airspeed as you would aim for on final approach. Treat the glide to landing as a slightly high final approach to flare (without the option to go around of course) **Remember to loudly call out that you are performing a "dead stick" landing in order to have priority to land.*
- If the engine fails immediately after take-off, it is much safer to attempt a landing straight ahead or slightly left or right to a relatively clear area. **The model will probably crash if a turn is attempted back to the runway.*
- If the engine fails on the downwind leg, establish a glide speed, reference any crosswind and judge when to make the turns onto the base leg and final approach leg to make a landing.
- If the engine fails after just turning onto the downwind in the far upwind corner of the pattern, it may be possible to attempt a downwind landing by turning quickly towards the closer end of the runway and judging how much to square off a base and final leg for landing

Evaluation:

The student should have a basic understanding of how to handle his/her model aircraft in crosswind conditions and different engine failure scenarios. (S)He should be prepared to perform the Evaluation test.

Notes:

Flight Evaluation Report

General Notes:

1. All persons performing this test must have completed at least two orientation flights.
2. Two instructors (one of whom may be the student's instructor) will complete the Flight Evaluation Test
3. All flying must be performed with the student pilot standing at a pilot position
4. All maneuvers will begin on the upwind leg and are to be performed in a safe manner with the aircraft flown beyond the marked flight line and within the traffic pattern at all times
5. If any part of the test is deemed unsafe, further instruction will be required. The student must then complete a re-test of the applicable part
6. After a successful test, *remove and submit this signed sheet* to a member of the Club Executive in order to receive a solo certification diploma.

PART A

____ - Perform a pre-flight inspection (including radio range test & checking battery charge levels)
____ - Using appropriate procedures, start the engine
____ - Taxi to take off position using appropriate calls
____ - Perform a normal take-off and enter the traffic pattern
____ - Perform a controlled flat figure eight pattern at pattern altitude (alert other flyers as required)
____ - Perform straight and level flight for three hundred feet approximately 30 feet above the runway along its centerline (beyond the flight line)
____ - Perform a proper approach and an overshoot (go-around) at 10ft back to the traffic pattern
____ - Perform a proper approach and a safe landing on the runway

PART B

____ - Perform a normal take off and enter the traffic pattern
____ - From a sufficient height, perform a simulated "dead stick" landing. Aircraft does not necessarily have to touchdown on the runway but it must be demonstrated that a controlled landing within the runway environment would have occurred

PART C

____ - Perform a normal take off. Instructor will place a flight control slightly out of trim (aileron or elevator) Pilot shall safely re-trim aircraft for straight and level flight
____ - Perform a proper approach and a safe landing on the runway

Passed Flight Evaluation Test:

Student Pilot Full Name: _____

Evaluator Instructor: _____

Evaluator Instructor: _____

Test date: _____

Have Fun and Fly safe!

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