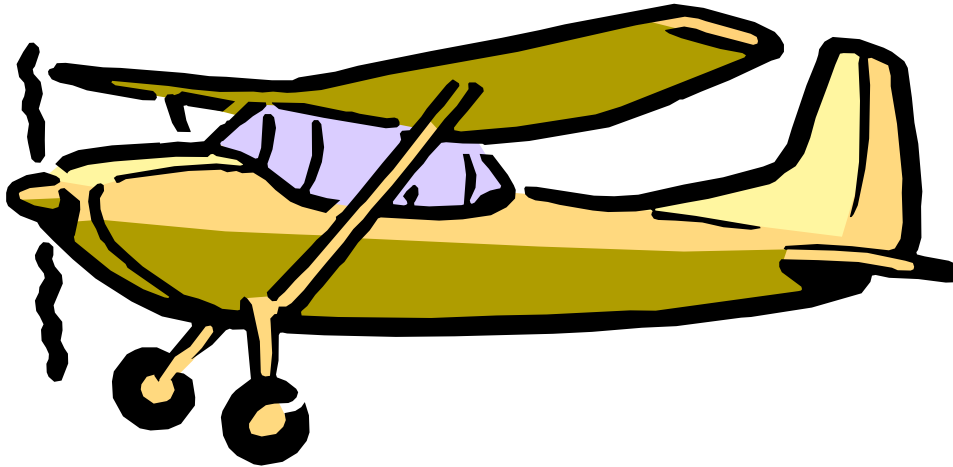


FOND DU LAC AEROMODELER ASSOCIATION



Instructor's Flight Training Manual

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Fond du Lac Aeromodelers Association

Flight Training

Forward

The following is a guide your instructor will use for the purpose of training student pilots. The guide should be followed step by step, so the student is required to complete the sections in the order of this book before proceeding on to the next. This is so different instructors can be used at different times and still know the accomplishments thus far of the student.

The instructor should work with the student until the student can perform each task without being helped. The first two sections do not require any flying skill. The instructor should make sure the student is fully aware of the items in sections I and II. Most lessons will need more than 1 session together with the instructor.

At the end of each section are areas where the instructor should place a check mark and initial after the student has successfully completed that item. After each section, the instructor will find a sign-off area. Each instructor should sign their name after the completion of each section along with the date. If the student did not complete the items at that instruction time, then nothing gets signed off yet. The instructor should keep in mind that he may not always be the one to instruct the student all the way through, so signing off each item is very important. This will allow the next Instructor to pick up where the student left off.

The student should NOT attempt to fly on his own until he has fully completed this program. This program is designed to help the student learn to fly as quickly and as safely as possible.

The purpose of this guide is to provide a degree of standardization in the training of new students, regardless of which instructor works with them. Most important is to insure that the many aspects of RC flying are brought to the attention of the student in a logical order so that they can build on prior knowledge and skills in working toward soloing and safe flying habits thereafter.

It's not enough for the instructor to simply stand next to the student and tell them which way to move the controls to prevent them from crashing or having to grab the transmitter away to save a plane. This method of leaching relies on the student learning from trial and error. This method does work most of the time, but is extremely inefficient. It's also likely to cost the student an airplane eventually because some important aspect of flying never came up in the pre-solo training.

The role of the flight instructor is to communicate his knowledge to the student, not just to prevent him from crashing while the student teaches themselves to fly. The instructor shouldn't be perceived as a safety net, but as someone that's willing to pass on the ability to fly RC planes to someone that wants to learn how. A great RC flyer may be very good at recovering from full-power spiral dives before the plane crashes, but this doesn't make him a good instructor unless he passes on this knowledge to the student. Also, being a "friend" and passing the student on would not be advisable if in fact the student is still having difficulty with something. A "friend" would make sure a "friend" is capable first and maybe save a plane in the future.

Method of Instruction

The teaching of every maneuver consists of four parts:

1. **DESCRIPTION:** A description of what is to be done, along with the information necessary to understand how to do it. An instructor often takes too much for granted about what the student already knows.
2. **DEMONSTRATION:** A demonstration of how to do the maneuver. You do it first so the student will know what you expect. Talk to him while you are doing it so he can relate the movement of the controls with what he sees the plane doing.
3. **PRACTICE:** The student's practicing of the maneuver himself. It may be necessary during the course of this practice to go back to the description and/or demonstration several times if the student is having trouble.
4. **EVALUATION:** The evaluation of the student's progress and determination that he's ready to move on.

The teaching of a new student will follow the general guidelines set forth above. The specific guidelines for the lessons are spelled out. This lesson book is not meant to infer that one pilot's style of teaching, or flying for that matter, is good or bad. This lesson plan will insure a degree of standardization and that each student is shown all of the important aspects of RC flying.

Each flight should be firmly structured. The student should not be permitted to wander the sky aimlessly. He should be told ahead of time what is to be done in general terms and then left to plan out the details. For example, if the session is to practice landing pattern approaches, the student should decide when and where to turn. If the instructor says "turn downwind now, throttle back now," etc. the student will never learn to make those decisions. Don't ever try to teach a student anything new while they are flying. 100% of their concentration is on the plane and not what you're trying to teach them. If you have to explain something, take over the controls first. The student should already have a pretty good idea of when, where, and how high by watching the demonstration already given to him by the instructor. The only way a student can learn to control the airplane is by flying it over a predetermined path. If he simply does what is necessary to keep the airplane from flying out of sight, then the airplane is controlling him.

A certain amount of nervousness is to be expected, but if it looks like the student is going to break off the sticks, it's time to take over. It's possible the lesson time might be too long at first so be attentive to the student. If they're tense or tired, they're not learning anymore so cut the lesson off for another day.

Be sure to praise the student on a task well done, even if it was just so-so. You must build up the student's confidence in their flying. An example could be: "That was a real good landing. Next time we will try to land on the field." Also, remember to never cut down a student's plane or equipment no matter how bad it is. Instead say something like "you did a real nice job here, but let me show you some tricks I've learned."

Conversely, if you have a student that is over confident, you can bring them back to reality by waiting for them to make some little mistake, and come down on them a little harder than you normally would. This will lead to another mistake in which you would come down the same way that would lead to another mistake. If you play along long enough, the student probably couldn't tell you his own name. This scenario can also hold true here unintentionally if maybe say you got up on the wrong side of the bed that day.

One thing modelers, as well as others, like to do is throw around big and confusing sounding names to describe things on and that happen to planes. Make sure that just because you know and use some of these terms doesn't mean your student knows them. Remember there was a time when you weren't the flying ace you are now, or was there?

The student should be told early on in his training to pay close attention, for example, to how his instructor fly's the landing pattern. He should note how high the plane is in each phase of the pattern, where he makes his turns and what the attitude of the plane is.

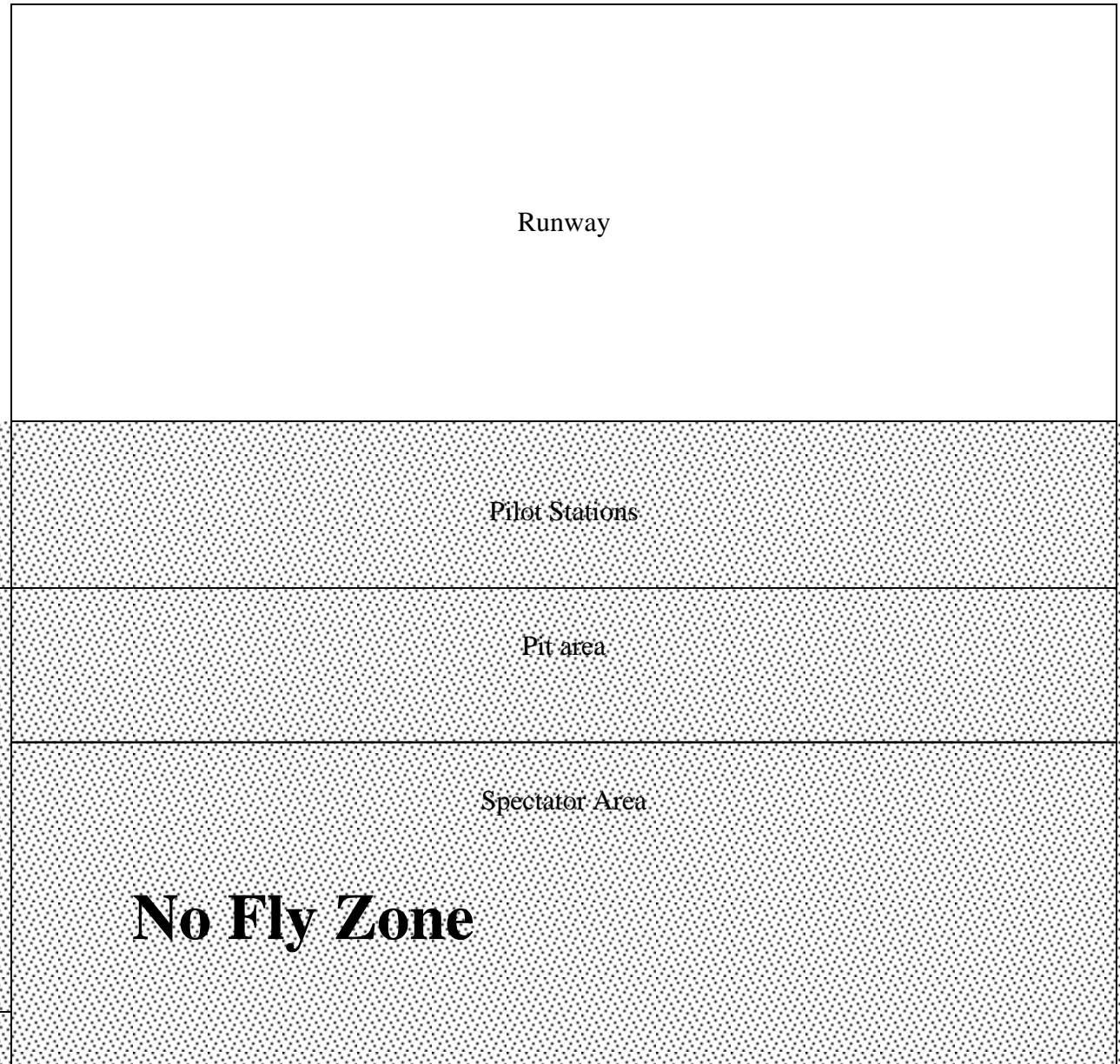
There is a checklist in the back of the student's booklet. When a student has accomplished the complete lesson, the instructor will legibly sign his name and date it. Also, there is space to make a note of what problems the student was having and make any suggestions on what to practice during the next session if a different instructor is used. This list will make it possible for other instructors to take over where others left off. This sign off list will insure that everything of importance was covered in a logical order and in sequence.

Lessons

I. General Information

- The Student has read and fully understands the rules and regulations of the Fond du Lac Aeromodelers Association.
- The student has read the rules and regulations of the AMA. and is a member in good standing.
- The student is aware of the relative location to the FDL Airport and is aware that any full-scale pilot has the "right of way".
- The student is fully aware of the "No Fly Zones" in relation to the field.
- The student has learned and fully understands how to use the frequency board. The student is aware that the only time a transmitter can be turned on at the field is when the frequency pin for the channel your on is clipped on your radio.
- The student is aware that whoever causes damage by turning on a transmitter without the proper frequency pin in their possession is responsible to replace or pay for the damage incurred, not being limited to just the airplane involved.
- The student understands that vehicles are prohibited from going on the flying field and pit area.
- The student is aware of the pit area and knows that any aircraft cannot be taxied into this area.
- The student understands they must stand on the pilots' stations when flying to maintain order and a minimum of 25' of spacing between pilots.
- The student is aware that if he observes anyone not following the rules and regulations of the Aeromodelers Club it is their duty to bring to the attention of the party in question at the time its noticed, then also inform one of the club officers.
- The student is aware there is no taking off from or landing toward the flight line.

Flying Site Layout and No-Fly Zones:



Runway

Pilot Stations

Pit area

Spectator Area

Helicopter area

No Fly Zone

II. Initial Inspection

- Transmitter and flight pack batteries are fully charged.
- Check for airworthiness -wing fuselage and center of gravity.
- Check radio installation and radio and servo connections.
- Check control linkage, collars, clevises, wing bolts, rubber bands etc.
- Check engine and engine mounts.
- Range check radio with antenna fully collapsed. (Make sure you have the frequency pin BEFORE even thinking about turning on the radio.)
- Check direction of movement and operation of all controls, no binding, rubbing, sticking and no excessive play either.
- Engine run-up. Is it properly set for high speed and reliable idle? When starting, people and other objects are behind you and are clear of oily wind.
- Fuel feed is clear with no bubbles present.
- Transmitter antenna is fully extended.
- Overall the aircraft appears to be airworthy with no obvious flaws that would jeopardize the success of the first flight.

III. Check out of a New Airplane

Objective: To get a new airplane checked out and trimmed, to show the student the proper preflight checks, and to begin learning shallow turns.

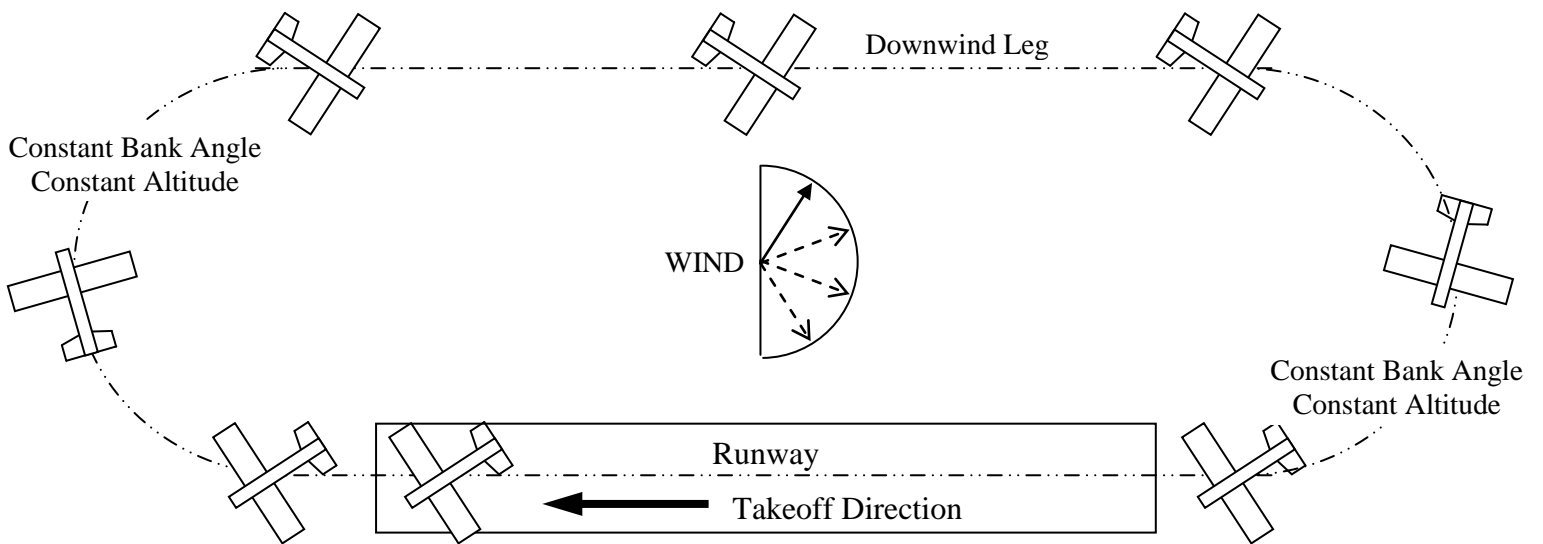
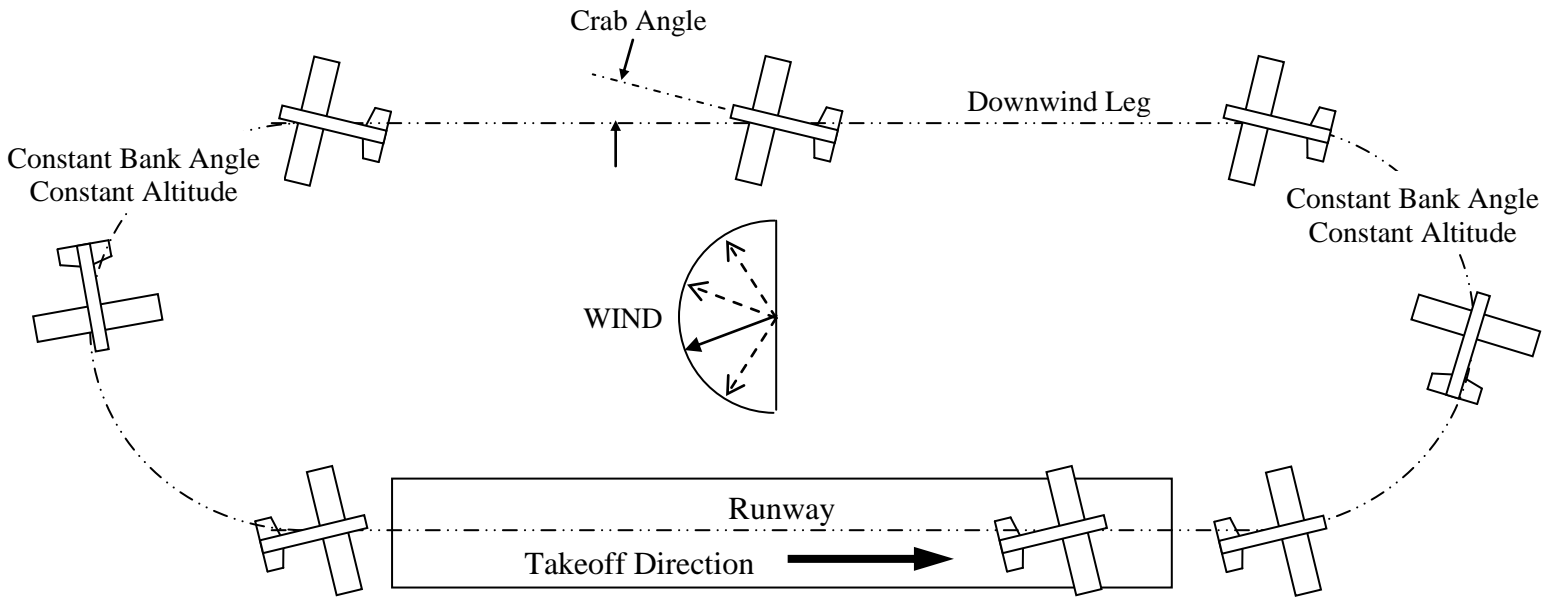
Description: Explain the operation of the controls, fast or slow rate determined by the amount of aileron and amount of roll determined by how long the aileron is held. Show how up elevator is needed continuously to hold nose up and how the steeper the bank the more elevator is needed. Physically point out where "off limit" areas are in the air, (over pits). See map. Also where he should fly (not too low or too high or far away). Refer to the checklists in "Appendix C—Checklists".

Demonstration / Practice:

1. The plane should be restarted (if necessary) and the engine adjusted by the instructor along with an explanation of what he's doing.
2. The instructor takes the aircraft off and climbs to a safe altitude and trims out the aircraft.
3. The instructor after explaining his previous actions hands the controls to the student and lets him just fly around and get the feel for the controls first.
4. The student may now do shallow left and right hand turns. The instructor will first demonstrate the desired bank angle, how to hold the nose up and how to rollout. The instructor will call the beginning of the turn for the student, which direction to turn and when or on what heading to roll out.

Evaluation: The student will be considered ready to advance to the next lesson when he can roll into shallow turns in the correct direction and roll out to level flight when directed turning both left and right. He must do these consistently without loss of control or excessive change in altitude.

Traffic Pattern with Wind Correction



IV. Figure Eight's, Medium Turns, Taxiing

Objective: To allow student to learn ground handling of airplane, to continue sharpening students skill at turning, and to begin training student to think and plan ahead, i.e. to make the student fly the plane over a preplanned path instead of just wandering all over the sky.

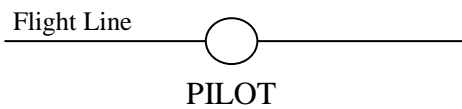
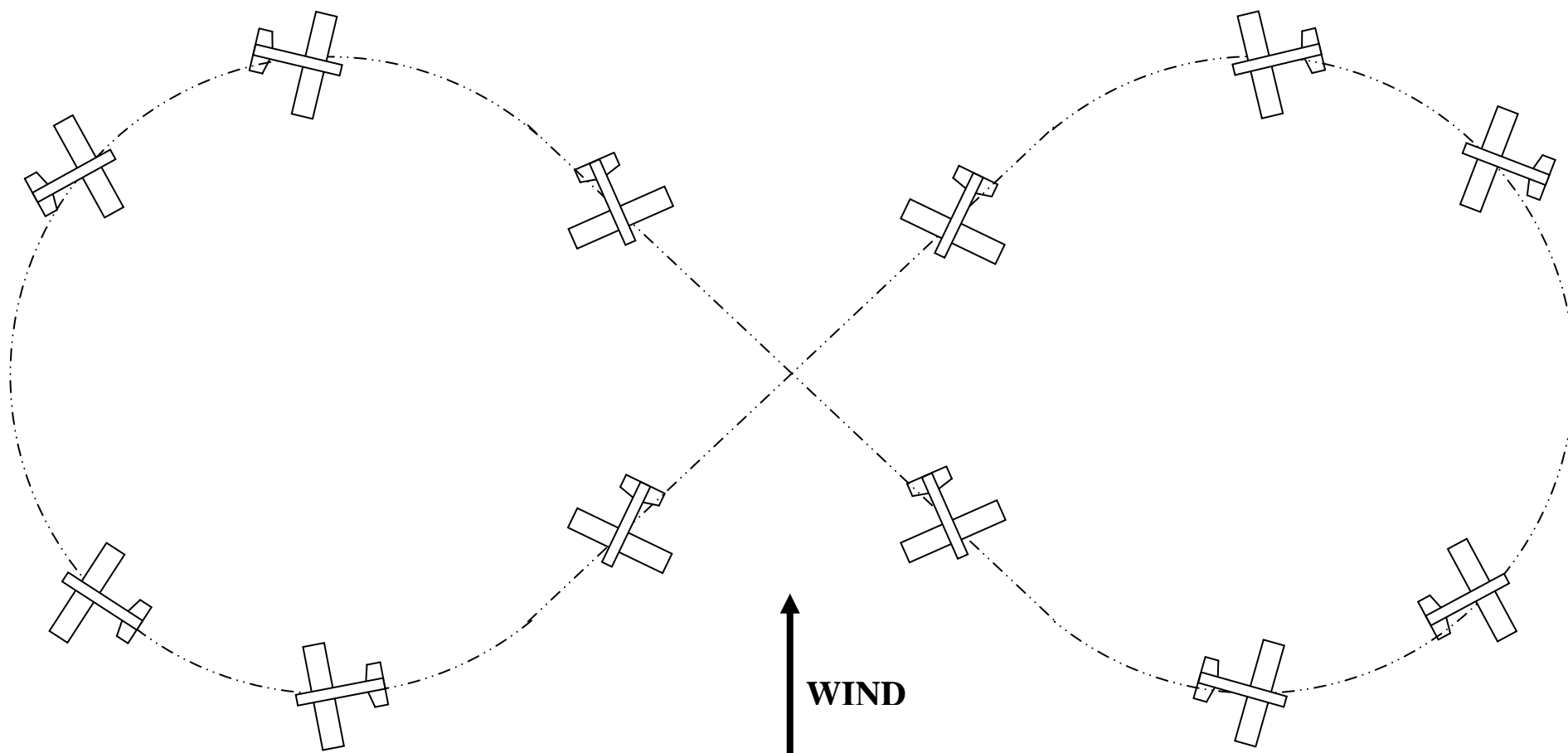
Description: Explain that the pattern to be flown will be elongated figure eight's parallel to the runway with a short stretch of straight flight in the middle. Tell the student that he will be handling the taxiing to the takeoff position and back to the flight line after landing. Explain that this will give him more practice turning, especially coming toward himself. It gives him practice with the ground handling which is helpful when he starts takeoffs. From this point on the student will handle all the taxiing chores.

Demonstration / Practice:

1. Taxiing to takeoff position will be done by the student with instructor supervision.
2. Elongated figure eight's will be demonstrated by the instructor and then practiced by the student. The instructor will offer necessary criticism but let the student decide when to turn, roll out, etc. Confine your remarks to generalities such as "stay away from the road, ""don't get so far away", or "stay a little higher". In other words make it necessary for the Student to plan and execute the turns so that he simulates the eight's that you demonstrated for him.
3. Taxiing back after the landing roll-out will be done by the student with instructor supervision, remembering that taxiing into the pits is not allowed.

Evaluation: The student will be considered ready to advance to the next lesson when he can consistently make uniform eight's within the flying area without losing control and while maintaining reasonable altitude control.

Figure Eight Flight Pattern (with wind correction)



V. Climbs and Glides

Objectives: To learn to control the airplane in a climb attitude and to learn both speed and directional control in glides. Both skills are important in post-takeoff and pre-landing phases of flight.

Description: Explain the objectives of the lesson. Talk about the hazard (stalls) of too steep a climb angle. Discuss speed control in the glide and again the hazard (stalls) of going too slow. Discuss the problem of too fast a glide speed in landing, which requires excessive flare and floating.

Demonstration / Practice:

1. Demonstrate climbs, both straight and in turns, and demonstrate glides, straight and in turns. Emphasize the need for elevator in the glides to control the glide speed and angle of attack.
2. Have the student practice climbs and glides. A good way to get practice in both would be to have the student alternately climb and glide through elongated figure eight's.

Evaluation: The student will be considered ready to advance to the next lesson when he can consistently execute the maneuvers without loss of control or orientation. He maintains good speed control in the glides without stalling and maintains proper climb angles (not too steep and not too shallow). He also exercises good judgment as to when to terminate the glide without going too low.

VI. Procedure Turns and Straight Flight

Objective: To continue sharpening skills at turning the airplane to a preplanned amount in both directions. Also, to learn controlled straight flight directly away from and directly toward the transmitter. This latter skill is an absolute must before successful landing approaches can be made.

Discussion: Discuss the purpose of the lesson and the importance it will have later on when learning landing approaches. Explain, or preferably draw, the flight path to be followed. Show him what the procedure turn looks like and in what direction you will make the outbound and inbound straight flight. Talk about the apparent control reversal syndrome when flying directly toward the transmitter and possible ways to overcome it.

Demonstration / Practice:

1. Demonstrate the pattern to be flown.
2. Let the student practice. Alternate the direction of the procedure turn on each outbound and inbound leg. Keep the verbal coaching of when to start the turn, stop the turn, etc. to a minimum. Make the student exercise planning and judgment.

Evaluation: The student will be considered ready to move on to the next lesson when he can consistently maintain straight flight without becoming disoriented. He can plan and demonstrate the procedure turn without flying excessively far away outbound or flying overhead on the inbound leg. He can turn the proper direction on the first try throughout the maneuver and can maintain reasonably constant altitude throughout the drill.

VII. Stalls and Slow Flight

Objective: To learn to recognize the cues an airplane gives prior to and during a stall. To learn the feel of maneuvering the airplane at very slow speed near the stall angle of attack. To learn firsthand, at a safe altitude, how turning can precipitate a stall when the airplane is already very close to the stall angle of attack. Finally, to learn proper stall recovery. Armed with this knowledge and skill, the student will be less likely to cause an inadvertent stall, or at least he will be able to recognize the stall and will take prompt recovery action.

Discussion: Explain the objective of the lesson. Be sure to talk about the cause of a stall as being excessively high angle of attack and not excessively slow airspeed, although the two are found together. For example, a snap roll from level flight at full throttle starts with a high speed stall. Tell the student that inadvertent stalls occur most often during final stages of the traffic pattern approach and just prior to landing. At these times the airplane is flying at reduced throttle and a higher than normal angle of attack, thus slower. For example, a frequent place to stall is on the turn from base leg to final, especially if the plane is a little low and the pilot is trying to stretch the glide. Point out that here the solution is a touch more power, not more back pressure on the stick. Of course, in a dead stick emergency this all takes on a new meaning. You should point out that here, since more throttle is not available, it is better to dump the airplane in the weeds than to try and make the runway. Plenty of practice with stalls and slow flight is the best way for the student, or any other RC flyer in fact, to learn what he can get away with in these dead stick maneuvers. It is important that the student realize that the wind will disturb the visual cues as to how fast the plane is moving. Some planes can be brought to a virtual standstill flying into a strong headwind and still be well above the so called stall speed. Airspeed, or more accurately, angle of attack is the important element determining when a stall will occur and the student must learn to compensate for wind in his determination of how fast the plane is really going.

Demonstration / Practice:

1. Demonstrate stalls and slow flight. Point out how the airplane seems to wobble a bit and drop its nose when the stall break occurs. Point out any other tendencies that that particular plane has, such as wanting to turn or drop into a spin. Show the student how slow you can make the airplane go without losing altitude or stalling. Then demonstrate what happens when a turn is attempted from that just above a-stall condition.
2. Have the student practice stall recovery, first from straight flight and then from turns. Have him try stalls from both idle power and from moderate throttle settings. If he is not having a lot of trouble recovering, you might even have a high speed stall from full throttle.
3. Have the student practice slow flight. Make him fly the plane slowly in level flight. Then have him maneuver the plane, making very shallow banked turns without stalling. Finally, have him attempt more steeply banked turns and turns while flying as slow as possible (the highest angle of attack possible) so he can see firsthand how the plane will stall when turned.

Evaluation: The student is considered ready for the next lesson when he can consistently recover from intentional stalls from straight flight and from turns. He can maneuver the aircraft in slow flight without stalling, or when an inadvertent stall does occur, he recognizes it and takes prompt action to recover. He can recover from both intentional and inadvertent stalls without loss of control or disorientation and without excessive loss of altitude.

VIII. Traffic Pattern

Objective: To develop the judgment, planning, and execution skills necessary to fly a traffic pattern approach so as to be able to consistently line up with the runway.

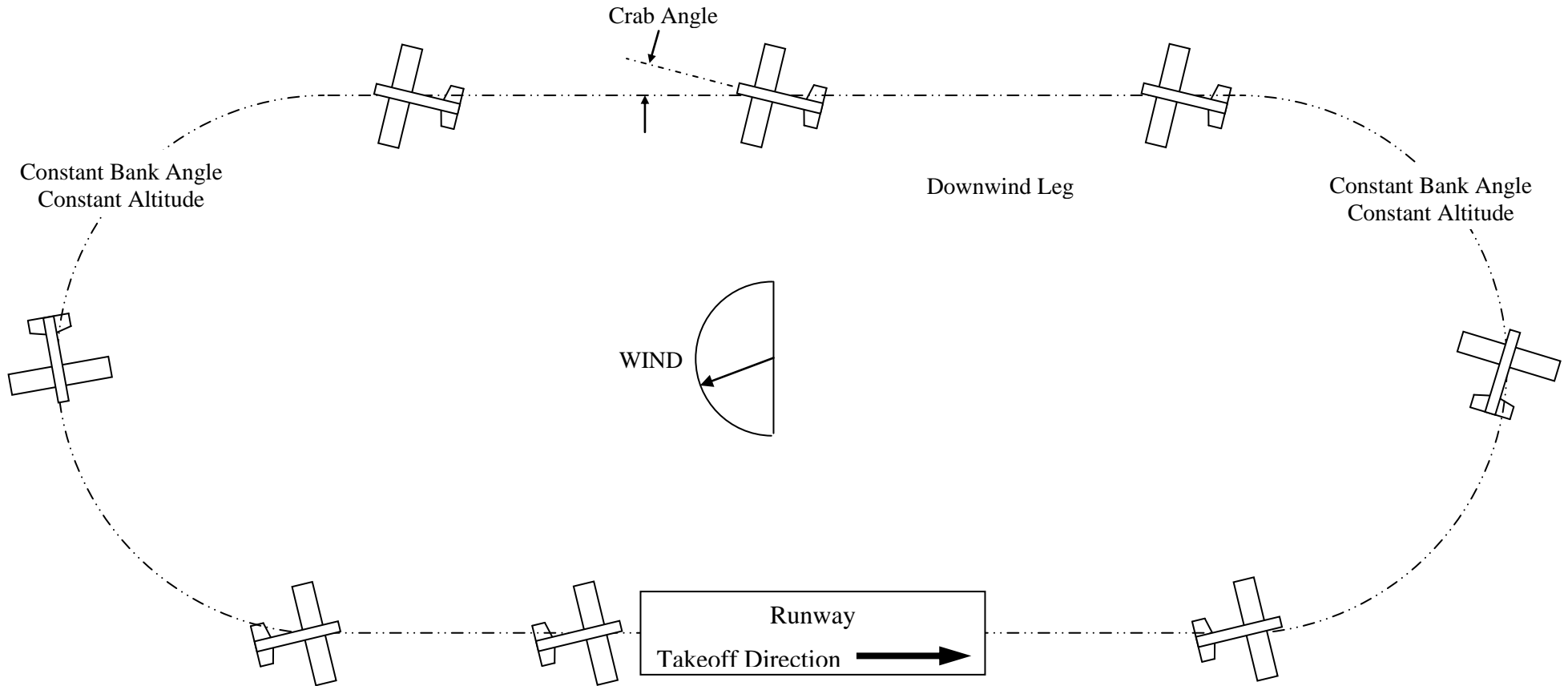
Discussion: Explain to the student verbally and with drawings what the traffic pattern looks like and what components it is made up of, i.e. takeoff, crosswind turn, downwind leg, base turn, and the final approach. Explain that the objective is to learn to fly the airplane through a predetermined path over the ground, culminating in a final approach leg in line with the approximate center of the runway. This is an essential skill to develop before successful landings can be made.

Demonstration / Practice:

1. Demonstrate the desired course around the field. Reference this point both to the perspective from where you and the student are standing and to some landmark in the area such as "the big tree". The student should have some idea of this already if he has been watching the instructor flying the traffic pattern and landing in prior lessons, which he should have been doing. In these prior lessons, the instructor may insure that the student is paying attention by asking, after an especially good approach and landing, "where did I start to turn final?" Point out to the student how, because of perspective, the turn to final must be delayed or the final approach path will be along the far edge of the runway or even beyond. Caution him that his turn to final should be carefully planned and initiated well in advance so that it can be accomplished with very shallow bank angles.
2. Student practices flying the pattern at lower and lower altitudes at about 1/3 throttle. Offer verbal corrections and suggestions but allow the student to do as much as possible of the specific planning of when to start turns, when to roll out, etc. Have the student do patterns in both directions of each runway so he learn~ what to line up with.

Evaluation: The lesson is considered complete when the student can fly a rectangular course with planning and judgment such that he consistently fly's the final approach leg over the center of the runway.

The Traffic Pattern with Wind Correction



IX. Takeoffs and Approaches

Objective: To learn take off procedures and to sharpen the skill gained in the last lesson in making traffic pattern approaches. Also, to add to this skill the planning, judgment, and skill necessary to descend on final so as to arrive over the runway threshold lined up with the runway at an altitude from which an actual landing could be made. Knowing that he is not actually going to land, the student can devote total concentration to the planning and flying of the approach and descent. Having mastered this phase of the landing procedure, the actual landing flare and touchdown will be much easier .

NOTE: DO NOT let the student make the initial takeoff. First have him make several go-rounds to get used to climbing out from low altitude. Let him attempt a takeoff only after he has demonstrated that he can make well controlled, straight climb outs from 10 to 15 feet.

Discussion: Explain the objective of the lesson as outlined above. Review with the student what pattern is to be flown, adding that this time the power will be reduced as competing the turn to final approach and will continue at normal glide speed, i.e. at a slower speed than cruise speed. Explain to the student how a too high approach can be corrected by angling the base leg away from the end of the runway, or if too low, a correction can be made by angling it in toward the runway. Explain also how a little more power can be used to correct the latter problem, assuming that the engine has not stopped. Mention to him that directional control on the takeoff run may require some right rudder because of torque. Explain how this may be more of a problem on some airplanes than others, like tail draggers compared to tricycle gear planes.

Demonstration / Practice:

1. Demonstrate the desired pattern, explaining in detail what you are doing during each phase of the pattern and why. Show how the imaginary touchdown point can be moved up or down the runway by adjusting the base leg as explained in the preflight. Break off the approach at 10 to 20 feet, low enough to see that the plane would have made the runway, but high enough to make a safe go around.
2. Have the student practice the pattern. Offer liberal criticism and advice but leave specific planning details to the student as much as possible. Make sure he exercises good speed control in the glide portion, not dangerously close to stall but not so fast that he has a lot of speed to bleed off in the flare were he to actually land. Good speed control is as important for good landings as being lined up with the runway at the right altitude over the threshold. Having the student break off the approach at 30 to 40 feet on the first approach until he becomes comfortable with executing a go around. Then allow him to descend to 10 to 20 feet above the ground. DO NOT allow the student to dive the plane at the end of the runway if it is too high. This excessive speed must be dissipated before a landing can be made and only results in a more difficult flare and excessive float that may carry the plane off the end of the runway anyhow.

3. Have the student practice takeoffs. By now the student has mastered turns without becoming disoriented and has had some practice climbing out from low altitude. The student should also have had plenty of practice in taxiing the airplane, however, it might still be a good idea to make several high-speed taxi runs before attempting an actual takeoff. When he can make straight, down the runway (not across it) high-speed taxi runs, he is ready for an actual takeoff. Caution the student to concentrate on keeping the wings level after liftoff and maintaining runway heading to a safe altitude before turning.

Evaluation: The student is considered ready to move on to the final lesson, landings, when he can maintain directional control on takeoff and climb out with a deviation of no more than about 15 to 20 degrees from runway heading. He can consistently fly the traffic pattern and final approach so that the plane arrives over the threshold in line with the runway. Also, the plane is at the correct height and speed to make a normal landing. There is no question in the instructor's mind that a successful landing could have been made safely within the boundaries of the runway. The student has done this without specific verbal coaching and has demonstrated good planning, judgment, and execution. He has also managed to consistently arrive over the runway threshold without excessive last minute maneuvering.

X. Landings

Objectives: To master the last phase of the landing sequence, the actual flare out and touchdown.

Discussion: Review with the student what he has learned about traffic pattern approaches in the last two lessons. Point out to him that the secret of a good landing is a good approach. Seldom does a good landing follow a snake dance type maneuver to get lined up with runway in the final seconds of the approach. If the approach is good and the airplane arrives over the runway threshold at the right altitude, lined up with the center section of the runway (not necessarily the center line), the landing can be as simple as raising the nose to slightly above the horizon and waiting for the wheels to touch. Point out to the student that tenseness and over control can be the biggest causes of making a bad landing following a good approach. Caution him about touching down on the nose gear before the mains. This could case a nose over, or at best, bouncing porpoise-like down the runway with each bounce bigger than the one before. Tell him that the most desirable touchdown is nose high with the mains touching first.

NOTE: Before letting the student attempt a landing, make a final check that the engine idle is not so high that it prevents the airplane from settling.

Demonstration / Practice:

1. Demonstrate for the student what was discussed in the preflight briefing. Emphasize good speed control in the glide: too fast and you have more difficulty flaring and a longer float (during which time something could go wrong), too slow and there is danger of stalling. Point out that you break the glide by bringing the nose level at about 20 feet above the ground, and then at about feet you begin final flaring to a nose high attitude, held until the mains touch.
2. Have the student practice lots of landings. In this critical phase of flight you will seldom, if ever, have the chance to take over control yourself unless you're using a buddy box and trainer cord. Therefore, make sure that you and the student have an understanding that is there is even a hint of trouble you will call for a go around, and he will respond immediately and without question. Initially, make full stop landings—the student does not need the added worry of thinking about an immediate takeoff while still trying to get lined up for the landing. Touch and goes may be tried later if the student has been doing exceptionally well. If however, these should probably be left for the student to learn after solo unless he is really sharp.

Evaluation: The student is considered to have mastered this lesson and is ready for his pre-solo test when he can make approaches such that he is aligned with, parallel to, the centerline of the runway. He is able to make minor last minute corrections to fine tune the alignment or to level the wings after being disturbed by a wind gust. He maintains good speed control and good elevator control (no excessive galloping) through the flare and touchdown, which should be safely within the sideline boundaries of the runway. In other words, the instructor has the feeling that the student has stayed well ahead of the airplane and has landed on the runway because of good planning, judgment in knowing, without being told, when to abort a landing and go around when something has gone wrong.

Appendix A—Student Signoffs

Pre-flight Knowledge:

- Instr.
Initials
- _____ **General Information**
The student has read and fully understands the “General Information” section.
- _____ **Initial Inspection**
The student has read and fully understands the “Initial Inspection of a plane” section.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Check out of a New Airplane:

- _____ Student is able to identify the correct control movement directions.
- _____ Instructor has pre-flighted students airplane, deemed it airworthy, test flown, and trimmed the airplane.
Airplane Name/Type: _____
- _____ Can complete shallow turns to the left, and a rollout level.
- _____ Can complete shallow turns to the right, and a roll out level.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Figure Eight's, Medium Turns, Taxiing:

- _____ Can complete uniform figure eight's without losing control.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Climbs and Glides:

- _____ Can consistently perform climbs and glides without losing control or orientation.
- _____ Maintains good speed control in glides without stalling and good climb angles.
- _____ Has good judgment when to terminate a glide without going too low.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Procedure Turns and Straight Flight:

- _____ Can consistently maintain straight flight without becoming disoriented.
- _____ Can perform the procedure turn without flying excessively far away or overhead.
- _____ Can turn the proper direction on the first try throughout the maneuver and maintain constant altitude throughout the drill.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Stalls and Slow Flight:

- _____ Can consistently recover from intentional stalls in straight flight and turns.
- _____ Can maneuver in slow flight without stalling and can recognize a stall and take prompt action to recover .

Section Sign-Off:

Instructor Signature: _____ Date: _____

Traffic Pattern:

_____ Can consistently fly a rectangular course that he consistently fly's the final approach leg over both of the center of the runways.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Takeoffs and Approaches:

- _____ Can maintain directional control on takeoff and climb-out.
- _____ Can consistently fly the traffic pattern and final approach so it's over the threshold in line with the runway.
- _____ The plane is at the proper speed and height to make a landing
- _____ Instructor has no question that a successful landing could have been made.
- _____ Student has done this without specific verbal coaching and has demonstrated good planning and execution.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Landings:

- _____ Can make approaches so he's aligned with the centerline of the runways.
- _____ He is able to make last minute adjustments due to wind gusts.
- _____ Maintains good speed and elevator control through the flare and touchdown. If the final instructor feels that the pilot has stayed ahead of the airplane and has landed on the runway because of good planning and judgment and without being told when to abort a landing and go around, then the pilot is ready to solo.

Section Sign-Off:

Instructor Signature: _____ Date: _____

Appendix B—Solo Flight Test

- _____ Reasonable amount of safety in the pit area
- _____ Reasonably safe and under control take-off
- _____ Straight and steady flight at high speed
- _____ Straight and steady flight at medium speed
- _____ Straight and steady flight at low speed
- _____ 5 reasonably consistent figure 8's done consecutively
- _____ Reasonably safe and controlled landing

Solo Sign-Off:

Pilot Name: _____

Airplane: _____

Instructor Signature: _____

Date: _____

Appendix C—Checklists

Airplane Setup Checklist

(Before First Flight of the Day)

1. Shake airplane vigorously and listen for any movement inside (i.e. Batteries or Receiver)
2. Check CG is within recommended range
3. Check that plane balances laterally (i.e. pick up by prop tip and the top of the Vertical Stabilizer—see if a wing drops)
4. Antenna secure
5. Hatches secure
6. Engine:
 - Engine secure
 - Muffler tight
 - Prop & Spinner tight
 - Fuel Lines connected
 - Throttle Cable connected
7. Landing Gear
 - Gear secure
 - Wheels secure and turn freely
 - Steerable wheel straight
8. Wing
 - Wing(s) secure and straight (bolts tight or rubber bands secure)
 - Aileron hinges secure and linkages tight
9. Tail
 - Horizontal Stabilizer Secure
 - Elevator hinges secure and linkages tight
 - Vertical Stabilizer secure
 - Rudder hinges secure and linkages tight

Pre-Flight Checklist

1. Frequency Pin
2. Check Receiver Battery Voltage (> 4.8V under load)
3. Receiver ON
(check for “controlled” movement which would indicate someone else is on the channel)
4. Transmitter ON
5. Check Transmitter Voltage (> 9.8V)
6. Control Directions correct and “reasonable”
(Aileron, Elevator, Rudder, Throttle)

Engine Starting (2-Stroke)


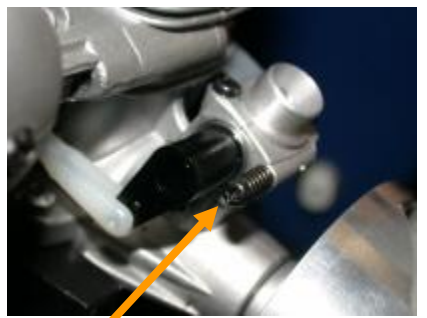
1. Plane and radio ON
2. Glow driver DISCONNECTED
3. Prime Engine
 - a) Open throttle completely (full throttle)
 - b) Flip Prop 2-3 times
4. Throttle to just above idle
5. Attach glow driver
6. Secure the airplane for safe starting
7. Flip prop manually or turn with starter to start the engine
8. Bring throttle up above $\frac{1}{2}$ throttle and let engine clear out and warm up (about 20-30 seconds)
9. CAREFULLY remove glow plug driver
10. Adjust full throttle mixture as described in the "Engine Adjustment" checklist

Engine Adjustment (2-Stroke)

1. Start Engine
2. Let it warm up for about 30 seconds
3. Adjust High-Speed Needle Mixture
 - a. Bring the engine to full throttle
 - b. Turn the valve a few clicks and wait for the engine to respond.
(Turning Clockwise will lean the mixture, counter-clockwise will richen the mixture)
 - c. Find the setting where the engine RPM peaks—then back out (richen) the valve 4 clicks or so.
 - d. At full throttle, pick up the airplane and point the nose straight up for at least 5-10 seconds
 - e. If the engine maintains RPM, the high-speed is set. If not, richen the mixture a few more clicks and repeat the nose-up test

Engine Adjustment (2-Stroke)— Cont'd

4. Adjust the low-speed (idle) mixture
(this is usually done after the engine is broke-in)

	Fuel-Metering Carburetor	Air Bleed Carburetor
		
Leaner Mixture	Clockwise	Counter-clockwise
Richer Mixture	Counter-clockwise	Clockwise

- a. Clear out the engine by running at full throttle for 5 seconds at full throttle
- b. The “Pinch” test (repeat step 4-b before each test)
 - i. Pinch (and hold) the fuel line going to the carburetor
 - ii. If the engine speeds up before slowing, it is rich.
 - iii. If the engine slows or just quits, it is about right or slightly lean—go to the next test
- c. The “Throttle-Up” test (repeat step 4-b before each test)
 - i. Bring the engine to idle for 20 seconds (after clearing)
 - ii. Swiftly and Smoothly bring the throttle up to full throttle
 - iii. If the engine sputters (and spits fuel/oil out the muffler) it is rich
 - iv. If it dies without sputtering, it is lean
 - v. Stop engine, adjust, and back to 4-d

Appendix D—Solo Certificate

FOND DU LAC AEROMODELER ASSOCIATION

CERTIFIES THAT

John Doe

has completed the required course and demonstrated the skills necessary for the successful solo flight of a model airplane.



Given this 1st day of January, 2007



Instructor

FDLAA President