Airdrie Modellers Aircraft Society
“AMAS”
RC Flight Training Course

AMAS Flight Training Course

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Introduction

Welcome to the Airdrie Modellers Aircraft Society (AMAS) training program. This program will teach you the basics of flying radio controlled model aircraft and is based out of Model Aeronautics Association of Canada (MAAC) and United States Academy of Model Aeronautics (AMA) training material, extended with the objective of entirely assist you throughout the learning process.

The main focus of the training is on "Fixed Wing" aircraft which is recommended as a basis for flying other aircraft. The basic "maneuvers" in this course will apply for flying Multi-Rotor aircraft or Helicopters.

The Safety Guidelines presented in this training guide also apply to water based aircraft (i.e. floatplanes, seaplanes, etc.).

There is nothing in this program that guarantees that you will become a successful R/C pilot. Nor, are there any expectations on how long it will take to complete this program. Like everything else, your success will all depend on your willingness to spend the time and practice.

This program is based on a series of Lessons designed to build upon previous training experiences, to aid in developing the required skills through step by step, progressive and safe techniques which will build your confidence and enable you to enjoy your new hobby.

Upon completion of this program, you will be ready to opt for “A” Wings test. This test is designed such that you can demonstrate to the club’s satisfaction that you are able to control your plane safely, that you understand and fly per AMAS field procedures and safety guidelines, and according to MAAC’s code of safety. After passing this examination, you will be allowed to fly without aid of an instructor.

We trust the completion of your “A Wings” is only the beginning of your learning and will serve as an incentive to get out and fly. Where you go from here is up to you. Good Luck and enjoy it “safely”.

Kindly allow us to provide you a reminder…
You must learn to crawl before walking, and walk before running. For this reason, AMAS strongly recommends that you start your flight instruction on a trainer type aircraft and then evolve to more advanced planes. A trainer will enable you to learn easier and it will simplify your instructor’s roles. Your plane will last you longer with less chance of a serious crash.

Remember, even the jet fighter pilots learn to fly in trainers before advancing to jets; leave the scale planes until after you have learned to fly.

AMAS thanks MAAC, for allowing using their Flight Training Course adopted as the “Canadian National Standard”; and AMA for sharing their associated clubs library, being these used as benchmark for development of this training manual.

“SAFETY FIRST, FUN SECOND”

Progress Check List

Student to present “progress” check list to Instructor prior to each days training. The instructor will initial each item when covered.

FLIGHT PROFICIENCY

INSTRUCTORS NOTE: You are to demonstrate each step of the particular lesson to be learned.

Field Layout (Please review with student to ensure understanding)

		Inst. Initial	Date
☐	Parking	_____	_____
☐	Gate (rules, keys, lock compo)	_____	_____
☐	Transmitter Store (Put away)	_____	_____
☐	"Discuss frequency control method contained in Club Field Rule"	_____	_____
☐	Flying Boundaries explained	_____	_____
☐	Flying site property	_____	_____
☐	Flying restrictions	_____	_____
☐	Runway (Pilot positions)	_____	_____
☐	Windsock	_____	_____
☐	Pit Area Rules – Safety- control method contained in Club Field Rules	_____	_____
☐	Flying restrictions for Members without "A" Wings	_____	_____
☐	Club Information Test completed	_____	_____
☐	Aircraft Engine	_____	_____
☐	Aircraft Radio (On board receiver and servos)	_____	_____

AMAS Flight Training Course

		Inst. Initial	Date
☐	Aircraft Fuel system	_____	_____
☐	Aircraft Balance	_____	_____
☐	Flight Controls: Direction and throw; Hinges and Clevises etc., Dual Rates	_____	_____
☐	Explanation of Battery Charging requirements	_____	_____
☐	Electric motor safety reviewed	_____	_____
☐	LiPo Battery care reviewed	_____	_____

Notes:

Flight Proficiency Progress

INSTRUCTORS NOTE: You are to demonstrate each step of the particular lesson to be learned.

Show the student what it looks like. When the student understands the control input sequences and reasons for them, then give the student control. You are to initial and date each sequence when the student has shown they have mastered it.

	Inst. Initial	Date
1. Taxiing out - right and left turns		
2. Taxiing in - right and left turns		
3. Taxi down center of runway at medium speed		
4. Straight and Level Flight		
5. Left Turns maintaining height		
6. Right Turns maintaining height		
7. Trim for level flight various power settings		
8. Horizontal 8's		
9. Tracking over runway at 150 ft. – 75ft. – 25ft.		
10. Slow Flying		
11. Stalls Recovery		
12. Take off, Climb, Level off - reduce power and trim		
13. Landings (Discuss why take off and land into wind)		
14. Take off; trim for level, slow flight, and land		
15. Overshoots		
16. Touch and Goes		

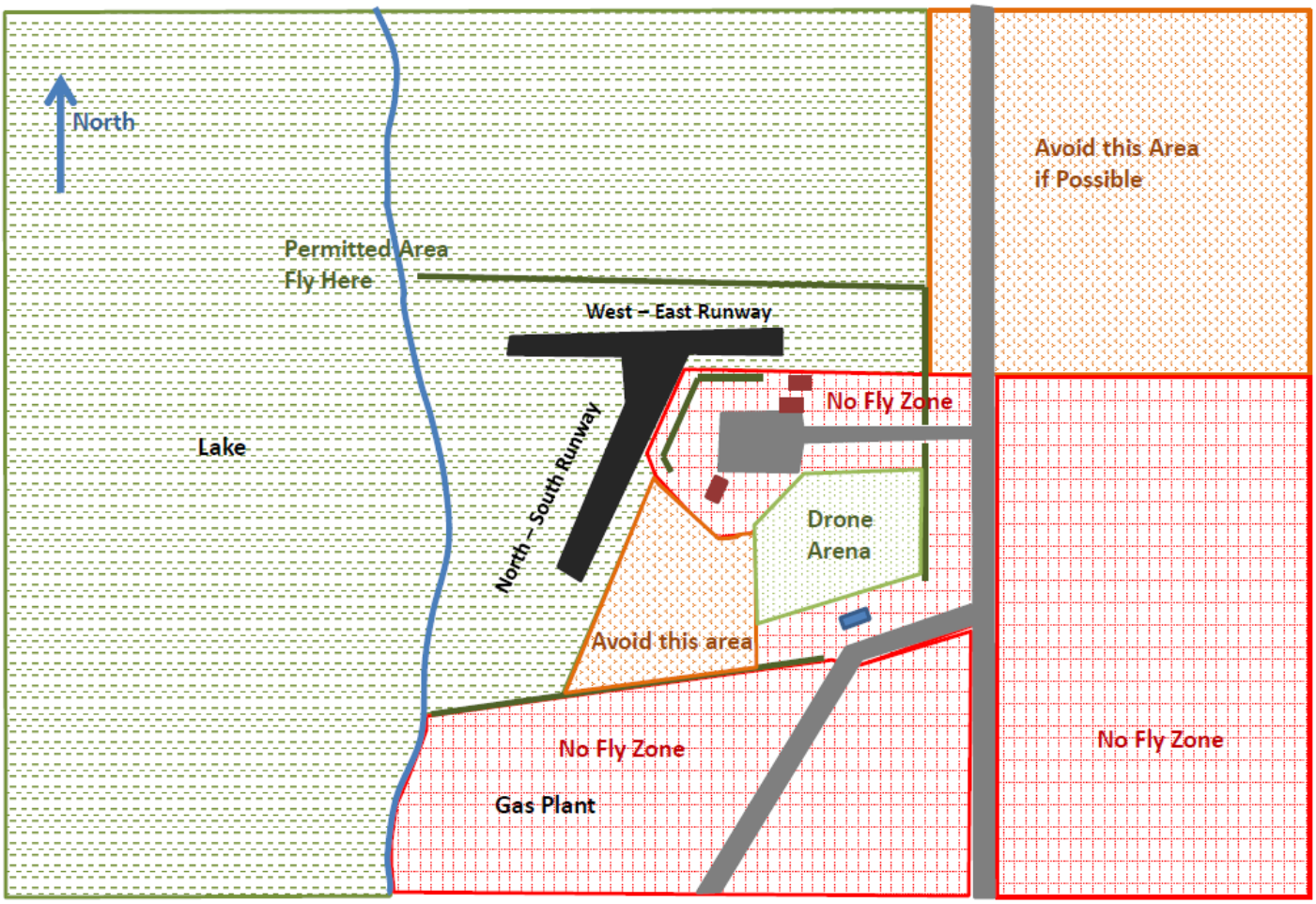
17. Dead Stick Demo - by instructor only, S turns etc.

18. "A" Wings practice

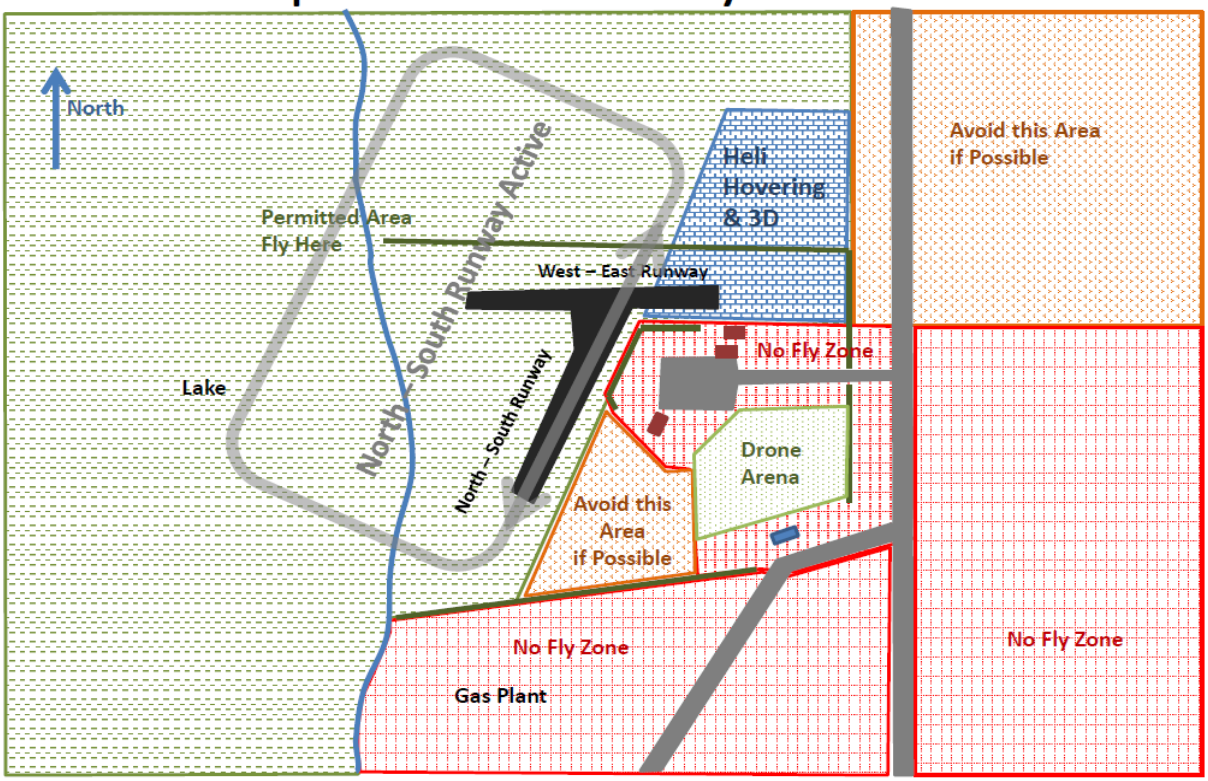
19. Recommended for "A" Wings test Date

AMAS Club Air Field Layout

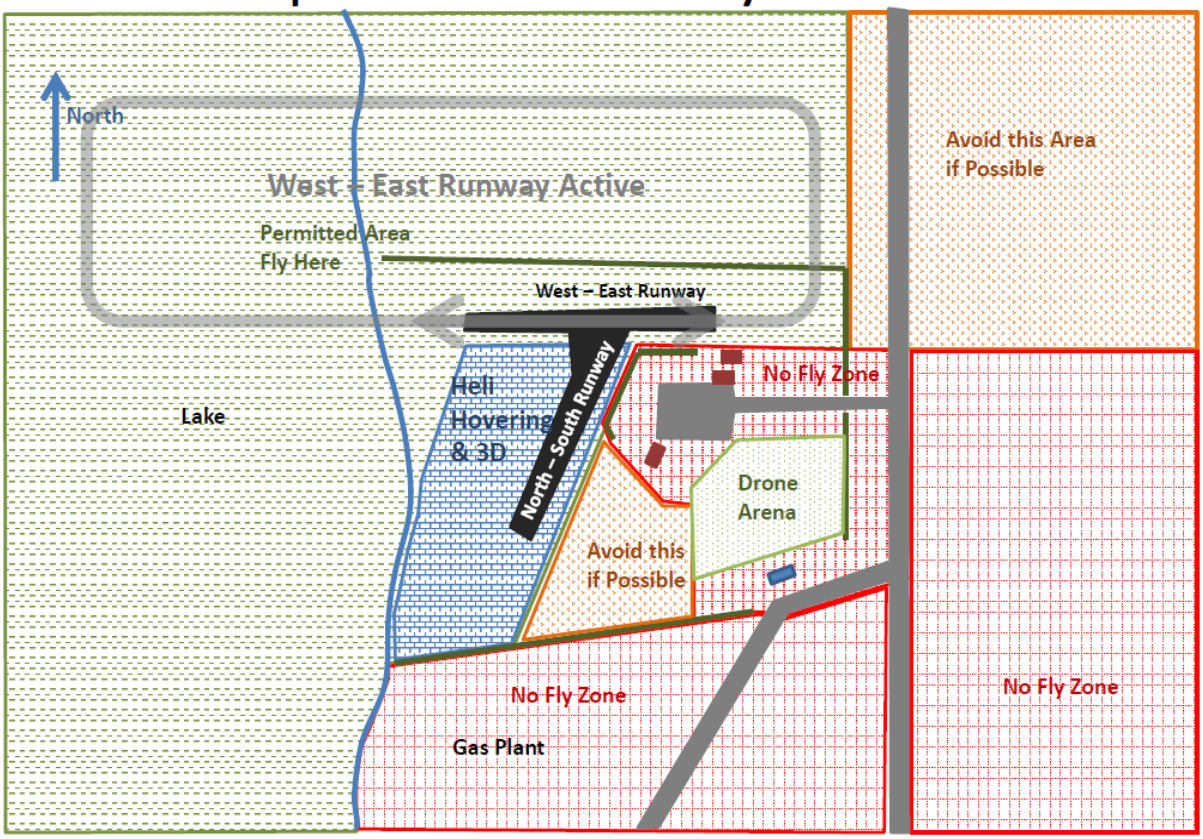
Airfield Zones



Current Heli Operations - NS Runway Active



Current Heli Operations – WE Runway Active



Field Procedures & Safety Guidelines

- MAAC insurance required
- All fliers and students must be members or guests (max two times a year) of active members
- Only qualified pilots are permitted to fly solo
- Members are responsible for their guests at all times
- Place pin on frequency board before turning on transmitter (including 2.4 GHz!)
- Only qualified pilots or trainees permitted in the flying area (behind the fence)
- Maximum four aircraft in the air at any time
- No flying over no fly zones (see the map)
- Standing on runways not allowed except to take off or to retrieve your aircraft
- All pilots shall call out their intention to take off, land or stepping on the runway, unless they fly alone
- When flying, pilots must be behind the pilot station fence
- Airplane pilots shall use only an active runway, determined based on the current wind conditions, for their take offs and landings
- Airplane pilots shall avoid the area dedicated to helicopter operation if there is a helicopter present in that area
- Helicopter pilots shall perform all hovering and 3D maneuvers within the dedicated area and avoid the area used by fixed-wing aircraft or helicopters flying circuits (see map 2 and 3)
- Helicopter pilots can choose to fly circuits in the same way as airplanes and use the area dedicated to general flying of the circuit. However, if there are airplanes present in this area, it is preferable to take off and land the helicopter away from the main, active runway.
- All engines must be equipped with mufflers
- Jet turbines not allowed on AMAS airfield

<u>Other Airfield Rules</u>

- No unleashed dogs (unrestrained animals) on the airfield
- No smoking

- Flying under influence of drugs or alcohol strictly forbidden
- Take your garbage home; keep the site clean
- The last person leaving the airfield is responsible for closing and locking the gate
- Violating the club airfield rules may result in revoking membership privileges

Constitution and related updates

- AMAS Constitution
- New AMAS By-laws

Additional precautions recommended to be followed

1. Never remove someone else's AMAS-MAAC card from the pin board without their permission.
2. When you turn on your transmitter, check to see if any airborne aircraft are affected. Be prepared to turn it off again!
3. Remove your pin (AMAS-MAAC card) when you completed your flying for the day.
4. When refueling your air craft, use a catch container, drain hose or some sort of material to prevent fuel from contaminating the soil and creating grass fire hazard.
5. Never start a loose aircraft; get assistance or use the anchors located at the field. Do not start at full throttle; partial is usually sufficient.
6. Do not turn your back to the flight area, especially if you are at a pilot station.
7. Do not taxi your aircraft in the pit area except to prepare for flight.
8. Fly only from pilot stations. Until you are approved for solo, always have a proficient spotter accompany you.
9. Before approaching the flight line, do a "systems" check.
10. All flying will be West-North of the flight line, which is the East-South edge of the runway. Never take off directly from the pilot station line.
11. Announce your intentions loud & clear: "taking off", "landing", "on the field", "dead stick", "component or radio failure", etc.
12. Do not fly over the parking lot, road, Club house and park area, and beyond Nexen facility "Green" fence.
13. Personnel who are not piloting an aircraft should refrain from disturbing, or distracting those who are.

14. No spectators or pets beyond the rail fence.

15. Talk to the spectators and answer their questions. They are the future growth of the sport and our club. Everyone is a potential new member. Politely request that they remain on the spectator side of the fence.

16. Above all else, conduct yourself in a professional and mature manner. Make club officers aware of those who don't and are detrimental to our image

17. Please clean up your trash i.e. water bottles, pop cans and coffee cups

Safe Flying Tips and Hints

1. Roll test steering in a driveway or basement. If it doesn't roll straight at home, it won't roll straight on a runway. Set control to the low-rate.

2. Put Monokote (or otherwise) small marks at the C.G. (Center of gravity) on the wing to indicate balance location. Makes it easy to check at field.

3. Balancing laterally (side to side) will help aircraft track better in maneuvers. Hold at spinner and tail. Add wing tip weight as necessary.

4. Check receiver battery every 2-3 flights. Make a chart of how long you have flown vs. Voltage drop.

5. Always turn on transmitter 1st, receiver 2nd. Always turn off receiver 1st, transmitter 2nd.

6. Range check you system before 1st flight every time out. This should be performed with engine stop.

7. When using the buddy box system, make sure both boxes are set identical. Never turn buddy box power "on".

8. Remove transmitter neck straps when starting engines.

9. If you don't have a starter, at least use a "chicken stick". Do not hit it against the propeller; to start your engine, flip prop with the stick next to it (Touching).

10. Never jamb a running starter onto the spinner. Back up the propeller, and place the starter cone against spinner before turning on.

11. When you start your engine, look at your watch and keep track of time. After flight, check fuel level to judge maximum available flight time.

12. Do not reach over propeller to adjust needle valve. Do it from the rear. Do not position yourself (or others) to the side of a rotating blade. It could fail on run-up or kick up debris.

13. Taxi while holding “up elevator”.

14. Fly with a co-pilot/spotter.

15. Never practice maneuvers at low altitude. Always practice “3 mistakes high”.

16. When trimming an aircraft in flight, trim only until it stops the incorrect movement. Trying to correct entirely will only put it out of trim to the opposite direction.

17. Most trainer aircraft will recover from unusual attitudes (mistakes) by killing the power, wait and pulling up elevator (depending on altitude). Be ready to level out and apply power.

18. Remember, unless you are “dead stick”, you do not have to land. If it’s not right, go around. It’s much easier, and safer, to do it over rather than try to salvage a bad approach.

19. Do not fly too far away as it is easy to get disorientated. This is especially true when the sun is low on the horizon and the aircraft becomes a silhouette.

20. If you are using dual rates, return to high rate before entering the landing pattern. Do a couple of turns to adapt to the greater sensitivity again.

21. On flat bottom wing trainer planes: Low speed handling (banking characteristics) can be improved by raising each aileron 1/8” or so. It makes the “up” aileron more effective.

Ground School

This section is designed for those that have little or no knowledge of aerodynamics, and/or are totally new to the hobby. Please read it thoroughly.

First, if you are just starting out, selecting a plane is a difficult task. A decision has to be made if you are going to buy used, ARF (Almost Ready to Fly) or a kit. Generally speaking, by the time you buy a kit, appropriate tools, the hardware and the covering, you have spent as much as the ARF and it will take it twice as long to put the kit together.

Major differences are if you do destroy an ARF, you won't have the time or investment loss. However the advantage of a kit is you know the mechanics of how it is built and how well it is constructed.

Second, if you are just starting out don't over-spend; just get the basics. Get to the field and work with an instructor or fellow pilots, then decide if you need an upgrade. All too often, new hobbyists overspend, don't learn as quickly as they had hoped, and get discouraged. This is especially true if they tear up their first airplane.

Third, get some flight time in after you've soloed and you'll have a better idea on your direction and path to take.

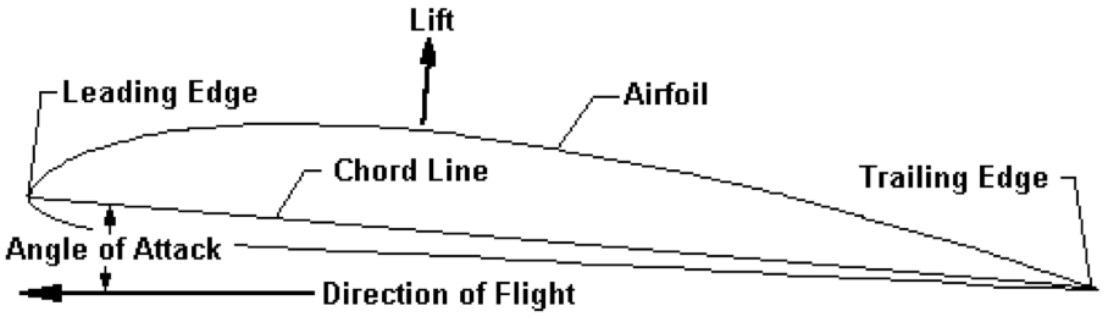
The intention of this learning guide is to provide general understanding of basic aerodynamics will help to understand why it does what it does.

"Ground school" is very important in the beginning to ensure the student, meaning "You" knows how the flight lessons will proceed, the common terms that will be use, the basic principles of flight, the radio transmitter "inputs" and their effect on the aircraft in flight. If you skip ground school, the student (You again) may not have a basis for understanding what is really going on and your first flights will be difficult or wasted.

Note: Referring to aircraft as to right or left, is as a pilot would view it from the cockpit.

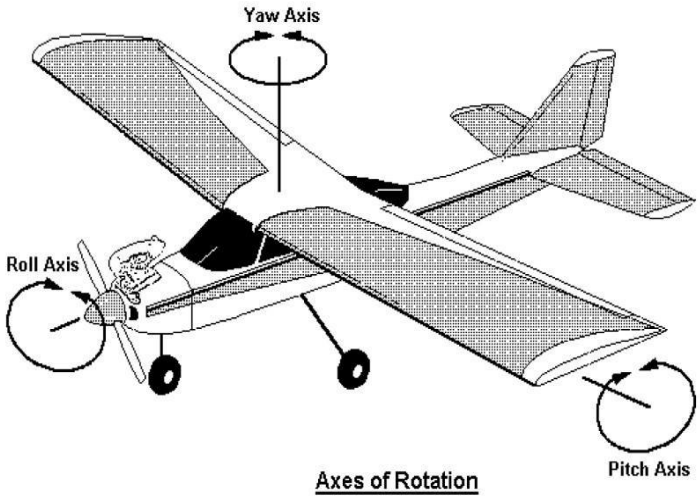
The Basics of Flight

The concepts of flight should be understood by a beginner. The theories behind the physics of flight are covered in many volumes of books. There are different and sometimes conflicting theories and arguments as how airplanes fly, but the one accepted principle is that lift is generated as a result of the air pressure on the bottom of the wing being higher than the air pressure on the top of the wing.



Lift increases as the velocity of the air passing over the wing increases or as the angle of attack increases as long as the flow of air over the wing remains smooth. Actual flight is attained when the force of the lift equals weight.

An aircraft pivots about three (3) axes; the yaw or vertical axis controlled by the rudder, the pitch or lateral axis controlled by the elevator, and the roll of longitudinal axis controlled by the ailerons. It can pivot about any one of these individually or in combination based on the control surfaces that are moved and the direction of the movement.



Axes of Rotation

The Basics of Flight…The Plane

One significant component(s) of any plane are the wings. Their design and location determine flight characteristics and each has specific flight attitudes.

Wing: The horizontal surfaces which provide the lifting force

There are three basic wing profiles.

Flat Bottom: Creates the most lift and is the most stable. Most trainers are flat bottom. This wing cross section should have a virtually flat bottom. This type of cross section has more gentle flight characteristics that are necessary for a beginner

Semi-Symmetrical:
Still stable, yet allows more maneuverability and extends aerobatic capability. Great for "second" planes.

Fully Symmetrical:
Least stable and most aerobatic. For more experienced flyers only. There are three basic wing locations.

Wing position/location

1. High-Wing. A high wing model is inherently more stable than a low wing model due to pendulum effect. Since the weight of the model is below the wing, the fuselage tends to swing downward like a pendulum in order to equalize forces.

2. Mid-Wing/Low-Wing. The weight of the model divided by the area of the wing should not exceed 19 oz./sq. This reduces the speed required to maintain an acceptable rate that the model descends when the power is reduced resulting in a lower landing speed.

   Stability diminishes as the wing comes down; the high wing being the most stable. Here too, most trainers are high wing. A fully symmetrical, mid-wing with no dihedral is the most aerobatic.

The Basic Trainer

A beginning pilot must realize the dedication that is required to gain the ability to fly the type of model that perhaps initially spawned his interest. He or she must begin the hobby with a basic trainer and progress through different levels of models until your goal is reached in order to be successful. Too often new pilots get discouraged from the onset by not making prudent choices with the introductory plane. These are called a trainer. The plane is called a trainer because of that reason, it trains.

There are certain criteria that a trainer should have in order to be satisfactory for a beginner.

1. **High-Wing –** A high wing model is inherently more stable than a low wing model due to pendulum effect. Since the weight of the model is below the wing, the fuselage tends to swing downward like a pendulum in order to equalize forces.

2. **Flat Bottom –** Creates the most lift and is the most stable. Most trainers are flat bottom. This wing cross section should have a virtually flat bottom. This type of cross section has more gentle flight characteristics that are necessary for a beginner

3. **Dihedral –** The wing should have some dihedral. This means that the tips of the wings are higher than the center. The effect of the dihedral is to try to equalize forces and keep the wings level or to return the wings to a level orientation.

4. **High Aspect Ratio –** The ratio of the wing length or span should be at least 5 ½ times the width or chord. This will reduce the rate at which the model responds to command input allowing more time for a beginner to react.

5. **Constant Chord –** The width of the wing should be the same from the center or root to the end or tip. This distributes the weight of the airplane evenly over the entire surface of the wing.

6. **Moderate Size –** Most trainers are for engine sizes between .15 and .60. The smaller ones are more susceptible to the effects of wind and normally the wing loading is higher simply because of the weight of the radio equipment. The larger sizes are easier to fly and easier to see but are more difficult to transport. Most trainers are for .40 size engines. These trainers have been widely accepted as the optimum size.

7. **Structurally Sound –** A trainer must be able to take the abuses imposed by a beginner. This is especially true for hard landings. It must be able to withstand minor crashes with minimal damage. It should be relatively easy to repair.

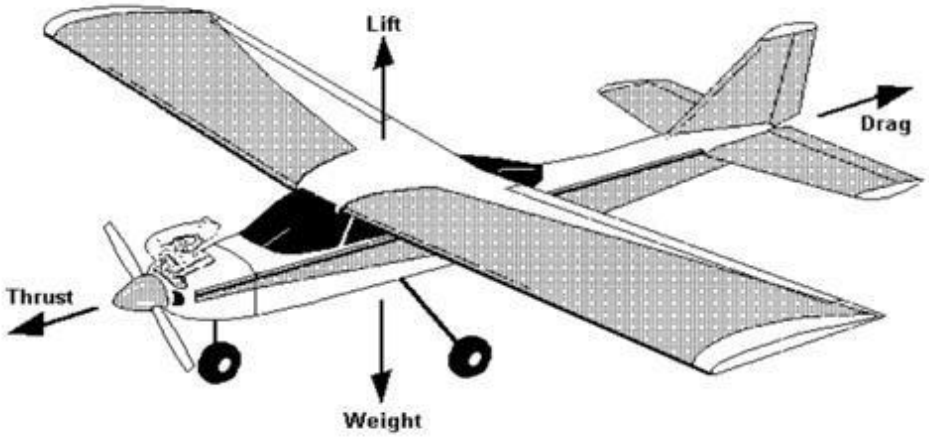
A trainer is a specific type of model aircraft that is designed to be stable in flight. This means that it has an inherent ability to correct itself and overcome the rotational forces applied so that it regains straight and level flight. Most trainers are designed to that they remain stable in slow flight so that they are easy to land.

Notes:

How These Things Fly

A trainer that meets these guidelines will give the beginner excellent service. There are a lot of considerations when choosing a trainer but the two most basic are time and money.

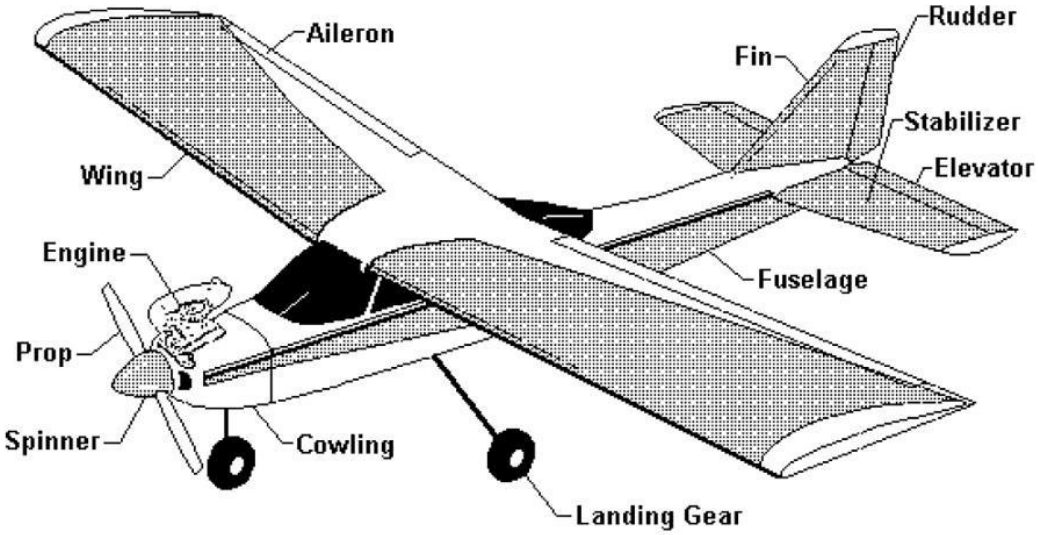
Almost Ready to Fly (ARF) models usually come complete with engine and radio. A trainer built from a kit has the advantage of being less expensive in some cases and it gives the builder the pleasure of building, the option of color and trim scheme, and the knowledge of the structure to perform repairs. The biggest disadvantage is the time required to construct the model when the beginner would rather be learning to fly.



Flight Forces

When the rudder is moved to the right, the aircraft will rotate to the right about the yaw axis and vice versa. When the elevator is moved up, the aircraft will pitch the nose upwards. The ailerons move in opposite directions. When the left aileron is moved up and right one down, the aircraft will rotate to the left and vice versa.

Aircraft Nomenclature



Aileron – The moveable portion of the wing which causes a change about the roll axis.

Cowling – The part of the fuselage which covers the engine.

Engine – A two cycle reciprocating machine which provides the motivational power.

Elevator – The moveable portion of the horizontal stabilizer which causes a change about the pitch axis.

Fin – Properly know as vertical stabilizer which provides stabilization about the yaw axis.

Fuselage – The main body of an aircraft

Landing Gear – The supporting structure of an aircraft including landing gear struts and wheels.

Propeller (Prop) – The combination of blades which provide thrust

Rudder – The moveable portion of the vertical stablizer which casues change about the yaw axis.

Spinner – Covering over the prop hub used in starting

Stabilizer – Properly known as horizontal stabilizer which provides stabilization about the pitch axis.

Radio Systems History

First, a few words about older "narrowband" RC systems...

Traditional narrow-band RC systems on anywhere from 27MHz to 72MHz are fairly easy to understand because they work like your regular AM or FM radio - sending out a signal that is picked up by the receiver and then sent to the servos.

Unfortunately, just like regular FM broadcast radio, these RC systems require a frequency all to themselves if they're going to avoid interference with each other. What's more, it doesn't take much to disrupt a regular narrow-band signal. A noisy thermostat or electric drill can often cause massive amounts of electrical interference when listening to an AM broadcast and FM isn't always that much better. But manufacturers of spread spectrum (SS) radio systems are claiming that you need never worry about being shot down by other fliers and that all 2.4GHz systems can get along in harmony, despite apparently using the same frequencies.

How do traditional RC systems work?

NARROWBAND FM/PCM RADIO CONTROL

Ever since the first radio control systems for models were built over half a century ago, the technology has been "narrowband".

Narrowband refers to the amount of space that signal takes on the spectrum of available frequencies.

Today's FM/PCM radio control systems operate on a tiny sliver of space on relatively low frequencies (27, 35, 36, 40, 41 or 72Mhz).

This tiny allocation of bandwidth for each RC channel creates a number can be likened to riding a bicycle down a narrow trail and the same problems apply:

- Firstly, you can't ride very quickly simply because it's such a squeeze to get past the bushes and fences either side of your trail. In radio terms this means you can't send the control information between transmitter and receiver very quickly.

- Secondly, if you run into another cyclist on that narrow track, chances are that you'll both fall off and get hurt. In radio terms it means that almost any other signal on the narrowband frequency you're using will result in interference (glitches or lock-out).

Clearly this isn't the best situation for controlling a potentially expensive and sometimes dangerous radio controlled model but, with careful channel management, it has served us well for decades.

Radio Systems Today

There are many modern radio systems from which the beginner can choose. There are several common brands including Futaba, Spectrum, JR, Hitec, among others. Each of these offers a

wide range of options from a simple 2-channel to a computer assisted 8-channel system. The buyer is limited only by his budget. A beginner should discuss his choice of systems with his or her intended instructor. There are several reasons for doing this, the primary reason being that the student's systems must be compatible with that instructor's system especially if a buddy box is being used.

All basic radio systems consist of four (4) basic components.

Transmitter – The unit which takes the input from the user through the gimbals or sticks, encodes it, and sends it to the aircraft.

Receiver – The unit that receives the signal, decodes it, and routes it to the appropriate servo

Servos – The device that converts the decoded signal to mechanical force to operate a control surface.

Batteries – The device that provides power for the other devices to operate.

There are specific frequencies assigned by the Federal Communications Commission (FCC) for use with airborne R/C models. A beginner must ensure that the system that he chooses is tuned to one of these frequencies. Most radio system manufacturers place a sticker on the outside of the carton that says, "For airborne use only". There is a frequency reference chart available that lists the purposes of all of the frequencies that are assigned for R/C use.

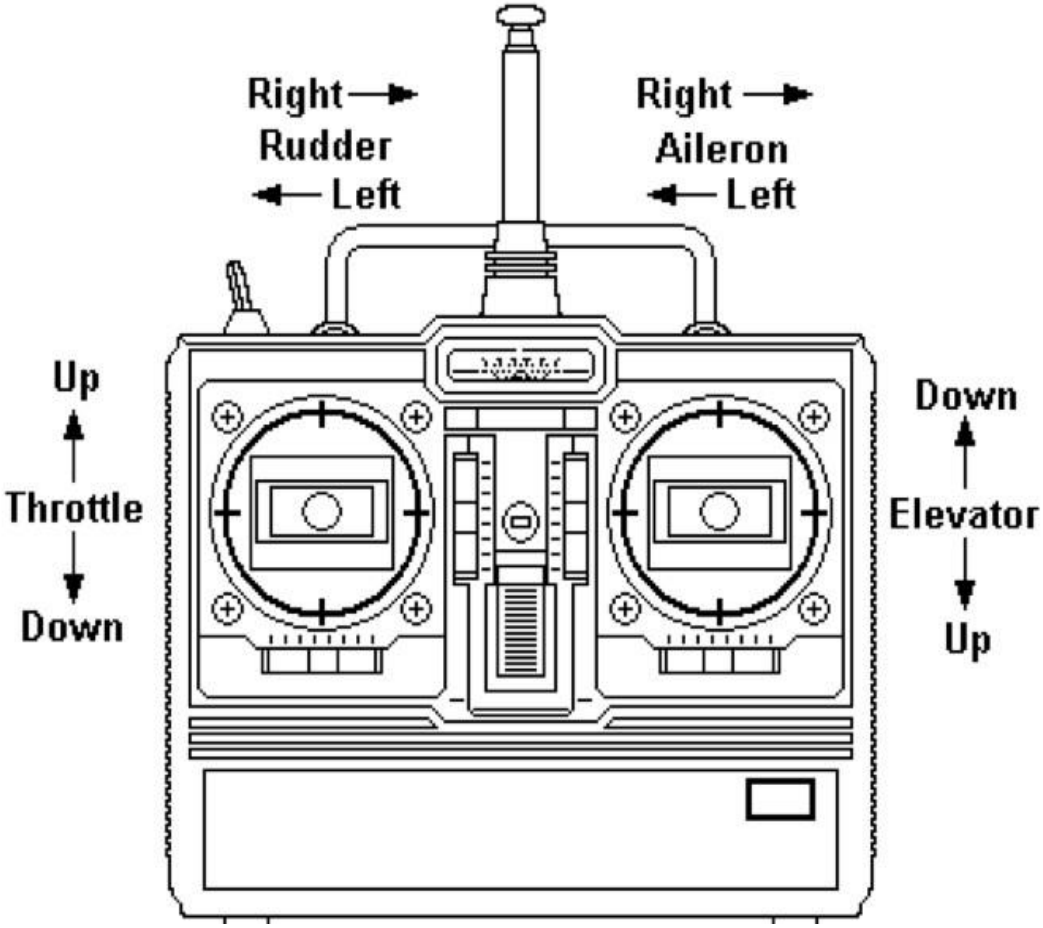
The radio that is chosen must meet the 1991 specifications for narrow band receivers. The actual requirements of these specifications need not be known by the beginner because the systems are required to be certified to this standard. The owner's manual for the system will note that the requirements are met and many of the transmitters and receivers will have a gold sticker to signify this fact.

Regardless of the brand of system, the number of channels, or the price, all transmitters have the same basic components. Transmitters may have additional switches, slides, and displays depending on the functions they perform but the basic components remain the same.

There have been discussions over the years involving the number of channels with which a beginner should start. Some people say that only three (3) channels should be used; rudder, elevator, and throttle. The argument here is that it is easier for a beginner to only be concerned with using the rudder to make turns and not be concerned with the ailerons. Others contend that four (4) channels should be used for the beginner; rudder, ailerons, elevator, and throttle. The contention in this argument is that by not using ailerons, a beginner must go through a second phase of beginner training that being learning how to use ailerons. A four (4) channel system offers better control of the model during takeoffs and landings in cross wind conditions. If a beginner chooses to use only three channels, he can set up the trainer so that the ailerons are not used initially and then add them later. The four (4) channel approach to training is more widely accepted.

Also, beginner might consider buying a six (6) channel systems to get some of the features that are not available in the basic system such as dual rate controls. This feature allows the user to reduce the sensitivity of the sticks thereby reducing the chance of over controlling. If

the beginner is relatively sure of future goals that involve the use of a six (6) channel system, he can consider this an investment in his future modeling and therefore save money. A lot must be determined before the initial purchase and should be discussed at length with experienced modelers, especially the intended instructor, before the purchase is made.



This is a typical lay-out of the transmitter and its functions.
Newer radios have an infinite number of changes and settings that can be made.

Types of Power Plant

There are two types of engines/motor's that are used today; glow and electric. Which is best? This argument will never go away.

Electric

- Electric motors are adequate for most beginning- to intermediate-level airplane models. They require an onboard battery pack that has to be recharged after each flight. An electric motor can be started remotely and does not require a separate starter. This is considerably safer for fliers, whose fingers don't have to get near a spinning propeller during start-up.

Glow

- A glow engine uses what is called a glow plug to ignite fuel inside the combustion chamber. Glow engines come in two-stroke or more powerful four-stroke varieties. A glow engine requires a battery-operated glow starter to heat the plug, in addition to a propeller starter or hand starting.

Electric Pros: Can be made infinitely faster, easier to maintain, quiet, lower operating costs.

Electric Cons: Expensive startup costs, down time between charges, unless you have multiple batteries.

Nitro Pros: Faster out of the box. Lower initial cost

Nitro Cons: Higher operating costs (nitro is $25.00 per gallon, and is not renewable. Batteries can be used over and over), Loud, smelly, difficult to maintain and may.

Comparison

- Both types of engines have their supporters. A glow engine provides a lot of power in a small package, plus a realistic engine sound that some modelers like. An electric motor is usually less powerful, but it is quiet and can be started with the push of a button.
- Glow engines can be messy, because they use oily fuel that can soak into the wood of your model plane, and they require constant refueling. They also often have a cylinder or carburetor that sticks out of the airplane's fuselage to the possible detriment of the model's aerodynamics and appearance.
- Fans of electric motors enjoy the devices' low maintenance, as opposed to the difficulty of tuning a glow engine.
- Either type of engine is usually suitable for aerobatics.

Costs

- The glow engine requires a specialized fuel, which can get expensive. Electric motors just need a recharge from any standard power source. The flight time of a glow-powered plane depends on the size of the fuel tank, whereas an electric plane can stay aloft for nearly an hour depending on battery type and size.

Types of Aircraft Models

ARF Almost Ready to Fly. The wings and fuselage are built and covered and varying amounts of assembly are required including installation of the engine, servos, control surface linkage, landing gear, and receiver. Plan on spending about 20 hours building your first simple ARF. Almost any model can be glow/ nitro fuel or electric powered these days with little trouble.

BNF Bind and Fly, This aircraft requires very little assembly and usually comes with everything you need to fly except a transmitter, batteries and or fuel. The landing gear and wings usually require some assembly.

RTF Ready to Fly, this aircraft usually has everything required to get in the air with very little assembly required. The transmitter is included, but is generally a very basic system, allowing connection to only one aircraft.

Kit, this usually means that the box contains a plans, bunch of sticks and sheets of balsa and requires construction of the entire aircraft, as well as covering the airframe.

Foamy, an airplane whose primary construction is a type of structural foam. Usually electric powered and very durable.

Types of Fuel

Glow/Nitro Fuel, a mixture of Alcohol, Nitromethane, and a lubricant (castor oil, synthetic oil, or a blend). This fuel is used in 2-stroke and 4-stroke Glow/Nitro engines. Fuel mixtures are available in 10%, 15% and 30%.

LiPo Lithium Polymer battery, A high capacity and high discharge capable battery used by most RC electric airplanes and helicopters to power the motor, receiver and servos. These batteries are rated at 3.7 volts per cell with a maximum charge for each cell at 4.2 volts. A LiPo is described by the number of cells or "S", total "mAh" of the pack, and the maximum discharge rate of the pack "C". For example a 3S, 2200mAh, 20C LiPo has the following characteristics; Total voltage = 3 cells x 3.7 volts = 11.1 V, 2200 milliamps of power, max discharge of 30 x 2200 mAh = 66 Amps.

WARNING: Special care is required when charging and handling LiPo batteries. If a LiPo is dropped, or punctured, quickly remove the battery to

a safe area that will not support a fire, like a concrete driveway. Always make sure that you use a charger designed for charging and balancing LiPo batteries

Aircraft Electrical Parts and Radios

Battery Usually refers to the battery used in a glow/nitro aircraft to power the receiver and servos. These batteries are typically NiCd (nickel-cadmium) or NiMh (nickel-metal-hydride) but may also be LiPo or LiFe.

> ***WARNING***: It is critical that the charge level of these batteries is checked after each flight. Low voltage of this battery during flight will result in the receiver losing signal and the aircraft becoming uncontrollable and probably crashing.

ESC Electronic Speed Controller, a solid state device that interprets signals from the throttle channel of the aircraft's receiver and increases or decreases the electric motor speed accordingly. This device replaces the throttle servo used in nitro aircraft. Many ESCs provide power to the aircraft receiver and servos through an integrated BEC.

BEC Battery Eliminator Circuit, this electronic device integrated into an ESC, or stand alone, provides regulated electric power to the aircraft's receiver and servos. Many of these systems allow the voltage to be adjusted between 4.8 and 7.4 volts

Transmitter, the radio that is used to communicate with your aircraft receiver. The device is characterized by the number of channels that can be controlled 4, 6, 8, etc. Most current transmitters sold operate on a frequency of 2.4GHz and do not require specialized crystals for designated frequencies. Older radios operate on FM and require dedicated crystals for each model. Additionally, FM radios may use the same transmitter/receiver channel as another transmitter. Because of this, strict rules are set forth for anyone using FM radios to prevent accidentally interfering with someone else's aircraft.

Receiver, a radio component that receives signals from your transmitter and controls the movements of servos, an ESC or other device. It receives power from the receiver battery pack or BEC. Receivers are rated by the number of channels they can receive and control, i.e. 4, 5, 6, 7, 8, 9, 10, 12. Receivers must be matched to your transmitter.

Servo, A small electric motor controlled remotely to move the control surfaces, throttle, landing gear and other components.

Glow Plug, a small device used in glow/nitro engines to allow continuous combustion of fuel after starting the engine. A glow plug looks like a small spark plug. A 1.5 volt electric current is sent to the glow plug by a glow driver or other electrical connection. The electricity heats a platinum wire in the center of the plug that is exposed to the atomized fuel and air mixture in the combustion chamber allowing the fuel to explode and move the piston. After starting the heat from the combustion stroke keeps the glow plug HOT and in turn allows combustion to continue.

Support Equipment

(usually in a box called the Field Box)

Glow Driver, a device that contains a 1.5 volt battery, NiMh or NiCd that has a stem that connects to a glow plug during engine starting. Some kits come with their own battery and charger for the driver. Some can connect to a power panel on your field box.

Fuel Pump, a device used to transfer Nitro fuel from the container to the aircraft's fuel tank. This device may be manual, using a hand-crank, or electric. An electric pump will run off of a 12V battery if you have one for your starter.

Starter Usually a 12-volt electric motor with a rubber cone mounted on the shaft, the rubber cone is placed on the aircraft's spinner to turn the spinner while starting a glow/nitro engine. The starter may be connected to any 12 volt source, or may have its own battery. Sealed 12V batteries are available to mount in your field box. You will need a charger for the 12V battery.

Aircraft Preparation

Use the information manual provided with your airplane to be sure it is properly set up before coming to the field. Be sure all control surfaces operate properly and the surface throws are as recommended by the manufacturer. Make sure your CG is within the bounds defined by the manufacturer. Use the information provided by the engine manufacturer to select an appropriate propeller. Acquire all the necessary field items to fly your airplane, such as fuel, igniter, tools, etc. The more time you spend getting familiar with your airplane and the items you will need at the field, the more likely you are to have a fun and successful training session.

Prior to starting training, the student pilot must read the latest safety code and the safety notice on the MAAC site (Copy provided under Appendix G); and AMAS field rules on the AMAS website located under “Our Club”, “Club Rules”, “Constitution and related updates section” listed as New AMAS By-laws

The instruction program starts with an inspection of your aircraft at the club field, to ensure that it is ready to fly. Any suggested adjustments or modifications can and must be done prior to commencing training.

If you can’t or face difficulties performing the suggested adjustments or modifications, any of the club’s experienced pilot members can assist you with the set-up.

Your instructor may also re-inspect the plane, before the first flight but this will reduce his instruction time. He will however give it a final check before performing a trim flight.

The Buddy Box System

The “buddy box” system almost eliminates risk to your aircraft and provides an enjoyable learning experience. Two transmitters are used; one for the student and one for the instructor. AMAS has “buddy box” transmitters and cables for the more popular radio brands. The

instructor controls the aircraft to a safe altitude using the primary transmitter. He depresses a switch on his transmitter, transferring control to the student, who then flies the plane. If it gets the plane in an unsafe situation, the instructor releases the switch and saves the plane to fly it back to a safe altitude. The instructor also lands the plane until he feels the student is able to do so safely.

Radio Control Terminology

Instructor Commands

Push, to move the right stick toward the top of the transmitter. This movement causes the elevator to deflect downward, thereby pushing the tail of the aircraft up. This stick movement will put the nose of the aircraft into a dive.

Pull, to move the right stick toward the bottom of the transmitter. This movement causes the elevator to deflect upward, thereby pushing the tail of the aircraft down. This stick movement will put the nose of the aircraft into a climb and is used when turning the aircraft.

Right, to move the right stick toward the right side of the transmitter. This movement causes the right aileron to deflect upward and the left aileron to deflect downward, thereby pushing the right wing down and pushing the left wing up. This stick movement will cause the aircraft to enter into a right bank. A banking movement is the first step of turning an aircraft.

Left, to move the right stick toward the left side of the transmitter. This movement causes the left aileron to deflect upward and the right aileron to deflect downward, thereby pushing the left wing down and pushing the right wing up. This stick movement will cause the aircraft to enter into a left bank. A banking movement is the first step of turning an aircraft.

Increase Throttle, to move the left stick toward the top of the transmitter. This movement causes more fuel and air, or electrical power, to go to the aircraft engine, increasing propeller speed. This increase in speed will usually cause the aircraft to climb.

Reduce Throttle, to move the left stick toward the bottom of the transmitter. This movement causes less fuel and air, or electrical power, to go to the aircraft engine, decreasing propeller speed. This decrease in speed will usually cause the aircraft to descend.

Neutral Position, to release both sticks and allow them to return to their spring-loaded center position on the transmitter. Telling the student to do this is a lot like pressing the reset button on the video game. It allows them to start again from a known position for you and them.

Bump, the act of tapping the right stick, left or right, and allowing it to return to the neutral position. The bump command shall include the direction of the bump. For example, bump-right or bump-left. This stick movement imparts a momentary aileron input that allows for minor course corrections. The bump is always a small movement and allowed it to return to the neutral position. If additional course correction is required, bump again. By using the bump method, it reduces the tendency of the student to swerve back and forth across their intended course. Although typically used for aileron control, it can be used for elevator control as well. Unfortunately, the terms bump-push and bump-pull, do not roll off the tongue very well.

Instruction Time

Weather permitting, instructors may be found at the field at any time however they will give priority to instructing students that have made an appointment with the instructor. If a student just shows up and hopes to get some instruction hopefully there will be another instructor that is free and willing to do so.

As you progress, we encourage you to work with 3 or 4 instructors. You will get different perspectives and you may feel more comfortable with some instructors, based on your and their personalities.

To make your time as a Student R/C pilot more enjoyable…

Inspect your aircraft at home to the best of your ability.

Get your model aircraft inspected and corrected if needed before every flight session at the field.

Consider getting flight simulator software for your PC, if you have one. Any time spent on an R/C flight simulator will greatly reduce the learning curve. A Flight Simulator is a good tool to start developing hand eye coordination before or during flight training at the field. It is also a great opportunity to see if the purchase of a simulator is for you.

Read the instruction manual for your transmitter. Instructors can't be expected to know how all the transmitters on the market function. Especially understand how to enable the "trainer' function on your transmitter.

Glow Engines: Read the instruction manual for your engine. Perform the break-in EXACTLY as instructed. Any break-in opinion expressed by a club member is exactly that: an opinion. It may a good one, but it may not. If breaking-in the engine at the field, be considerate and do so where the noise will not intrude (Behind the South East shed if the Quad area is not being used), or well away from the pit area. Do not adjust the idle mixture until the engine has consumed about 10 tanks of fuel, unless the engine just will not idle. Expect to have a slightly higher idle rpm while the engine is new.

Electric Motors: Read the instruction manual for your ESC and know how to set its parameters. Read the instructions for your battery charger and know how to charge your batteries.

Bring to the field, the instruction manuals for your radio, aircraft, engine, ESC and Charger as applicable.

Review all pertinent instructions so you know what to expect.

If you make **ANY changes** to your aircraft between instruction sessions, inform your instructor.

The Instructors volunteer their time. Remember that they like to fly their own planes too.

Through the instruction process and beyond, the more you put into the club, the more you will get out of it. Join in as many of the activities as your time permits.

R/C aviation is enjoyable and you will enjoy both the learning process and club membership by following the guidelines above.

Once you and an instructor agree you have the confidence and ability to fly safely, he will sign you off for your "First Solo Flight".

Instruction (Tasks to be accomplished)

Radio and Field Procedures

The first time you bring your plane to the field a member of the AMAS Flight Training Staff will do a thorough inspection to make sure the plane is airworthy. They will check that all control surfaces are properly attached and move correctly. Engine/motor mounting, servo mounting and control linkages are checked as well as the balance (CG) center of gravity.

The staff will help with engine break-in and tuning if needed.

You will be acquainted with your radio, normal and abnormal operation, interference, and conducting a range check. Your instructor will also explain the field facilities for the models and radios along with field procedures and field rules for safe and courteous operation. See the field rules and the description of the frequency control system at the field control board.

Ground School and Flight Training

"Ground school" is very important in the beginning to ensure the student knows how the flight lessons will proceed, the common terms that will be use, the basic principles of flight, the radio transmitter "inputs" and their effect on the aircraft in flight. If you ***skip*** ground school, the student may not have a basis for understanding what is really going on and your first flights will be difficult or wasted.

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GROUND SCHOOL

___ Discuss the scope of the firsts lessons.

___ Operation of the radio and buddy box

- ❖ Transmitter on first, off last (Explain why this is done.)
- ❖ Fingers versus thumbs; use of neck strap is highly recommended so student doesn't drop the transmitter while trying to get use to flying two sticks and making trim adjustments while also trying to hold the transmitter.
- ❖ Never glancing down at transmitter while aircraft is in air; making your fingers find the trims and making adjustments. Never take your eyes off your airplane.

___ How control surface inputs will change the flight attitude.

___ Discussion of aircraft flying away from pilot and facing pilot ("*correct to low wing*").

___ Discussion of corrections to level flight---trimming an aircraft to the ultimate "hands off straight and level flight".

___ Discussion of dangerous situations:

- ❖ Thunderstorms, rain, drizzle (Stop or don't start flying.)
- ❖ Any glitching or abnormal, unexpected flight—LAND NOW!

- ❖ Calling out intentions to other pilots ("Coming Out", "Clear", "Low pass", "Dead stick", "On the field", "Crossing the runway to retrieve aircraft")
- ❖ Handling a DEADSTICK---yours and others.

****

PIT OPERATIONS AND FLIGHT PREPARATION

___ Sun glasses, hat, and other personal considerations

___ Frequency control rule refresher and cautions:

- ❖ Sharing a frequency, 15 minute use courtesy
- ❖ 2.4 GHz SPEKTRUM radio use

___ Field box introduction / requirements---the basics first; nice-to-have items later.

For Nitro Planes:
___ Fueling the airplane.

___ Engine starting procedures / problems

Use extreme caution here and take it slow--a good, proper example is needed. STOP any bad habits immediately. Don't allow a casual approach or distractions. If student is using a neck strap, make sure they understand the danger of the strap getting into the propeller arc. ***Tuck it away!***

- ❖ Ensure the aircraft is secured—use deadweights or starting stand
- ❖ Carefully avoiding the propeller arc.
- ❖ Once the glow plug igniter is attached, assume the engine is hot and could backfire.
- ❖ Require the use of a "chicken stick" or electric starter; never allow fingers to touch or flip the propeller blades after the glow plug is attached.
- ❖ Correctly stopping the engine if running backwards—use the transmitter or seal the muffler exhaust; never apply "friction" to the spinner or toss a rag into the spinning propeller.

___ Engine adjustments (idle and full power). Extended run-ups should not be done in the pits area as a courtesy to other pilots and spectators. Train the student right correctly right from the beginning.

For Electric Planes:
____ Safe Battery charging and storage practices (especially Lipo batteries)

____ Ensure the aircraft is secured—use deadweights or starting stand

____ Carefully avoiding the propeller arc.

First Flight

During this lesson your instructor will fly your model to verify its airworthiness and handling qualities. He will then explain the controls and what kinds of reactions you can expect. He may, at any time, present you with a list of items to be corrected before the plane flies again. You will be expected to correct these on your time. Only after your instructor is satisfied the airplane will fly safely and has been trimmed for straight and level flight, will he have you take the controls, and then, only after the model is at a safe altitude.

By using a “buddy box” the instructor will keep you out of trouble. Just relax and get the feel of the controls. Listen to your instructor. He will “talk” you through each control function and you will observe the plane’s responses. If you get nervous, which happens occasionally, tell your instructor and he will take the controls. Remember, all you want to do during this lesson is get the feel of flying the model and begin to understand the dynamics of model flight. There will be a number of flights where you are only allowed to fly in the air; no takeoffs or landings.

Progressive Training

After you have gotten the feel of flying your model, your instructor will teach you the five basic maneuvers required to get around the sky. They are:

Level flight
Banked turns
Straight climbs
Gliding
Climbing and gliding turns

Your instructor will also explain disorientation. This is a problem that everyone experiences sooner or later in flying models. Basically, disorientation occurs when you become confused about the direction or orientation of your model. For example, when the model is coming toward you and you start a left turn, the model will turn left, but it will move to your right! Your hands have told your brain: Left; but your eyes are telling your brain: Right!

Result: Disorientation. Experience will teach you how to respond to this problem. It’s like learning to balance when riding a bicycle. Learning directional control when the plane is heading towards you takes practice. Your instructor will help you.

Accuracy Maneuvers

Now that you can fly around and do the basic maneuvers, it’s time to start learning how to control your model with precision. Again, you will be working with the five basic maneuvers, but now turns will have to be more exact (90 or 180 degrees) at a constant altitude. The whole idea of these lessons is to improve your skill and ability as a flier.

Orientation Maneuvers

During these lessons your instructor will have you fly a figure-8 pattern and a rectangular pattern. The purpose of these maneuvers is to discipline your reflexes and judgments. Decide to really master these maneuvers. Their importance will soon be evident.

Stall and Recovery

"If you pull back on the stick, the airplane goes up. Pull back some more and the airplane goes down!" That's a stall. But there's a little more to it and in this lesson you will learn to recognize and recover from stalls. More important, you will learn how to avoid unintentional stalls. Each airplane has different stall characteristics but the concepts are the same.

Take-Offs

As you gain flying experience and confidence, you will want to try to take off from the runway. Take-offs are nervous times because the model is near the ground and if it's not properly controlled, trouble can happen very fast. So, during this lesson, your instructor will explain the forces that affect a model during take-off and will assist you in making your first take-off. Once you have mastered the skill to maintain a straight line on take-off, you've got it made.

Approaches to Landing

In this lesson you instructor will discuss how to land your model. You will fly a rectangular pattern again, and this time you will learn how to make a decent in preparation for landing. You'll get to practice this maneuver up high and as you become comfortable with it, the altitude will get lower. A good landing is always preceded by a good approach. As with full size airplanes, attitude controls speed and power controls altitude.

Landings

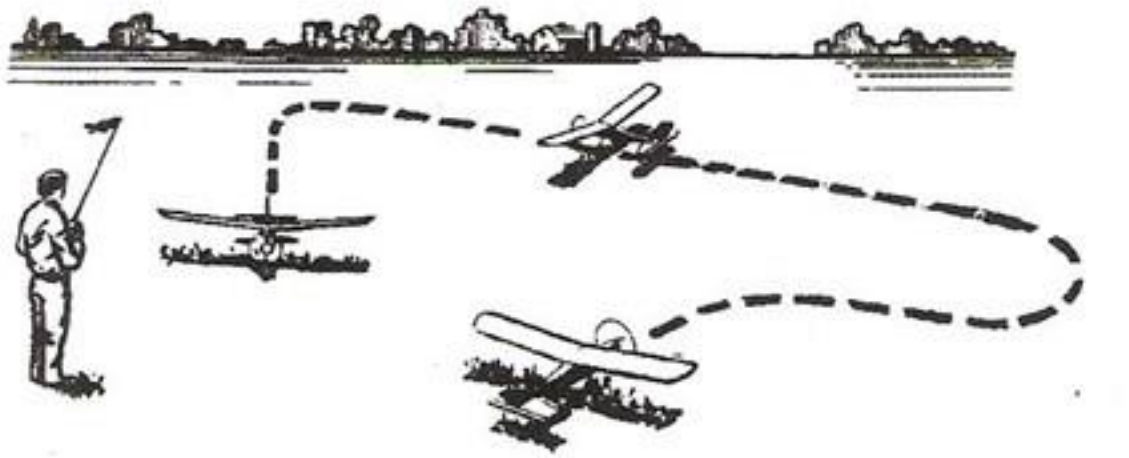
At the time the approaches are fully under control you keep getting lower and lower and all of a sudden you are landing. Only this time you need to remember to flare at the last moment. If at any time things don't look good, go around and try again.

Supervised Solo

At some point you will become proficient in all preceding phases of flight. It is time to solo. You will conduct a flight starting with getting your transmitter from impound, and ending, after you fly, with your transmitter back in impound. Your instructor will monitor this lesson and assist you when necessary. All you have to do is demonstrate good judgment, observe the field rules, and conduct your flight in a safe manner. Your instructor may have you do several supervised solo flights before this lesson is considered complete. You will be signed to have your Flight Test for "A" Wings, when it is, check your logbook for the names of all your instructors. Search them out and thank each one. This is the only pay they receive.

Maneuvers (Detailed Procedures)

Ground Steering Practice



For a couple of hours, practice taxiing the model around at low speed. This is a very helpful step in making you feel more at ease in controlling the model. Do not rush it. Use a parking lot rather than a street where you are likely to run into a curb and damage your model.

Practice taxiing in light breezes or when the air is calm; as strong or gusty winds can catch a wing and flip your plane over. Apply minimum throttle that just keeps the model moving at a walking pace.

With the rudder stick and rudder trim in neutral position, the model should move straight ahead. If it constantly turns left or right, the nose wheel is not pointing straight forward and should be adjusted by loosening the steering arm.

When the plane is pointing at you, the steering will seem "reversed." When you give right rudder, the plane turns to your left-but the model actually is turning to its right. With practice, you will become accustomed to this. The more familiar you become with the behavior of the model, as you control it on the ground, the better prepared you will be when flying it.

After taxi runs are completed, thoroughly examine the model and tighten any loose screws, etc. Checking your aircraft after each and every flight is an important habit to form, as loosened parts are the frequent cause of crashes.

General Flight Techniques

In flying, it is very important to make all your **control movements slow and measured**. Rapid movements tend to throw the model out of control. Try to make all turns gentle, not tilting (banking) the wing very much.

If you increase the bank, making the turn steeper, there will be a corresponding weight increase and reduction of lift. Therefore, when you bank your plane, it will start to descend. To maintain altitude in a turn, add enough back stick (up elevator) to hold the nose "up" through the turn.

First flights should be made on a day that is not very windy or gusty. There should be very few people or other distractions around; you will need to concentrate.

Your success doesn't depend on following the instructions here to perfection, but you should have a flight sequence in mind. Think ahead of the model; don't chase it around the sky, always one thought and one control command behind it.

While learning to fly, you may feel more comfortable looking over your shoulder (with your body in the same direction as the model) as the plane comes toward you. Simply push the stick left or right, in whichever direction the ship is turning.

"Head-on disorientation" is dangerous in the air, where things can happen pretty quickly. Before flying, it is wise to spend some time familiarizing yourself with orientation by operating the controls, with the plane set on a table, while you view it from different positions.

First Flight

There is no way to fully explain the principals of flight and the techniques of flying in a few pages. Entire books have been written about apparently simple subjects, such as the shape of the wing. Furthermore, there is no substitute for an experienced R/C flight instructor. The following information is not intended to replace your instructor, but to help give you understanding of basic flight concepts and techniques.

As stated earlier, choose a day on which there is little or no wind and the flying field is relatively quiet.

One of the most important, yet sometimes forgotten pre-flight checks is to always make sure the wing is securely attached to the fuselage; and the control system is 100 % operational.

Remember "A model, engine, motor, or radio that is not prepared and working properly on the ground before takeoff, will not improve in the air - it will get worse! There is no point in attempting to fly until everything is 100% correct."

Plan to make your first flight a short one. You will be surprised how exhausting beginning flights can be. Plan to spend no more than 2-3 minutes in the air the first few times you fly.

Take-Off

First, point the model directly into the wind. Switch the motor on (or slowly advance the throttle) and gently steer the model straight with rudder as the model gains speed rapidly.

After it rolls about 50-75 feet, add slight back stick (up elevator) pressure, so that the model rises smoothly from the ground. Only hold as much back stick as necessary to keep the plane in a 5º to 10º gentle climb. Be patient; let it climb slowly, as a steep climb will cause it to stall. (If you try to pull the model up too steeply, it may slow down and then stall and crash.)

Level Flight

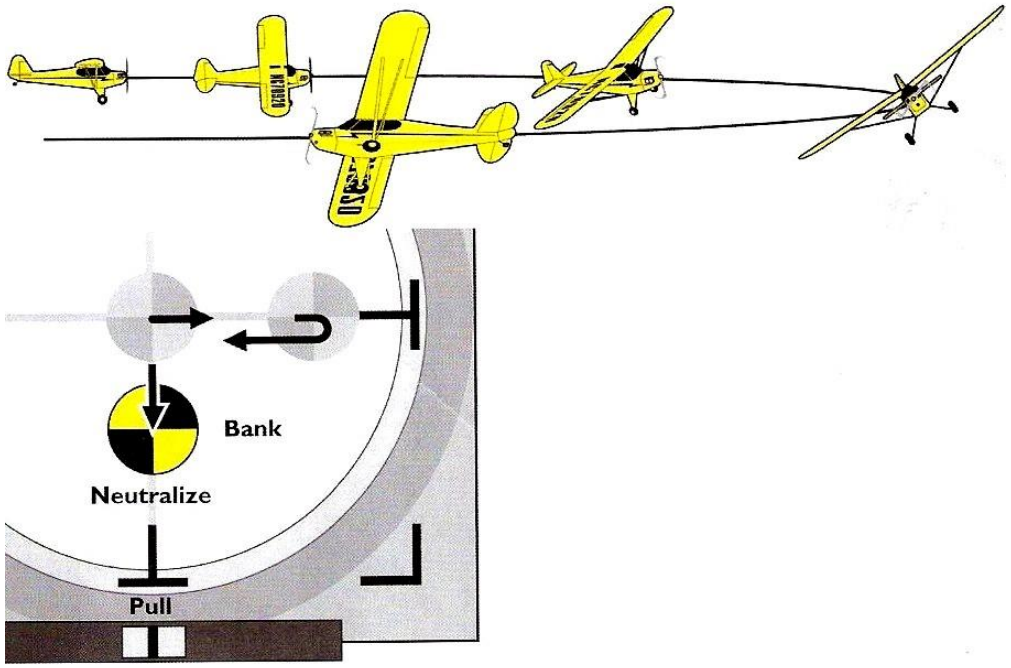
Most crashes are due to moving the controls too much, so once again, be slow and gentle on the controls during throughout the whole flight. Over-controlling tends to throw the plane out of control and wastes power.

When achieving a safe altitude after "climb out", reduce power and trim the aircraft for level flight.

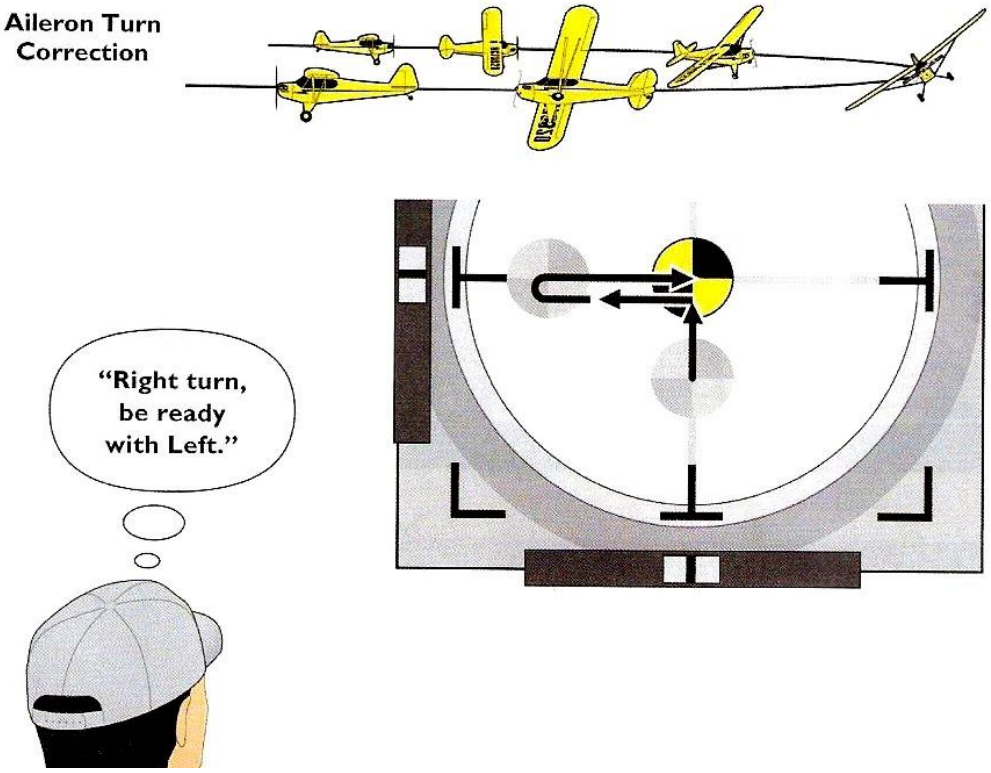
Keep the wings level, adding just a touch (or Bump) of left or right aileron.

Banked Turns

Apply a little right or left (aileron) stick pressure until the model begins a very shallow turn in the direction you want to go. Then “neutralize” the stick position. If losing altitude apply some back stick pressure (up elevator) until the descent is arrested.



At the point at which you want to exit the turn, neutralize the elevator and smoothly apply opposite aileron to level the wings.



During windy conditions, try to maintain shallow turns. Do not let the turn get too steep.

The wind will tend to blow your plane further downwind. Try to keep it upwind at all times. It is more difficult to fly a model when it is downwind, and if a mistake is made, the model will end up further away, making it harder to fly back to the field. To compensate for wind, continue

making upwind turns shallow, but make downwind turns a little steeper.

Over-Stressing the Airframe

Spirals occur, as explained earlier, when the bank angle increases and up elevator (back-stick) is added to keep the plane flying level.

If the bank becomes too steep, the model will spiral downward at an increasing rate of speed. Trying to “pull” the aircraft out of the spiral by pulling back on the elevator only makes things worse. This sequence of events happens very often.

Abrupt control changes can stress ANY airplane, even those designed for aerobatic competition. If you find yourself in a steep, high-speed dive, immediately level the wings and gently pull the stick back (add up elevator) pressure to recover.

Stalls

Your model’s movement through the air keeps it flying. If you fly too slowly, there is a point where it will stop flying and fall out of the sky. This is called a stall.

When the nose drops, the plane will gain some speed. Give it a little more power as you gently give the plane up elevator to bring the plane nose level with the horizon.

Setting Adjustments

As you get used to the controls, you probably will notice the model turning somewhat, or climbing or descending, without any stick pressure on your part.

Bear in mind that airplanes have forces that must be balanced in order to fly straight and level.

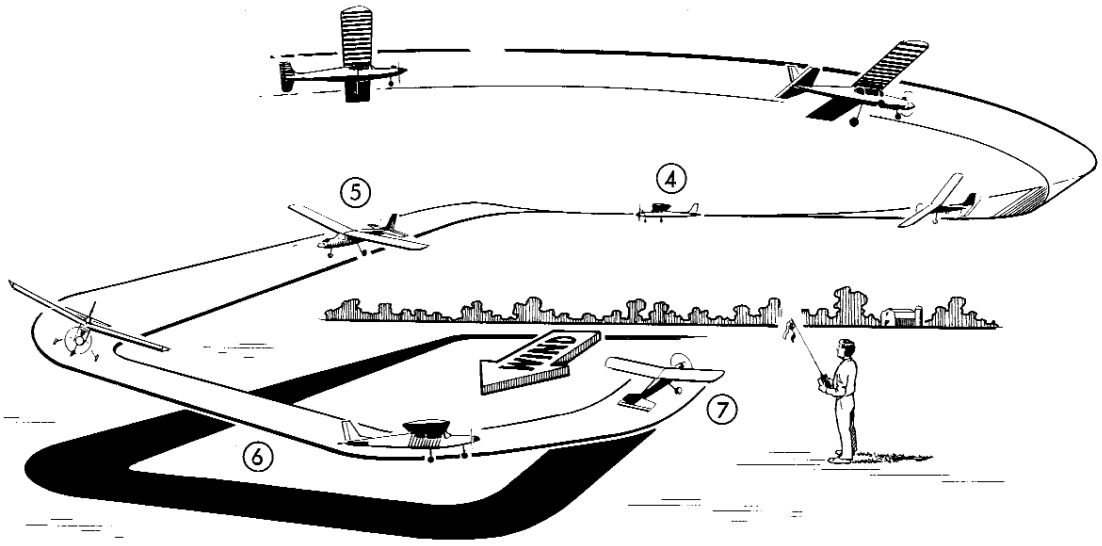
These tendencies can be corrected in the air by moving the trim tabs on the transmitter. Usually when you change power settings be ready to “trim” the aircraft for nose up or down.

Flying a Pattern

At most flying fields, models fly in a rectangular path around the runway. This is called the "pattern." The most important reason for flying the pattern is that, as the model flies in different directions in the wind, the pilot will be better prepared for landing conditions when

the flight ends. Full-scale aircraft fly a landing pattern for this same reason. Another important reason for flying the pattern is to organize the take-off and landing traffic, reducing confusion.

The "traffic" pattern consists of PATTERN ENTRY (position 4), DOWNWIND LEG (position 5), BASE LEG (position 6), and FINAL APPROACH & LANDING (position 7).



Landing

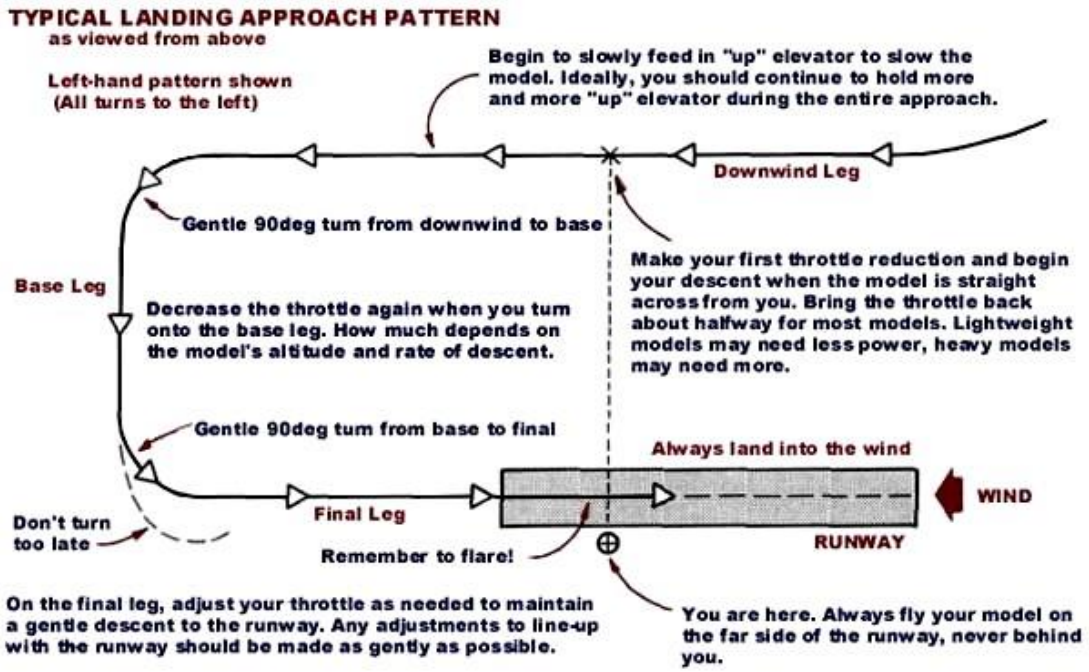
In preparation for landing, plan to enter the pattern upwind, at about 120 - 150 feet altitude. Make the Downwind Leg far enough away to allow for gentle turns to Base Leg and Final Approach. Avoid tight "panic" turns, particularly when landing.

When the model reaches the Downwind Leg reduce power (when the model is straight across from you) to establish a gradual descent until it is about 45º downwind of the landing area, turn to Base Leg.

When you have reached an altitude of about 100 feet, add just a touch of left or right stick until the model begins a very shallow turn. Try to maintain this shallow turn, keeping it gentle, and not tilting (banking) the wings very much.

From now on if you increase the bank, making the turns steeper, there will be a corresponding weight increase and reduction of lift. The combination of low airspeed and reduced lift can result in a spin which will (most likely) panic new pilots into flying the model right into the ground!

Reduce power again. How much depends on the airplane’s altitude and rate of descent.

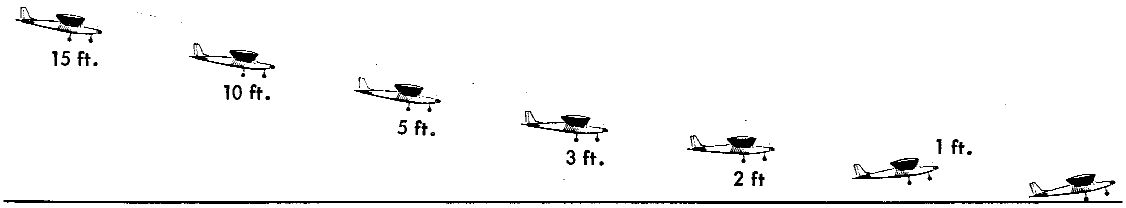


For your FINAL APPROACH & LANDING, make a gentle turn to point the model in the direction of the landing area. Keep the nose of the plane slightly down, so you don't stall.

This is your decision point, if everything looks good, continue your descent, letting the model slowly lose more altitude. (If you are not happy with the approach, turn the power back on, climb out, and set up for another pass.) Remember "good approach results in a good landing". Consequently don't rush it.

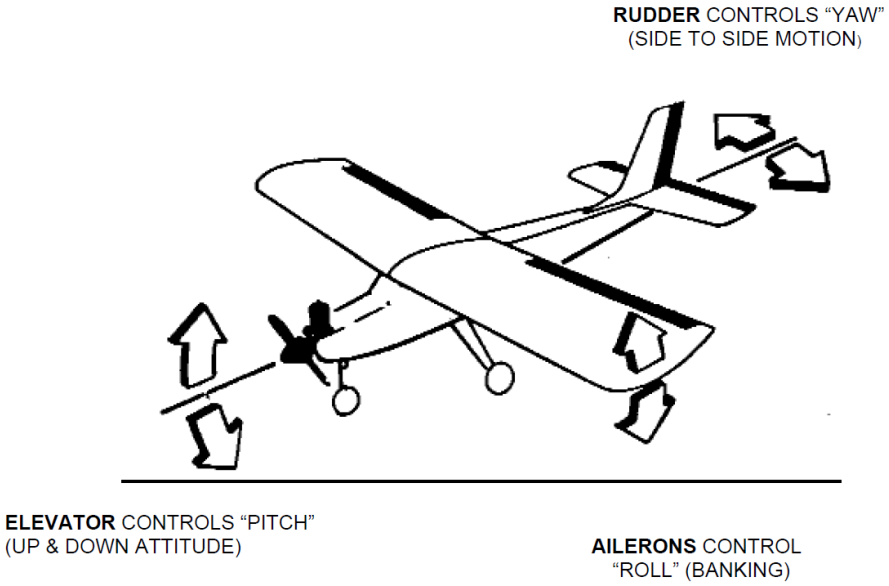
For your first landings, don't be concerned about trying to land in a particular spot. Just land safely, without damage to your model. At first, concentrate on flying a gradual descent straight into the wind.

Steer the plane into the wind as it glides, keeping the wing level. Let the model settle in toward the ground and land. Just before the model touches down, you can add just a bit of back stick (up elevator) to "flare" and soften the landing.



After landing is complete taxi your aircraft to the pits, walk over to your plane and turn off the receiver first, and then the transmitter. Congratulations! You've just completed your first flight.

Glossary of Modeling Terms



ARF: Almost Ready to Fly

AILERON: the control surface on the wing that rolls the plane

AIRFOIL: the shape of the wing as seen from the end

ANGLE OF ATTACK: the angle at which the wing meets the air flow

CA Cyanoacrylate glue or "super glue" For model building there are several types of CA. The most common is "Medium gap-filling". This glue bonds skin on contact, and many other objects, instantly. If you have an aircraft made of foam use "Foam Safe" CA as other glues may dissolve your aircraft.

CONTROL HORN: a device attached to each control surface to provide an attachment point for the pushrod

COWL (COWLING): the nose section of the fuselage that encloses the engine

DECALAGE: the difference between the incidence of the wing and stabilizer

DIHEDRAL: the inward angle of the wings, as seen from the front

ELEVATOR: the moveable part of the horizontal tail, which controls pitch

EMPENNAGE: the tail of the plan

FIN: the fixed vertical part of the tail

FIREWALL: the hard wooden former at the front of the fuselage, to which the engine is mounted

FORMER: a piece which shapes the fuselage; and to which the sides of the fuselage are attached.

INCIDENCE: the angle of the wing or the tail in relation to the thrust line

LAMINATE: to glue two thin sheets of material together to form a thick sheet

LEADING EDGE (L.E.): the edge of the wing that first meets the airflow

OUTPUT ARM: the piece that attaches to the servo and connects it to the pushrod

PITCH: an up and down movement of the nose of the plane, which is controlled by the elevator

PUSHROD: the long, stiff dowel or plastic piece that connects the servo with the control horn

RTF: Ready to Fly

RIB: the airfoil-shaped piece that connects the leading edge, spars and trailing edge of the wing together and holds them in shape

RETRACTS: devices for extending and retracting the wheels on command

ROLL: tilting of the plane as viewed from the front, controlled by the ailerons

RUDDER: the moveable vertical tail of the plane,

SERVO: the part of the airborne radio system that moves the control surfaces

SPAR: a wooden stick running lengthwise through the wing that serves as its backbone

SPINNER: the rounded cone that fits over the propeller hub

STABILIZER (STAB): the fixed horizontal part of the tail

STALL: a situation in which the plane is flying too slowly to move sufficient air across the wing to produce lift

THRUSTLINE: a line drawn from the center of the propeller hub straight through the airplane

TORQUE: a rolling tendency caused by the spinning propeller

TRAILING EDGE (T.E.): the edge of the wing that faces the rear of the plane

TRIM: small adjustments made to the control surfaces to cause the plane to fly straight and level by itself

WASHIN: a twist in the wing that makes the trailing edge lower than normal

WASHOUT: a twist in the wing that makes the trailing edge higher than normal

WING SADDLE: the shaped part of the fuselage in which the wing rests

WHEEL COLLAR: a metal ring that holds the wheel on the axle

YAW: a right-to-left movement of the nose, controlled by the rudder

Solo Flight - Sample

1. Three take offs and landings with adequate control with no damage (other than broken prop or nose gear.)
2. Power on and off stall with recovery.
3. Controlled pattern at low or idle speed.
4. The ability to control an airplane during an emergency. Such as engine failure
5. Horizontal Eight

****The certification will be done by two instructors and 1 soloed pilot. ****

AMAS Student Pilot Program - Task Goals

Task #1: Ground support equipment, engine starting, & taxi training

- Perform aircraft preparation and inspection.
- Perform engine start and radio checks.
- Perform taxi course.

Task #2: Orientation Flight

- Observe orientation flight.
- Note ground and flight safety restrictions.

Task #3: Basic flight skills development

- Become familiar with speed, yaw, pitch, and roll commands.
- Become familiar with flight trim techniques.
- Execute straight and level flight.
- Execute left and right turns.
- Initiate stall or unusual attitude recovery.

Task #4: Takeoff

- Execute proper upwind takeoff runway alignment.
- Initiate takeoff throttle setting.
- Maintain runway centerline ground steering during takeoff acceleration.
- Execute takeoff rotation at proper speed.
- Execute proper climb speed, pitch, and bank angle.
- Perform a takeoff abort if required.

Task #5: Turns

- Perform level shallow turns (left & right) at approximately a 20° bank angle.
- Perform level medium turns (left & right) at approximately a 40° bank angle.
- Perform level steep turns (left & right) at approximately a 60° bank angle.
- Execute shallow, medium, and steep turns (left & right), level flight, at low, medium, and full speeds.
- Execute turns in a designated area.

Task #6: Planning maneuvers

- Perform level rectangular patterns (left & right) as well as figure eights over specific ground location(s).
- Apply crosswind technique to maintain proper ground tracking during planning maneuvers.

Task #7: Landing pattern and go-around

- Execute upwind landing patterns.
- Execute crosswind landing patterns.
- Execute downwind landing patterns.
- Perform go-arounds at a 2 – meter height on final approach.

Task #8: Touch-and-go landing

- Perform traffic pattern(s), final approach, and touchdown, followed by power application and pattern reentry.
- Perform normal and crosswind traffic patterns with touch-and-go maneuvers.

Task #9: Full stop landing and supervised solo control

- Execute full stop landing followed by taxi back and takeoff.
- Execute simulated engine out landings.
- Perform a supervised solo flight.

Task #10: Supervised Solo Proficiency/Mid-phase Review (Solo Flight)

- Practice Task 1 – 9 maneuvers.
- Place additional emphasis on instructor-recommended areas of needed improvement.

Task #11: Mid-phase Evaluation Task (Solo Flight)

- Perform the sequence of maneuvers required during the mid-phase evaluation.
- Review mid-phase I flight evaluation results and discuss strengths and weaknesses with instructors.

Task #12: Airspeed Control Maneuvers (Solo Flight)

- Perform full, medium, and slow speed rectangular patterns (left and right) as well as figure eights from level flight.
- Execute a constant speed climbing rectangular pattern as well as figure eights.
- Execute a constant glide rectangular pattern as well as figure eights.
- Perform all maneuvers over designated ground locations.

Task #13: Power-On Spot Landing (Solo Flight)

- Perform near stalled touchdowns on the runway with power on.
- Execute near stalled touchdowns within 2 meters of the runway centerline.
- Perform touchdowns initially within a 30-meter long touchdown zone, within 2 meters of runway centerline, graduating to a 15- meter long touchdown zone.
- Execute a go-around whenever overshoot landing conditions exist.

Task #14: Power-Off (Idle) Spot Landings (Solo Control)

- Perform a near stalled touchdown on the runway with power off (idle).
- Adjust landing pattern to touch down within 2 meters of runway centerline with power off (idle).
- Adjust landing pattern to touch down within 2 meters of runway centerline and within a 30-meter long touchdown zone.

AMAS Flight Training Course

Lesson 1: Instructor - Student Responsibilities

You are about to embark upon the Primary Flight Training Course of AMAS. Although you may seek instruction from any club instructor your primary instructor is: Name:_____Phone:_____ The instructor will work with you and monitor your progress.

Your instructor has met the qualifications of MAAC. In doing so has accepted the responsibility to teach you to become a responsible and safe pilot who can be proud of their flying abilities and an enjoyable fellow club member. If the instructor ignores their responsibility, you may be a pilot who is a hazard to yourself and other persons wherever you fly. You may seek training assistance from any other club instructor. However you should look to your designated instructor as your primary source of assistance.

You may not take your "A" Wings test until your instructor, or the Chief Instructor has signed below indicating that you have completed the elements of your primary training program and you are ready for your “A” Level Wings test. You must pass your "A" Wings test before you are allowed to fly at the AMAS club field without supervision.

As a student, you have shown interest to acquire your first trainer aircraft; seek out the AMAS Club and join this training program. It is your responsibility to apply yourself diligently to learn and apply the material presented in this course. By doing so, you will learn the minimum amount of information and skills to allow you to safely enjoy radio controlled flight.

Each section of this course deals with a different aspect of flying a radio controlled model aircraft.

Your instructor will explain and demonstrate each element of each lesson. Where applicable the element will demonstrated in the air "*using your aircraft".* You will have opportunities to perform each element and receive an evaluation from your instructor. In each lesson there is a space for a club instructor to “initial” that the material has been reviewed with you. It is important that you keep your training program with you at all times and ensure that instructors initial elements after they have been covered. Other club instructors will use the initials and notes to assist you when your instructor is absent.

*I recommend that*_____*take the MAAC “A” Wings test/quiz.*

Instructor; _____

Lesson 2: Aircraft Familiarization

Purpose:
To teach the student how to properly pre-flight their model.

Objective:
At the completion of the lesson the student should be able to inspect their model and identify any deficiencies that could cause a malfunction or safety hazard. They will be able to start and adjust the engine properly and/or electric power system.

Elements:

- ☐ Inspection of aircraft structure, center of gravity and longitudinal balance.
- ☐ Inspection of radio installation.
- ☐ Inspection of all linkages and control surfaces including controls for proper throw, direction and freedom of movement.
- ☐ Engine, fuel system installation and security (including propellers).
- ☐ Instructor's demonstration of safe engine starting procedure and starting of engine or safely arms electric motor.
- ☐ Student starts and adjusts engine or safe battery connection and sequence arming for electric motor.
- ☐ Instructor teaches student how to identify rich and lean Internal Combustion engine settings.
- ☐ Instructor teaches student how to adjust the idle mixture to get optimum performance from that type of Internal Combustion engine.
- ☐ Electric Motor power system safety; see www.modelairplanenews.com/tips-for-getting-started-with-electric-airplanes/.

Evaluation:
Student should be able to perform lesson objectives.

THIS LESSON SHOULD BE REVIEWED AS NECESSARY AT THE START OF ALL LESSONS IN THE PRIMARY TRAINING COURSE.

Notes:

AMAS Flight Training Course

Lesson 3: Field Procedures

Purpose:

To familiarize the student with all safety aspects associated with model aircraft both on the ground and in the air. Also to ensure good flying habits per MAAC Guidelines which are used at all MAAC/AMA (Academy of Model Aeronautics - United States) events.

Objective:

At the completion of the lesson the student will be aware of all MAAC and AMAS safety rules and field procedures. The student shall also be able to perform a pre-flying session and pre-flight check list.

Elements:

AMAS SAFETY AND FIELD RULES

- ☐ Student to be given a copy of your clubs Flying Site Rules (Found at Ground School section of this training book or at https://www.amasrc.ca/).
- ☐ Review club frequency control procedure. MAAC insurance is mandatory to fly.
- ☐ "A" Wings qualification accomplished before Solo Flying.
- ☐ No Taxiing in the pit area – Please turn engines off before entering pits area.
- ☐ Flying is ABSOLUTELY NO PERMITED:
    - Over any general area where people or equipment/vehicles are active.
    - Behind the Flight Line no matter how far away from the runway. No flying over the Pits, Car parking.
- ☐ Maximum aircraft flying at a time per AMAS rules (4 at a time).
- ☐ MAAC noise limits apply measured at 3 meters (10 feet) with full throttle.
  As of April 1999, MAAC noise guide lines are:
    - 98 dba @ 3 meters on hard surface.
    - 96 dba @ 3 meters on soft surface.
    - Review club field rules regarding noise control.
- ☐ When flight line is busy; Flight Station possession time is limited to 15 minutes (recommended) per flight.
- ☐ *All aircraft shall be flown in a safe manner with consideration to others at field. Aircraft shall be flown in a fashion so as to minimize the noise footprint as perceived in adjacent areas.*

Lesson 3: Field Procedures cont;

- ☐ Unaccompanied spectators (any observer who is not a club member unless invited) and animals must stay out of the pit area.
- ☐ No "engine break in" the pit area while other members are flying.
- ☐ Follow club procedures for Transmitter control.
- ☐ No flying before club posted times.
- ☐ Pilots shall announce their intention to take off or land.
- ☐ Landing aircraft shall have the “right of way”.
- ☐ Fly a "wagon wheel" (Oval or Race Track) circuit when two or more aircraft are present in the air; spotters are Strongly advised (a must at AMAS events).
- ☐ It is advisable that when in the pit area, aircraft shall be placed between the pilot and the runway to promote an unobstructed view of other persons, pilots, parked and flying models to promote the timely awareness of a potential hazard.
- ☐ Importance of MAAC and AMAS safety rules.
  - Link to MAAC Safety Document link page; MSD 06 - General Category R/C Model Aircraft (found at Appendix G) - has been reviewed by the student.
- ☐ Enforcement of MAAC safety rules.

Note: *If you are flying in another flying field or country it is up to you to find out what the club rules are* ***before*** *you fly. (Is AMAS expectation his members will be good guest when visiting other Clubs).*

Notes:

AMAS Flight Training Course

Lesson 4: Radio & Pre-Flight Checks

Student should be able to perform lesson objectives <u>before each flying session:</u>

☐ Range Check - correct model on radio must be done on ***<u>each model</u>*** before the first flight of the day.
- Consult Radio manual for Transmitter to Receiver range check procedure.

☐ Overfly area is clear of people & vehicles before each flight.

Pre-Start

☐ Frequency/Identification Board – MAAC License and AMAS card in Place.

☐ Receiver Battery – Voltage Check.

☐ Radio Antenna – set o.k.

☐ Radio Transmitter – On, Radio Receiver – On and Checked for Interference (All control surfaces stable).

☐ Transmitter Operation Check – Aircraft Control surfaces checked for correct direction.

☐ Throttle set.

Start

☐ Aircraft Secure.

☐ All Clear – Ahead (prop) and Behind.

☐ Run Up – Mixture Set (engine testing to take place in testing area).

☐ Idle – Reliable.

☐ Fail Safe Check completed – engine running – secure aircraft – Turn transmitter off – engine should go to minimum or shut off.

Pre-Takeoff

☐ Fly over area clear of people & vehicles – Checked.

☐ Engine check – Full Power – Performance O.K.

☐ Controls – Free and Correct.

☐ Rate Switches – Set.

- ☐ Trims – Set for Take-off.
- ☐ Timer – On.
- ☐ Wind Sock – Checked.
- ☐ Runway – Clear.
- ☐ "Announce" – intention to take off to other pilots on flight line.

Evaluation: **THIS LESSON SHOULD BE REVIEWED AS NECESSARY AT THE START OF ALL LESSONS IN THE PRIMARY TRAINING COURSE.**

Notes:

Lesson 5: Flight Familiarization

Purpose:
To introduce the student to what controls the model in flight - "Directional Control".

Objective:
To ensure that the student learns the model's control surfaces and how they affect the model in flight.

Elements:

☐ On the ground; instructor to familiarize the student with controls (pitch, yaw and power) and what kind of affect they will have on the aircraft in flight.

The procedures used by the instructor to transfer “Control” to the student transmitter and taking over during the flight will be explained.

> **NOTE:** *As each instructor has different preferences concerning the process of transfer “Control” to the student transmitter, student & Instructor should ensure they have reviewed and understands this procedure and its communication process as described at page 29 – Instructor Commands.*

☐ Instructor flies and lands the student's model to evaluate its performance and worthiness.

CHECK FLIGHT of Student’s Plane BY INSTRUCTOR

___ Rubber bands in good shape and property quantity if used.

___ Engine idle and power up check.

___ Aircraft tracks correctly during taxi without excessive rudder inputs.

___ Airborne trim settings for acceptable hands-off flight.

___ High and low speed flight characteristics, stall characteristics, inverted flight characteristics. Aircraft has proper amount of “throws” on all control surfaces.

___ Land and make control surface trim adjustments.

___ Instructor clears aircraft as safe for student flight instruction.

This flight determines any changes necessary for control throws and trims. The instructor will then land the aircraft for setting up the buddy box. It is only after that moment when “Control” can be passed over to the student thru the buddy box.

☐ With the assistance and direction of the instructor, the student will start process of becoming familiar with the controls.

- ☐ The student will strive to keep the model in level flight and follow turning instructions given by the instructor.
- ☐ When the student becomes tired or disoriented ask the instructor to take control from the buddy box.

NOTE: Concentrate on flying within your ability. If you become disoriented or confused, ask the Instructor to take control back.

Evaluation:

The lesson is complete when the instructor has determined that the student is able to determine and execute proper control inputs to achieve a desired change in the model's attitude.

Proficiency and accurate control are not critical at this point.

Notes:

Lesson 6: Flight Maneuvers

Purpose:
To acquaint the student with the basic flight maneuvers.

Objective:
During basic maneuvering, teach the student to properly control the model.

Elements:

- ☐ Level flight and trim (Ailerons and elevator).
- ☐ Banked turns (30 degrees).
- ☐ Straight climbs (add power and trim).
- ☐ Climbing turns.
- ☐ Gliding. (idle power and trim).
- ☐ Disorientation. (Silhouette and R+L reversal with inbound aircraft).

NOTE: An explanation of disorientation and the use of trim should proceed this lesson. The five maneuvers should be taught in the order listed, if possible.

Evaluation:
The lesson is complete when the student can perform the maneuvers without assistance from the instructor. Each maneuver should be done with a reasonable degree of accuracy.

Example:
Turns should be fairly smooth and altitude maintained fairly well.

Notes:

Lesson 7: Accuracy Maneuvers

Purpose:

To teach the student to perform the five basic maneuvers to a standard that will develop proficiency in their executions.

Objective:

To develop the skill and ability of the student to control the model in a specific manner.

Elements:

- ☐ Level flight, maintaining heading and altitude.
- ☐ Level flight at reduced power; maintaining heading, altitude and trim.
- ☐ Left and right turns to specific headings.
- ☐ Climbing turns to specific headings.
- ☐ Use of rudder for turns and maintaining straight flight at slower speeds.
- ☐ Power off (idle) glides that require the student to maneuver the model to a specific area and approximate altitude.

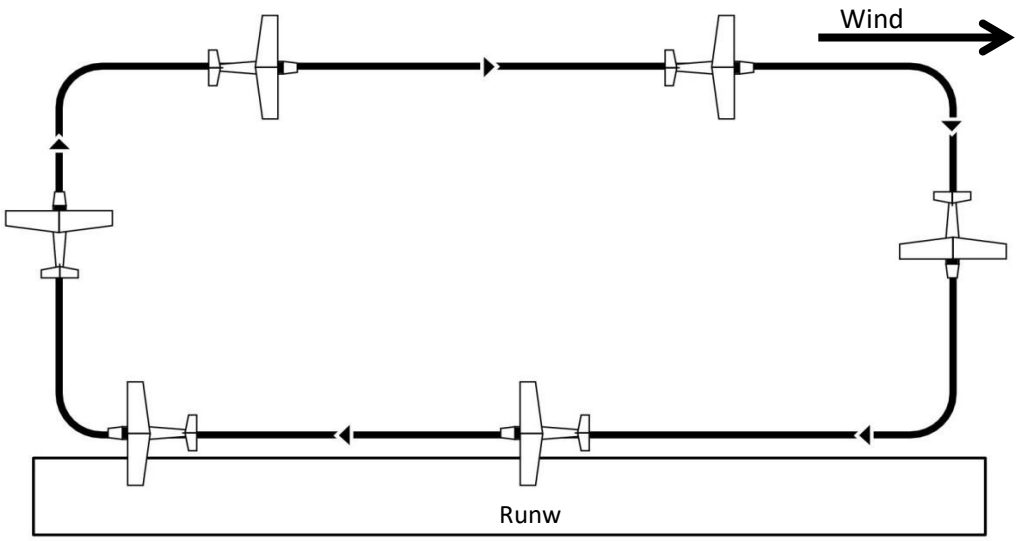
***Example*:**

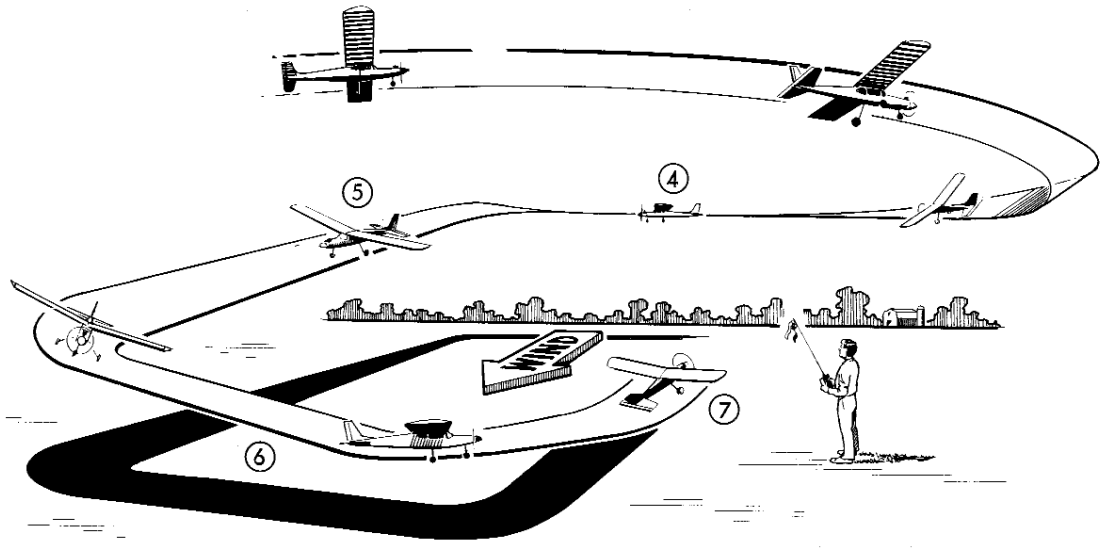
Have the student close the throttle over the one end of the field at 50m and glide to the other end at an altitude of about 30m.

Rectangular Pattern:

The maneuver begins with the model flying straight and level into the wind parallel to the runway. At the far end of the runway, the model turns 90 degrees away from the flight line for the first cross-wind leg. The model makes a second 90 degree turn into the downwind leg. The model makes a third 90 degree turn into the second cross-wind leg. The model makes a fourth 90 degree turn into the wind and continues on to the starting position of the maneuver.

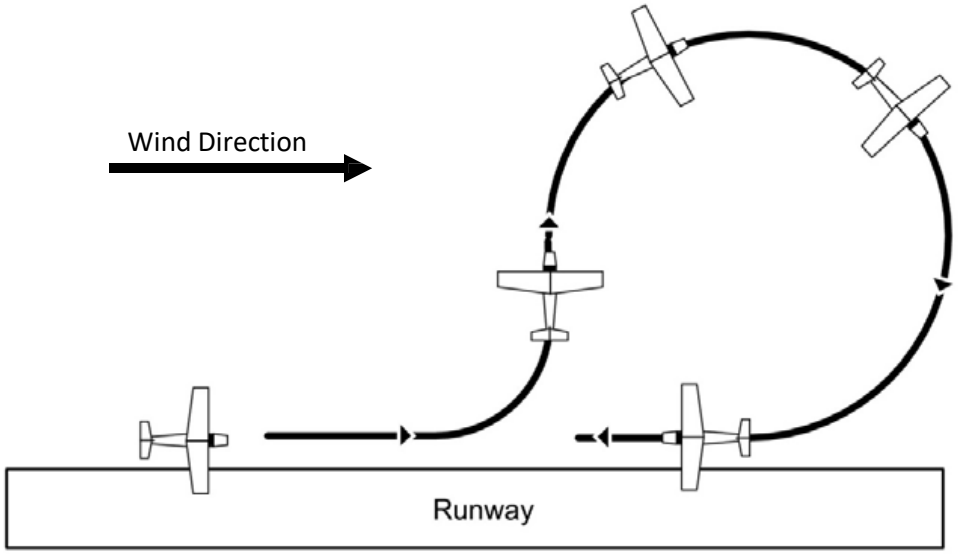
Diagram top view





Procedure Turn:

After the Straight Flight Out, model makes a 90 degree turn away from the flight line followed by a 270 degree turn in the opposite direction back to the reverse flight path of the Straight Flight Out.



NOTE: Keep in mind that the object is to develop skill and ability, and an awareness of the model's position relative to directions and altitude. Don't insist on mechanical precision. Review disorientation with the student if necessary.

Evaluation:

The lesson is complete when the student can maneuver the model at the instructor's directions and can demonstrate an ability to control the model in an accurate manner.

Notes:

Lesson 8: Orientation Maneuvers

Purpose:

To develop the judgment, skill and ability necessary for the student to make a landing.

Objective:

To teach the student relative to them self to control the model regardless of its heading or direction during flight and while landing. (Directional Control)

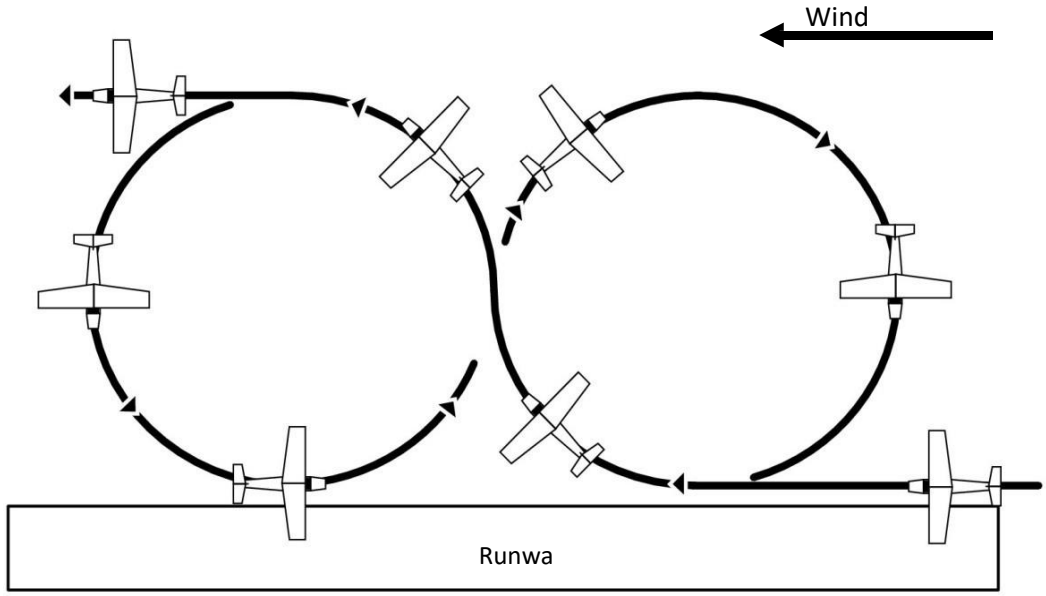
Elements:

- ☐ Figure 8 - the students must fly a figure 8 pattern consisting of two 360 degree turns, one left and one right. The student must place the maneuver in front of themselves at a safe distance and altitude.

Figure Eight:

The model will attain altitude and must be flown parallel to the runway to a point at the center-line of the runway. Model then makes a 90 degree turn in a direction away from the flight line, starting with level wings, and then makes a 360 degree banked turn to the right or left. When the model returns to its original heading away from the flight line, it makes a second 360 degree banked turn in the opposite direction to the first 360 degree turn. The maneuver is complete when the model levels its wings after the second 360 degree turn.

Diagram top view



Lesson 9: Stalls

Purpose:
For the student's understand stalls, their cause and avoidance.

Objectives:
To teach the student to recognize and recover from stalls.

Elements:

- ☐ Pre-flight discussion of stalls; what causes them and how to recover.
- ☐ Practice of stalls by the student with power and without power.
- ☐ Stalls in turns. (Take-off, departure stalls)

NOTE: Take-off and departure stalls are almost impossible to set up with most trainers, but do occur in more advanced models. Therefore, it is recommended that power be reduced to about 1/3 throttle and a steep climbing turn entered. The stall entry will look similar to a spin entry with the model rolling towards the high wing. During this lesson it should be emphasized to the student that a stall can occur at any airspeed and is a function of angle of attack.

Evaluation:
The lesson is complete when the student understands the cause of stalls and has demonstrated the lesson elements and proper recovery.

Reference: Stalls
Sufficient airspeed must be maintained in flight to produce enough lift to support the airplane without requiring too large an angle of attack. At a specific angle of attack, called the critical angle of attack, air going over a wing will separate from the wing or "burble" (see *Fig.1*), causing the wing to lose its lift (stall). The airspeed at which the wing will not support the airplane without exceeding this critical angle of attack is called the stalling speed.

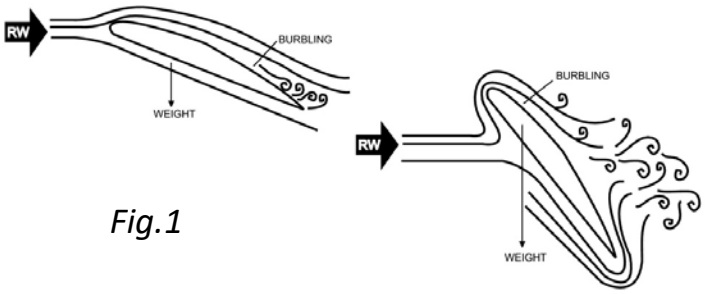


Fig.1

This speed will vary with changes in wing configuration (flap position). Excessive load factors caused by sudden maneuvers, steep banks, and wind gusts can also cause the aircraft to exceed the critical angle of attack and thus stall at any airspeed and any attitude. Speeds permitting smooth flow of air over the airfoil and control surfaces must be maintained to control the airplane.

Notes:

Lesson 10: Take-off

Purpose:
To teach the student how to make a normal take-off.

Objective:
To teach the student how to control the model during take-off.

Elements:

- ☐ Discussion of the effects of torque during take-off and initial climb.
- ☐ Use of rudder.
- ☐ Use of throttle.
- ☐ Use of elevator.
- ☐ Student makes a normal take-off INTO wind.

Evaluation:
The lesson is complete when the student has successfully taken off and established a normal climb with adequate airspeed. The student must also demonstrate adequate directional control during take-off.

Notes:

Lesson 11: Approaches to Landing

Purpose:

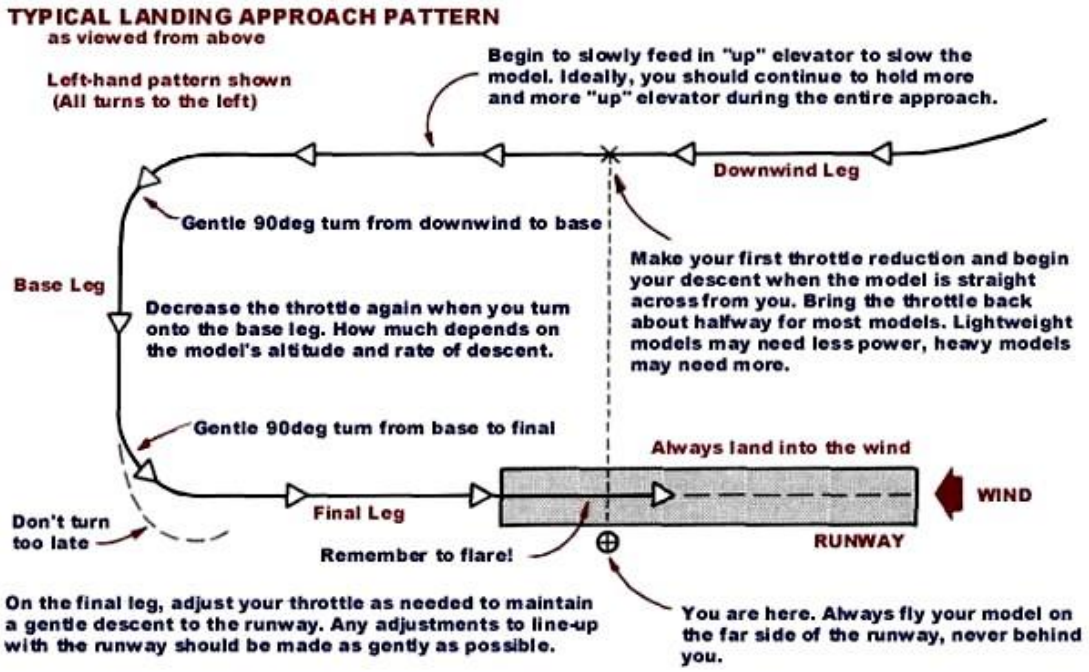
To prepare the student for their first landing.

Objective:

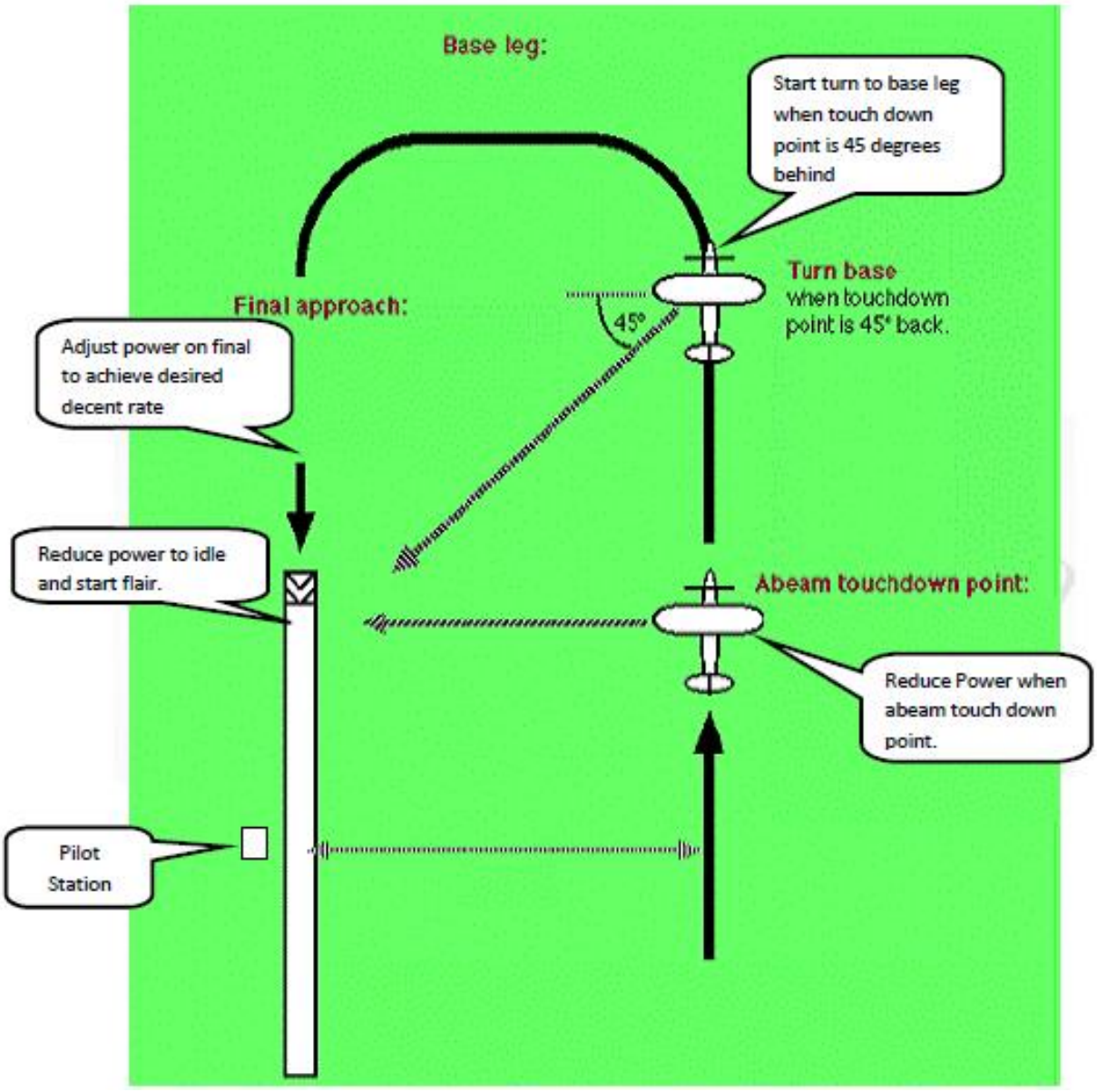
To develop the student's ability to visualize and perform a stable controlled approach followed by landing if approach is satisfactory - otherwise go around.

Elements:

- ☐ Review of Lesson 6. (Slow Flight and Gliding)
- ☐ Discussion of proper landing techniques.
- ☐ Student flies a rectangular pattern as in Lesson 6, but reduces power and establishes an appropriate glide on the base leg and continues the approach until over the end of the runway, at which point add power and go around. The minimum altitude at the end of the maneuver should be no less than 20 ft.

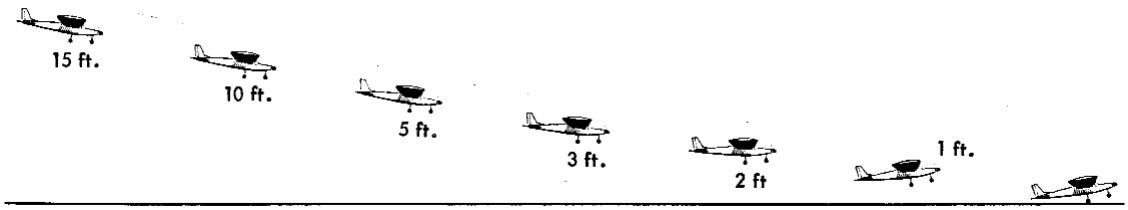


Standardized Landing Approach



- ☐ As the student becomes comfortable with the maneuver; the altitude should lowered until the instructor is confident that the model can glide to the runway at reduced power.

- ☐ Landing; At this point the instructor will tell the student to continue the approach and land.



NOTE: The chances of a successful landing will be increased if the instructor reminds the student to reduce the power. It may be necessary to talk the student through the flare and touchdown.

Evaluation:

The lesson is complete and the student can advance to supervised solo flight after the student has successfully landed the model several times and is comfortable with the maneuver.

Notes:

Lesson 12: Emergency Procedures

Purpose:
To prepare the student for the unexpected.

Objective:
To acquaint the student with safe procedures to be used in emergencies.

Elements:

- ☐ Discussion of possible in-flight problems and how to deal with them.
- ☐ Unusual attitude training (optional): a) Loops; b) Rolls; c) Spins.
- ☐ Student performs dead stick landing.
- ☐ Cross wind take-off and landings (optional).

Evaluation:
The elements of this lesson are only suggestions and there is no minimum performance requirement. The objective is to provide the student with insights that will assist in safely dealing with the unexpected. Experience will teach the student the rest.

Notes:

Lesson 13: Flight Test

***Purpose**:*
To allow the student to achieve and demonstrate flight proficiency.

Objective:
At the completion of the lesson the student should prepare for the Wings program and be able to practice the level "A" Wings maneuvers in preparation for the level "A" wings flight proficiency tests.

Elements:

- ☐ Discussion of Wings program levels “A” through “D”. Refer to Appendix “E”- Link to: MAAC Wings Program page location.
- ☐ Discussion of "A" wings maneuvers; Take off, straight flight, flat figure eight, 360 degree landing circuit, landing under power, and maneuver expectations.
- ☐ Supervised flight in which student practices and demonstrates "A" Wings maneuvers (without supervision) they are granted their "Wings".
- ☐ Review and critique.

Evaluation:
The student should be able to show instructor (without instruction) each of the "A" Wings maneuvers.

Notes:

Appendix A - Student Signoffs

Pre-flight Knowledge:

Instructor
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: _____

AMAS Flight Training Course

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
- ❑ _____ 3 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)

Shake airplane vigorously and listen for any movement inside (i.e. Batteries or Receiver)

1. Check CG is within recommended range
2. Check that plane balances laterally (i.e. pick up by prop tip and the top of the Vertical Stabilizer — see if a wing drops)
3. Antenna secure
4. Hatches secure
5. Engine:
    - Engine secure
    - Muffler tight
    - Prop & Spinner tight
    - Fuel Lines connected
    - Throttle Cable connected
6. Landing Gear:
    - Gear secure
    - Wheels secure and turn freely
    - Steerable wheel straight
7. Wing:
    - Wing(s) secure and straight (bolts tight or rubber bands secure)
    - Aileron hinges secure and linkages tight
8. 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) Hand turn 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 ½ 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

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

Airdrie Modellers Aircraft Society

AMAS

CERTIFIES THAT

John (Ace) 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 June, 2018

Instructor

AMAS President

Appendix E – MAAC Flight Training Standard

Note: All maneuvers to be done from pilots left and right.

STUDENT:
Safety Code, Field Rules, Field Etiquette
Radio range check
Preflight safety inspection
Aircraft flight prep
Start and tune engine
Taxi instruction

SOLOED STUDENT:
High-speed taxi
Controlled take-off
Aircraft flight trimming
Safe, predictable flight at altitude
Controlled landing

PILOT:
Take-off with rectangular field circuit to altitude
Straight, level flight – length of runway
Procedure turns maintaining altitude
Horizontal figure 8's maintaining altitude
Rectangular landing circuits
Climb to stall – power off landing approach
Join circuit – downwind leg – controlled landing

INSTRUCTOR:
Pilot test maneuvers PLUS
Three inside loops
Half reverse Cuban 8
Straight inverted flight
Stall turn
Cobra roll
Immelmann turn
Alternating horizontal rolls
Split S
Cuban 8

SHOW PILOT:
Annual status awarded to instructors by Chapter executive/management recognizing flight skills, dedication to safety, service as an instructor and ability to perform flight demonstrations from foreign sites and/or before large congregations of spectators.

AMAS Flight Training Course

R/C Ground School

Prerequisite: MAAC Membership

Understanding of:

- MAAC Safety Code
- Club and Field Rules/Etiquette
- Frequency Control

Preflight Inspection

Prior to any days flying, perform an examination of the airframe, engine, radio and control linkage installation.

Radio Range Test

Prior to any days flying, check battery levels and rang test the radio system consistent with the manufacturers instruction manual.

Start and Tune Engine

Gain the ability to safely start and tune an engine for consistent operation.

_____

Student (Print)

_____

MAAC #

R/C GROUND SCHOOL COMPLETED

_____

Instructor (Print)

_____ _____

MAAC # Date

AMAS Flight Training Course

R/C Pilot Rating

Prerequisite: R/C Ground School
Alternate Test: MAAC Sportsman Precision Aerobatics Routine (Routine to be tested from left and right)

- Take off with rectangular circuit to altitude Straight and level flight for 300 feet
- Procedure turn
- Straight flight back
- Procedure turn
- Horizontal figure 8 maintaining altitude
- Left hand rectangular circuit with landing approach and overshoot at 10 feet
- Right hand rectangular circuit with landing approach and overshoot at 10 feet
- Climb to stall, power off landing approach and overshoot at 10 feet
- Join circuit on downwind leg and execute controlled landing

_____
Student (Print)

_____
MAAC #

SOLO FLIGHT – TRAINER AIRCRAFT ONLY

_____
Instructor (Print)

_____ _____
MAAC # Date

R/C PILOT RATING ACHIEVED

_____
Instructor (Print)

_____ _____
MAAC # Date

AMAS Flight Training Course

R/C Instructor Rating

Prerequisite: R/C Pilot Rating
Alternate Test: MAAC Intermediate Precision Aerobatics Routine (Routine to be tested from left and right)

- Takeoff
- Reverse Cuban 8
- Humpty Bump, Pull, Push, Pull
- ½ roll down 2 Point Roll (thru center)
- Stall Turn
- 3 Inside Loops (at center) Half Reverse Cuban 8
- 2 Horizontal Rolls (thru center)
- Stall Turn ¼ rolls up & down (at center) Immelmann turn
- 1 Outside Loop (at center) Split S
- Square Loop (at center) Landing

_____
Pilot (Print)

_____
MAAC #

R/C INSTRUCTOR RATING ACHIEVED

_____
Instructor (Print)

_____ _____
MAAC # Date

AMAS Flight Training Course

R/C Senior Instructor Rating

Prerequisite: R/C Instructor Rating
Alternate Test: MAAC Advanced Precision Aerobatics Routine (Routine to be tested from left and right)

- Takeoff
- Stall turn, ¾ rolls (at center)
- Humpty Bump, Pull, Pull, Pull
- ½ roll up Slow roll (thru center)
- Stall Turn
- Outside Loop (at center)
- Half Cuban 8
- Avalanche (at center)
- Stall turn
- ½ rolls Square Loop (at center)
- Half Reverse Cuban 8
- 4 Point Roll (thru center)
- Half Square Loop with ½ roll up (exiting)
- Inverted Humpty Bump Push-Push-Push
- ½ rolls (at center)
- Split S
- Knife Edge Flight (thru center)
- Immelmann Turn
- 3 Turn Spin (at center)
- Landing

_____
Instructor (Print)

_____
MAAC #

R/C SENIOR INSTRUCTOR RATING ACHIEVED

_____
Senior Instructor (Print)

_____ _____
MAAC # Date

R/C Show Pilot Rating

Prerequisite: R/C Senior Instructor Rating

A SHOW PILOT must be a superior and responsible flyer that is well aware of the safety and public concerns that are involved in demonstration or show flying.

Additional factors may be considered which include workmanship and reliability of aircraft to be flown in a demonstration or show and the ability of the pilot to retain his composure when exposed to large congregations of spectators and distracting influences.

SHOW PILOTS may only be selected and approved by a club or zone executive; each of whom have personally witnessed the flying ability of the candidate.

Under no circumstances should an individual be given a **SHOW PILOT** rating merely because of the desire of that individual.

SHOW PILOTS should be the only pilots to fly demonstrations or shows.

_____
Senior Instructor (Print)

_____
MAAC #

R/C SHOW PILOT RATING ACHIEVED

_____
Club President or Zone Director

_____ _____
MAAC # Date

AMAS Flight Training Course

Appendix F – MAAC Wings Program – Guideline

Purpose of the Program

1 To provide an interesting and challenging flying achievement program that will encourage individual club members to improve their overall flying ability.

2 To develop a membership of competent flyers to assist new club members regarding all aspects of the sport that pertain to powered flight.

3 To minimize safety hazards and accidents by encouraging all club members to develop better and more proficient flying habits,

4 To make radio control flying a more meaningful and satisfying experience for all club members.

5 Guideline details are found at www.maac.ca/en/documents.php under Wings Program Guidelines

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 receive a certificate for the appropriate wings level.

The following is a list of levels and flyer status:

- "A" - Basic control
- "B" - Intermediate
- "C" - Intermediate advanced
- "D" - Advanced

The current flying proficiency level attained by each club member will be recorded on a membership list.

General Rules and Conditions

1 Qualified instructors of the club will be appointed as examiners for the purpose of granting Wings. All other members wishing to participate in the judging are welcome and are encouraged to qualify.

2 To qualify as an Official "Examiner", the member must attain their "C" level Wings.

3 The above qualification is good for marking "A" and "B" levels only. To mark "C" and "D" levels one of the two examiners must hold a "D" level.

4 Two examiners are required for "B", "C" and "D" levels. To ensure that all members have an opportunity to obtain the required "A" level one qualified examiner will suffice if two are not available. However the candidates instructor cannot be the sole examiner.

5 Examinations may be taken at any time, however to ensure that an examiner will be on hand a candidate should contact the Chief Instructor so that arrangements can be made. During an examination no other aircraft shall be flying or running in the pits. This is to ensure every advantage to the candidate.

6 All maneuvers will be judged out of 10 points. A minimum of 6 points for each maneuver and 60% for each flight is required for a passing grade. Two successive flights must be made and both of them must be successful (attain at least 6 points in each maneuver).

7 Judging for "A" levels will tend to be softer than for the other categories. This is to account

for trainer type aircraft and nerves. However, the other 3 categories will be marked in the same manner as at a contest. When you win your wings you can be proud of them!

8 Candidates may, if they wish, have an assistant to aid them in the pit area and call the maneuvers out during the flight.

9 If there are 10 or more planes waiting to fly approval from all pilots is required before test may commence.

"A" Level Basic Control

Before taking the "A" level Wings test the prospective pilot must demonstrate to their instructor that they are capable of flying the test from either direction and have mastered dead stick landing procedures. While these capabilities are not suitable to be demonstrated in a "test" situation they are viewed as mandatory capabilities for competent pilots.

Candidates must demonstrate on two successive attempts during their examination period his ability to:

1 Take off and land unassisted.
2 Maintain straight and level flight parallel to the runway.
3 Perform a figure eight.
4 Rectangular Approach.
5 Land under power.

"B" Level Intermediate Control

Candidates must demonstrate on two successive attempts during the examination period their ability to:

1 Take off.
2 Straight flight out/back
3 Procedure turn.
4 Two overlapping loops.
5 One horizontal role.
6 Rectangular approach.
7 Landing under power.

"C" Level Intermediate Advance

Candidate must demonstrate on two successive attempts during the examination period his ability to:

1 Take off.
2 Stall turn.
3 Two consecutive horizontal turns.
4 Immelman Turn.
5 Cuban 8.
6 Straight inverted flight.
7 One outside loop.
8 Landing.

"D" Level Advanced

Candidate must demonstrate on two successive attempts during the examination period their ability to:

AMAS Flight Training Course

1 Take off.
2 Stall turn with 1/2 rolls.
3 Three horizontal rolls.
4 Three reverse outside loops.
5 Horizontal 8.
6 Four point roll.
7 Three turn spin.
8 Landing

Pilots Instructions

1 The pilot must stay within the designated pilot area for all maneuvers.

2 The pilot or their aid must call his maneuvers prior to execution.

3 At no time should the aircraft fly behind the flight line.

4 The candidate must perform all maneuvers and/or procedures parallel to, but beyond the designated runway.

5 Candidates will maintain a reasonable height and range while being judged.

6 Candidates are allowed only two free passes per flight.

General Downgrading

A general downgrading of the total score will be made due to the following:

- 5 points for each time the aircraft crosses the flight line.
- 2 points for each time a maneuver is not clearly called.
- 5 points for each free pass made over the allowed limit of two,
- 5 points for flying too far away.

NOTE: See description of maneuvers for individual downgrading found at www.maac.ca/en/documents.php under Wings Program Guidelines.

AMAS Flight Training Course

Appendix G – MAAC Safety Code and Safety Documents

Safety Code

This document contains safety rules and forms part of the MAAC Safety Code for all activities described herein.

MAAC Safety Document #MSD 3- ALL MODEL AIRCRAFT

The operation of a model aircraft in Canada is subject to rules contained in the Canadian Aviation Regulations (CARs) administered by Transport Canada. CAR 101.01 provides the legal definition of a model aircraft as follows. "Model aircraft means an aircraft the total weight of which does not exceed 35 kg (77.2 pounds), that is mechanically driven or launched into flight for recreational purposes and that is not designed to carry persons or other living creatures".

In addition, (CAR) 602.45 states, "No person shall fly a model aircraft or a kite or launch a rocket or a rocket of a type used in a fireworks display into cloud or in a manner that is or is likely to be hazardous to aviation safety".

All members operating a model aircraft either for sport or in competition shall adhere to the following basic requirements. Because these are basic requirements and because the safe operation of a model aircraft can be influenced by many factors such as local field conditions, weather, size of gathering, mix of model types etc. local club officials, event organizers or other assigned responsible persons shall provide interpretation, clarification and enhancements as necessary to ensure safe flight.

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 and/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 changes. Notification of all changes approved by the Board of Directors will be posted on the MAAC Web site as well as recorded in Model Aviation Canada in a prominent location so identified and will include the effective date of the changes.

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 or 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 Air 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 it is prohibited by law.

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

8. No member shall launch or allow to be launched any projectile from the ground aimed at or in the direction of a flying model aircraft.

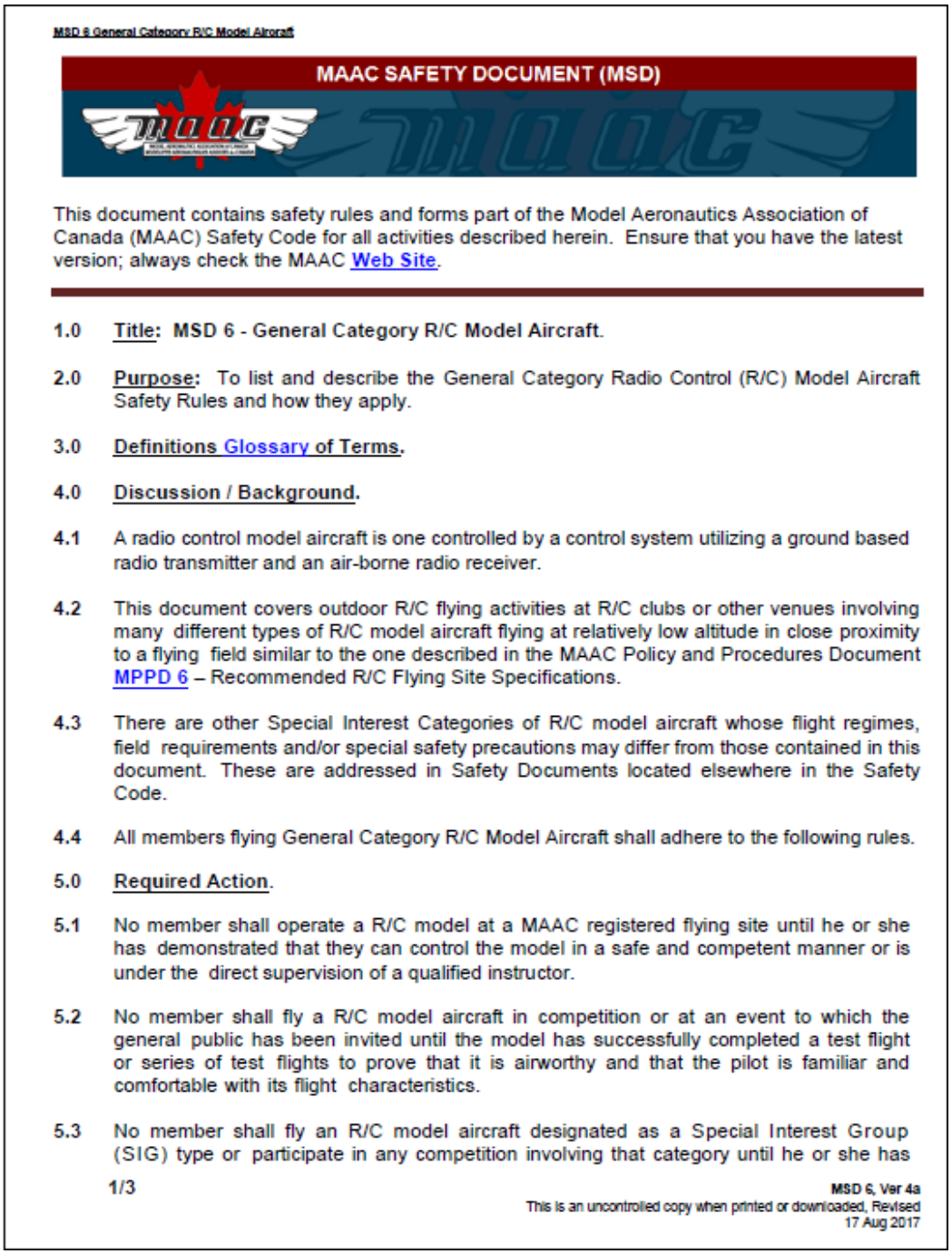
9. No member shall allow any projectile to be carried by or launched from a model aircraft.

10. No member shall operate a model aircraft with the intent of providing a target for projectiles launched at it.

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

Approved by the BOD March 24, 2013.
Revised by the BOD May 30, 2013
Revised by the BOD Jan. 16, 2014
Proposed revision submitted February 5, 2016, Approved by the BOD Mar 17/16

NOTE: Hard copies of this document may become outdated through revision, cancellation or replacement with another document. To ensure that you have the latest version approved by the Board of Directors, always check the MAAC web site under Resources – Documents – MAAC Safety Code.



MSD 6 General Category R/C Model Aircraft

MAAC SAFETY DOCUMENT (MSD)

This document contains safety rules and forms part of the Model Aeronautics Association of Canada (MAAC) Safety Code for all activities described herein. Ensure that you have the latest version; always check the MAAC Web Site.

1.0 **Title: MSD 6 - General Category R/C Model Aircraft.**

2.0 **Purpose:** To list and describe the General Category Radio Control (R/C) Model Aircraft Safety Rules and how they apply.

3.0 **Definitions Glossary of Terms.**

4.0 **Discussion / Background.**

4.1 A radio control model aircraft is one controlled by a control system utilizing a ground based radio transmitter and an air-borne radio receiver.

4.2 This document covers outdoor R/C flying activities at R/C clubs or other venues involving many different types of R/C model aircraft flying at relatively low altitude in close proximity to a flying field similar to the one described in the MAAC Policy and Procedures Document MPPD 6 – Recommended R/C Flying Site Specifications.

4.3 There are other Special Interest Categories of R/C model aircraft whose flight regimes, field requirements and/or special safety precautions may differ from those contained in this document. These are addressed in Safety Documents located elsewhere in the Safety Code.

4.4 All members flying General Category R/C Model Aircraft shall adhere to the following rules.

5.0 **Required Action.**

5.1 No member shall operate a R/C model at a MAAC registered flying site until he or she has demonstrated that they can control the model in a safe and competent manner or is under the direct supervision of a qualified instructor.

5.2 No member shall fly a R/C model aircraft in competition or at an event to which the general public has been invited until the model has successfully completed a test flight or series of test flights to prove that it is airworthy and that the pilot is familiar and comfortable with its flight characteristics.

5.3 No member shall fly an R/C model aircraft designated as a Special Interest Group (SIG) type or participate in any competition involving that category until he or she has

1/3

MSD 6, Ver 4a
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read, understands and intends to comply with all rules specific to that category.

5.4 Aircraft flown in this category must be equipped with a convenient means for the operator or helper to quickly and positively shut down the various types of engine(s) used; on the ground, or in the air by radio control. For electric powered models, on modern R/C equipment, it is recommended the member program a "Throttle Cut/Arm" function on their radio transmitter (refer to Original Equipment Manual (OEM) for details). This function provides a means to help prevent accidental throttle stick movement and motor operation. See MAP 6 - Tips for operating Electric Powered Models.

5.5 All members shall prior to the first flight of the day conduct a thorough preflight inspection of all control linkages and control surfaces for correct direction of movement and secure installation. Where possible carry out a functional check of:

a. **Range Check:** Where prescribed by the manufacturers operating instructions; all members shall perform a range check before the first use of the day and after any mishap that requires repairs (MSD 17 - Radio Spektrum); and

b. **Fail Safe:** On modern R/C equipment, ensure the Fail Safe function (enables the operator to preset parameters such as throttle position to return to a safe setting in the event of a loss of contact between the transmitter and the receiver) operates as described. Refer to MAP 11 - Setting the Fail-safe Feature on Modern R/C Equipment for additional information.

5.6 All members shall use an appropriate method of restraining their model during starting and ground running of the model or during range checks when conducted with the motor running or where there is any danger of the motor starting as in the case of electric powered models.

5.7 No member shall taxi a model in a pit area so designated on the club field layout or in any other area where there are people. All models shall be carried or in the case of very large models walked to the flight line. The assistance of a helper shall be requested by the pilot if necessary. Where starting areas adjacent and having direct access to the runway are provided, taxiing directly to the runway is permitted.

5.8 All pilots shall fly from a designated pilot area and/or designated pilot-station where provided. Standing behind a model for take-off or hand launching a model from a position on the runway is permitted but once airborne the pilot shall move to the pilot area as soon as possible. All movement on and off the field shall be called out to other pilots. Club officials and/or event organizers may designate other areas of the field from which pilots may fly for certain events.

5.9 No member shall fly a model directly over pit or spectator areas; vessels; vehicles; and structures; no-fly zones as designated on the club field layout or any other areas where there are people or emergency response personnel performing their duties.

5.10 All initial turns after take-off shall be made away from the pit, spectator and parking areas.

5.11 All takeoffs, flying and landings must be carried out on the side of the flight line opposite

the pilot stations.

5.12 All members shall yield the right of way to all other types of aircraft including full-scale human carrying aircraft, Unmanned Air Vehicles (UAVs) and unmanned balloons.

5.13 All members shall utilize the assistance of a Spotter and/or a Helper when deemed necessary. (See MSD 7 – Need for and Duties of Spotters and Helpers).

5.14 Maximum of five aircraft airborne at one time is recommended however Club officials and/or event organizers may increase or decrease the maximum number based on specific events after taking into consideration the many factors that may affect safe operations. Such changes shall be documented in the club's Field Guidelines and/or the rules for a specific event.

5.15 All pilots shall maintain direct unaided (except for corrective lenses and sunglasses) visual line of sight (VLOS) with their model at all times during the flight.

5.16 All R/C flying shall be conducted in an area of the sky and at an appropriate altitude where the consequences of any mishap will minimize the danger to persons or property.

6.0 History of Revisions.

a. Approved by the BOD, (March 24, 2013)
b. Version 2, Revised by the BOD, (January 23, 2014)
c. Version 3, Revised by the BOD, (March 17, 2016)
d. Version 4, Draft revision, formatted to new MSD template standards, (Aug 17, 2017)

Note: Hard copies of this document may become outdated through revision, cancellation or replacement with another document. To ensure that you have the latest version approved by the Board of Directors, always check the MAAC web site under Committees, Safety, View Committee Documents.

Safety Code and associated MAAC Safety Documents (MSD) are found at www.maac.ca/en/documents.php under Committee (Standing) - Safety

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Wings Quizzes - Check off the correct answer to the following True or False questions.

Club Procedures
1.The Frequency Board, at the Club Field, may not be used when 5 or less flyers are present. T F
2. During normal flying times 3 transmitters may be in use providing only 2 aircraft are actually flying. *T F*
3. Club's method of frequency control must be complied with. *T F*
4. No Flying before or after the times specified in the clubs field rules. *T F*
5. Vehicles must park by the road unless unloading or loading by the Pits. The one exception is if less than 4 vehicles are present and one of the flyers is an instructor. *T F*
6. Guest pilots must comply with the club's field rules and be in the company of a sponsoring member who is responsible for their safety. *T F*
7. Flying is not permitted over the pits except on final landing approach. *T F*
8. Pilots shall announce their intent to land or take off. *T F*
9. Full throttle engine noise level is to be in compliance with the club's field rules. *T F*
10. Aircraft are not to fly at altitudes less than 50 ft. when above people in 'fly over' area. *T F*
11. The only time aircraft that are allowed to be flown over the pits is during fun flies. *T F*
12. Only instructors may start an engine on the runway. *T F*
13. Taxing in the pits is not permitted. *T F*
14. Every member must have an " A " Wings rating to fly alone at the field. *T F*
15. Ways to reduce engine noise are:
1. Use a larger propeller. *T F*
2. Use less Nitro. *T F*
3. Stuff muffler with brass scrubbing material. *T F*
4. Richen the high speed mixture. *T F*
Quiz answers are on page 98

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Safety
1. At medium speeds, it is safe to adjust the High Speed Needle from directly in front of the airplane. *T F*
2. Care must be taken to keep spectators away from, in front of, or in line with the propeller arc when running up a motor. *T F*
3. Chicken sticks are for sissies. *T F*
4. Taxing is not permitted within 20 ft. of the Pits. *T F*
5. It is safest to set Dual Rates so that low rate produces.
1. Only a little control throws. *T F*
2. About half throw. *T F*
3. About 80 to 90% of full throw. *T F*
6. Always charge your batteries the night before flying. *T F*
7. It is wise to check your airborne battery before every flight. *T F*
8. Sometimes it is OK to turn on your 72mhz radio without checking the frequency board. *T F*
9. If a transmitter is left on in a car:
1. It won't bother anyone's airplane because it is shielded by The metal car body. *T F*
2. It might cause someone's airplane to "glitch". *T F*
3. It could cause someone's airplane to crash. *T F*
4. Because the transmitters secured against accidental use is not in the Compound the owner is not responsible. *T F*
10. If one person without MAAC insurance flies at the field it will void the MAAC Field (Land Owners) Policy. *T F*
11. MAAC Insurance ***"will not"*** cover loss of personal/club property and personal injury. *T F*
12. The "Flight Line" is:
1. Something attached to gliders. *T F*
2. Divides the Pits from the Runway. *T F*
3. Is an extension of the "Pit" edge of the runway that goes horizon to horizon. *T F*
13. Proof of MAAC Insurance is absolutely necessary when flying at any MAAC Field. *T F*
14. MAAC insurance is VOID if you *intentionally* fly behind the Flight Line. *T F*
15. It is the pilots responsibility to know the MAAC safety requirements for **"Special Interest Groups"** Otherwise MAAC insurance could be null and void. *T F*

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Check off the correct answer to the following True or False questions.

Aerodynamics:
1. An aircraft will balloon when coming out on a turn if:
a. It is turning into wind. *T F*
b. The back pressure on the stick controlling the elevator is not released coming out of the turn. *T F*
c. If the aircraft is allowed to dive in the turn due to a lack of "up" elevator. *T F*
2. The stalling speed of an aircraft is the same when traveling upwind as downwind. *T F*
3. Attitude controls airspeed and throttle controls height. *T F*
4. A spin is when one wing is stalled and auto rotation sets in. *T F*
5. An aircraft rolls about its center of gravity. *T F*
6. An aircraft Yaws about its vertical axis. *T F*
7. Rudder controls or prevents Yaw. *T F*
8. Ailerons can produce yaw. *T F*
9. Most aircraft will recover from a spin by just letting the sticks return to neutral. *T F*
10. During take-off most aircraft Yaw to the left and require right rudder. *T F*
11. In other than calm conditions, the takeoff run must always be into the wind. *T F*
12. Taking off into wind gives the aircraft maximum airspeed and minimum ground speed. *T F*
13. The airspeed of an aircraft will remain the same when flying upwind Or downwind. *T F*
14. The ground speed of an aircraft will change when turning upwind or downwind. *T F*

Club		***Safety***		***Aerodynamics***	
1	F	1	F	1.a	F
2	T	2	T	1.b	T
3	T	3	F	1.c	T
4	T	4	T	2	T
5	F	5.1	F	3	T
6	T	5.2	F	4	T
7	F	5.3	T	5	T
8	T	6	T	6	T
9	T	7	T	7	T
10	F	8	F	8	T
11	F	9.1	F	9	T
12	F	9.2	T	10	T
13	T	9.3	T	11	T
14	T	9.4	F	12	T
15.1	T	10	T	13	T
13.2	F	11	T	14	T
13.3	T	12.1	F		
13.4	T	12.2	F		
		12.3	T		
		13	T		
		14	T		
		15	T		

Revision History

Date	Revision	Reason
May 10, 2018	Rev. A thru G - Issued for Review	Draft
May 25, 2018	Rev.0 – Issued For Use	Approved by AMAS BOD