

MIDDLE POINT R/C FLYERS

(Tennessee's Only Gold Leader Club)

Instructor Guide

Introduction: This pamphlet is prepared through the combined efforts of the MPRCF Instructor Cadre, and is provided primarily for the first time instructor. It is offered to assure a standardized training program, and also provides considerations and techniques commonly used by other instructors. We are always open to improvements in our training, and welcome any and all suggestions for changes to this pamphlet and/or the MPRCF Flight Training Guide, (FTG).

As a club instructor, you are agreeing to follow the guidance provided in this pamphlet and the FTG. Utilizing this material will assure that the proficiency and safety considerations that are of concern to our club membership are met.

Standardization: The reasons for standardization are many. Our membership has agreed on the Field Safety Rules and other policies that influence our flying activities. We have agreed on certain performance standards by which a new member should be able to perform. The student needs to be offered a consistency from one instructor to another. The student should expect the instructor to follow the curriculum contain in his manual. There may be circumstances that will require some adjustments to these procedures. While it is permissible to make slight modifications to the program as might be required with a particular student, you still have an obligation to train the student to the desired goals of safety and proficiency.

Phase Training: The training program is based on several phases. The reason for this is to allow a better continuity for the student, especially if using more than one instructor. The phase approach also enforces the "building block" concept for training. The successful completion of one phase prepares the student for the next. It is vital that you stay within the phase outline.

Instructor Comments: There is space on the student training record sheet for instructor comments. It helps the student to include some comments after each session. This allows a record for the student to review prior to his next flight, and also smoothes the transition if another instructor works with him next time out.

Buddy Box: The FTG allows that the first phase can be accomplished without the use of the buddy box. Conditions permitting, all other training should be accomplished using the device. The reasons are several; first of all it will allow you to let the student progress further into a problem area before you intervene. This is beneficial in that it allows him more time to recognize his mistake and correct it. Another major plus is that having the immediate ability to take over is an extremely effective safety measure. With the use of a buddy box comes the potential for problems to occur. First of all, it is vital that a thorough pre-flight control check be accomplished. You can just about rely on the fact that one or more servos/channels will have to be reversed.

Another given is that the trims will need adjustment. These can be set in the ball park by toggling the instructor switch on and off and observing the slight movement of the individual channels. Adjust the buddy box trims until no movement is noted.

Be sure to check the throttle channel very carefully. The engine you think is starting at idle may just start at full throttle! For in-flight trims, the preflight procedure will probably result in a good trim for the student, however if you need to trim the transmitter any at all, i.e., a slower speed common with initial training, you will need to reset the buddy box trims as well. Duh!

As far as individual boxes are concerned, there are a few differences to remember. The Futaba unit should have the power switch off and the transmitter collapsed. The JR unit needs to have power on and the antenna collapsed. Watch the battery condition in the JR unit.

Fatigue: In case you forgot, learning to fly R/C takes a lot of concentration. As the day progresses, the student will begin to show signs of mental fatigue. When performance levels off or back-slides, it's time to go home. When the performance starts to suffer, the student will view it as failure on his part and not as a symptom of fatigue. Hence, we enter an area of negative learning. A good rule of thumb is that three sessions is a normal maximum. This also is about the same time devoted to a lesson in full scale flying.

Briefing: You will find that there is a benefit to giving a briefing prior to each flight. Explain what you will be doing and ask questions of the student to determine the level of understanding.

Things for the new instructor to remember:

- You aren't there to impress the student with your flying abilities, you're there to help him learn and he'll never learn if you are hogging the controls.
- Positive reinforcement. Never pass up the opportunity to praise the student for good performance. (Even if you have to look a long way to find it)
- Students are under a great deal of pressure. They might not show it, but it's there.
- Look for fatigue. Stop training as soon as performance starts to back-slide.
- Overload occurs when there is more to do than the brain can sort out. Every one reacts differently to overload. Many tasks that are done poorly at first suddenly become much better as abilities improve and the overload phenomena no longer occurs. One consideration that is common to almost every one is that when a student is in overload, their peripheral vision suffers. Visual acuity suffers as well, particularly distant vision. You may think the student is blind; they're not, just overloaded!
- Don't try to explain something while they are flying the model. Take control and then explain, or better still, save it until you're on the ground if conditions permit. If you try to lecture while he has control, you might just as well be talking to your dog.
- Know your "comfort zone", and don't let the model go past without taking over control. You should also have a 'no-fly zone' near the sun for the same reasons. If the model gets in the sun, use the transmitter as a sunshade or close one eye until the model clearly visible.
- If the model has become a long way off and is out of control, one way to recover is to bring both sticks full aft and hold them there. Eventually the model will be recognizable and in a low speed/stalled condition. It's extreme, but better than guessing. Try it sometime under controlled conditions. It works with trainers, but I wouldn't try it with a 42% Ultimate.

- If you find yourself with a situation that you're not real sure how to handle, ask one of the old heads how he would handle it. There is nothing wrong with getting a little help from another fellow instructor.
- The Flight Training Guide has quite a bit of information accompanying the phases. It might be a good idea to review what the student has read prior to each lesson.
- Anytime something new is introduced, demonstrate it first. The student needs to see what the maneuver looks like in order to do it.
- Sometimes the karma just isn't there. There are times when a student will learn faster with another instructor. If you suspect this to be the case, there is no harm in suggesting another instructor.
- There are common errors that all students make. If there were 10, you could count on every student committing 8 of them. This is not an issue. The thing that will get you is that every student brings something new to the party. Something you did not anticipate. That's what will get you! And, it will happen at the worst possible time!
- Every student will have some place in the traffic pattern that gives them difficulty with orientation. It might be the turn to base leg or the turn to final. I have seen some have a great deal of difficulty transitioning from "coming toward them, to going away from them". This happens when the model is directly in front and usually just when they begin go-around training.]
- Don't delay taking over control until the last possible second. Doing so only underscores the fact that the student nearly crashed and consequently goes a long way in destroying his confidence. As soon as it is obvious that the student is far behind the situation, take control.
- Always make a positive change of control, "I've got it", "You've got the airplane".

Phase One

Introduction to R/C Flying

This phase is for only one flight and is an automatic success. The only goal is to experience the sensation of radio control flight. Simple enough. It also serves to start a sense of accomplishment with the student. It's like getting a Good Conduct medal and then wanting to reenlist!

You should give him some ground school before the flight. Give the model a good, close inspection. It is very possible that you will discover something that will have to be fixed at home. This is a great time to impress upon him on the importance of a good maintenance program. Go over the safety and field rules with particular attention to frequency control. Anytime during training, if/when he violates one of the rules, bring it to his attention and reinforce the fact that it was a rule he violated. Early on you should instill a respect for the no-fly zones and frequency control.

Discuss how the model turns, and how it is different from turning a boat or a car.

You can pass on using the buddy box for this one if you want. Everything will be done at plenty of altitude. This will probably be the first flight on the airplane, so you're in the roll as a test pilot at the same time. Climb the airplane to a safe altitude and trim it out. After trimming, try a stall to see how it will handle. Now is the time to discover any problems that might exist. If it trims out O.K. let the student have it. If not, land it and start using the clevises. Don't have the student try to fly the model if it's not in trim.

Demonstrate the proper pitch attitude for maintaining altitude during turns, and how it varies with bank angle. Mention the importance of maintaining a gentle bank. Keep the fuselage level with the elevator control. Give verbal instructions for turning using reference to his left or right. Expect him to be in overload and forget. A tap on the shoulder does wonders for concentration. Always use a clearly understood change of control. There should be no doubt in the mind of the student as to just who is flying the model. "I've got it" or "You have the airplane". This is obvious if you're not using the buddy box, but when you do, it can really rattle the student if you take control and don't tell him. Discuss the "Zoom" phenomena. Show how the speed will build up during a descending turn and then result in a zoom upward when rolling out of the turn. Point out that it is preferable to manage the altitude in the turn and to avoid the pitch up that follows.

Talk him around the sky for 10 minutes or so, and then land the airplane. You can let him taxi back to the starting point if you want. It's always a good idea to make him do everything that he is capable of.

Phase Two Oval Patterns

In this phase the student begins trying to place the model in a particular position and to control where it's going. We're not just boring holes in the sky as we did in Phase One.

Give him some ground school beginning with him telling you what he learned in Phase One about making turns and holding the altitude during turns. The concept of a "reversed briefing" helps you to get a feel for what the student truly understands and what he is bluffing about. Discuss what you are going to do during the flight. What the Oval Pattern looks like. Discuss the effects that wind has on the model.

Let him taxi out, then you make the takeoff (possibly explaining what you are doing as you do it). Climb back to a comfortable height then reduce the speed to a speed appropriate to flying the traffic pattern. Demonstrate the oval pattern using turn points about 100 – 200 feet beyond the departure end of the runway and at the turn to final approach point at the other end. Show him the effects of wind drift on the model and how it's necessary to crab slightly to maintain the desired track. If the wind is down the runway (as if that ever happens) consider making a track perpendicular to the runway so he can see the drift. You might cross into the no-fly zone, but you can be forgiven this one time.

In all likelihood, the model will continually lose altitude due to poor control techniques. Consider having the model trimmed slightly nose-up to help with altitude control. This is a good time to introduce the concept that power changes result in altitude changes. Demonstrate that if you increase power slightly, the nose will rise a bit and the model will start to climb. From time to time, ask the student if he thinks he's too high, or low. This will help you understand how he sees things and if he is thinking.

Expect to spend two or more flights before seeing a minimum of proficiency with this maneuver. Don't sign him off until he can do a pretty fair job of holding altitude in the turns and he has grasped the concept of managing the effects of wind on the model.

If conditions permit, practice the pattern in both directions. When you change directions from what has been used so far, you can expect a great deal of back-sliding. Everything looks different to him and his flying will suffer. Tell him this is to be expected, but he will learn the new direction much quicker than before.

Don't forget positive reinforcement. Watch for signs of fatigue.

Put some comments in his training record. How is he doing, did you do turns in both directions?

Phase Three

Rectangular Pattern

This is by far the most difficult phase and will take several flights/days to master. What we are really doing is flying a traffic pattern. You should call it a traffic pattern and use the terms found in the definitions section of the FTG. Upwind/Final, Crosswind, Downwind, Base Leg, etc. These patterns will be flown at a constant altitude at first, then flown as low approaches/go-arounds getting progressively lower as the student's proficiency allows.

During the briefing portion of this phase, you should discuss what the pattern will look like, and that it is in reality a traffic pattern. The student will have to understand that any crosswind will have to be compensated for. The immediate aim is to fly the Upwind/Final leg in alignment with the runway centerline. He likely won't do it. He'll turn final too soon and approach the runway from an angle. Show the student some land marks to help with this orientation. You can do this during the briefing, but you should reinforce it during the flight. A nickel says that you will notice some degradation in his peripheral vision. "Oh Yeah, now I see it!"

The Flight Training Guide contains a lot of information about the "Stabilized Approach" concept. This is a high emphasis item in full scale flying and has just as much applicability in models. The importance of a stable approach begins with runway alignment. Don't let the student progress into really low approaches until he can consistently align the model with the runway. Emphasize that a good landing begins with a stable approach.

When the student begins doing a pretty good job of runway alignment, it's time to put him back into overload. Have him position his left thumb on the left stick and leave it there! C/A the thumb if you have too! Seriously, it is almost humorous how a student will resist another control feature. He has just started getting a little bit comfortable, and now you complicate his life with another stick to use. He had enough trouble getting used to the right stick, and now this!

Before beginning low approach training, it helps to have him fly the model, at a comfortable height, to a front and center position, and then retard the throttle to idle. Point out that the model becomes a bit easier to control and a little slower responding due to the lack of prop blast over the tail feathers. Also, on some models, you might have to make a slight nose-up pitch adjustment to settle into a stable glide. If this is necessary, usually only one adjustment is required and then it maintains a nice glide hands-off. Point out that the model glides down on its own, just like it had an autopilot. Let him practice several gliding descents. Now that he sees how it handles in a glide, it's time to progress to approaches.

Take control and demonstrate a high altitude go-around. Begin by reducing the power when on final and then add power back to a medium setting to initiate the go-around. Explain what you are doing as you perform the maneuver. Point out the importance of climbing straight ahead and at a proper climb attitude. Emphasize the sequence of "wings level, power up, nose up". If the engine was new when you started training, you might have to lean the idle a little bit now that it has some running time on it. For sure, you want to avoid the engine going rich and/or quitting just as you initiate a go-around. As you continue with the training, begin reducing the power further out. This of course results in a lower

altitude when the model is directly in front. As his skill at handling the power on the go-around increases, have him start using more and more power until you reach a point that he can handle full power comfortably. These first go-arounds can get hairy quickly. Be ready to take control. Demand that he maintain a good, positive rate of climb and not let the airplane turn. Climb out straight ahead. Often our patterns will result in a left turn after the go-around. Since the model is often trying to turn left by itself, it is vital that the student be in control and not allow it to happen. Maintain the heading and when you are ready for the crosswind leg, then turn.

At the beginning of the go-around training, you will be calling for the go-around. "Power up, go-around". As his comfort level increases, have him announce when he is going to go-around. It's good to get him verbalizing this decision. During this part of the training, there will be times that his performance is very poor and the go-around is the only viable alternative. Sometimes there will be REAL go-arounds. The best thing you can see during his training is for him to make the decision to go-around when things suddenly become ugly!

As the go-around point gets lower and approaching that of a landing approach, it will probably be necessary to lower the traffic pattern altitude somewhat so that a proper landing in the first third of the runway could occur.

When the go-arounds are consistently smooth and totally under control, it's time to progress to takeoffs. When the approaches are stable and on centerline, it's time to consider landings.

Enter some comments in his record.

Phase Four Takeoff and Landing

Takeoff: His manual describes the takeoff as two separate maneuvers. First – going down the runway with full throttle. Second – rotate to a stabilized climb straight ahead, and is the same as the go-around that he has been practicing. His manual cautions that the first part is with the left thumb, and then switching gears mentally to the right thumb for rotation and climb out.

During your preflight briefing, stress the importance of doing an abort/reject maneuver if the plane gets out of control.

For sure use the buddy box, and position yourselves behind the airplane on the runway. This is a great help for the first few takeoffs and allows the student to see a deviation in steering quickly. Also, by now you should have had him desensitize the steering to the maximum possible.

You might consider presetting the throttle on the transmitter to idle in anticipation of an aborted takeoff. He needs to see some aborts and hopefully will decide on his own to abort some. Also, stress the importance of not forcing a plane into the air. Get a good flying speed and then rotate it to a positive climb.

You should anticipate calling out “rotate” or “now” or “give it some up”, something to let him know that the plane has reached a safe takeoff speed. If you don’t have to take control during these first few takeoff attempts, it’ll be a miracle! Be ready!

After he’s getting the idea of how to make takeoffs, introduce the technique of holding a little aileron into the cross wind to make takeoffs easier and smoother.

Landing: Just as the go-around training introduced half of the takeoff, the approach training should have taken care of half of the landing training. All we have to do now is to learn how to flare the model and we’re home free!

His manual describes a procedure wherein the model is leveled off at a certain height, usually waste or chest high, with an attempt to maintain that altitude. It seems that every model is slightly different. As you made the landings during the earlier phases, you will have noted where this first flare point should be. As the model decelerates, it will begin a descent. He should attempt to stop the descent and hold the new altitude. This sequence of slowing and descending to a lower point occurs until the model touches down (main gear first hopefully). When you demonstrate the flare maneuver, call out each time you add some up elevator all the way to touch down.

It should be understood, until now the student has always flown with the model in trim. He has not be required to hold a constant displaced stick position as you would if the model were out of trim. He will experience this issue when first performing the flare maneuver. It will be very difficult to add some elevator, hold it and then add some more. It helps to have them dry-run this movement on the ground so they see and feel the difference.

During your briefing, point out that if there is a crosswind present, the drift angle will increase as speed dissipates during the flare. It will be necessary to make some slight corrections with the aileron during the flare. Here is another great potential for overload. Also you should discuss the issue of flaring too much and the resultant ballooning and how to manage this issue whether it is to fly through it or to go-around if it's extreme.

Discuss that it will be necessary to revert back to the left thumb to steer the airplane after it has landed.

Common mistakes would be:

- Not performing a go-around when called for.
- Over controlling the flare with resultant ballooning
- Not compensating for drift as the aircraft slows during the flare
- Trying to steer the aircraft on the ground using the aileron control
- Not holding elevator displacement during the flare.

Phase Five After Solo

There are a few more areas to cover before the newbie gets signed off. These are topics that not all instructors consider. Most of us just get the student to the point that they make descent takeoffs and landings and turn him loose. Experience has shown that adding these extra topics will make a difference in the future.

Trim: The student has really been spoon fed up until now. As he progresses through his experiences in the hobby, there will be times when he will need to trim the aircraft. It is by far better if he gains proficiency in this while he has you there beside him. You should have the buddy box available and plan to use it for this exercise. While he is boring some holes, reach over and move one of the trim levers about half-way to the stops. Get a dialog going regarding his impressions of what has happened. Don't tell him you've messed with the elevator trim. Have him evaluate the conditions and arrive at that conclusion himself. This is very important. Even with a slight deviation like this, many students fall apart and loose control of the model. Have him keep the model at a front and center position, this is vital! When he has resolved the nature of the problem, have him correct it. He should be able to verbalize to you what he's thinking and what he will be doing to correct the problem. He may have to hold the transmitter up in line with the model to find the right trim lever. When he has the model returned to an in-trim condition, change other controls. He should be able to deal with all three trim controls moved to the limits. You can remind him during the briefing that there is nothing you can do with the trim levers that he can't override with the sticks. Don't be surprise if you have to take control of the aircraft with the buddy box. It will probably happen, and will underscore how important this exercise is.

Dead Stick: This normally is more of a confidence maneuver than anything. The good news is that because there have been so many approaches flown during the course of his training that he has a good feel for the glide angle required to fly a successful dead stick approach. During the briefing, point out and then demonstrate ways to loose excessive altitude. Show him how much altitude is lost doing a 360 degree turn. Work with "S-Turns" as well. Point out that the aircraft has a flatter glide angle when the propeller is not turning and thus producing drag. Demonstrate the fallacy in trying to stretch a glide and of trying to dive off excessive altitude. Demonstrate how these just don't work. Help him get the mind-set to making a decision where to land a.s.a.p., and then don't change his mind. Give him practice by reaching over and retarding the throttle to idle at odd times, like maybe during a loop or roll.

Aerobatics: We really don't expect our instructors to teach aerobatics, but there is some opportunity to help the beginner in this area. One of the temptations facing all new pilots is to wring out the airplane and bore holes all over the sky. Sometimes the beginner forgets where the model really is and gets disoriented. As you introduce aerobatics, have him always position the airplane front and center before executing the maneuver. This results in a model that is easier to see and avoids the chance of disorientation. Loops and Rolls can be introduced even as early in training as Phase Two. It makes a nice desert after having a good lesson.

Check Flight

Once the student and his instructor agree that the student is ready, one of the following should be contacted to schedule a Check Flight:

- Any MPRCF approved Flight Instructor (other than the student's current instructor)
- Any current MPRCF Officer or Board Member

Successful completion of the Check Flight permits the student open and unsupervised flying at the MPRCF field. Keep in mind that the Check Flight is not intended to be a precision pattern contest. We are simply looking for the student to show he can control his plane through the fundamentals of flight.

The following must be satisfactorily demonstrated by the student to pass the Check Flight:

PREFLIGHT

1. Check for understanding of MPRCF Safety and Flight Rules.
2. Check for understanding of AMA Safety Code.
3. Check for understanding of MPRCF frequency control system.
4. Set-up and check aircraft, engine and radio (including range check) correctly prior to flight.

FLIGHT

1. **TAXI** – Straight, at moderate speed. Not toward the flight line.
2. **TAKE-OFF** – To the left and right (wind permitting), straight down the runway.
3. **CLIMB** – Straight, smooth, moderate angle of climb.
4. **FIRST TURN** – Start after the flight line ends, at safe altitude. May climb during this turn.
5. **PATTERN** – One left-hand and one right-hand pattern. A rectangular and/or racetrack pattern may be used. Maintain approximately constant altitude including during turns. Straight down the runway. Turns may be either 90 degrees or 180 degrees.
6. **KEEP WITHIN THE FIELD BOUNDARIES.**
7. **LANDING** – Smooth approach. Straight down the runway. Land approximately in front of the pilot. Note: This is not intended to be any kind of “spot” landing. If the pilot chooses, he may “go-around” twice, however, the go-around must be done while maintaining good control. Come to a complete stop. The plane may be carried to the pit area and the engine restarted if necessary.
8. **FORCED LANDING** – Fly the pattern until “cut power” is announced (one to three minutes after take-off). Cut the throttle to idle power throughout the forced landing. Same criteria as normal landing but touchdown must be comfortably within the runway. No go-around. Engine may be restarted if necessary.
9. **TAXI BACK** – Straight, at moderate speed. Do not taxi into the pit area. Stop engine. Do not use your hand on the spinner or throw a rag into the prop to stop the engine. Carry the plane into the pit area.
10. **TO COMPLETE THE FLIGHT** – Turn off the receiver and transmitter.

MIDDLE POINT R/C FLYERS
(Tennessee's Only Gold Leader Club)

TRAINING RECORD

NAME _____ AMA # _____

Phase	Date Completed	Instructor Name
Phase One		
Phase Two		
Phase Three		
Phase Four		
Cleared for Solo		
Phase Five		
Check Flight Sign-off		