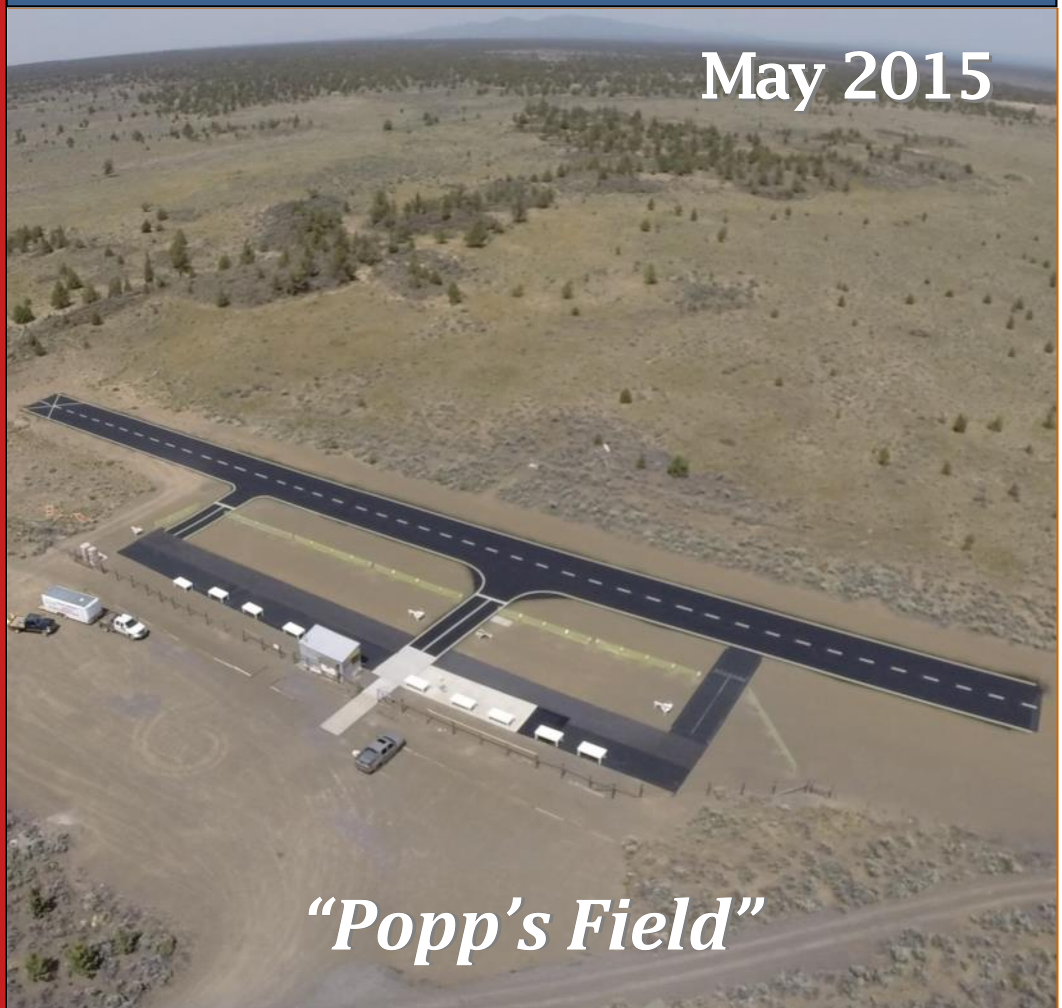
Bend Aero Modelers

Flight Report



Next Meeting

May 27, 2015
6:30pm at Black Bear Diner
Food available
Come early to visit and eat!

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FROM THE PRESIDENT

Message from the President

Dear Members & Interested Readers:

By now, most of you have had a chance to try out our recently repaired runway. ***Central Oregon Asphalt Sealing (COAS)*** did a fantastic job eliminating our six major runway cracks. After flying at Popp's Field the last few weekends, I can barely remember what it was like to taxi down that crack infested runway. I want to thank **Tom Rainwater** for all of his hard work coordinating the entire repair job. Tom met with several asphalt repair contractors at Popp's Field over the past few months. When Tom and I met with **Ron Williams** from COAS, we knew we had a good fit here. Ron got excited about our club and gave us a deal that we could hardly refuse. COAS is the only asphalt repair company in Central Oregon that uses the *infrared* technology. Ron's infrared machinery actually heats the old asphalt to 300 degrees, making it very pliable and easy to work with. By using the infrared machine, plus a little "new" asphalt, Ron's team was able to completely erase our major runway cracks. These cracks were becoming more and more of a problem as they slowly expanded, causing even our larger planes to stumble across these fault lines. After repairing the cracks, Ron's team resealed the entire runway and taxi ways, giving it a very uniform and dark color. After that, they repainted our striping and the now we have a smooth and beautiful runway. Ron told us that he will come back in the fall and will repair (at no charge) any cracks that may have developed. We are also talking with Ron about an annual service to our runway. Yes, folks, our number one asset is looking very good. If you haven't had a chance to see the runway in person, I want to encourage you to do so in the near future. And, while you are at it, bring a plane to fly!

Hey, lets go flying!

Greg McNutt

Radio Talk: Dual Rates, Exponentials, and Endpoints

By Waldermar Frank

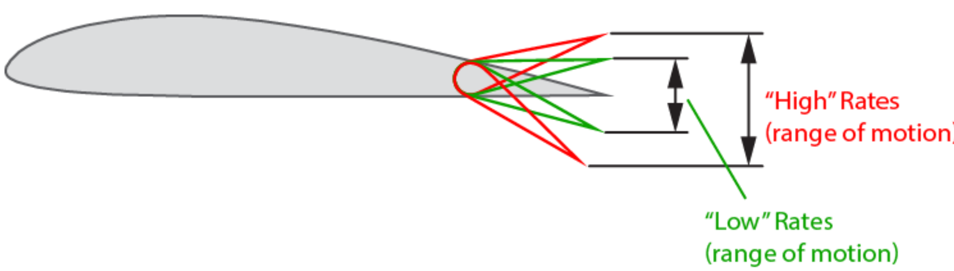
We have seen many new members join our club over the past 12 months with several of them just starting out in this hobby. Next to learning to fly, getting to know your radio gear and the many programming features can be intimidating and confusing at times. Knowing some key, fundamental programming features can be very helpful while improving your flying experience in the process.

There are three useful programming features that even entry-level radio transmitters offer these days as standard options—these include **Dual Rates**, **Exponentials**, and **Endpoints**. The specific programming steps to enable them can vary based on brand and transmitter model. However, their overall purpose and application is the same across transmitters.

Dual Rates

The **Dual Rates** feature allows you to set different throw settings for the aerodynamic control surfaces such as Ailerons, Elevator, and Rudder. "Throw" refers to the maximum deflection of a control surface. For example, the assembly instructions of your airplane might prescribe a certain range of motion for each control surface to ensure proper control of your airplane. This range is typically indicated as a lower and upper travel distance from the center (neutral) position of the control surface. Sometimes you are given two settings, which correspond with the recommend Dual Rates settings.

As the name implies, the standard is to have at least two (dual) settings per control surface—one setting for the maximum range (100%) and a second setting for a smaller deflection (e.g., 75%). Depending on your transmitter model, the settings are either assigned to a dedicated (predefined) Dual Rates switch (typically marked on your transmitter) or you have the option of assigning it yourself to any other available generic toggle switch. And you can even use a 3-position switch if available to set triple rates if preferred. Each control surface can be set independently and there is no prescribed approach to setting Dual Rates and/or using them standalone or in conjunction with each other.



Because the level of control surface deflection correlates with the level of responsiveness of the airplane, being able to set different maximum deflections for each control surface allows you to change the airplane's agility around each desired control axis (yaw, pitch, and roll). The goal is to adjust the maximum throw to the desired flying style and application.

Flying at higher speeds requires only small deflections to achieve adequate responsiveness. For instance, flying a pylon racing airplane at full speed would represent an application where changing to smaller throws would improve the controllability of the airplane (especially during tight turns around the pylons).

3D aerobatics offers another example. Since 3D aerobatics involves slower speeds (or no speed at all), using higher deflection settings to maintain satisfactory controllability is preferred. Or perhaps you are still learning to fly and the default throw settings for your airplane are still too much for your personal liking. Having the option to change to a lower deflection might help you with your flight training and can give you greater comfort while learning to fly your airplane until you are ready to handle higher throw settings. And you may have overheard other pilots talk about their "high" and "low" rate settings for a specific airplane. They are usually referring to the Dual Rates settings.

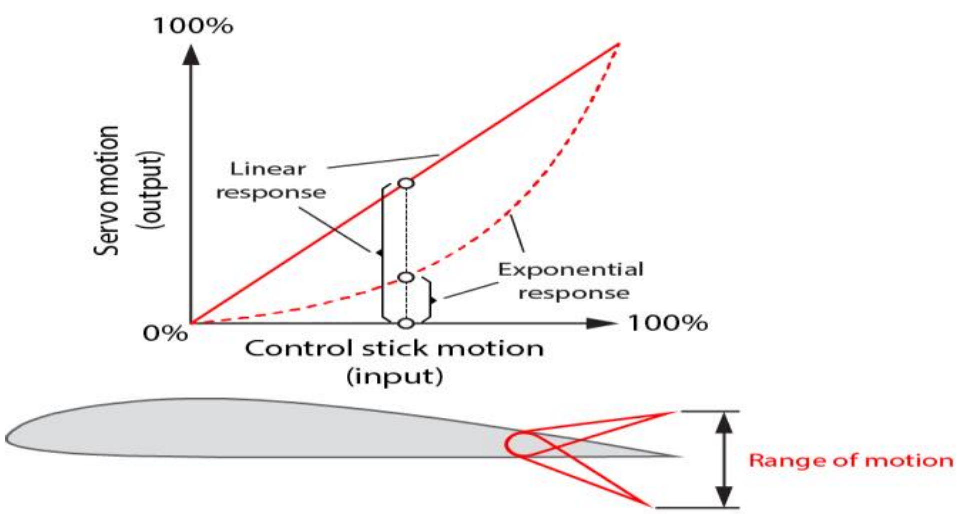
In summary, Dual Rates represent a great programming feature for novices and experienced pilots alike. It can significantly improve controllability of an airplane for specific flight conditions and applications. Likewise, checking the selected Dual Rates settings prior to flying is as critical as choosing the right settings when initially programming Dual Rates.

My recommendation is to follow the instructions provided with your airplane and use 100% for the default ("high") setting and then use a value between 50%-75% for the second ("low") setting. After a few test flights with both settings, you will quickly figure out where you should set each value to make you happy.

Exponentials

Similar to Dual Rates, the **Exponentials** feature is used to set a desired behavior for each control surface. It also can be used for controls such as the nose wheel (or tail wheel) steering during taxiing or takeoff (or landing) and the throttle response, for example.

However, this feature has a fundamentally different purpose than Dual Rates. Whereas Dual Rates affects the maximum throws, Exponentials affects the sensitivity (responsiveness) of the control input. For example, the default transmitter setting is to have a linear (proportional) relationship between the transmitter stick input and the response of the control surface (servo). That is, if you move a transmitter stick by 50%, the corresponding control (servo) will move by 50% of its possible range of motion. It is a one-to-one conversion of input to output.



And here is the interesting thing about Exponentials: You can change the default linear response behavior to an exponential response behavior. In other words, moving a control stick creates an exponential response, making the output faster or slower with increasing stick movement depending on how the exponential behavior is set up.
Why would that be useful you might ask? There are several good reasons, but one example involves keeping the airplane straight on the runway. Perhaps you have observed or even experienced a crazy fish-tailing takeoff or landing. It often indicates that the nose wheel (or tail wheel) is too sensitive for the range of motion to keep the airplane adequately aligned on the runway. At slow speeds such as during taxiing, the range of motion might be perfect to make a 180-degree turn on the runway to turn into the wind.

However, as you accelerate and pick up speed and to compensate for the torque created by the propeller rotation (engine/motor), you will need to steer the plane to keep it aligned. If the linear stick input is too sensitive for the possible range of motion, your airplane will respond more erratically with increasing speed. The same applies when landing and you could find yourself rapidly moving from left to right until you manage to come to a halt (or you might completely veer off the runway, or flip your airplane).

You could adjust the mechanical setup of your nose wheel and reduce the range of motion, which could improve the steerability during takeoff and landing, but it could also negatively affect your ability to make adequate turns during taxiing and to fully turn around at the end of the runway. A better approach would be to use Exponentials to avoid overcompensating and fish-tailing down the runway at higher speeds without changing the available range of motion (available deflection of the wheel). By setting up an exponential response behavior, you could adjust your nose wheel so it will move just a little bit within the first 50% of stick movement and move a lot when moving the stick between 50% and 100% of the range of motion.

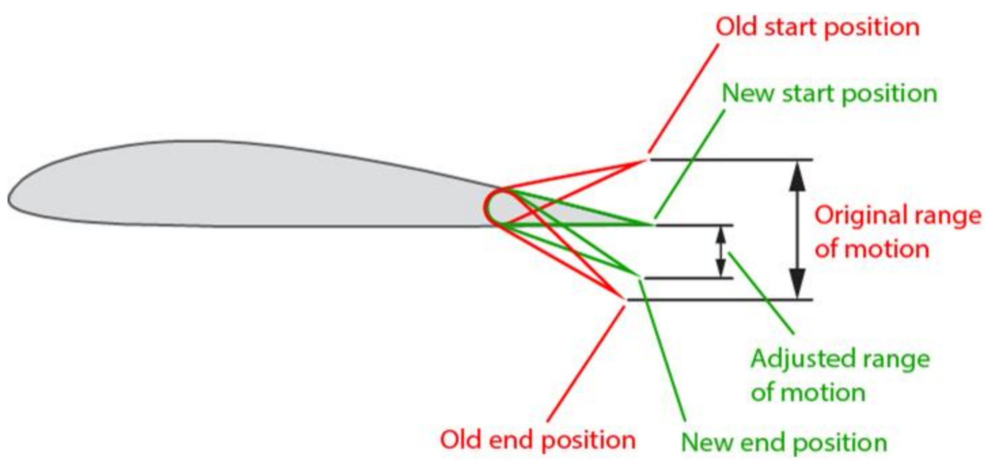
And in a sense, you can use the same approach for adjusting the sensitivity of your other controls, for example, your ailerons and your elevator. Using the pylon racing example from above, instead of using Dual Rates to manage the controllability of your airplane during high speed flying, you could use Exponentials to achieve a similar effect. The main difference between the two scenarios would be that Dual Rates provides you with two maximum throw settings, but a linear response to stick input. The Exponentials scenario provides one maximum throw setting, but a non-linear response behavior across the range of motion.

Both have advantages and disadvantages. It really depends on the specific application and your personal preferences to determine what makes sense. For instance, I prefer flying pylon racing airplanes with Dual Rates settings and a linear response to my stick input—it simply seems more natural to me and I feel more closely connected to the airplane.

Endpoints

This particular programming feature provides an additional capability to manage the range of motion of an airplane's controls through your transmitter without having to mechanically adjust them. The key benefit is to be able to set a new start and endpoint of motion for a given range of motion of a control surface or other control that is mechanically operated via a servo (or electronically such as the ESC for an electric airplane).

Let's say that you have tried to mechanically adjust your throttle motion of your glow-powered airplane, but realized that it is impossible to accurately set both the start and end positions so that the carburetor fully closes and opens as you move the throttle stick. In addition, you notice that in the fully open position, your push rod is being bent because the throttle servo's motion extends beyond the endpoint of the carburetor's control horn motion. Likewise, the fully closed position seems to strain the servo arm because it can't reach its start position without applying a permanent pull (and current draw).



Using your transmitter's Endpoints programming feature, you can set the new start and endpoints by limiting the available range of motion of your servo. And here is the nice thing that your transmitter will automatically do for you: Once you set a new start and end position, the transmitter's control stick range of motion is automatically adjusted to the servo's new (sub) range of motion.

In other words, the bottom position of the transmitter's control stick will correspond with the new lower endpoint (start position) and the top stick position will correspond with the new upper endpoint (end position).

There are other applications where endpoint adjustments are very useful such as flaps, especially when multiple flap positions are preferred in combination with 3-position switch. Or when you need to adjust the travel position of your airplane's mechanical retractable landing gear.

Conclusion

These three programmable features are extremely useful for properly setting up your airplane and improving flight characteristics. While the first two features (Dual Rates and Exponentials) are helpful for managing the controllability of your airplane, the third feature (Endpoints) helps you fine tune the range of motion of your control surfaces to ensure accurate positioning and avoid unnecessary loads (and potential damage) to your servos.

Although these beneficial features are available on most programmable entry-level transmitters (6-channels and up), pilots often ignore them or don't effectively utilize them for different reasons. I must admit that most user manuals that come with transmitters are not the easiest to read and can become an exercise in patience.

In part this is due to the lack of logical arrangement of interdependent topics or the lack of context to effectively follow the instructions. This is especially true if the setup of one feature requires related settings in another menu prior to the use of the feature, but the instructions fail to mention this. Furthermore, some of the newer transmitters are designed to help the user by only displaying the features that are enabled for a given configuration. So looking for a feature can be a game of hide and seek unless the instructions clearly explain that to view and access feature "XYZ" one has to enable setting "ABC" in menu "123."

Some user manuals are better than others, but too often they can discourage pilots from ever taking advantage of the transmitter's standard and advanced features. Or if you are stubborn and determined enough, you will eventually learn to program your transmitter through trial and error. Fortunately the many forums and social media channels provide plenty of knowledge and information—and of course, you can always ask other members to help and share their experience.

So give it a try and program one of the described features. You might be surprised how easy it is once you figure it out and experience the improved flight characteristics.

Happy flying!

Waldemar

2015 BAM Pylon Racing Begins

By Bruce Burgess & Waldemar Frank

Hello Race Fans! We just completed our first pylon race of the season and we had a blast. All week we were thinking it was going to be canceled due to weather but the race gods gave us a window for some racing action. I arrived at the field around 8:45 am with the pylons up and a small group already practicing. The weather was cool with some wind but very doable for racing the Super Sportster.

2015 Season - Score Tracker

Season Standings (after 1 race)		Points	Legend:	
1	Bruce Burgess	21	DNF	Did Not Finish (e.g., crash, mid air, engine issues, etc.)
1	Greg McNutt	21	DQ	Disqualified (e.g., 2 or more cuts, etc.)
3	Ryan Thomas	17		
4	Waldemar Frank	16		
5	Eric Suing	11		
6	Tony Bass	9		
7	Dan Costello	4		

Race 1 (May 16, BAM)

Rank	Pilot	Points	Efficiency	Heat 1	Heat 2	Heat 3	Heat 4	Heat 5	Heat 6
1	Bruce Burgess	21	88%	3	4	3	3	4	4
1	Greg McNutt	21	88%	4	3	4	4	3	3
3	Ryan Thomas	17	71%	3	1	3	2	4	4
4	Waldemar Frank	16	67%	2	4	4	4	DQ	2
5	Eric Suing	11	46%	2	DNF	3	3	3	DQ
6	Tony Bass	9	38%	1	1	2	1	2	2
7	Dan Costello	4	17%	1	DNF	2	1	DNF	-

We had 7 racers signed for the event but it should have been more with all the airplanes D's sold. I hope to see you at the next race. The air start turned out to be a lot of fun and very challenging to get it timed right. You needed to cross the start line when the starter (**Bob Ingram**) finished the count down to zero. There were a lot of us doing loops right before the start line so we did not cross to soon and get penalized. The racing was quite and exciting. The length of the race course turned out to be perfect (265 ft) for the Super Sportster with the winning racer going about 10 laps in 2 min. If you have good batteries that leaves plenty juice to land and it doesn't over burden your battery. The most popular battery was the 1350mah Pulse sold at D's they do very well. I was running the 1500mah Nanotech from Hobby King they also did well. I tried a 1300mah from Flitepower it was noticeably slower. **Greg McNutt** also tried a different battery and it was slower. Batteries with a higher C rating do make a difference.

From l to r; **Dan Costello, Bruce Burgess, Waldemar Frank, Eric Suing, Tony Bass, Gene Suing & Greg McNutt. Not pictured is Ryan Thomas**

The racing was fun and more exciting than I would have thought with a fairly slow foam airplane. We each flew in 6 different heats and the usual things happened. **Waldemar Frank** with his competitive spirit was the top cutter (4 cuts) of the day. There was one midair on a start between **Dan Costello** and **Eric Suing**. Both airplanes survived to race but eventually Dan's plane hit the ground hard due to faulty thumbs. I would like to thank all those who participated and helped at the race, it made for a very enjoyable day. I want to thank **Ryan Thomas** from D's for his support with these airplanes. I hope to see at the next race. You can watch a short video of our race by going to our BAM website (**bamrc.com/gallery**). Let's go racing! Bruce

Pictures from Popp's Field

Fun,Flying and a newly refurbished Runway

Many of our members showed up in late April for some "good weather" flying . . . And to say "goodbye" to our old runway. Shortly after the group picture (below) was taken, the runway work began. ***Central Oregon Asphalt Sealing*** did an outstanding job repairing the runway. Those nasty "wheel eating" cracks are now a thing of the past.

Saying "goodbye" to those nasty runway cracks are: (from left to right) are **Richard Carlson, Jon Putnam, Tom Schramm, Waldemar Frank, Larry Vose, Tom Rose, RJ Gorman, Dave Reiss, Brian Downer** and **Chris McDougal** (kneeling).

Pictures from Popp's Field—Continued

Bill Hand & Glider

Dave Reiss & his Cub

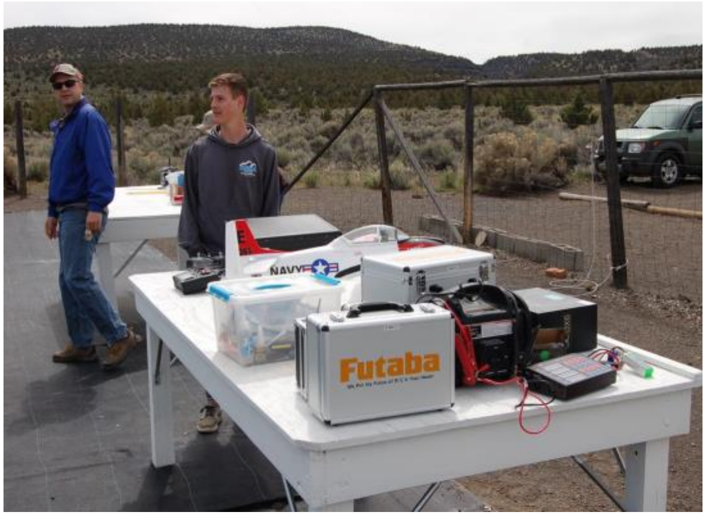
Flight Row

Brian Downer piloting a T-28

RJ Gorman preparing to land

Pictures from Popp's Field—Continued

Richard "Air Raid" Carlson preparing to bring one of his planes in for a landing. Notice the concentration! Nerves of Steel!



Waldemar Frank and Brian Downer and their flight table.

Jon Putnam preparing one of his planes for flight.

Larry Vose heading to the runway to fly his Sport Cub.

Pictures from Popp's Field—Continued

COAS owner **Ron Williams** (l) and one of his crew

COAS owner **Ron Williams** discussing how his infrared machinery eliminates the cracks on our runway. From left to right: **Tim Peterson, Tom Rainwater, Tom Schramm, Steve Younger, Ron Williams** & crew

Pictures from Popp's Field—Continued

Pictures from Popp's Field—Continued

Pictures from Popp's Field—Continued

Pictures from Popp's Field—Continued

Joe Stone inspecting the runway repair from the air. Joe is flying his Cessna 150 on a beautiful sunny day.

Tom Rainwater and **Steve Younger** christened the repaired runway with a spectacular midair collision.

Show & Tell

Rick Burgess showed of his newly completed Aeromaster 60 by Alien Aircraft during our April meeting. This is a beautiful "kit built" plane that is powered by a 15cc Evolution gasoline motor. Rick did a great job building this plane. He used Ultracote in a blue and white color scheme with a checkerboard pattern on the bottom of the wing and tail feathers. Great job Rick!

Academy of Model Aeronautics National Model Aircraft Safety Code

Effective January 1, 2014

A. **GENERAL**: A model aircraft is a non-human-carrying aircraft capable of sustained flight in the atmosphere. It may not exceed limitations of this code and is intended exclusively for sport, recreation, education and/or competition. All model flights must be conducted in accordance with this safety code and any additional rules specific to the flying site.

1. Model aircraft will not be flown:
   (a) In a careless or reckless manner.
   (b) At a location where model aircraft activities are prohibited.
2. Model aircraft pilots will:
   (a) Yield the right of way to all human-carrying aircraft.
   (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D.)
   (c) Not fly higher than approximately 400 feet above ground level within three (3) miles of an airport without notifying the airport operator.
   (d) Not interfere with operations and traffic patterns at any airport, heliport or seaplane base except where there is a mixed use agreement.
   (e) Not exceed a takeoff weight, including fuel, of 55 pounds unless in compliance with the AMA Large Model Airplane program. (AMA Document 520-A.)
   (f) Ensure the aircraft is identified with the name and address or AMA number of the owner on the inside or affixed to the outside of the model aircraft. (This does not apply to model aircraft flown indoors.)
   (g) Not operate aircraft with metal-blade propellers or with gaseous boosts except for helicopters operated under the provisions of AMA Document #555.
   (h) Not operate model aircraft while under the influence of alcohol or while using any drug that could adversely affect the pilot's ability to safely control the model.
   (i) Not operate model aircraft carrying pyrotechnic devices that explode or burn, or any device which propels a projectile or drops any object that creates a hazard to persons or property.
   Exceptions:
   - Free Flight fuses or devices that burn producing smoke and are securely attached to the model aircraft during flight.
   - Rocket motors (using solid propellant) up to a G-series size may be used provided they remain attached to the model during flight. Model rockets may be flown in accordance with the National Model Rocketry Safety Code but may not be launched from model aircraft.
   - Officially designated AMA Air Show Teams (AST) are authorized to use devices and practices as defined within the Team AMA Program Document. (AMA Document #718.)

   (j) Not operate a turbine-powered aircraft, unless in compliance with the AMA turbine regulations. (AMA Document #510-A.)
3. Model aircraft will not be flown in AMA sanctioned events, air shows or model demonstrations unless:
   (a) The aircraft, control system and pilot skills have successfully demonstrated all maneuvers intended or anticipated prior to the specific event.
   (b) An inexperienced pilot is assisted by an experienced pilot.
4. When and where required by rule, helmets must be properly worn and fastened. They must be OSHA, DOT, ANSI, SNELL or NOCSAE approved or comply with comparable standards.

B. **RADIO CONTROL (RC)**

1. All pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others.
2. A successful radio equipment ground-range check in accordance with manufacturer's recommendations will be completed before the first flight of a new or repaired model aircraft.
3. At all flying sites a safety line(s) must be established in front of which all flying takes place. (AMA Document #706.)
   (a) Only personnel associated with flying the model aircraft are allowed at or in front of the safety line.
   (b) At air shows or demonstrations, a straight safety line must be established.
   (c) An area away from the safety line must be maintained for spectators.
   (d) Intentional flying behind the safety line is prohibited.
4. RC model aircraft must use the radio-control frequencies currently allowed by the Federal Communications Commission (FCC). Only individuals properly licensed by the FCC are authorized to operate equipment on Amateur Band frequencies.
5. RC model aircraft will not knowingly operate within three (3) miles of any pre-existing flying site without a frequency-management agreement. (AMA Documents #922 and #923.)
6. With the exception of events flown under official AMA Competition Regulations, excluding takeoff and landing, no powered model may be flown outdoors closer than 25 feet to any individual, except for the pilot and the pilot's helper(s) located at the flightline.
7. Under no circumstances may a pilot or other person touch an outdoor model aircraft in flight while it is still under power, except to divert it from striking an individual.
8. RC night flying requires a lighting system providing the pilot with a clear view of the model's attitude and orientation at all times. Hand-held illumination systems are inadequate for night flying operations.
9. The pilot of an RC model aircraft shall:
   (a) Maintain control during the entire flight, maintaining visual contact without enhancement other than by corrective lenses prescribed for the pilot.
   (b) Fly using the assistance of a camera or First-Person View (FPV) only in accordance with the procedures outlined in AMA Document #550.
   (c) Fly using the assistance of autopilot or stabilization system only in accordance with the procedures outlined in AMA Document #560.

C. **FREE FLIGHT**

1. Must be at least 100 feet downwind of spectators and automobile parking when the model aircraft is launched.
2. Launch area must be clear of all individuals except mechanics, officials, and other fliers.
3. An effective device will be used to extinguish any fuse on the model aircraft after the fuse has completed its function.

D. **CONTROL LINE**

1. The complete control system (including the safety thong where applicable) must have an inspection and pull test prior to flying.
2. The pull test will be in accordance with the current Competition Regulations for the applicable model aircraft category.
3. Model aircraft not fitting a specific category shall use those pull-test requirements as indicated for Control Line Precision Aerobatics.
4. The flying area must be clear of all utility wires or poles and a model aircraft will not be flown closer than 50 feet to any above-ground electric utility lines.
5. The flying area must be clear of all nonessential participants and spectators before the engine is started.