

BEND AERO MODELERS



FLIGHT REPORT

SEPTEMBER 2013

Holy Cow!! A Day Destined for Disaster!



This picture was taken at the 3rd session of Club 40 pylon racing at the La Pine RC Flyers field on August 31st. It does not begin to portray the drama that went on at the event that day. You will find more details in the Club 40 section of this newsletter. To say the day was interesting would be a significant understatement!

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Next Meeting

September 25, 2013
6:30 pm at Jake's Diner

Food available
come early to visit and eat.



FROM THE EDITOR



by Andy Niedzwiecke

Well, here it is another month and Summer is almost over but that doesn't mean that we are done flying or having fun. There's always something to do, as Jason Westlind points out in his article about building. We are coming onto the season that is just right for building and making repairs and improvements to our planes.

I was reminded the other day that wives have a big influence on our hobby as well. My wife just commented the other day as I was preparing to return some stuff to a vendor that had been damaged in shipping. She didn't see why I was returning the stuff that came "pre-crashed". Wives always have a tendency to "needle" us a bit with comments like "why do you need another plane" or "what's this \$500 on the VISA to Horizon Hobby?". Then there's always the dash we make to "head off" the UPS truck and get our plunder out of sight as quickly as possible.

There are a couple of good articles in this issue. One is contributed by Waldemar Frank, explaining the information we need to use LiPo batteries. Maybe some of you understand all of the terminology and ways of figuring out what battery, motor or ESC to use but it sure confuses the heck out of me, being relatively new to electrics.

If you have something to share along those lines or you are building something that you wish to share, please submit it to me so the entire club can enjoy and learn. I like to have stuff no later than two Wednesdays before our monthly meetings so I have time to prepare and include them in the newsletter. My goal is to publish the newsletter one week before the meetings.

Also in this issue is some coverage on the improvements to our clubhouse. This building is getting better and better and to top it off, we are getting a new wood-burning stove for it. Dan Clark from the La Pine RC Flyers and a former member/treasurer of BAM donated a stove that his son had. Waldemar and Dan and I are going to Portland on the 23rd of this month to pick it up. The same trip will be to pick up Waldemar's new "Mobile Hanger" so that is what we will be packing the stove home in.

Finally, if you haven't been out to the Pine Nursery Park on Thursday evenings at 6PM, you are missing some fun. The time is coming that this will be over for the year so in the next few weeks be sure to get out there before the light of day tells us we're done. Usually instructors are there to help people that need or want it.

Well, that's it and I hope you all enjoy this installment. I'll see you all at the meeting on the 25th!

Andy

Welcome



NEW MEMBERS



Welcome new member Ron Plomer! Ron is getting back into the hobby and has been a former member of the Cascade Flyers. He sold most of his gear some time ago and realized that he should have kept some of it since he is getting back into the hobby. Ron is an old-school hobbyist and noticed how much the hobby has advanced over the past years. He is appreciative of having access to instructors and other experienced members that can help him back into the hobby. He recently acquired some new equipment to get started. Welcome to BAM Ron!

FROM THE PRESIDENT



Message from the President

by Waldemar Frank

Dear Members, Fellow RC Pilots, and Interested Readers:



This time, I would like to talk about something that we at BAM have done very well over the past two years or so: Having fun and embracing the hobby!

Clubs that are active tend to be more exciting and fun—and it often doesn't matter what activity it involves. Participation and interaction between club members is generally more crucial than the specific activity. One could certainly argue that it's the members that make the difference. However, I actually believe that it is both the members and the activities.

In a way, frequent club activities prevent members from becoming complacent and passive. Moreover, activities generate energy and excitement. This in turn creates a healthy, resilient club culture that inspires people to stay involved. Members who regularly interact with each other foster cohesiveness and a sense of identity, which is crucial because it benefits the club as a whole.

One of the things that we at BAM continuously emphasize is staying active and engaging with members as well as the public whenever possible. Not everybody needs to participate or volunteer to make a difference, but sufficient participation can easily carry a club and make it appealing for all members, including members who prefer staying in the background. Not everybody needs to lead, but anybody can participate or benefit from it.

We all have, at some point, encountered clubs that come across as cold, distant, and sometimes emit a certain level of negativity. These are usually clubs that are not very active or are simply indifferent towards their mission as an AMA-charted club. In fact, their indirect "mission" is often to achieve the opposite. That is, to remain closed and hidden from outsiders.

Of course, the size of a club can make a big difference and not all clubs have enough members to generate the necessary drive and excitement. However, the appreciation of new members and a club's openness to change is a good reflection of its culture and willingness to try new things. I think that we should be proud of ourselves and extremely pleased with what we have accomplished over the past few years here at BAM.

This brings up two other vital points that I have been thinking about for some time: Memberships and making the most out of what we have. I believe that clubs need to routinely draw new members—not only to make up for natural turnover, but also to remain active and healthy. New members are generally a good thing for most clubs because they instill new ideas and energy. They can also validate existing practices and provide a sanity check for the club. A diverse club shows a natural resistance to monotony and typically offers better solutions for dealing with change.

When talking to other clubs and members, I occasionally hear phrases along the lines of "the good old times" or "we don't need more members." These sorts of opinions are generally rare and often assume circumstances that no longer exist or are simply out of context. The reality is that clubs change over time whether we like it or not.

The important thing is that we make the most out of what we have. This may include managing our funds differently and changing priorities for their allocation. It may also mean that we see shifts in interests, skill levels, and participation. These are normal cycles of change that all clubs have to master. And it is up to each of us to decide how we can make a difference so we don't lose sight of our mission and why we joined a club in the first place. We don't save lives or cure diseases—we are a club that brings joy into people's lives through our activities and mutual interest in a great hobby.

So don't forget to enjoy this hobby and make the most out of your membership! And don't forget to mingle—socializing with other members is sometime half the fun and you might find yourself surrounded by friends you didn't know you had!

Sincerely, Waldemar Frank, BAM President

MEMBER SPOTLIGHT

by Andy Niedzwiecke



Well, it seems like we have kind of a celebrity in our club. Tom Staffeld, in case you missed it, was featured in the Focal Point section of our latest AMA publication Model Aviation on page 79. Tom is a long-time modeler and does things "HIS" way and certainly does a remarkable job on any plane that he designs/builds. I have included the picture and comments in this section as well as Tom's comments to me when I emailed and talked to him about his fame.



F-5

Tom Staffeld (email: tstaffeld@bendbroadband.com) first saw Bill Hinnant's 1975 F-5 in "MA Plans Showcase" and wanted to build one.

The F-5 is completely built-up and covered in light fiberglass that is finished with acrylic lacquer. Tom deviated from the plans on the control surfaces. He used a servo in each wing panel for the ailerons, a pull-pull rudder, and a separate connection to each elevator half.

Tom already had a new O.S. 61FSR and Spring Air pneumatic retractors to use on the F-5. Control is a 2.4 Futaba radio with digital servos, which was the only deviation from a completely vintage airplane.

Tom Sez:

I was wondering if they were even going to run the picture since it had been 18 months since I submitted it. I thought it would be a no-brainer since it was from the first plans they ever published. I even posed it like the cover of the magazine when they ran the build article. They edited my text and left out BAM in Central Oregon and other things. Check out the build article and plans for a historical perspective (plan #100). More details in an ARF assembly article these days.

Contrary to what it says in the magazine, you can submit pictures through the MA website, you don't have to mail them. This was the most challenging model that I have built which is why I submitted it.

The fuselage is currently being reworked for use as the plug for a fiberglass mold (swore I'd never build that fuse with balsa again), so you'll never see this one fly. I'm hoping to have a fiberglass fuse/foam wing version ready to fly next summer. I'm hoping to have something closer to 7 pounds and it will be a great aerobat.

Congrats Tom!!

DO YOU KNOW YOUR LIPO?

by Waldemar Frank



Electrics have become very popular with many pilots—mostly because of their perceived ease of use and advancements in battery technology that offer much better performance compared to products of the past. Interestingly, pilots who fly exclusively electrics or have added electrics to their arsenal of planes often don't know as much about their electric equipment (batteries) as they should. To some degree, the lack of knowledge stems from human nature: We tend to project our knowledge of similar products onto new products. That is, pilots might think that all batteries work the same way and have similar characteristics. This article aims to provide some clarification by focusing specifically on the popular LiPo batteries ("LiPos") that power many electric planes these days.

LiPos, or more specifically Lithium Polymer batteries, were originally designed to power electronic devices such as cell phones, calculators, watches, laptops, etc. The initial battery design for these devices involved lithium-ion batteries, which were eventually replaced by LiPos.

To make LiPos suitable for use with RC airplanes, manufacturers had to make design changes to allow capacities and current discharge rates that can deliver the necessary power and flight times needed to offer a viable alternative to combustion-based propulsion systems.

Lithium, the lightest among the solid metals, has an extremely low melting point of only 180.5°C (357°F!). To allow the flow of electrons (create electricity), the lithium-salt electrolyte is held in a solid polymer composite, hence the name *Lithium Polymer*. In addition to traditional industrial applications, Lithium is also used as an anti-depressant ingredient in some medications. Its low weight is one main reason why LiPos can deliver such high energy relative to their weight compared to traditional batteries used in RC airplanes (NiCd or NiMH).

However, good performance comes with a price: Lithium has also violent reactive characteristics, which require special care in its handling. When on fire, it produces corrosive and toxic fumes. Further, it aggressively reacts with water and has explosive tendencies. Thus, these tendencies should be taken into account when dealing with LiPos.



A typical setup of a LiPo battery for RC applications includes one or more cells that are connected in series and/or in parallel. Each cell has a nominal voltage of 3.7 volts and up to 4.2 volts when fully charged. For example, a 3-cell battery (e.g., 3 cells connected in series) has a nominal voltage of 11.1 volts ($3 \times 3.7V = 11.1V$) and 12.6 volts ($3 \times 4.2V = 12.6V$) when fully charged. When taking a closer look at a LiPo battery designed for RC airplane use, one can clearly see the sandwich structure of the cell configuration.

The first LiPo batteries only included the battery leads—a balance connector was added as a safety feature once it became clear that LiPo batteries could ignite during charging. Because each cell has its own physical characteristics, charging LiPos requires balancing of the voltage across cells to ensure that no cell is being overcharged (in excess of 4.2 volts), which could lead to sudden combustion and fire. Equally important, to ensure longevity in LiPo batteries one should not discharge individual cells below 3.3 volts.

DO YOU KNOW YOUR LIPO?

by Waldemar Frank...continued



Following is a summary of the key information used for labeling LiPo batteries. Please note that the arrangement of the information can vary by manufacturer:



1 — Manufacturer/brand name

2 — Product line

3 — The capacity of the battery expressed in milli Ampere hours or simply Ampere hours. This is the current the battery could supply for one hour (less time if a load is applied). In the above example, this battery has a capacity of 3,000mAh or 3.0 Ah.

The capacity can be viewed as the “size of the electric fuel tank.” That is, the higher the capacity, the longer the flight time when used with the same motor and propeller configuration. A bigger propeller (diameter and/or pitch) draws a higher current and therefore depletes the energy more quickly, hence reducing the flight time. The same applies when a more powerful motor is used on the same airplane.

The theoretical flight time (in minutes) can be calculated as follows:

$(\text{Capacity of battery} \times 60) / \text{Current draw of motor-prop configuration}$

Example:

3Ah (3,000mAh) LiPo battery with motor-prop configuration that pulls 34A at full throttle

$(3\text{Ah} \times 60) / 34\text{A} = 180 / 34 = 5.3 \text{ minutes}$

Please note that most flights don't involve full throttle and the actual flight time is longer. A good measure is to assume an average current draw of 60%-70% of the maximum current.

DO YOU KNOW YOUR LIPO?

by Waldemar Frank...continued



Example: $0.7 \times 34 = 24A$ for the above scenario. At this average current draw, the flight time would be as follows:
 $(3Ah \times 60) / 24A = 180 / 24 = 7.5$ minutes

Many motor manufacturers provide information about different propeller and cell configurations as well as the corresponding maximum current draw for that configuration. You can use this data to determine which battery size, propeller, and speed control work best for your specific airplane/application.

- 4 — The C-factor indicates the maximum discharge rate of the battery. For example, 1C means that a battery can provide a maximum continuous current discharge rate of 1 x capacity. The above battery has a C-factor of 25, meaning that it can provide a continuous current of $25 \times 3A = 75A$. Some manufacturers list a range such as 25-50 as shown in the above example. The second value indicates the maximum burst discharge rate. In the example, the battery could provide a burst discharge rate of $50 \times 3A = 150A$. However, the burst discharge rate can be supplied for just a few seconds before damaging the battery (usually for 10-15 seconds or so). Thus, never use the burst discharge rate as the design measure for your battery selection.
- 5 — Nominal voltage and cell count. In the above example, the cell count is 3 and the nominal voltage is 11.1V. Please note that some manufacturers or distributors use classifications such as **3S1P** to indicate the cell setup. “3S1P” simply refers to the number of cells and their circuitry. In this case, 3 cells are connected in series (“3S”) with 1 parallel circuit (“1P”).

A few words about safety and charging LiPo batteries:

- Never charge a LiPo battery unsupervised or unattended for long periods of time.
- When charging, place LiPo batteries on a non-flammable surface (e.g., brick, concrete) and away from combustible materials (e.g., fuel) or place them in a charging pouch available specifically for charging LiPos.
- Always use a charger that is specifically designed for charging LiPo batteries. Using the wrong charger can result in the destruction of the battery or charger, or can cause a fire.
- For safety, charge LiPo batteries using the charger’s “balance” mode to ensure that cells are not charged in excess of their maximum voltage. If using the normal charge mode, make sure to balance your batteries after the second or third regular charge to prevent overcharging of individual cells.
- Always charge your LiPo batteries at 1C (1 times the capacity of the battery) to ensure the longevity and safety of the battery. Although some manufacturers indicate that selected models can be charged at a higher rate (e.g., 2-5C), it usually means that you will compromise the integrity and life of the battery over the long term.
- Never charge a LiPo battery when installed in the airplane. Always remove the battery from the airplane before charging.
- Always inspect LiPo batteries for damage or excessive puffiness, especially after a crash.
- Don’t use LiPo batteries if they show clear signs of wear and damage.
- Always discard LiPo batteries following the manufacturer’s recommendations.

CLUB 40 RACING



Ah, here we are, all a bunch of happy pilots and volunteers.well almost all, if you notice in the foreground, Waldemar Frank's racer was the victim of a fatal crash while practicing for the races. What to do?

As noted on the front page, it seemed like it was going to be a beautiful day of racing but Waldemar, while practicing, encountered a mechanical/electrical/pilot failure which resulted in the aforementioned crash. When his wife Marissa arrived she took one look and said "HOLY COW!!!" Well, Bruce Burgess, being the fine gentleman that he is, offered to let Waldemar use his backup plane so Waldemar could race and he accepted Bruce's generous offer. After a test flight of the loaned plane the races proceeded. The first race began and all of a sudden, computer errors began to arise so the initial race was called to a halt. The computer being down as it were, it was decided to do things manually and by walkie talkie. So let the first race begin again! Well, it did.briefly.after about 3 laps Darrell and Waldemar were rounding pylon 1 when Darrell's propeller chewed off the tail of the plane Waldemar was piloting, or the tail of the plane that Waldemar was piloting attacked Darrell's plane. Anyway, Waldemar's plane went spiraling to the ground and Darrell's plane blew up in the air like a chicken in a fan.



Waldemar Frank and the plane that Bruce Bugess lent him to be able to compete. The second crash of the day for Waldemar.

La Pine RC Flyers president, Joe Stone holding parts of both planes. . . .the wing of Darrell's plane and the tail of Bruce's plane

Darrell surveying what is left of his "backup" plane. He bought this plane from Jason Westlind and ended up using it as his front-line fighter.



If you want to fly in La Pine these days, this BAD BOY had better be there...a new requirement.

Bruce Burgess was more than a little frustrated with the computer and the loss of his plane. Hence the phrase that Marissa Frank came up with "a day destined for disaster!"



JASON'S SIG HOG BIPE ADVENTURE



by Jason Westlind....Part 1

I have been bitten by the build bug once again and have found that special kit! I first saw the original Hog Bipe in a magazine my Grandpa had when I was 10 years old. I had that picture on my wall for my whole childhood. I went to the Hobby Show International in 1996 and was shocked when I walked by the Sig Mfg. booth and saw their version of the Hog Bipe and immediately put a pre-order in for the hobby shop I co-owned at the time. Almost two years had passed before I received a call from Sig Mfg. that they were ready to ship. Unfortunately they were only sending one kit for which I reluctantly sold to a very good customer of mine.

Up until recently I had forgotten my love for the Hog Bipe even after knowing the kit was still available. It was just a month ago that my Dad called and told me he had stumbled upon a lady in my home town that was selling her late husband's kit collection. I told him to buy them all and I would be over in a week. The collection consisted of about 50 kits from vintage pattern planes to free flight and even some control line planes. My eyes lit up when I pulled a box out with a bright red label that read "HOG BIPE". I was even more astonished when I saw a label on the back from my old hobby shop. It was my Hog Bipe!



I finally got my build bench set up and began to tackle the build. I ordered up one of the new O.S. FS95V engines that should be a great match. Too much power should almost be enough! The quality of the kit is superb. It has many laser cut parts for the main fuselage which is making life much easier in that department. The only problem I have come across are that the cabane struts are two different widths and drilled off center. I called Sig to order new ones but they refused to allow me to pay for them and am sending a set free of charge even after 15 or so years.

Over the weekend I was able to get the main fuselage built. I am really taking my time with this kit, although it is a pretty simple and straight forward build. The laser cutting really went together nicely. I am at the point now where I need to finish mounting the engine, secure the fuel tank, and route the throttle cable. Then I will start sheeting the fuselage top deck and move onto the wings. I have included some pictures of my current progress and will continue to do so in each upcoming newsletter until it is complete.



I hope this has been good motivation for the rest of you to get that special kit and start building. I love the special feeling I have after each piece is glued on knowing I am building something myself. Show me what you got!

Jason Westlind

AUGUST 2013 MEETING SHOW & TELL



Bob Ingram brought his Fairchild PT-26 to the meeting. It has a 57 inch wingspan and is outfitted with a ThunderTiger .46 engine. The plane was a gift from Bob's wife for his 68th birthday.



Jason Westlind brought his Hog Wild Wing to the meeting. It is designed for combat but Jason just uses it for a fun flyer. It is made from Coro-plast so it is very sturdy and crash resistant. It is an electric plane.



Greg McNutt towed his new 6' x 12' cargo trailer to Jake's to show it off after the meeting. It has been modified specifically to facilitate model airplane transport and mobile repair. It has a myriad of features such as a work bench, electrical setup (two batteries and an inverter) and wing racks on the sides. NICE GREG!



I missed the last meeting but Greg McNutt took pictures for me. I have to say that these guys really look happy to be there!!! It just goes to show you how much fun we have at these meetings which is why I hate to miss even one! Would you look at the faces on these guys. How can you beat that.....be sure to attend our next meeting for more hilarious fun!!!!

FIELD MAINTENANCE AND IMPROVEMENTS



On August 24th, a work party was held at the field to “finish” the interior walls and do some outside maintenance. Several club members met at the field at 9AM and proceeded to get busy. Bill Hand single handedly took care of all of the weeds that lined the edges of the runway and taxiways. Meanwhile, Waldemar Frank, Tony Bass, Greg McNutt, Steve Younger, Tom Schramm, Tim Peterson and Andy Niedzwiecke took on the job of insulating the walls and installing sheet rock. Also installed were panels of “handiboard” which are concrete based behind where the wood stove is installed. The entire interior, after a long hard day, was completed with the exception of doing the “mudding” of the seams. Steve Younger has been out there since to start that process. All in all a good day’s effort and one that will be enjoyed by members out there on a cold day.



Tom Schramm and Tony Bass, measuring and cutting sheet rock to fit. A lot of pieces!!!



Greg McNutt measuring and cutting a whole lot of insulation. He installed most of it himself .

It’s a shame that we have so few pictures but Waldemar was the only one with a camera so that is why he is not in any. My thanks to him for providing these pictures to show you what went on that day. You should all try to get out on a work day because it’s not only work but we have fun together!!!



Must be a union shop!! Four guys standing around watching one guy work!!!

And then, of course, there was the usual amount of fooling around and having fun together.



OBITUARIES

Rest In Pieces



This page is blank because all occurrences of destruction happened at the August 31 Club 40 Pylon races so check out that section of the newsletter! Of course not to be prejudiced, but how could the crash trophy go to anyone else when one of our members crashed two planes in one day? Nice going Waldemar!!!



SAFETY REPORT



I cannot believe how fast time is going by this summer. It must mean we are having lots of fun! As you all know, the new safety guidelines have been completed and were published in last month's newsletter. We will continue to include them in each month's newsletter for new members as well as a reminder for current members. A copy of the guidelines will also be posted in our newly remodeled club house. We also plan to have some signs made to be posted at the two main entryways to the field. We have had great feedback regarding the new guidelines and the awareness that they are bringing.

A common concern has been that of taxiing in the pit area which will be my topic this month. Taxiing of aircraft is allowed in the pit area as long as caution is used. Regardless of the type of propulsion system used, there are a few guidelines to make taxiing safe for everyone. Have your aircraft restrained until you have a clear path to the flight line. It is good practice to make others aware of your intentions, as well as for all pilots to be aware of aircraft ready to taxi and to give them room to do so safely.

Our designated pit taxiway is the center of the pit mat that parallels the runway. Please taxi your aircraft at a walking pace. If the engine idle accelerates your plane beyond walking pace, please hold the tail until you get to the flight line where you can secure it until you are ready to announce your take off.

It may also be advisable to have someone assist you in taxiing your aircraft to the flight line if appropriate. Knowing your aircraft's ground handling will also aid in safe taxiing practices. Using some up elevator for tail draggers will help keep the tail pinned to the ground surface and prevent wandering or bouncing of the tail which could lead to a dangerous nose over. Use gentle throttle inputs and watch your speed.

The biggest key to safe taxiing: Be aware of what may be happening around you and enable others to be aware of your intentions. "Look both ways before crossing the street!"

Have fun and be safe!

Jason Westlind
(Field Safety Officer)

SAFETY REPORT continued



POPP'S FIELD SAFETY GUIDELINES

All pilots shall be current members of A.M.A. and B.A.M. Proof of current A.M.A. membership is required prior to flying at B.A.M.

Visiting A.M.A. pilots and new members of B.A.M shall receive a safety orientation prior to their first flight.

Pilots shall ensure safe flight operations in concordance with A.M.A. Safety Rules and these Field safety Guidelines.

Pilots shall ensure safe operation of their aircraft and associated equipment prior to use.

Pilots are encouraged to verbally enforce safe flying practices.

All guests, children, and pets shall be supervised by a B.A.M. member while inside the flying field and are encouraged to remain behind the pit tables.

All pilots shall restrain their aircraft during the start-up/arming process. This includes electrics.

Pilots shall never leave their aircraft unattended while the aircraft is running or armed..

Pilots shall only taxi aircraft in the specified taxi area and use caution while taxiing.

While flying, pilots are encouraged to remain 25 feet behind the closest edge of the runway, preferably behind a pilot station.

Pilots shall verbally communicate their intentions such as landings, take-offs, or aircraft problems while flying.

Pilots shall fly their aircraft north of the centerline of the runway. This is known as the "deadline".

Pilots only are permitted beyond the flight line (e.g., to retrieve an aircraft)

Landing aircraft have the right of way. Dead-stick landings shall be announced as such and given full priority.

Pilots shall communicate any aerobatic maneuvers such as, low passes, touch and go's, and hovering directly near or above the runway.

Pilots shall not take-off or land on the taxiways.

A maximum of five (5) aircraft is allowed in the air at one time. This includes helicopters and micros.

Pilots shall call all maiden flights prior to flight. All other aircraft shall be grounded throughout the entirety of the flight.

Hand launches shall be performed approximately 25 feet from the edge of the runway closest to the pilots' station.

Pilots using AM/FM radio equipment shall have the appropriate frequency pin attached to the transmitter antenna whenever the radio is in use.

R/C cars and other surface vehicles are prohibited anywhere inside the flying field.

Smoking is prohibited anywhere inside the flying field and shall be carried out in a safe and respectful manner in the parking lot.

The consumption of alcoholic beverages before or during flight is prohibited.

Academy of Model Aeronautics National Model Aircraft Safety Code, Effective January 1, 2011

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 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 man carrying aircraft.
 - (b) See and avoid all aircraft and a spotter must be used when appropriate. (AMA Document #540-D-See and Avoid Guidance.)
 - (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 Aircraft 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 which could adversely affect the pilot's ability to safely control the model.
 - (i) Not operate model aircraft carrying pyrotechnic devices which 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-Recommended Field Layout):
 - (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 operate within three (3) miles of any pre-existing flying site without a frequency-management agreement (AMA Documents #922-Testing for RF Interference; #923- Frequency Management Agreement)

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 flight line.

7. Under no circumstances may a pilot or other person touch a model aircraft in flight while it is still under power, except to divert it from striking an individual. This does not apply to model aircraft flown indoors.

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.

9. The pilot of a 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.