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Bend Aero Modelers

Flight Report

May, 2016

Next Meeting

May 25, 2016
6:30pm At Black Bear Diner
Food Available
Come early to visit and eat!

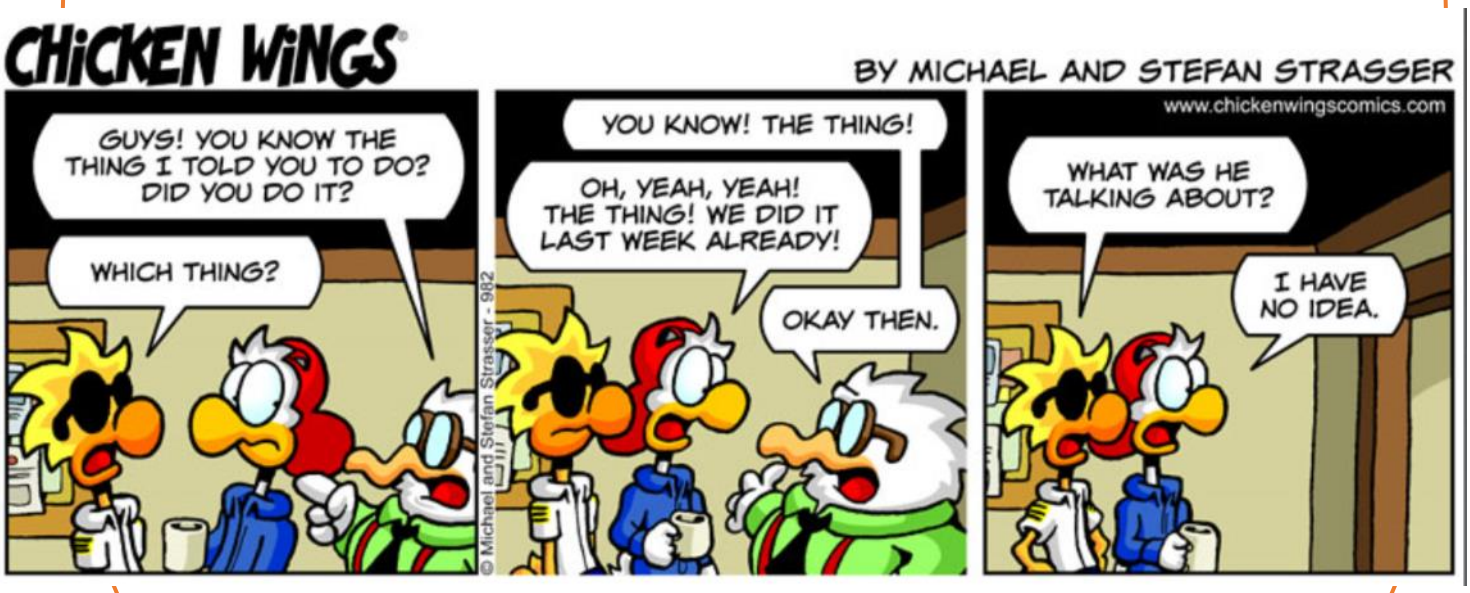
From the Editor

By Bob Ingram

May

*The Flight Report Editor is making **ANOTHER** call for information—including pictures if you have any—of BAM history. Would like to create a section of BAM history … When did BAM start? Any pictures? Anything to do with history of BAM would be appreciated. Thank You.*

Continue to feel free to submit pictures and stories during 2016. Without your contributions the BAM Newsletter would not exist at the level you expect it.



New Members

Since the last newsletter … April issue of the Flight Report … there are no new members that joined BAM

Awards

At the April club meeting, Dave Reiss was given an Appreciation Award for all the outstanding work that he has done. Dave has been instrumental in getting many of the needed tasks done at Popp's field. A handicapped Porta -Potty was delivered and Dave has already "mouse-proofed" it. Leveling the parking lot, filling in the holes with ODOT dirt, prep work for the new cargo container (that is now installed at the field) along with his many other contributions.

Flight Safety: Current Draw and Voltage Drops

This month's Safety Report was prompted by a recent email exchange I had with one of our members concerning receiver battery selection and reviving batteries that have been stored for a long time. One of the questions that came up was that of servo current draw and its impact on flight time. Although it is obvious that current draw affects flight time, more importantly it also made me think about flight safety linked to current draw as a result of the airplane's configuration and intended use.

Flight time per se is not a safety issue, but rather an inconvenience if the receiver battery's capacity cuts the flight time short and you safely land the airplane before it becomes an issue. Therefore, in this month's report I would like to focus on several factors and measures related to battery power and flight safety.

We often assume that as long as we choose a receiver battery with a sufficient capacity to supply power to our servos and other installed equipment (e.g., retracts), things should be fine. And perhaps many of us tend to mitigate the risk by oversizing the battery's capacity. Furthermore, in most cases small to mid-sized electric airplanes share the same battery for both the motor (propulsion) and the receiver (including servos, retracts, etc.).

In contrast, larger electric R/C airplanes and airplanes that use a combustion propulsion system have a dedicated receiver battery and often a backup battery to ensure that sufficient power can be supplied to the installed radio gear.

The number of powered items not only determines the power requirements (consumption), but also when it make sense to break down items into logical sub-systems that benefit from a separate power source for safety and flight time reasons. This is usually the case for larger airplanes.

In addition, the power consumption increases under certain flight conditions as the various loads on the airplane increase (e.g., tight and high-speed turns) and the servos for the different control surfaces are operated simultaneously, causing an increased current draw while holding the respective control surface deflection. Likewise, poorly installed hinges or retracts could further increase the current draw as a result of "built-in" friction of mechanical components. The servos have to work harder to move mechanical components.

In other words, the type of flying and the quality of the airplane's build can lead to combined increased current draws that can cause a significant voltage drop in the battery supplying the power. In the case of the receiver battery, a voltage drop below the minimum receiver voltage will trigger a reset (restart) of the receiver and connected components (e.g., control surface servos), which can result in a fatal crash if there is not enough time to recover from the reset. Essentially, the effect of the voltage drop is the same as if you turn your radio gear off and on in midflight.

And I speak from experience. A couple of years ago, I crashed one of my Club-40 pylon racers due to a receiver reset caused by my aileron servos. It took me a while to pinpoint the root cause after the crash, but it was undoubtedly initiated by the two (substitute) aileron servos once I analyzed the airplane and tested the servos (the servos did survive the crash without issues, but the airplane frame did not). Fortunately, nobody got hurt and the low altitude during racing was the reason why the airplane hit the ground quickly.

The two (digital) servos were undersized for the type of flying (pylon racing). In addition, digital servos draw higher currents than equivalent analog servos. During high-speed, tight turns the aileron servos drew so much current to withstand the load that it caused a fatal voltage drop. And flying this close to the ground did not leave enough time to recover from the airplane's directional change that the receiver reset triggered.

Flight Safety: Current Draw and Voltage Drops (continued)

In summary, understanding your equipment and how much power it can consume does impact flight safety. The more servos are used on an airplane, the higher the combined current draw and the risk of peak current draws during high-load flying and simultaneous use of multiple servos.

Selecting the right equipment (e.g., servos) for the right application (type of flying) is also critical to avoid unexpected voltage drops. This is one main reason why larger airplanes use dedicated batteries and voltage regulators to keep the voltage above a safe value. Moreover, the negative effects of a voltage drop due to increased current draw is greater as flight time goes by and the voltage naturally decreases as the battery is drained during flying.

A voltage regulator may not always be necessary (e.g., small to midsized airplanes) and some R/C pilots like to use capacitors that are installed into the receiver power supply circuit to bridge potential voltage drops. The type and size of capacitor (one or more capacitors can be used) depends on the overall current draw and expected power consumption.

In either case, it is always a good practice to review and understand the equipment used on a given airplane, especially when making custom modifications (your own designs) or using different radio gear than recommended by the original manufacturer. You can usually find out what a component's power consumption and current draw are by checking the manufacturer's website or contacting them directly. However, please keep in mind that manufacturers typically do not provide current draws under loads. Many R/C forums have information that R/C pilots have collected and measured themselves (always double-check your sources and information before applying it to your situation).

Or, as a simple experiment, you could use a voltmeter to measure the current draw of different servos under load and the potential voltage drop by pushing against the servo arm or control surface (if connected) when operating the servo. This type of experiment would have to be set up properly to collect reliable results, but it would at least demonstrate that higher current draws can cause substantial, sudden voltage drops.

Fly safely!

Waldemar Frank

Show & Tell

We had 2 show and tells at the April meeting …

Bill Hand brought in his latest glider. Hobby King Blanic L-13. It has a 2300mm wingspan and an 900Kv outrunner motor requiring a 3S 3300mAh battery. Bill had ordered some Red Bull graphics for a motorcycle and applied them to the model making it more visible and very unique. Nice job Bill.

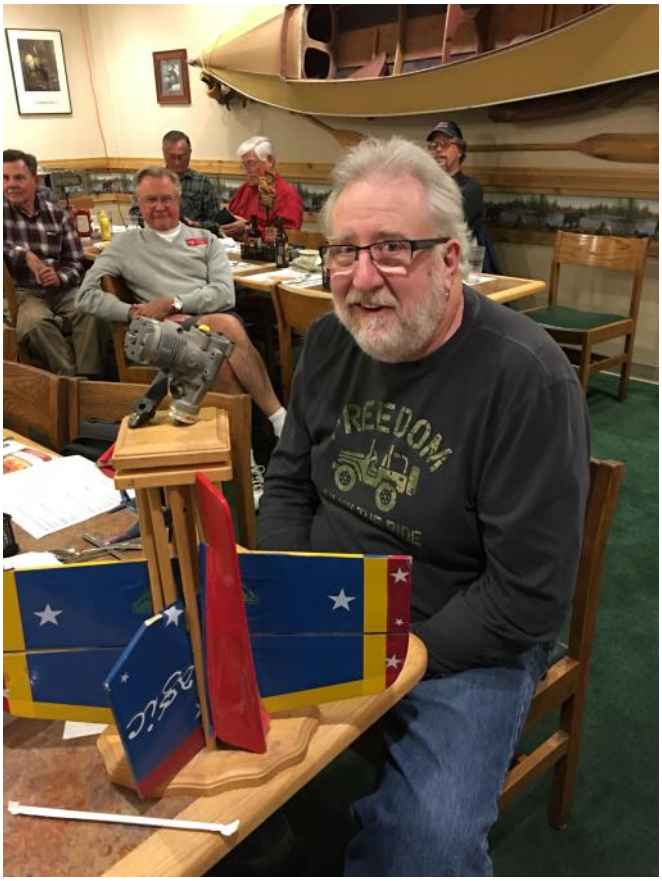
Bob Ingram brought in his recently completed ESM T-6 Texan II. It has an 80” wingspan and has a DLE35RA gasoline engine. The plane weighs in at about 18 lbs. And only required a few ounces of weight in the tail to balance. Rick Burgess was the primary builder teaching Bob about building BIG plane with fiberglass fuselages. Bob hopes to fly the model soon. UPDATE: Actual maiden flight was by Tom Rainwater on Tuesday May 3rd. Bob flew it for the 2nd flight later in the day. Beautiful plane.

New at the field—cargo container for storage and new signs as BAM moves forward toward obtaining an AMA Gold Leader status.

Crash Trophy

The crash trophy has found another new home.

The crash trophy for the month of April was given to Tom Rainwater who crashed his new Zero (Giant Scale)—on a maiden AND just before the club meeting. WOW! We all feel your pain Tom! And on top of that he had more then enough witnesses and photographers to cover the event.



GOOD NEWS—the 4-40 screws used for the landing gear held up.

SPECIAL NOTE: As of this moment 5/10/2016 the Zero is back together and will be ready for a new maiden as soon as the new canopy is received and installed.

Attendance at the club meeting

VP Waldemar led the meeting. Many came early to visit and eat.

What else is happening

Bend Aero Modelers - 2016 Event Calendar

Last Update: 1/24/2016

Club Meeting
Pylon Race Practice
Contest Pylon Race
BAM Renewal Deadline
Last Chance to Renew
Pine Nursery Park Fun-Fly
National Holiday
BAM Christmas Party
Family BBQ & Scale Fun-Fly
Annual National Model Aviation Day

January

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1						1	2
2	3	4	5	6	7	8	9
3	10	11	12	13	14	15	16
4	17	18	19	20	21	22	23
5	24/31	25	26	27	28	29	30

January 1st - New Year's Day

February

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
6		1	2	3	4	5	6
7	7	8	9	10	11	12	13
8	14	15	16	17	18	19	20
9	21	22	23	24	25	26	27
10	28	29					

March

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
10			1	2	3	4	5
11	6	7	8	9	10	11	12
12	13	14	15	16	17	18	19
13	20	21	22	23	24	25	26
14	27	28	29	30	31		

April

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
14						1	2
15	3	4	5	6	7	8	9
16	10	11	12	13	14	15	16
17	17	18	19	20	21	22	23
18	24	25	26	27	28	29	30

April 5th - Easter Day

May

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
18	1	2	3	4	5	6	7
19	8	9	10	11	12	13	14
20	15	16	17	18	19	20	21
21	22	23	24	25	26	27	28
22/23	29	30	31				

May 10th - Mother's Day / May 25th - Memorial Day

June

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
23				1	2	3	4
24	5	6	7	8	9	10	11
25	12	13	14	15	16	17	
26	19	20	21	22	23	24	25
27	26	27	28	29	30		

June 21st - Father's Day

July

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
27						1	2
28	3	4	5	6	7	8	9
29	10	11	12	13	14	15	16
30	17	18	19	20	21	22	
31	24/31	25	26	27	28	29	30

July 4th - Independence Day

August

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
31		1	2	3	4	5	6
32	7	8	9	10	11	12	13
33	14	15	16	17	18	19	20
34	21	22	23	24	25	26	
35/36	28	29	30	31			

September

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
36					1	2	3
37	4	5	6	7	8	9	10
38	11	12	13	14	15	16	17
39	18	19	20	21	22	23	24
40	25	26	27	28	29	30	

September 7th - Labor Day

October

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
40							1
41	2	3	4	5	6	7	8
42	9	10	11	12	13	14	15
43	16	17	18	19	20	21	22
44	23/30	24/31	25	26	27	28	29

November

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
45			1	2	3	4	5
46	6	7	8	9	10	11	12
47	13	14	15	16	17	18	19
48	20	21	22	23	24	25	26
49	27	28	29	30			

November 24th - Thanksgiving Day
NOTE: Due to Thanksgiving the November meeting is a week earlier.

December

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
49					1	2	3
50	4	5	6	7	8	9	10
51	11	12	13	14	15	16	17
52	18	19	20	21	22	23	24
53	25	26	27	28	29	30	31

December 24th - Christmas Eve
December 25th - Christmas Day
December 31st - New year's Eve
January 1st - New Year's Day

Bend Aero Modelers

Bend, Oregon | AMA District XI

Field Safety Guidelines

A. GENERAL

1. All pilots shall be current members of AMA. Proof of current AMA membership is required prior to flying at BAM.
2. Visiting AMA pilots and new members of BAM shall receive a safety orientation by one of BAM's members prior to their first flight.
3. Pilots shall ensure flight operations in accordance with AMA's Safety Code and these Field Safety Guidelines at all times.
4. Pilots are responsible for the safe operation of their aircraft at all times.
5. All guests, spectators, children, and pets shall be supervised by a BAM member at all times while inside the flying field (fenced area) and are encouraged to remain behind the pit tables.
6. Pilots shall always secure/restrain running or armed aircraft.
7. R/C cars and other surface vehicles are prohibited anywhere inside the flying field (fenced area) during active flight operation.
8. Smoking is prohibited anywhere inside the flying field (fenced area).
9. The consumption of alcoholic beverages before or during flight is prohibited.

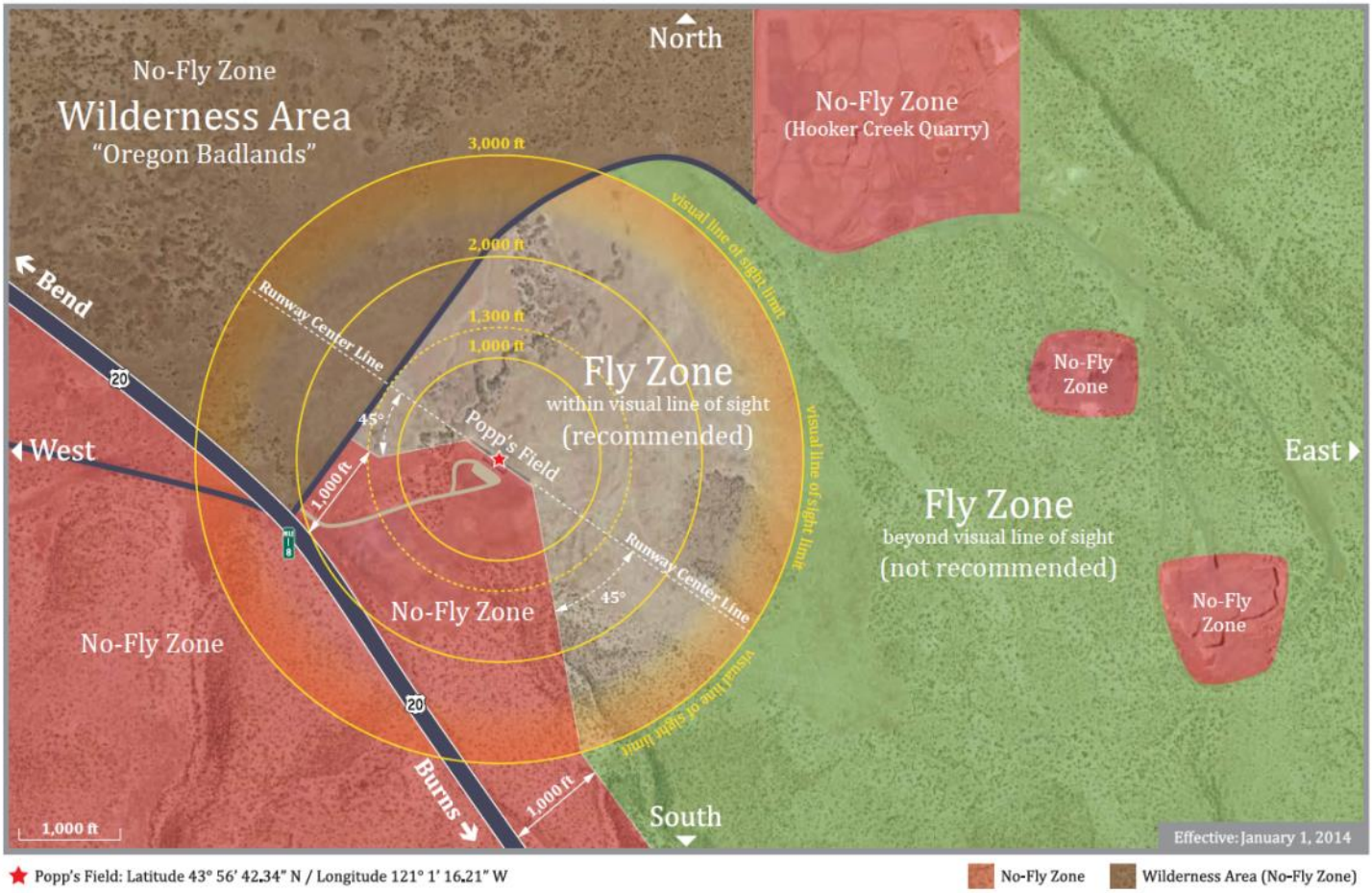
B. PRE-FLIGHT OPERATION

1. Pilots that use AM/FM radio equipment (50 MHz, 53 MHz, and 72 MHz) shall possess the appropriate frequency pin.
2. Pilots shall place their AMA card on the respective channel pin on the frequency board. This does not apply to pilots using 2.4 GHz transmitters.
3. Pilots shall not start/run their aircraft in the pit area.
4. For extended engine tuning and troubleshooting procedures (e.g., more than usually needed to start the engine), pilots shall use the marked areas designated for tune-ups, break-in and troubleshooting.
5. Pilots shall never leave their aircraft unattended while the aircraft is running or armed even if it is secured and restrained.

C. FLIGHT OPERATION

1. Pilots shall only taxi aircraft on the taxiways and runway. No taxiing is permitted in the pit area.
2. While flying, pilots must remain behind the safety fence.
3. Pilots shall verbally communicate their intentions during takeoffs, landings, low passes, touch-and-gos, and emergencies.
4. Pilots shall always fly their aircraft north of the centerline of the runway and remain within the approved fly zones (see fly zone map for details).
5. Only pilots and a supervised helper are permitted beyond the safety fence (e.g., to retrieve an aircraft).
6. Landing aircraft have the right of way. Dead-stick landings shall be called as such and given immediate right of way.
7. Aircraft shall not take off from the taxiways south of the safety fence.
8. Aircraft shall not land on the taxiways at any time.
9. Pilots shall call all maiden flights prior to flight. All other aircraft shall be grounded until the maiden flight has been completed.

Fly / No Fly Zone's for Popp's Field



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.