



# Radio Control Combat 2017-2018



RULES GOVERNING MODEL AVIATION COMPETITION IN THE UNITED STATES

# Amendment Listing

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<b>Amendment Topic</b>	<b>Publication Date</b>	<b>Description</b>
Original Issue	1/1/2013	Publication of Competition Regulations
Complete re-write and addition of event 761	4/7/2015	Complete rules re-write and addition of event 761
RCAA Limited B	4/7/2015	Added Limited B provisional event rules
Gnat	4/7/2015	Added Gnat provisional event rules

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# Radio Control Combat

## GENERAL RULES AND SCORING.

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### **1. Objective.**

To recreate the excitement of aerial combat in an enjoyable, safe competition that will be interesting for spectators and challenging for the contestants.

### **2. General:**

All AMA and FCC regulations covering the R/C flier and his/her plane and equipment shall apply to this event. Every contestant shall sign the AMA Flight Safety Declaration Form, and attest that he/she meets the requirements stated therein. Contestants are expected to act in a safe and sportsmanlike manner at all times. Any conduct by a contestant deemed by the Contest Director (CD) to be hazardous or unsportsmanlike will be cause for immediate disqualification of that contestant from the event at the discretion of the CD. The judgment of the CD on safety matters shall not be protested. The builder-of-the-model rule does not apply to this event. There shall be no limitation on the type of equipment fitted to the model, or the number of controls, except as specified in the following sections. The contestant shall be allowed only one (1) model per round (except as noted in section 3.5), but may switch to an alternate model of his/her choice for any following rounds. All models flown must be safety inspected for airworthiness and inspected for compliance with the model weight and engine class requirements for which they are participating prior to the competition by the Contest Director or a CD appointed representative prior to competition.

### **2.1. Safety**

Safety for spectators, contest personnel and contestants is of the utmost importance for this event. The CD has the authority to enhance safety requirements to suit the need of the flying site and the contestants. The Combat Engagement Line, Safety Line, Pilot Line and Spectator/Pit Line should be clearly marked for the duration of the event. Spectators shall maintain a distance from the Combat Engagement Line of at least 500 feet for every 1.0 cu. in total displacement of the largest displacement aircraft in the contest. All individuals forward of the Spectator/Pit Line shall wear protective headgear, as outlined in the Official AMA National Model Aircraft Safety Code, while combat flights are in progress. Each pilot is responsible for obtaining such headgear and shall have the sole responsibility to provide for his/her own protection.

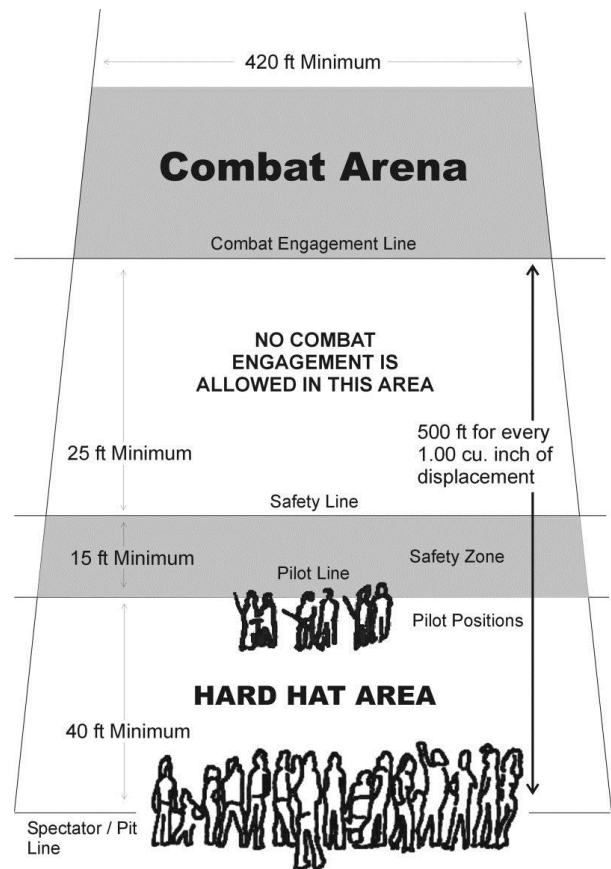
### 3. Contest Rules

#### 3.1. 3.1 Contest Site:

The contest site will be comprised of the areas/lines described below:

##### 3.1.1. *Combat Arena:*

The Combat Arena shall be an area of limited width and depth to be determined by the constraints of the flying facility and at the discretion of the Contest Director. The minimum width shall be 420 feet. The boundaries of the Combat Arena designate the only location where aircraft may engage in the act of combat. Once an aircraft leaves the Combat Arena, for any reason whatsoever, the act of combat by or against that aircraft must cease immediately.



##### 3.1.2. *Combat Engagement Line:*

The Combat Engagement Line shall be a line immediately adjacent to the Combat Arena. (See Contest Site Diagram in Section 3.1.9.) Planes may not engage in combat behind this line under any circumstances. (See these rules, Section 5, Scoring, for penalties to be imposed due to a violation of the Combat Engagement Line.)

##### 3.1.3. *Safety Line:*

The Safety Line shall be a line no less than 25 feet behind the Combat Engagement Line. At no time during the contest may an aircraft be flown behind the Safety Line except during the launch thereof (See Sections 3.1.5 Launch. 3.1.6 Landing and 3.1.8 Penalty Exceptions below). (See these rules, Section 5, Scoring, for penalties to be imposed due to a violation of the Safety Line.)

##### 3.1.4. *Pilot Line:*

The Pilot Line shall be a line no less than 15 feet behind the Safety Line. This area is where the pilots will stand during combat. Pilots must remain behind the Pilot Line at all times, except when

launching or retrieving a landed aircraft. Permission for anyone to move beyond the Pilot Line to retrieve a downed or landed aircraft before all aircraft have landed at the end of combat is at the sole discretion of the Line Marshall. (See these rules, Section 5, Scoring, for penalties to be imposed due to a violation of the Pilot Line.)

#### **3.1.5. *Launch:***

Aircraft shall be launched from a point at least 15ft (approximately 6 steps) in front of (closer to the Combat Zone) the Pilot's Line. The launcher should not cross the Safety Line to launch. A pilot and/or their helper may cross the Pilot's Line and move forward to the above designated "Launch Zone" for the express purpose of such launch. Any plane, retrievable or not, is subject to all rules and penalties regarding any or all line violations.

#### **3.1.6. *Landing:***

Any landing, regardless of the reason, cannot be made any closer to the Pilot Line than the Safety Line. Any violation of the Safety Line on landing will incur the penalties designated for a Safety Line violation. No portion of the aircraft can be on or over the Safety Line. For this purpose the string and streamer(s) will not be considered part of the aircraft. (See penalty exceptions in Section 3.1.8.)

#### **3.1.7. *Spectator/Pit Line:***

Spectators shall maintain a distance from the Combat Engagement Line of at least 500 feet per cubic inch of engine displacement (See AMA Safety Code). The largest engine displacement allowed to compete in the contest shall be used to determine the required setback of the spectators from the Combat Engagement Line. Only contestants and contest personnel wearing hardhats may enter the area in front of the Spectator/Pit Line during combat. There must be a minimum of 40 feet between the Pilot Line and Spectator/Pit Line.

#### **3.1.8. *Penalty Exceptions:***

Planes that cross the Combat Engagement line, Safety Line or Pilot Line due to loss of control that is a direct result of a midair shall not be subject to penalty. However, if an aircraft is involved in a midair and it is determined by the pilot and the pilot's judge to be able to safely continue, and the aircraft is reengaged in combat, the pilot forfeits any opportunity to have the penalty exception apply to a future violation due to that midair, regardless.

### **3.1.9. Contest Site Setup Example:**

Determine spectator location (spectator line), measure out to the combat engagement line the required distance for the largest engine displacement competing in that event (500 feet per cubic inch of displacement), determine where pilots will stand for flying (Pilot Line) then measure out 15 feet from Pilot Line for the Safety Line. If, with these measurements, the Combat Engagement Line is at least 25 feet in front of the safety line (Pilot Line can be no closer than 40 feet behind the Combat Engagement Line) and there is a minimum of 40 feet between the pilots and the spectators you are good to go.

### **3.2. Contest Structure:**

The contest shall consist of at least 4 non-elimination rounds. Each round shall include as many heats as necessary to allow all contestants to fly the round. At least four (4) or more aircraft will be flown against each other in each heat provided the number of pilots allow and no frequency conflicts exist. After each pilot has had the opportunity to compete in at least four (4) rounds, the scores will be totaled. The pilot with the highest total score throughout the competition is the winner. In case of a point tie, the total of the previous rounds will be used to determine the winner of the tie. If a tie break cannot be found in previous rounds scores, then a simple coin toss shall be used to break the tie. The CD may option for a fly off or spot landing to break the tie if the pilots are in agreement.

If more than 18 pilots are entered the CD may, at his/her option, use a preliminary and finals format wherein the top scoring pilots from the preliminary four or more rounds advance into a series of at least three Finals rounds. The number of pilots advanced to the Finals will be at least one-third and at most one-half of the total entries, based on the total scores from the preliminary rounds. Final scores will be determined by adding the total scores for each pilot from the Finals rounds to one-half of his total score from the preliminary rounds. The CD must inform pilots of the intention to use a Preliminary/Finals format prior to the start of the event.

### **3.3. Launching:**

Aircraft may be launched by hand, dolly, landing gear or catapult. Every contestant is allowed the use of one (1) assistant to help with starting, launching and retrieving the pilot's model.

### **3.4.**

Round Structure: Each round shall consist of:

#### 3.4.1. *Preparation/Preflight:*

The CD or Line Marshall shall ensure that each pilot has a judge. Then he/she will announce that there is one (1) minute until the "Start Engines and Launch" signal.

#### 3.4.2. *Scramble/Launch:*

A call/signal to "Start Engines and Launch" begins a window of ninety (90) seconds for launching aircraft into the Combat Arena (no combat is allowed during this period). The period ends when the last aircraft is airborne, or ninety (90) seconds has elapsed, by the call/signal to "Start Combat".

#### 3.4.3. *Duration/Combat:*

For scoring purposes, flight scoring entails all safety related scoring. Combat scoring entails all related streamer and length of flight scoring. The combat period has a duration of five minutes. The combat period and all combat scoring begins at the call to "Start Combat". The combat period and any combat scoring will end after the call to end combat. Flight scoring is in effect for the duration of the round, from the call to start engines and launch until all aircraft have landed. The CD or Line Marshall is responsible for keeping the time and advising the pilots of the time left or time passed during the round. The CD and Line Marshall are responsible for encouraging, or reminding the pilots to keep their aircraft near the center of the Combat Zone and at a reasonable distance and altitude in relationship to the Combat Engagement Line.

#### 3.4.4. *Restarts/Re- launches:*

If a contestant's aircraft fails to launch on takeoff or must land any time during the Combat Period and is still airworthy, an unlimited number of restarts are allowed within the time between "Start Engines" and "End Combat" is called, provided the aircraft is down in an area that allows for its safe retrieval. The area of safe retrieval is that area between the Combat Engagement line and the Safety Line. This rule is in place for the safety of pilots. No part of the pilot or aircraft retriever's body may cross the plane of the Combat Engagement Line. An aircraft straddling the Combat Engagement line where a portion of the airplane may be secured for retrieval without any part of the retriever's body crossing the Combat Engagement Line, is allowed. To be retrieved all or some part of the aircraft must be on the pilot's side of the combat engagement line. In the case where only the streamer or the string of the streamer is on the pilot's side of the Combat Engagement line, retrieval is not permitted. In all cases the pilot or retriever must first have the permission of the contest official monitoring the line before attempting to retrieve the aircraft. Any plane,



retrievable or not, is subject to all rules and penalties regarding any or all line violations.

#### **3.4.5.**

Landing/Stand Down: Landings will begin after the phrase/signal to "End Combat" has been given. Aircraft will land in an area designated by the CD and/or Line Marshall forward of the Pilot Line. Line rules are enforced. Aircraft known to be low in fuel are given first opportunity to land.

### **3.5. Change of Aircraft:**

During a round, no change of aircraft is allowed once the pilot has launched or attempted a launch. Between rounds, the contestants may freely choose from any aircraft available to them. All aircraft switched during a round, prior to an attempted launch, must be on the same frequency.

### **3.6. Inter-Round Safety Inspection:**

The CD or his/her appointed representative may, at his/her discretion, re-inspect any aircraft that he/she suspects may have become unsafe. If the CD pronounces the aircraft unsafe, it will not be flown until the aircraft has been repaired and resubmitted to the CD for inspection. The CD is obligated to inspect an aircraft resubmitted for safety inspection as soon as the aircraft is presented. If it passes inspection, the aircraft is immediately available for use. The judgment of the CD on safety matters cannot be protested.

### **3.7. Streamers:**

Streamers and string are provided by the CD to ensure uniformity. Crepe paper and cotton string are recommended. Streamers will be thirty (30) feet long and no less than five-eighths (5/8) inches wide and no more than one (1) inch wide, attached to the model by a cotton string extending at least five (5') feet from the tail of the model. (At the discretion of the Contest Director, alternate streamer materials not meeting these specifications may be used if weather conditions prevent the use of standard streamer material).

## **4. Officials:**

### **4.1.1. Contest Director:**

A Contest Director (CD) will be in charge of each event. The CD or his/her representative will lay-out and prepare the field and check each aircraft for conformance to displacement and safety requirements. The CD or his/her representative will be responsible for the making of flight matrices for all heats and rounds of the

contest. The CD or his/her representative will use the start signal once the 90-second launch window has elapsed or if all aircraft are airborne. At the end of the 5 (five) minute heat the CD or his/her representative will signal to the pilots to cease combat. The CD or his/her representative shall also tally scores from the individual aircraft judges for each individual in the competition. Streamers for the event will be supplied by the CD or his/her representative

**4.1.2. Judges:**

There will be one (1) judge for each aircraft flown per round. Each judge will register points gained or lost by the aircraft being judged, according to the scoring list. After the landing of that aircraft, the judge will inspect the streamer for final determination of points.

**4.1.3. Line Marshall:**

The Line Marshall will signal all Combat Engagement Line, Safety Line and Pilot Line infractions. The individual judge scoring any plane confirmed as having crossed the Combat Engagement Line, Safety Line and/or Pilot Line by the Line Marshall is to inform the pilot of the infractions. If a pilot is disqualified for that round the judge will ask the pilot to land immediately.

**5. Scoring:**

Points gained	
Streamer cut (other than your own)	+100 per cut
Launch within 90 second launch window (plane must be airborne with a complete streamer when Start Combat is called)	+20
Continuous 5 minute flight	+20
Remaining streamer	+4 points per foot of streamer remaining on aircraft. (+120 max.)
Non-engagement. Pilots will be given 1 verbal warning for not attempting to engage the opponent without penalty. Second offense and subsequent offenses will score -25 points. Non engagement shall be considered flying too high or too far from the combat area. Low level flying will not be considered non-engagement.	-25

<b>Points Lost</b>	
<p><b>Crossing Combat Engagement Line</b></p> <p>This penalty is only enforced during the Combat Period, which is defined as the time between Start Combat and Stop Combat. Pilots who cross the Combat Engagement Line during the combat period while engaged in combat (i.e. not landing or taking off) shall receive a verbal warning by the Line Marshall. Pilots who commit a second or third violation in the same round shall have -25 added to his/her score for each. Should a fourth offense occur in the same round, the pilot shall lose any positive points earned in that round, have an additional -100 added to his/her score, be required to land immediately and remain grounded for the remainder of the round.</p>	<p>First occurrence - verbal warning</p> <p>Second occurrence same round -25 added to score</p> <p>Third occurrence same round -25 added to score</p> <p>Fourth occurrence same round -100 added to score plus loss of positive points accrued in that round and pilot grounded for remainder of round.</p>
<p><b>Crossing Safety Line</b></p> <p>During each heat, the first time a pilot's plane crosses the Safety Line during the combat period, he will be verbally notified by his judge or the Line Marshall of the violation and have a -100 penalty added to his/her score. If a second offense shall occur in the same round, the pilot shall again be notified verbally of the violation, have another -100 added to his/her score, lose any positive points earned in that round, and be required to land immediately and remain grounded for the remainder of the round.</p>	<p>First occurrence -100 added to score</p> <p>Second occurrence same round -100 plus loss of positive points accrued in that round and pilot grounded for remainder of round.</p>
<p><b>Crossing Pilot Line</b></p> <p>The first time a pilot's plane crosses the Pilot Line he will be verbally notified by his judge or the Line Marshall of the violation and have -300 added to his/her score and lose any positive points earned in that round and be required to land immediately and remain grounded for the remainder of the round. If a second offense shall occur in the same event the pilot shall lose any positive points earned in that round, have -300 added to his/her score, be required to land immediately and remain grounded for the remainder of the event.</p>	<p>First occurrence -300 plus loss of positive points accrued in that round and pilot grounded for remainder of round.</p> <p>Second occurrence at the same event -300 plus loss of positive points accrued in that round and pilot grounded for remainder of event.</p>

### **5.1. Loss of streamer:**

A streamer shall be considered lost if it was improperly secured or broken in any way other than being cut by an opponent. Streamers lost or cut or not fully extended during launch for any reason shall be considered to have launched without a complete streamer. In these cases, the pilot must land and secure another streamer and the pilot is denied any positive scoring until a new streamer is attached. An aircraft that is airborne with a complete and extended streamer attached when the call to Start Combat is made, will receive launch on time points and is eligible for continuous flight points. Any time a pilot lands after Start Combat is called, continuous flight point will be lost (see exceptions to this in 5.2).

### **5.2. Midairs:**

Any pilot involved in a midair collision must disengage from combat, and leave the combat arena to the left, right or above, if possible. At the moment of impact, the plane shall be considered dead from scoring or being scored against. If the plane crashes as a result of the midair, the pilot shall earn +20 points for Continuous Flight. If the pilot can maneuver safely to an area outside the arena, and he/she and the Line Marshal both agree that the plane can safely continue, the plane shall be deemed alive and the pilot may re-engage and become subject to Continuous Flight scoring. If the plane is deemed unsafe, the pilot shall land immediately beyond the Safety Line and shall earn +20 points for Continuous Flight. If a flying facility makes the safe landing impossible due to its size restrictions, the pilot shall remain airborne in an area away from the Combat Arena, pilots and spectators. After the round is complete and all other aircraft have landed, the pilot may be given clearance to land the crippled aircraft. It is the CD's responsibility to give a "heads up" warning in such case. At no time shall a pilot attempt to land a crippled aircraft inside the Safety Line or near the pilots during the round. Aircraft that midair during launch are considered failed launches, and shall be treated as if the plane failed to launch.

### **5.3. Optional Spot Landing:**

The CD can use a Spot Landing for points if he so chooses. The Spot Landing shall take place after completion of the Round and score +25 points. The plane must land within and remain within the designated area. The Landing Area (size and location to be determined by the CD) shall be located on the runway in the Combat Area. After each aircraft has landed the area shall be cleared for the next aircraft to land.

#### **5.4. Streamer Cut Scoring:**

##### **5.4.1.**

A streamer cut is defined as any time one contestant's aircraft removes any part of a streamer attached to or being towed by another contestant's aircraft between the announcement of "Start Combat" and "End Combat".

##### **5.4.2.**

Cutting or removing any streamer being towed by another contestant's aircraft will be scored as a cut.

##### **5.4.3.**

A cut must be observed and confirmed by a judge to be eligible for scoring. The decision of the judge(s) regarding scoring of cuts is final.

##### **5.4.4.**

If two streamers intertwine during combat and any part of one becomes removed, the pilot whose streamer remains intact will be awarded the cut.

##### **5.4.5.**

If more than two streamers are intertwined, the pilot(s) whose aircraft retain the original portions of their streamer will score the cut(s).

##### **5.4.6.**

If two streamers become intertwined and any portion of both are removed, both pilots will score a cut.

##### **5.4.7.**

Multiple cuts on multiple streamers towed by a single aircraft in a single pass count as one cut.

##### **5.4.8.**

Multiple cuts on a single streamer in a single pass count as one cut.

##### **5.4.9.**

Streamers not being towed by a contestant's aircraft (i.e. floating unattached) are not eligible for scoring.

#### **5.5. Scoring of Remaining Streamer:**

##### **5.5.1.**

To be eligible for remaining streamer points, the aircraft must start the heat by completely crossing the Combat Engagement Line into

the combat arena in controlled powered flight with an attached, fully extended streamer.

**5.5.2.**

To be eligible for remaining streamer points, the streamer must still be attached to string attached to the model (except as covered in 5.5.3), and may not be a streamer cut from an opponent.

**5.5.3.**

Should a streamer, string or attachment break on landing or in recovering the model from a crash site it may be taped together for scoring in a manner that does not increase the length of the streamer, provided that such action is observed and approved by a judge.

**5.5.4.**

Streamer length will be rounded down to the nearest foot when measuring remaining streamer.

**5.6. Reinstatement of points lost:**

No incident may occur that would reinstate continuous flight points once lost. For example, a pilot does not launch on time (losing continuous flight points), and midairs later in the heat. While pilots do not lose continuous flight points because of a midair, the pilot had already lost them prior to the midair for not launching on time. Once continuous flight points are lost, they are lost for the entire round. Likewise, no incident may occur that would reinstate points lost for failure to launch on time.

**5.7. Combat Engagement Line, Safety and Pilot line violations:**

Combat Engagement Line, Safety Line and Pilot Line violations will be scored independently. That is, if a pilot violates more than one line rule, multiple penalties will be assessed.

**6. Scale RC Combat (Event 750)**

**6.1. Model Aircraft Requirements:**

The model must be up to a 48” span scale replica of a pursuit, fighter, or attack aircraft produced or in service between 1935 and 1955. Models are to be scaled to a wingspan of no more than 48 inches and no less than 40 inches. For the purpose of this contest, an aircraft shall be considered a pursuit, fighter, or attack aircraft if its missions routinely involved, or its designer intended any of the following:

- a. interception of enemy aircraft
- b. high-speed ground or sea attack

- c. dog fighting
- d. long- and short-range escort

The aircraft must have been originally designed to have had onboard guns installed. Aircraft that had guns mounted for defensive purposes only shall not qualify as pursuit, fighter, or attack aircraft.

## 6.2.

Aircraft must resemble their full- scale counterparts. Single engine models are to be scaled to a wingspan of no more than 48 inches and no less than 40 inches. Multiengine aircraft are to be 1/12th scale +/- 10%. All deviations from scale outline must be within ten (10) percent of each other and within ten (10) percent of scale, and retain scale shape and proportions. For example, scaling a model's wingspan up 10% and the fuselage down 10% is not allowed. The deviations shall all be in the same direction (plus or minus); it is not permissible to scale some elements up and others down.

The Contest Director shall determine accuracy-of-scale by simple visual inspection at 15 feet and may, at his/her discretion, request from the pilot a three-view drawing or photo, to help in determining scale fidelity. The burden of proof of scale fidelity shall reside solely with the pilot of the aircraft.

*6.2.1. Fuselages must be three-dimensional. Profile fuselages will not be allowed. Any part of the engine and/or muffler not concealed by the cowl or fuselage shall be ignored when considering the scale outline of the aircraft.*

*6.2.2. Landing gear is allowed but is not required. Protrusions on the leading edges of the wing scale or non-scale shall not be allowed. Canopies, either structured or painted on, are required. The aircraft must begin the event with a cowling.*

*6.2.3. Aircraft are to be finished in prototypical or unit/squadron colors for that type of aircraft of the period. Unusual color schemes are allowed when supported with simple photograph or drawing documentation supplied by the pilot of the aircraft. Color schemes must be based on combat units. Colors based on such non-combat activity as target towing, prototype testing, R&D, war weary and civilian uses are not allowed.*

### **6.3. Weight:**

#### **6.3.1.**

A maximum dry weight of 3.5 pounds for any single-engine design.

#### **6.3.2.**

The maximum dry weight for multi-engine designs shall be determined from the following table:

Twins up to and including a 50 inch span - 4 lbs.

Twins with greater than 50 inch span up to and including 60 inch span - 4.5 lbs.

Twins over 60 inch span - 5 lbs.

### **6.4. Engines:**

Maximum total nominal displacement for single engine designed aircraft shall be .30 cu. in.

#### **6.4.1.**

Maximum total combined nominal displacement for multiengine-designed aircraft shall be .30 cu. in. Multiengine model aircraft must have more than one functioning engine as per its full-scale counterpart. Designs which utilize two (2) engines contained in the fuselage may employ a single functional engine, but must comply with all single engine aircraft restrictions in this section.

#### **6.4.2.**

A muffler or tuned silencer is required and may not exceed eight (8) inches in length. No other engine restrictions are in effect. Two-stroke, four-stroke, or diesel engine, stock or modified, that satisfy the displacement requirements are acceptable. The use of electric motors is acceptable as long as the aircraft meets the weight requirements as detailed in Section 3 with batteries in place. All engines must have some sort of rounded spinner or safety cover on the propeller shaft, such as an “acorn nut” or AMA safety nut. No bare threads are allowed.



### **6.5. Engine Shut Off:**

The pilot must be able to shut off the model's engine(s) by radio control with the airplane in any position (e.g., a servo dedicated to throttle control or a kill switch).

### **6.6. Artificial Devices/Substances:**

There will be no structures, roughened leading edges, or other devices allowed on the model that could aid in the cutting of an opponent's streamer. Sticky fluids, sticky pastes and tape are allowed. Wingtip skid plates are allowed, but must not extend forward of the leading edge of the wingtip.

## **7. OPEN RC COMBAT (Event 755)**

### **7.1. Model Aircraft Requirements:**

Any aircraft design may be used if it meets the following guidelines:

### **7.2.**

Open Combat will be broken down into these classes:

<b>Class</b>	<b>Max Weight</b>	<b>Electric Max Weight</b>
A = up to .15 cu in	2.5 lbs	3.0 lbs
B = up to .30 cu in	3.5 lbs	4.0 lbs

All airplanes will be weighed dry. Electrically powered aircraft will be weighed with batteries in place.

### **7.3. Engines:**

Multiengine aircraft are allowed as long as the sum of the engine displacements does not exceed the allowed total displacement for the particular class. Mufflers or tuned silencers are required but may not exceed eight (8) inches in length. No other engine restrictions are in effect. Two-stroke, four-stroke, or diesel engines (stock or modified) that satisfy the displacement requirements are acceptable. All engines must have some sort of rounded spinner or safety cover on the propeller shaft, such as an "acorn nut" or AMA safety nut. No bare threads are allowed.

#### **7.4. Engine Shut Off:**

The pilot must be able to shut off the model's engine by radio control with the plane in any position, (e.g., a servo dedicated to throttle control or a kill switch).

#### **7.5. Artificial Devices/Substances:**

There will be no structures, roughened leading edges, or other devices allowed on the model that could aid in the cutting of an opponent's streamer. Sticky fluids, sticky pastes and tape are allowed. Wing tip skid plates are allowed, but must not extend forward of the leading edge of the wing tip.

### **8. SLOW SURVIVABLE COMBAT (SSC) (Event 760)**

#### **8.1. Contest:**

With the exception of the following restrictions, all OPEN - Class A rules and scoring will be used. SSC combat rounds will be 5 minutes in duration.

#### **8.2. Engine:**

.15 cid engine available from normal retail outlets for a non-sale retail price of \$85 or less, excluding taxes or shipping. Engine must be classified by the manufacturer for use in R/C flying model aircraft. Engine must be complete with carburetor and muffler. Carburetor must be fully R/C functional as intended by the manufacturer and servo operated. The muffler must be expansion chamber type with no internal pipe (which would effectively increase its length and there allow "tuning"). The front of the muffler must be closed and "flow through" mufflers are not allowed. The use of electric motors is acceptable as long as the aircraft meets class weight specifications plus 1.5 ounces with batteries in place and meets propeller and RPM restrictions.

#### **8.3. Aircraft:**

Flight ready un-fueled aircraft shall weigh a minimum of 2 ½ pounds. Minimum wing area shall be no less than 400 square inches.

#### **8.4. Power Plants and Propellers:**

All aircraft will use a non-modified Master Airscrew 8 x 3 prop. Max allowable RPM shall be 17,500 at time of launch for combat. RPM testing is to be performed as part of tech inspection. The maximum RPM shall be 17,500 measured on the ground with the carburetor barrel and throttle stick fully open. Pilots are expected to bring their planes to the meet ready

to comply with the RPM limits. Pilots should tach their own aircraft at the contest prior to official RPM testing, and at other times during the contest to ensure conformance. It is the sole responsibility of the contestant to present an engine and aircraft that meet the specifications of the event. The Contest Director will determine the frequency of rpm testing. The Contest Director may choose one or more of the following approaches to ensure engine rpm compliance at an SSC Combat contest.

#### 8.4.1.

The Contest Director or his/her designated technical inspector may test every contestant's engine for maximum rpm compliance before the first round of the contest. In addition competitor's engines may be randomly tested during the contest. A competitor may be tested more than once during an event. If, in the opinion of the contest director, engine rpm testing is required more frequently to ensure that all participants are in compliance, the CD may choose to have each engine tested any or every round by the pilot's judge.

#### 8.4.2.

The contestant may choose to have a technical inspector or judge adjust the engine's needle valve to achieve maximum rpm for the check or may elect to have the inspector "pinch" the fuel line to achieve peak rpm. If the contestant chooses the "pinch" check method, the inspector will hold the tachometer on the engine and he/she will "pinch" the fuel line to peak the engine's rpm ability. If the engine exceeds 17,500 rpm's, the engine and airplane to which it is attached are declared ineligible for combat and may not be launched for combat.

#### 8.4.3.

The contestant is allowed to make changes necessary to meet the specifications. The contestant may change fuels, make adjustments to the carburetor to limit its peak travel or utilize restrictions to the intake or exhaust system which limit the engines performance to that which is at or below the maximum allowable rpm specification. A disqualified engine and airplane may be tested after the pilot makes adjustments to his/her engine to bring it into rpm compliance. Testing may be conducted from "Start engines" through "End combat" of each round. If the contestant fails to achieve the rpm specifications, the plane is ineligible from combat and may not be launched for combat.

#### 8.4.4.

Any engine, which in the CD's opinion is running over the limit in any round, may be tested at the end of that round. The changes

made above give the CD the option to test once, randomly or every round at his/her discretion and choosing.

#### **8.4.5.**

Electric motors shall be tested prior to flight by letting the motor run at full throttle for 10 seconds. The motor shall be tached and the ATV adjusted so that the maximum RPM is not exceeded.

#### **8.5. Pink Slip:**

By signing the event entry, you have agreed that should you place first in the contest, your engine shall be sold to any other competitor who wishes to buy it for \$85.

### **9. 2948 Scale RC Combat (Event 761)**

#### **9.1. Objective:**

To recreate the excitement of WWII fighter combat in an enjoyable, safe, scale competition that will be interesting for spectators and challenging for the contestants through the use of widely recognized propeller driven fighter aircraft types.

#### **9.2. Model Aircraft Requirements:**

Aircraft shall meet all requirements defined in sections 9.2, 9.3, 9.4 and 9.5 of these rules, or be disqualified from entry, judging and combat. The CD/judges may disqualify a model from the contest if they decide that it does not effectively represent a World War II fighter/fighter bomber on the Approved Aircraft List (Appendix A). A CD is under no requirement to allow a plane to fly because another CD allowed it at a prior contest.

##### **9.2.1. *Aircraft Requirements:***

###### **9.2.1.1. Types:**

The model must be a scale fighter/fighter bomber selected from the approved list of aircraft contained in Rules Appendix A.

###### **9.2.1.2. Key Dimensions:**

Fuselages must be three-dimensional. Profile fuselages will not be allowed. The maximum wingspan shall be 48" for single engine fighters and 60" for multi-engine fighters.

###### **9.2.1.3. Weight:**

The minimum dry weight shall be 3.25 pounds (52 ounces) for any single engine design. The minimum dry weight shall be 4.0 pounds (64 ounces) for twin-engine designs.

#### **9.2.1.4. Scale Fittings:**

Landing gear is allowed but is not required unless the full scale aircraft had a fixed gear. Protrusions on the leading edges of the wing, scale or non-scale, shall not be allowed. Canopies, either structured or painted on, are required. The aircraft must begin the event with a cowling.

#### **9.2.1.5. Changes to the Approved Aircraft List (Rules Appendix A):**

The proposed aircraft addition/deletion shall document the justification relative to Appendix A3 Selection Criteria of these rules. Proposed changes not meeting the spirit and intent of section 1.0 Objective or the more detailed requirements in section Appendix A3 shall be rejected.

### **9.3. Engines, Propellers and RPM:**

#### ***9.3.1. Engine Displacement:***

Maximum total nominal displacement for single engine designed aircraft shall be .29 cu. in. Maximum total combined nominal displacement for twin-engine designed aircraft shall be .30 cu. in.; both engines shall be the same displacement. The engine(s) must be complete with carburetor and muffler. The carburetor(s) must be fully R/C functional as intended by the manufacturer and servo operated.

#### ***9.3.2. Electric Motors:***

The use of electric motors is acceptable as long as the aircraft meets the class weight with batteries in place and the RPM limits.

#### ***9.3.3. Engine Shut Off:***

The pilot must be able to shut off the model's engine(s) by radio control with the plane in any position, (e.g., a servo dedicated to throttle control or a kill switch).

#### ***9.3.4. Propellers:***

Single engine aircraft shall use an unmodified APC 10x3, Kavan yellow 10x4 or MAS 10x4 propeller. Multi-engine aircraft shall use unmodified MAS 8x3 propellers (same as SSC). The propeller(s) may have coatings applied. At contest site elevations of 3500' MSL or higher, unmodified APC 9.3x3 propellers may be substituted.

#### ***9.3.5. Exhaust Systems:***

Exhaust systems designed to increase performance through a "tuning" effect or use of an internal pipe or similar arrangement, are not allowed. Examples include, but are not limited to, tuned

pipes and mousse cans. The front of the muffler must be closed and “flow through” mufflers are not allowed.

#### 9.3.6. *Maximum RPM:*

The maximum RPM for single engine aircraft shall be 14,500 RPM, and for twin-engine aircraft shall be 18,500 RPM measured on the ground with the carburetor barrel and throttle full open. Pilots are expected to bring their planes to the meet ready to meet the RPM limits, and should provide their own tachometer. Pilots should tach their own aircraft at the contest prior to official RPM testing, and at other times during the contest to ensure conformance. It is the sole responsibility of the contestant to present an engine and aircraft that meet the specifications of the event. The Contest Director will determine the frequency of RPM testing.

The CD may choose one or more of the following approaches to ensure engine RPM compliance at the contest:

##### 9.3.6.1.

The Contest Director or his/her designated technical inspector may test every contestant's engine for maximum RPM compliance before the first round of the contest. In addition competitor's engines may be randomly tested during the contest. A competitor may be tested more than once during an event. If, in the opinion of the contest director, engine RPM testing is required more frequently to ensure that all participants are in compliance, the CD may choose to have each engine tested in any round by the pilot's judge.

##### 9.3.6.2.

The contestant may choose to have technical inspector or judge adjust the engine's needle valve to achieve maximum RPM for the check, or may elect to have inspector “pinch” the fuel line to achieve peak RPM. If the contestant chooses the “pinch” check method the inspector will hold the tachometer on the engine and he/she will "pinch" the fuel line to peak the engine's RPM ability. If the engine exceeds the RPM limits the engine and airplane to which it is attached are declared ineligible for combat and may not be launched for combat.

#### 9.3.6.3.

The contestant is allowed to make changes necessary to meet the specifications. The contestant may change fuels, make adjustments to the carburetor to limit its peak travel or utilize restrictions to the intake or exhaust system which limit the engines performance to that which is at or below the maximum allowable RPM specification. An ineligible engine and airplane may be tested after the pilot makes adjustments to his engine to bring it into RPM compliance. Testing may be conducted from “Start engines” through “End combat” of each round. If the contestant fails to achieve the RPM specifications the plane is ineligible from combat and may not be launched for combat.

#### 9.3.6.4.

Any engine, which in the CD’s opinion is running over the limit in any round, may be tested at the end of that round. Electric motors shall be tested prior to flight by letting the motor run at full throttle for 10 seconds. The motor shall be tached and the ATV adjusted so that the maximum RPM is not exceeded.

### **9.4. Artificial Devices/Substances:**

There will be no structures, roughened leading edges, or other devices allowed on the model that could aid in the cutting of an opponent’s streamer. Sticky fluids, sticky pastes and tape are allowed.

### **9.5. Scale Compliance Verification:**

The 2948 scale compliance verification rules are designed to encourage pilots to fly model aircraft that represent WW2 fighters while taking into account the rigors of combat competition. 2948 is focused on getting the model to replicate the major aspects of the scale outline, color scheme and markings, and not focus on minor details that are fragile or hard to replicate. The burden of proof of scale fidelity shall reside solely with the pilot of the aircraft.

#### ***9.5.1. Accuracy of Outline:***

The model should closely match the scale outline as shown in a commercially available or RCCA-provided three (or more) view drawing. The contestant must provide a three (or more) view drawing (line, tone or color). The drawing may not be distorted to reshape or distort the original outline of the subject plane. Failure to closely match the scale outline may result in the model being banned from competition.

### 9.5.2. *Color Scheme and Markings:*

The model must appear in appropriate colors and markings of a WW2 combat aircraft of that type. A specific plane does not have to be replicated. Planes in civilian or sport colors and/or markings are not allowed.

## **10. Limited B (Provisional)**

Rules for Provisional Limited B Class

### **10.1.**

With the exception of the following requirements, all RCCA Open B class rules and scoring will be used.

### **10.2. Airplanes:**

Aircraft deemed ready for combat shall have an all up dry weight of no less than 3.25 pounds (52 ounces). There is no maximum weight restriction. All aircraft shall have a maximum wingspan of 64 inches, with no more than 600 square inches of wing area (a root/tip chord chart will be developed in order to expedite pre-contest inspections for the CD).

#### **10.2.1.**

To encourage participation, aircraft meeting ALL requirements of SSC or 2548 classes will be allowed to fly in Limited B. SSC must meet all SSC requirements but are allowed a maximum RPM increase to 18,500.

### **10.3. Engines, Propellers and RPM.**

#### **10.3.1. *Engine Displacement.***

Maximum nominal displacement shall be .29cu. in. The engine must be complete with carburetor and muffler. The carburetor must be fully R/C functional as intended by the manufacturer and servo operated.

#### **10.3.2. *Electric Motors.***

The use of electric motors is acceptable as long as the aircraft meets the class weight with batteries in place and the RPM limits.

#### **10.3.3. *Engine Shut Off.***

The pilot must be able to shut off the model's engine by radio control with the plane in any position, (e.g., a servo dedicated to throttle control or a kill switch).



#### 10.3.4. *Propellers.*

All aircraft shall use an unmodified APC 10x3, Kavan yellow 10x4 or MAS 10x4 propeller. The propeller may have coatings applied for balance purposes. At contest site elevations of 3500' MSL or higher, unmodified APC 9.3x3 propellers may be substituted.

#### 10.3.5. *Exhaust Systems.*

Exhaust systems designed to increase performance through a "tuning" effect or use of an internal pipe or similar arrangement, are not allowed. Examples include, but are not limited to, tuned pipes and mousse cans. The front of the muffler must be closed and "flow through" mufflers are not allowed.

#### 10.3.6. *Maximum RPMs.*

The maximum RPMs shall be 14,500 RPM, measured on the ground with the carburetor barrel and throttle stick full open. Pilots are expected to bring their planes to the meet ready to meet the RPM limits, and should provide their own tachometer. Pilots should tach their own aircraft at the contest prior to official RPM testing, and at other times during the contest to ensure conformance. It is the sole responsibility of the contestant to present an engine and aircraft that meet the specifications of the event.

The contest director will determine the frequency of RPM testing. The contest director may choose one or more of the following approaches to ensure engine RPM compliance at the contest:

- i. The Contest Director or his/her designated technical inspector may test every contestant's engine for maximum RPM compliance before the first round of the contest. In addition competitor's engines may be randomly tested during the contest. A competitor may be tested more than once during an event. If, in the opinion of the contest director, engine RPM testing is required more frequently to ensure that all participants are in compliance, the CD may choose to have each engine tested in any round by the pilot's judge.
- ii. The contestant may choose to have technical inspector or judge adjust the engine's needle valve to achieve maximum RPM for the check, or may elect to have inspector "pinch" the fuel line to achieve peak RPM. If the contestant chooses the "pinch" check method the inspector will hold the tachometer on the engine and he/she will "pinch" the fuel line to peak the engine's RPM ability. If the engine exceeds the RPM limits the engine and airplane to which it is

attached are declared ineligible for combat and may not be launched for combat.

- iii. The contestant is allowed to make changes necessary to meet the specifications. The contestant may change fuels, make adjustments to the carburetor to limit its peak travel or utilize restrictions to the intake or exhaust system which limit the engines performance to that which is at or below the maximum allowable RPM specification. An ineligible engine and airplane may be tested after the pilot makes adjustments to his engine to bring it into RPM compliance. Testing may be conducted from “Start engines” through “End combat” of each round. If the contestant fails to achieve the RPM specifications the plane is ineligible from combat and may not be launched for combat.
- iv. Any engine, which in the CD’s opinion is running over the limit in any round, may be tested at the end of that round. Electric motors shall be tested prior to flight by letting the motor run at full throttle for 10 seconds.

The motor shall be tached and the ATV adjusted so that the maximum RPMs are not exceeded.

## **11. GNAT (Provisional)**

### **11.1. Contest:**

With the exception of the following restrictions, all Open A-class rules and scoring will be used. GNAT combat rounds will be 5 minutes in duration.

### **11.2. Aircraft:**

All aircraft will be of the popular GNAT design. The following aspects must be met:

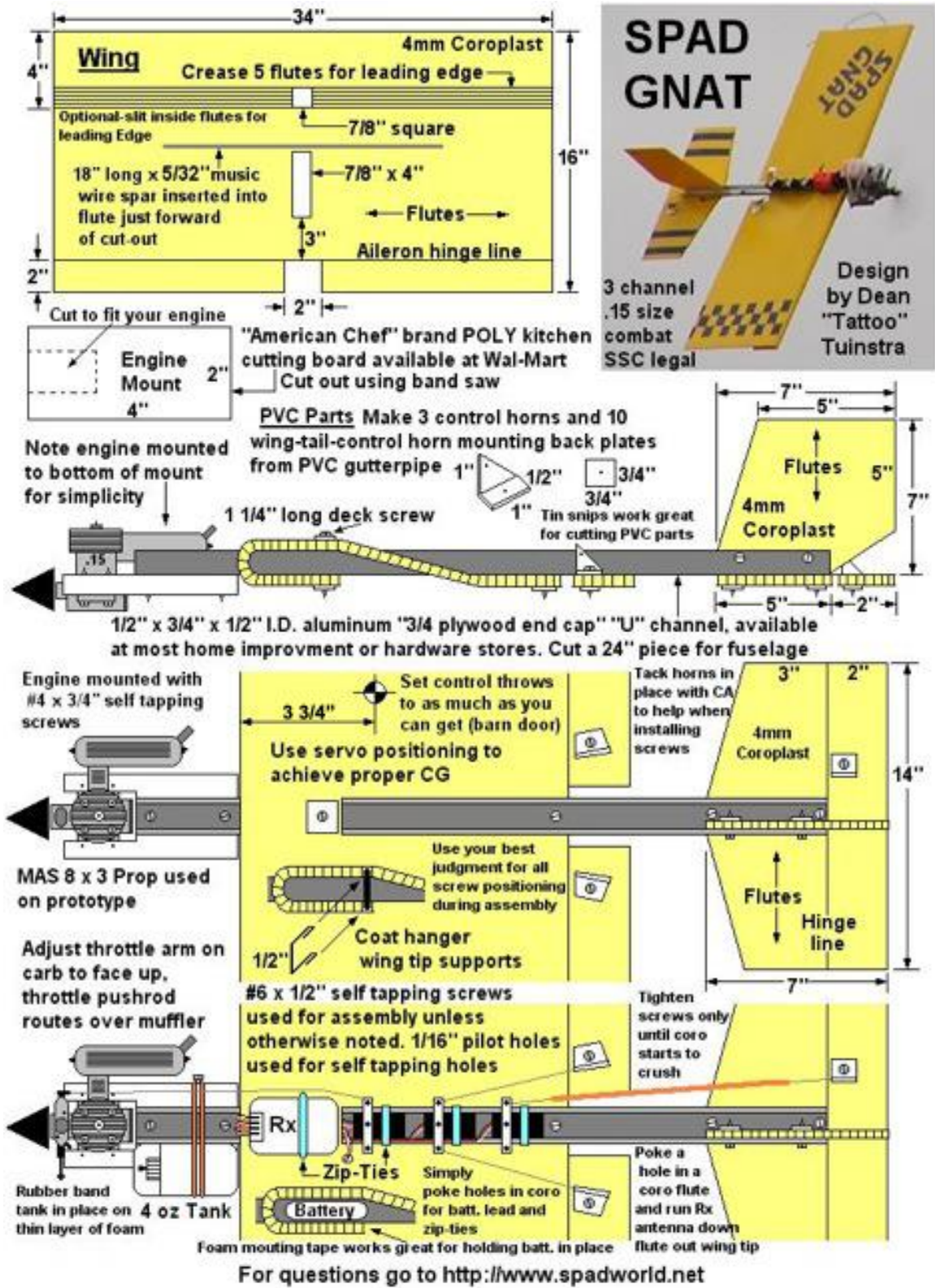
- A. Wing constructed out of coroplast.
- B. The leading edge of the wing must be folded over or have the flutes running with the wingspan or have the exposed flutes of tapered wings covered with tape.
- C. Maximum wingspan of 34 inches.
- D. Maximum chord of 13 inches.
- E. Fuselage length of 24 inches.
- F. Equipped with horizontal and vertical stabilizers.
- G. Equipped with aileron, elevator and throttle control.

### **11.3. Power Plants and Propellers:**

Only engines legal for SSC will be allowed. Electrics will be allowed. All aircraft will use a non-modified Master Airscrew 8x3 prop. To ensure electrics are on a level playing field with glow engines, the Contest Director will randomly tach 3 aircraft prior to the start of each day of the contest. The highest RPM attained will be the maximum RPM for Electrics for that day. Electric motors shall be tached and the ATV adjusted so that the maximum RPMs are not exceeded prior to each flight.

### **11.4.**

Sticky fluids/sprays, double sided tape and sandpaper/tread tape are NOT allowed. Notches in wingtips and tail feathers are allowed.



# AMA Official Combat Score Sheet

Pilot Name: \_\_\_\_\_ RCCA# \_\_\_\_\_ AMA# \_\_\_\_\_ Freq: \_\_\_\_\_

Event Name/Location \_\_\_\_\_ Date: \_\_\_\_\_ Sanction # \_\_\_\_\_

Class (Circle one)    RCCA:    Scale 2610    Scale 2948    Open A    Open B    Open C    SSC    Limited B    GNat

Round	Pre-Flight Check	Launch on time +20	Flew Entire Round +20	Kills +100 Each	Cross CEL	Cross Safety Line	Cross Pilot Line	Non Engagement Each	Streamer 4pts Each	Round Total	Pilot & Judges Initials
<b>1</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>2</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>3</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>4</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>5</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>6</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>7</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>8</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>9</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
<b>10</b>		+20	+20	+ _____ pts	Warning -25 -25 -100*	-100 -100*	-300**	-25 -25	+ _____ pts		
										<b>Total Score</b>	

\*denotes pilot also loses any positive points accrued in that round and is grounded for the remainder of the round

\*\* on first violation pilot is grounded for the remainder of the round and loses all positive points for that round.

on second violation pilot is grounded for event and loses all positive points for that round.

**Pre-Flight Check** verifies aileron/elevator direction and transmitter model selection when appropriate.

Revised 7/25/2012

## APPENDIX A. APPROVED AIRCRAFT

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### **A1. Single Engine Aircraft**

1. Bolton Paul Defiant - Commonwealth
2. Fairey Firefly - Commonwealth
3. Fairey Fulmar - Commonwealth
4. Gloster Gladiator - Commonwealth
5. Hawker Hurricane - Commonwealth
6. Hawker Tempest V - Commonwealth
7. Hawker Typhoon - Commonwealth
8. Supermarine Seafire I, IIc, III - Commonwealth
9. Supermarine Spitfire I, II, V, VI, VII, IX,X, XI, XII, XIV, XVI, XVIII - Commonwealth
10. D.520 - France
11. MB.152 - France
12. MS.406 - France
13. FW-190A/D/F - Germany
14. Me-109 D/E/F/G/K - Germany
15. Ta-152H - Germany
16. Fiat CR.42 Falco - Italy
17. Fiat G.50 - Italy
18. Fiat G.55 - Italy
19. Macchi C.200 - Italy
20. Macchi C.202/C.205 - Italy
21. Regianne Re.2000/2002 - Italy
22. Regianne Re.2001 - Italy
23. Regianne Re.2005 Sagittario - Italy
24. Kawanishi N1K2-J (George) - Japan
25. Kawasaki Ki.100 - Japan
26. Kawasaki KI.61 Hien (Tony) - Japan
27. Mitsubishi A5M (Claude) - Japan
28. Mitsubishi A6M (Zero) - Japan
29. Mitsubishi J2M Raiden (Jack) - Japan
30. Nakajima Ki.27 (Nate) - Japan
31. Nakajima Ki.43 Hayabusa (Oscar) - Japan
32. Nakajima Ki.44 (Tojo) - Japan
33. Nakajima Ki.84 Hayate (Frank) - Japan
34. Fokker D.XXI - Netherlands, Finland
35. PZL P.11 - Poland
36. IAR 80 - Rumania
37. Polikarpov I-15 - Russia
38. Polikarpov I-153 - Russia
39. Lavochkin La-5/7 - Soviet Union
40. Lavochkin LaGG-3 - Soviet Union
41. MIG-3 - Soviet Union
42. Polikarpov I-16 - Soviet Union

43. YAK-1/3/7/9 - Soviet Union
44. F2A Buffalo - US
45. F4F Wildcat - US
46. F4U Corsair - US
47. F6F Hellcat - US
48. P-36 Hawk/Hawk 75 - US
49. P-39 Aircobra - US
50. P-40C-N Warhawk/Kittyhawk - US
51. P-47C/D/N Thunderbolt - US
52. P-51 Mustang - US
53. P-63 King Cobra - US
54. Il-2/Il-10 Sturmovick – Russia
55. Hawker Sea Fury – Commonwealth
56. Northrop/Grumman A17A (and the Douglas built Version – DB-8A-3N)
57. Douglas SBD Dauntless/A-24 Banshee
58. Curtiss SB2C Helldiver/A-25 Shrike
59. Grumman F8F Bearcat
60. Douglas AD Skyraider

## **A2. Multi-Engine Aircraft**

1. Beaufighter - Commonwealth
2. Mosquito - Commonwealth
3. Westland Whirlwind - Commonwealth
4. Potez 631 - France
5. Do-217N - Germany
6. Dornier Do-217J - Germany
7. He-219 - Germany
8. Ju-88C/G - Germany
9. Me-110 - Germany
10. Me-410 - Germany
11. J1N1 Gekko (Irving) - Japan
12. Kawasaki Ki.102 (Randy) - Japan
13. Ki-45-KAI Toryu (Nick) - Japan
14. Ki-46-III KAI (Dinah) - Japan
15. P-38 - US
16. P-61 - US
17. P-70 - US
18. Petlyakov Pe-3bis - USSR
19. P-82 Twin Mustang – US
20. F7F Tigercat - US
21. Hornet/Sea Hornet - Commonwealth

### **A3. Selection Criteria**

The aircraft must be a scale model:

- of a single or twin piston engine aircraft
- that flew prior to 1946
- that saw air-to-air combat or active squadron service at some point (including after 1945)