

# WARBIRD NATS RACE RULES

## **Purpose:**

The following is a description of the event and the rules that are to be followed in conducting a Nats Warbird Championship Race with the purpose of bringing together the various warbird racing groups in the nation to allow as many pilots and aircraft as possible to compete in a once a year event to crown a Gold, Silver and Bronze class champions of warbird racing.

## **Pilot Qualifications:**

***Pilots must show proof of current AMA membership. Furthermore it is mandatory that all pilots use AMA approved 2.4 radios for this Warbird Nats Event.***

Each pilot will be allowed one caller/crew member per aircraft entry. All pilots and caller/crew members will be issued an armband granting access to the pit/flight line area. Only those workers and contestants wearing armbands will be allowed in the pit area. All spectators must be in approved spectator areas.

Pilots must take off, fly the heat laps, and land the aircraft. In the event of an emergency, the aircraft can be landed by another pilot resulting in disqualification for the heat.

Pilots, callers, and crewmembers will not be permitted to consume alcoholic beverages or any other illegal substance while competing in the event.

Flying or operation of an aircraft, in an erratic or unsafe manner will not be tolerated. Violations will result in a warning or black flag disqualification from the heat at the discretion of the flagman or Contest Director (CD). The CD's decision, in this regard, is final. **The CD may also require any pilot to demonstrate the safe flying characteristics of an entered aircraft, if the pilot's capability with said aircraft is unknown.**

No timing devices (watches, stopwatches, transmitter timers, etc.) will be allowed to be used at the pilot station during the heat racing. Also no help from pit area during a race as to lap times be reported to pilot while he/she is racing will be allowed. Unsportsmanlike conduct by a pilot, caller, or crewmember is grounds for the pilot's disqualification from the event.

All pilots and callers must adhere to the guidelines established in the AMA safety guide as well as the points covered in the waiver for this event.

## **Model Aircraft Requirements:**

The only models qualified to be entered in a Nats Warbird Championship Race event must be scale models replicating heavier than air, fixed wing, man carrying, fighter, fighter-bomber aircraft that were in production (*or Military prototype aircraft intended for production that were flight tested*) after January 1, 1937, or scale models of non-military aircraft that have raced in the unlimited category of the Reno Air Races. To "have raced" means that the aircraft must have crossed the starting line while participating in an official heat. No profile fuselage types no Q40

with hollow molded wings no F3D type planes will be allowed as they do not fit the intent of the class. The intent of the class is to promote true warbirds or reno racers in the unlimited class. Single engine aircraft must be models of full scale aircraft that have the wing mounted in the lower half of the fuselage. Observation or trainer aircraft that may have been modified to carry a weapon in unique circumstances do qualify as fighter or fighter-bombers. In addition, pilots may compete with additional aircraft used as WW2 era or later military trainers such as, but not limited to, T28's and T34's or T6's. Pilots that have questions regarding aircraft eligibility are encouraged to contact the CD(s) prior to the event.

Any pilots that have questions regarding aircraft eligibility are encouraged to contact the CD(s) prior to the event. A plane may only be flown in only one class per event. Once a plane has attempted take off for a heat in any class (Bronze, Silver, Gold) said plane may not be used in any other class for the event. Also, a plane may only be flown by one entrant. Planes that have attempted to compete or have competed in a heat race by a pilot cannot be used by any other pilot for the event. However, back up aircraft that have not been flown may be assigned to another pilot for the event. Once the assigned plane has attempted take off the assigned plane will have to be used for the remainder of the event unless damage to the plane occurs (see damaged aircraft procedures below). Scale – models that do not approximately resemble the scale outlines of their full scale counterpart are not permitted. There will be no hollow, composite wings allowed. Composite materials can be used in wing construction for spars or landing gear areas or wing tips, etc., just no all composite type hollow wings. All entered aircraft whether primary or back up must be thoroughly flight tested prior to use at an event. Recommendation would be that aircraft be flown a minimum of two times prior to the event. In no circumstances will a plane be allowed to fly its maiden flight as part of a heat race.

**Engine and Wing Area Requirements:**

The maximum engine displacement for single engine aircraft is 1.40 cubic inches for 2 stroke engines and 1.85 for 4 stroke engines. The Maximum combined displacement for multi-engine aircraft is 1.80 cubic inches for 2 stroke engines, and 3.70 cubic inches for 4 stroke engines. The maximum engine size for a particular aircraft will be determined using the wing area/engine displacement tables provided below. Wankel engines are classified as 2 stroke engines. Proof of engine displacement is the responsibility of the contestant. Wing area will be determined by average chord X span when requested by specific protest.

**Single Engine Displacement/Wing Area Table:**

2 Stroke Maximum Cubic Inches	4 Stroke Maximum Cubic Inches	Wing Area Minimum Square Inches
0-.50	0-.89	400
.51-.60	.90-.99	440
.61-.70	1.00-1.09	480
.71-.80	1.10-1.19	515
.81-.95	1.20-1.29	550
.96-1.05	1.30-1.39	565

1.06-1.10	1.40-1.49	580
1.11-1.15	1.50-1.59	595
1.19-1.20	1.60-1.69	610
1.21-1.30	1.70-1.75	630
1.31-1.40	1.76-1.85	650

**Multi Engine Displacement/Wing Area Table:**

2 Stroke Maximum Cubic Inches Total Displacement	4 Stroke Maximum Cubic Inches Total Displacement	Wing Area Minimum Square Inches
0-1.00	0-1.50	500
1.01-1.22	1.51-2.00	600
1.23-1.40	2.01-2.50	700
1.41-1.60	2.51-3.00	850
1.61-1.82	3.01-3.70	1000

**Engine Requirements:**

Mufflers or tuned pipes are required on all 2 stroke engines. All engines must have an operational carburetor and be able to demonstrate if asked by the CD, or flight line boss, the ability to maintain an engine speed of 4000 RPM or less for a period of ten seconds prior to takeoff. During this “idle down” period and prior to take off, no contact will be made between the pilot or holder and the engine or fuel system. (No needle adjustments, fuel line pinching, etc.) It will be up the CD to determine if this is needed by any aircraft demonstrating inability to idle properly, during the first flight of each aircraft.

**Safety Inspection:**

The following criteria will be used to inspect all aircraft that are flown in Nats Warbird Championship races. CD’s, safety inspectors, and contestants should equally be aware that following these criteria to the letter is extremely important in helping to minimize individual liability during the course of the race. During registration, a safety inspector who is a knowledgeable individual appointed by the CD will examine each aircraft.

Specific items to look for are as follows:

1. Short pieces of rubber tubing used to secure all clevises to prevent them from becoming disconnected in flight. Clevises using a bolt and self-locking nut fastener, or other locking device do not require safety tubing.
2. All fasteners holding the engine to the engine mount, and the mount to the firewall, must be in place and secure.
3. Receiver and battery pack should be protected against vibration in accordance with the manufacturer’s recommendations. Servos operating all flight surfaces shall be of sufficient size, a minimum of 57 oz torque on control surface requirements. Airborne battery packs must be of at least 500 mah capacities.

4. Washers will be used on all screws holding the servos to the mounting trays, and also on all screws holding the tray to the rails (all washers will be approximately the same diameter as the grommets). Servos mounted directly to the rails will also have washers on the mounting screws. If screw head diameters are as large or larger than the grommet diameter of the servos being used then, or if with screws with the washer built into the head (such as those provided with JR, Futaba, Airtronics and Hitec servos) are being used, separate washers will not be required. All servo trays, if used, will have at least one extra safety screw (not necessarily turned down tightly) placed between the grommets on the rear or front of the tray to prevent the tray from slipping out of the grommets in flight. Servos must be mounted by using fasteners as recommended by the equipment manufacturer. The use of servo tape to directly attach a servo into the aircraft is unacceptable in racing aircraft.
5. When servo manufacturers supply a grommet servo mounting system with brass eyelets, the brass eyelets must be correctly installed. The eyelet must be inserted into the grommet with the rolled end of the eyelet against the material that the servo is being mounted to. This will help prevent collapsing the grommet by over-tightening the fastener.
6. A keeper, or collar, will be on all push rods that have a right angle bend that connects them to the servo output arms. Z-bends are acceptable. If clevises are used at both ends of a push rod, one must be secured, so that the push rod will not turn. EZ connector type fasteners are NOT permitted on servo arms and push rod ends that control flying surfaces such as ailerons, elevator(s), and rudder(s).
7. All control surfaces will be firmly attached on the hinge line without excessive play, (at the discretion of the safety inspector).
8. Positive thread type wing bolts or screws will secure the wing in place on all two piece aircraft.
9. The entire aircraft should be inspected for any stress cracks.
10. Every aircraft should have the owner's name, AMA number affixed to the inside per the AMA safety code.

If an aircraft fails to conform to any of the above inspection criteria, it shall be repaired before it can be entered. Any aircraft damaged after it has been safety inspected, shall be re-inspected before it is allowed to fly again. Aircraft with a known history of safety or performance problems should be rejected unless acceptable changes have been made to eliminate the problems.

### **Declared Racing Class: Breakout times:**

The following breakout times will be used in the fixed-bracket racing format. There are NO adjustments to these breakout times.

***BRONZE CLASS 2 minutes, 30 seconds***

***SILVER CLASS 2 minutes, 0 seconds***

***GOLD CLASS 1 minute, 30 seconds***

### **Heat size, Matrixing, and number of rounds flown:**

Once the registration and safety inspections have been completed, and the number of entries in each class is known, heat sizes will be set at 4 airplanes maximum per heat. Matrixing, (determining which contestants will fly against each other in each heat), will be determined randomly per the AMA/ RCPylon rule book and software system used at this event. except for the final trophy race of the event. The final trophy race will be determined by point position from the preceding heats, i.e. the 4 highest point positions will race against each other in the final trophy race. Racing will consist of as many rounds of heats in each class, as time will permit, over the duration of the event. In event of a tie, the tie will be broken by the following criteria in this order:

Fastest Legal Time wins the Tie. If there is still a Tie between two or more pilots with identical legal fast times, Then Next Fastest Legal Time, if Still a Tie, then next Legal Fast Time until it is determined who has the next fastest legal time

### **Heat Racing Total Points Awards**

#### **Awards to the Overall points Winner:**

Here are the awards for the over all points leaders - we will add up the point totals for all the rounds and award the top four finishers in the point standings.

Here is the criteria for determining the over all points winners.

-The top 4 finishers with the most points will be awarded the trophies based on over all points from the rounds run. Highest points gets first, next highest gets second and so on down to fourth place. All tie breaking criteria will be used in case of any ties

### **If time permits and we successfully get 5 rounds in, we will have a trophy dash race for each class**

**The top four finishers in the points of previous rounds qualifies you for a shot at the trophy race in your respective class.**

#### **Awards to Trophy Race winners:**

**All pilots who qualify for the trophy race will start at 0 points for the trophy race.**

After the trophy race ends, the pilot with the fastest clean legal time will win the trophy race.

Then the next fastest clean legal time for 2<sup>nd</sup> and then 3<sup>rd</sup> and fourth respectfully. In the event of a tie whether it be time, B/o's, cuts, or DNS or DNS or what ever, the tie breaker will be completed by using the fastest legal time(s) from the heat racing.

Only the first place winners in each of the three classes will receive a trophy

It would be our goal to provide trophies for first through fourth in each of the three classes to the over all points winners, as well as first place only in each of the three trophy dash races if time permits.

### **Matrix Setup:**

At the CD's discretion the number of rounds per day will be set. Recommendation would be for a minimum of 3-5 rounds on any one day race with a trophy race for each class at the end of the heat racing if time permits, or for two rounds with an additional trophy finals round on the second day of any 2 day event if time permits. Entries and time needed per round as well as weather and other "acts of God" will affect the number of rounds run each day and in total as well as any trophy races. Modification to the race will be at the CD's discretion based upon points and the number of entries and days allowed to race.

Each plane will be required to have color markings on designated wing tip top and bottom. There will be a high or low red and a high or low green color applied to outer wing tips.

These colors will be supplied by the race promoter and applied once matrix and lane assignments are set up.

### **Engine Run-up area:**

Testing of engines must be conducted within the designated engine run-up area, and must be accomplished without the use of a transmitter once heat racing has begun, unless positive controls are in place to eliminate frequency conflicts with racing aircraft.

### **Engine Starting Procedures:**

After aircraft flying in the heat have been identified to the pylon judges, and radios have been checked to insure they are operating, the starter will begin a 120-second timing device. Pilots and their callers will be instructed to start their engines and have the 120-seconds to get their engines running and launch their aircraft. Pilots are allowed one takeoff attempt. Once either of the aircraft main wheels leaves the ground an attempt has been made. If during the 120-second window an engine dies and a takeoff attempt has NOT been made, the plane may be restarted. No one may attempt a take off once this clock has expired.

### **Take off Procedures and Directions:**

Contestants may take off on a first come, first served basis, but the starter will control access to the runway. Callers will carry, or guide, the pilot's aircraft onto the runway, and should take great caution when handling aircraft with the engine running, so as to not pose danger to themselves or others. Taxiing of aircraft onto the runway to take off is prohibited. The starter will determine what direction the aircraft must use to take off. This will generally be dictated by the wind direction. If the takeoff direction is from right to left the aircraft must be carried to a position on the runway beyond the left most pilot station and released from there. This is a safety procedure to help compensate for aircraft that tend to turn to the left on takeoff, due to engine torque and/or wind

### **Heat Start Procedure:**

After the 120-second engine start up time has elapsed, the 45-second countdown clock is started. The System announcer will then count down from 10 seconds to the start of the heat. The heat begins when the clock reaches zero and the starter drops the green flag. At this time, all aircraft are to be to the left of the start/finish line. Failure to meet this requirement is a jumped start and

results in disqualification for the heat. Loops to avoid jumping the start are NOT permissible. **Pilots, who find they are about to jump the start, can execute a legal sharp left pitchout turn and then circle back safely to the start/finish line by leveling their wings at least once in that turn.** Pilots should avoid turning and heading directly towards the pits or starting line in this maneuver.

### **Heat Racing Procedure:**

The heat will consist of 10 laps in a racetrack pattern flown past and around each pylon pole without crossing the deadline. Pilots must also keep their aircraft above the tops of the pylon poles. Pilots who fly near the deadline, or who consistently drop below the top of the pylon poles will receive one warning from the flagman or assistant flagman. Any aircraft crossing the deadline will result in a black flag disqualification from the heat.

Repeated infractions of the deadline, or flying too low, or other unsafe erratic flying can disqualify the pilot for the remainder of the day, and the pilot may be required to demonstrate flying proficiency on the race course before being allowed to fly on the second day. Victory rolls and other acrobatic maneuvers at any time during, or after the heat, are strictly prohibited, and are grounds for black flag disqualification for the heat. Any pilot not pulling off the racecourse after receiving the black flag for any reason will be disqualified from the rest of the event.

### **Heat Finish Procedure:**

For each competing pilot, a racing heat will be concluded when the aircraft has flown 10 consecutive laps, and it has crossed the finish line in the air. Aircraft are not required to be under power when crossing the finish line to finish the heat, and may complete the heat by gliding across the line. The starter will waive the checkered flag as the lead aircraft crosses the finish line completing the 10<sup>th</sup> lap. When the heat is finished, the assistant flagman will record the finish positions of all aircraft then contact the pylon judges by radio to ascertain if any of the competing aircraft had pylon cuts. Noted cuts will be recorded on the heat card. The assistant flagman will also obtain the heat time for each aircraft from the timing device(s) and record those times on the heat card. In the case of a “photo finish” or apparent tie, the winner will be declared by the starter and or assistant Starter.

Pilots are not permitted to taxi their planes back to the pilot station while other pilots are waiting to land. Care should be taken to exit plane off to the side of the runway and leave runway clear for next pilot to land.

### **Heat Scoring Procedure:**

For the Gold and Silver and Bronze brackets a four plane maximum heat size will be used. The first place finisher in the heat will receive the same number of points as the number of planes in the maximum heat size in the class. Each subsequent place finisher will receive one less point. For example, with a four-plane maximum heat size with the class, the 1<sup>st</sup> place finisher receives 4 points, 2<sup>nd</sup> place will receive 3 points, 3<sup>rd</sup> place will receive 2 points, etc. Any aircraft that was unable to take off or that was to the right of the start finish line at the start of the heat receives no (0) points. Any aircraft that did not finish the heat receives no (0) points. Any aircraft that completes the heat in less than the prescribed break out time for its class receives no (0) points.

EXTREME BREAK OUT penalty will be enforced to any pilot flying a time more than 5 seconds under their respective breakout is considered an EXTREME BREAK OUT and that pilot will not be told their finishing time. Pilot will simply be told they had an extreme break out time. Any aircraft that was black flag disqualified receives no (0) points. Effect of Cuts on Points Awarded: If an aircraft cuts one pylon, by not flying past it, that aircraft will receive only 1 point for the heat regardless of finish position. Any aircraft cutting more than one pylon will receive no (0) points for the heat. Aircraft finishing without cuts behind aircraft receiving cuts will have their finish position advanced one place in the standings for every aircraft ahead of them that received cuts. The following four plane heat example illustrates the point scoring system. If a plane has both a cut and a break out the heat is considered a break out and receives a 0 for that heat.

1<sup>st</sup> place finisher with one cut 1 point  
2<sup>nd</sup> place finisher with two cuts 0 points  
3<sup>rd</sup> place finisher with no cuts 4 points  
4<sup>th</sup> place finisher with no cuts 3 points

### **Damaged Aircraft Procedures:**

In the event of a mid-air collision, the starter will signal both aircraft to climb off the race course. Both aircraft will be given a zero for that heat. The remaining aircraft in the heat will be allowed to finish the race. Both aircraft involved in the mid-air will be landed as soon as it is safe. Any other damage observed by the starter (flutter, loose control surfaces, etc.) will result in a black flag for that heat and the aircraft will be landed when safe. Before any damaged aircraft is allowed to fly in a subsequent heat, it must be re-inspected by an approved safety inspector and deemed airworthy. If a pilot chooses to switch from the aircraft that they started the event with (for any reason -damage or otherwise) then the original plane will not be allowed to compete for the rest of the event unless the backup aircraft becomes damaged and the CD grants permission to the pilot to re-instate their original aircraft.

Also, Pilots are encouraged to make the CD aware immediately if any aircraft are to be changed and or pulled from competition in an effort to help the race administrators in their record keeping.

### **Race Scoring Procedures:**

Race scoring shall be the sum of all heat scores.

### **Protests:**

It is unfortunate that sometimes disagreements arise when conducting any sporting event. Kindly remember to be calm and sportsmanlike when discussing disagreements with the contest director. If a contestant believes that he/she has a legitimate complaint regarding a specific aspect or incident, a protest should be registered with the contest director within a timely manner. Only contestants may file a protest and protests must be filed prior to the conclusion of an event. The CD(s) is (are) the only point of contact for the protests and his (their) ruling will be final.

### **Safety/ Safety Equipment:**

All provisions of the Official Academy of Model Aeronautics National Model Aircraft Safety Code are incorporated into these rules by reference.

The Academy of Model Aeronautics requires that all contestants, callers, crew members, and event officials and workers participating in any organized racing event wear helmets (hard hats), that are approved by ASHA, DOT, ANSI, SNELL, NOCSAE, or a comparable standard, while “on the course”, in accordance with the AMA’s definition of “on the race course. Contestants, callers, and crew members are required to provide their own helmets (hard hats) that meet these requirements. There are absolutely NO exceptions to these policies and they shall be kept in strict compliance and enforcement at all times. Willful disregard of these policies will result in ejection from the event.

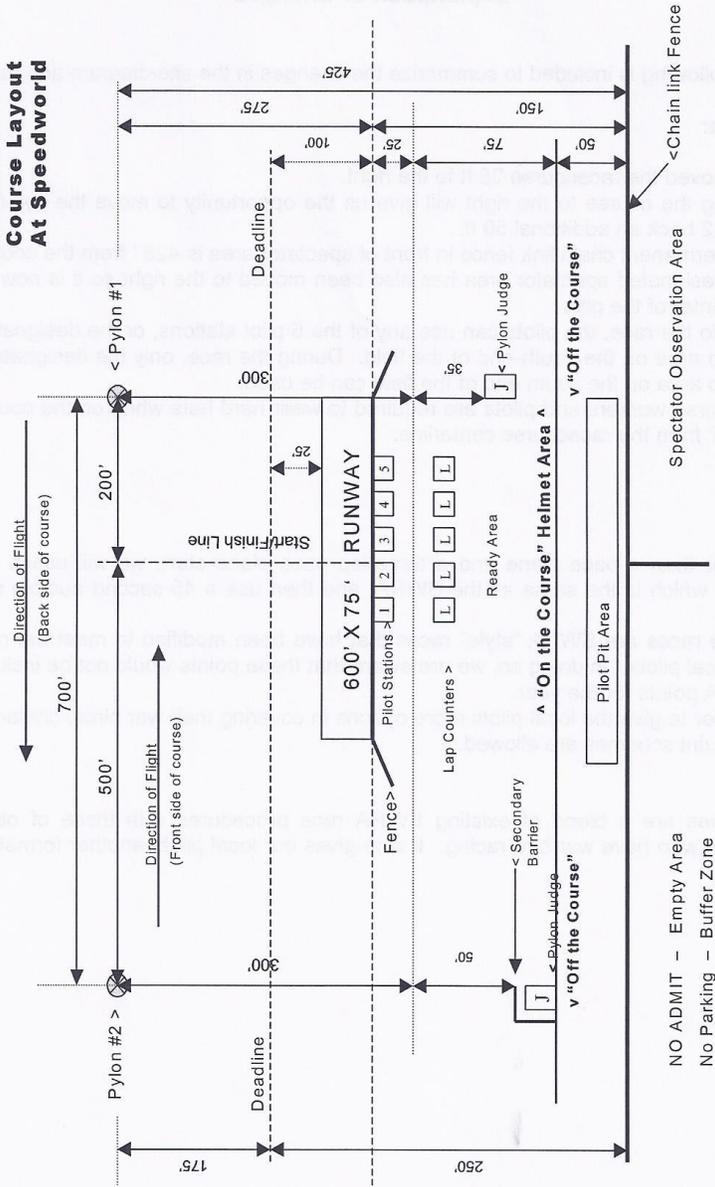
**Race Awards or Incentives:**

Each class will receive a trophy for first through fourth in the overall points totals for that class, as well as additional 1st place only award for a trophy race if held, in each class as described previously. Any additional prizes are determined by race sponsorship incentives and permitted.

**Anything not covered in the rules above:**

The event CD(s) will have the ability to interpret the Nats Warbird Championship Race rules and make any decisions needed.

# Warbird Race Course Layout At Speedworld



(Drawing Not To Scale)

NO ADMIT - Empty Area  
No Parking - Buffer Zone

