

# SWRA Warbird Racing - Rules

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[www.SWRA-Warbird.com](http://www.SWRA-Warbird.com)

## **Purpose:**

The following is a description of the event and the rules that are to be followed in conducting **SWRA** Warbird Races. These rules must be followed for event points earned during a race to count toward the year end points championship.

## **Pilot Qualifications:**

Pilots must show proof of being current members of the AMA. Pilots operating transmitters on the HAM band must additionally possess a current FCC license. Each pilot will be allowed one caller/crew member per aircraft entry. All pilots must read the pilot requirements and sign the AMA Sanctioned Event Flight Safety Declaration. Pilots and caller/crew members must agree to be compliant with all AMA rules and safety protocols. Only those workers and contestants who agree to be compliant with all AMA rules and safety protocols will be allowed in the pit area. All spectators must be in approved spectator areas. The Pilot of Record must fly all heat laps from the end of the countdown to the end of the tenth lap. For safety reasons, takeoffs and/or landings may be executed by the caller providing **they are** an AMA pilot. Unsportsmanlike conduct by a pilot, caller, or crewmember is grounds for the pilot's disqualification from the event. Pilots, callers, and crewmembers will not be permitted to consume alcoholic beverages and compete in the event. Flying or operation of an aircraft, in an erratic or unsafe manner will not be tolerated, and pilots will receive only one warning. Further violations will result in a black flag and disqualification from the heat. The flagman or CD's decision, in this regard, is final. The contest director may, at their discretion, require any pilot to demonstrate the safe flying characteristics of an entered aircraft, if the pilot's capability with that aircraft in the entered class is unknown. No timing devices (watches, stopwatches, transmitter timers, etc.) will be allowed at the pilot station during the heat racing.

## **Model Aircraft Requirements:**

The only models qualified to be entered in a **SWRA** Warbird event must be scale models replicating heavier than air, fixed wing, propeller driven, **human** carrying, military aircraft that were in production after January 1, 1937, or scale models of non-military aircraft that have raced in the unlimited category of the Reno or Mojave Air Races or in an unlimited air race affiliated with the Unlimited Air Racing Association. To "have raced" means that the aircraft must have crossed the starting line while participating in an official heat. Civilian markings, paint schemes, & modifications to military aircraft are allowed. Civilian aircraft that were not designed for but can be documented and were used by the military, will be allowed.

At the CD's discretion, the Bronze class may allow any RC aircraft under 18 lbs ready to fly, which passes the required safety inspection. The "Run-What-You-Brought", (RWYB), option is offered to encourage participation by pilots new to racing. Events utilizing this option will earn annual Championship points normally. It must be noted in all pre-race publications that the Bronze class will be run by the RWYB option.

All models must have a full fuselage, no profiles allowed. Because they do not meet the "intent" of the event, airframes designed for use in AMA Q40 and/or F3D racing will not be allowed. If you have any question as to whether your particular airframe will qualify for warbird racing, please contact the Contest Director prior to bringing it to an event.

## **Engine/Motor & Wing Area Requirements:**

For internal combustion powered aircraft, there will be a minimum wing area of 400 square inches for single engine aircraft and 500 square inches for a multi engine aircraft. The minimum wing area for electric powered aircraft is 300 square inches.

The maximum weight of any plane will be 18 lbs ready to fly.

Power may be Glow, Gas or Electric. Since there are no restrictions for power vs wing area, we caution all contestants to carefully select a combination that will result in a model that can safely fly the course and remain within the time constraints for the class in which it is being flown. At the CD's discretion, any plane/pilot which is deemed questionable may be asked to fly a demonstration heat prior to racing. The CD has the right to disqualify any aircraft or pilot which he feels may create a safety risk.

## **Muffler Requirements:**

Mufflers or tuned pipes are required on all 2-stroke engines. Some venues may also require mufflers for 4-stroke engines. This section does not apply to an electric aircraft.

## **Safety Inspection:**

The following safety criteria will be used to inspect all aircraft that are flown in **SWRA** Warbird Races. Contest directors, 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 contest director will examine each aircraft. Specific items to look for are as follows:

1. Short pieces of fuel tubing or similar material will be used to secure all clevises to prevent them from becoming disconnected in flight. Clevises using a bolt and self-locking nut fastener, do not require safety tubing. Metal clevises shall be protected from deterioration of the threads due to vibration by means of a jam nut, thread treatment such as Loctite® or Vibra-Tite®, or a similar method. Ball links shall be tight.
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 equipment manufacturer's recommendations. Servos operating the elevator and ailerons shall be of sufficient size (torque) for the weight and speed of the aircraft. Airborne battery packs must be at least of 500 mAh capacity. Receiver battery packs may not be required in an electric aircraft using an electronic speed control (ESC) with a battery eliminator circuit (BEC).
4. Washers will be used on all screws holding the servos to 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 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, or if screws with washers built into the head (such as those provided with Futaba, JR, and Hitec servos) are being used, separate washers will not be required. All screw mounted 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 or any adhesive, cement, or silicon to directly attach a servo into the aircraft without the benefit of shock absorbing grommets with fasteners, is unacceptable in racing aircraft.

5. When servo equipment 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 output arms and push rod ends that control flying surfaces such as ailerons, elevator(s), and rudder(s). If an aircraft is supplied as a Plug and Play (PNP) or Bind and Fly (BNF) from a manufacturer with EZ connector- type fasteners on flight controls, the fasteners may be accepted but shall be verified to be tight during inspection.
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. A positive method of holding wheels onto axles will be used, and the wheels shall not bind.
10. The entire aircraft shall be inspected for any stress cracks.
11. Failsafe must be enabled so that the engine/motor is shut off in the event the transmitter signal is lost
12. Every aircraft shall have the owners name, AMA number, and phone number affixed to the inside per the AMA safety code.
13. The pilots FAA registration number is appropriately displayed on the outside of the aircraft

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 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

Gold class: 1 minute, 30 seconds

### **Important!**

Since we rely on the breakout times to control safety, any recorded time faster than 1:25 will be posted as 00:00.00.

### **Heat Size, Matrixing, & Number of Rounds Flown:**

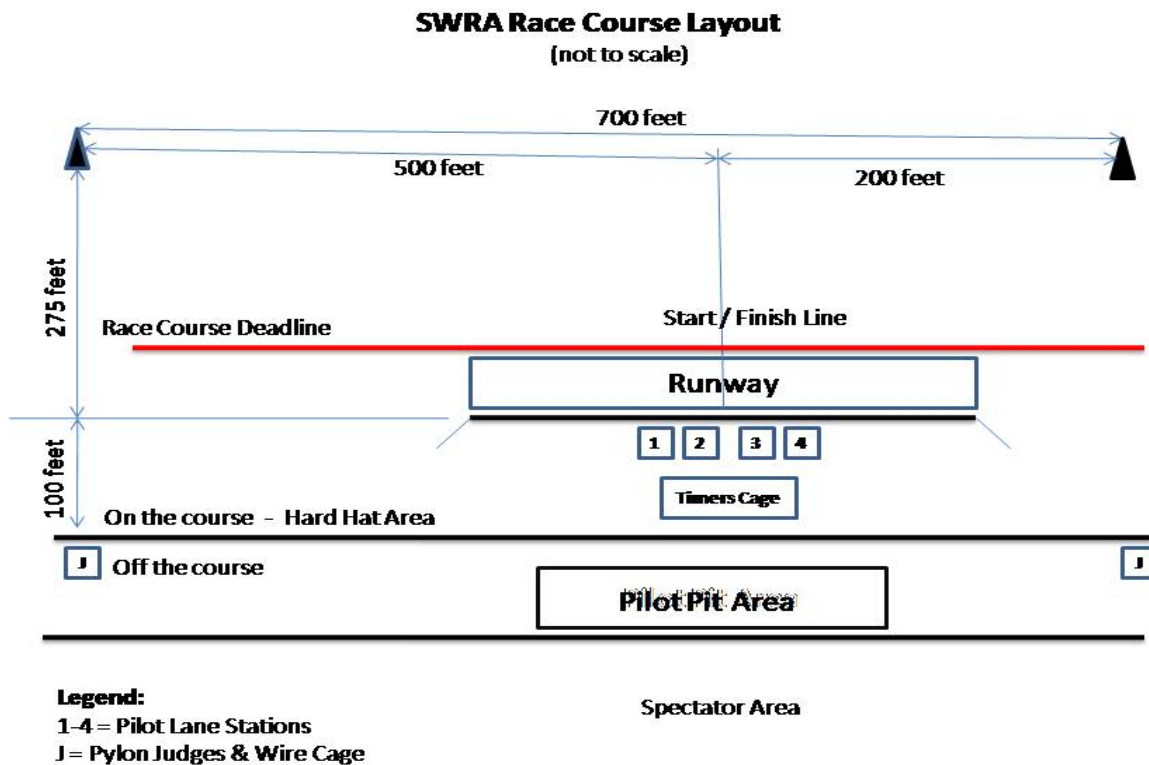
Once the registration and safety inspections have been completed, and the number of entries in each class are known, maximum heat sizes will be set for each class, at the contest director's discretion, between 3 and 4 airplanes per heat. The maximum heat size must be decided before racing begins and may not be changed thereafter. Matrixing, (determining which contestants will fly against each other in each heat), will be done by a method that complies with the AMA RC Pylon rules. The NMPRA Matrix software is one method to do that. Other matrix methods, such as manually with

pencil and paper, may be used but must rotate in an orderly manner to maximize the number of rounds before pilot matchups repeat. Racing will consist of as many rounds of heats in each class as time will permit over the duration of the event. Points in all rounds flown will be totaled to determine the winners in each class. There must be a minimum 4 rounds completed in all classes for the event to count toward year end points, unless there is an unforeseen circumstance, (weather, daylight, etc.), which occurs to prevent this from happening.

**Engine Run-up Area:**

Testing of engines must be conducted within the designated engine run-up area. If the model uses single frequency radio communication like 72-75mhz or HAM frequencies, the testing must be accomplished without the use of a transmitter, after heat racing has begun, unless positive controls are in place to eliminate frequency conflicts with the racing aircraft. This does not apply to models equipped with spread spectrum technology such as 2.4 ghz. If an electric propulsion system requires testing with a prop during the race, the electric motor testing must be completed in the designated engine run-up area.

**Course:** Typical Course Layout: Note variations from the 2 pole course as shown in the AMA Rulebook. AMA District X Waiver dated March 22, 2004 for this layout.



## **Take Off Procedures & Direction:**

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. There will be no running while holding an airframe at any time. Taxiing of any aircraft onto the runway to take off is prohibited. The starter will determine what direction aircraft must use to take off. This will generally be dictated by the wind direction. If the take off 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 take off, due to engine torque and/or wind. No tuning or other adjustments, or anything else that may hinder or inhibit the launching of other aircraft, is to be done on the runway. If an adjustment of any kind is needed, the airplane must be moved off the runway and clear of any other planes being launched and not interfere with the line of sight of the other pilots launching their aircraft.

## **Heat Start Procedure (Nitro, Gas and Electric):**

After the aircraft flying in the heat have been identified to the pylon judges and timers, and radios have been checked to insure they are operating, the starter begins a 135 second, (2 minute 15 second), heat timing device or devices. The pilots and callers can then start their engines to prepare for and begin takeoff procedures. The timing device(s) can be any combination of timers as long as it equates to 135 seconds from the time the engine start command is given to the start of the heat, (meaning zero on the clock), and the countdown can be conveyed to the flagman and pilots/callers.

Pilots are allowed 1 takeoff attempt. Once either of the aircraft main wheels leaves the ground an attempt has been made. If during the countdown window, an engine dies and a takeoff attempt has not been made, the plane may be restarted, however the Starter or Flagman will be tasked to determine whether the plane can be recovered in time to have everyone clear of the runway 15 seconds before the heat starts. If not, the airplane will be required to be left where it is until the Flagman deems it safe to be recovered, after the last plane in the heat lands.

## **Heat Start Procedure (electric only warbird heat):**

After the aircraft flying in the heat have been identified to the pylon judges and timers, the pilots need to arm their planes. The starter and/or the assistant starter will ask that radios be checked to insure they are operating. The starter then begins the timing device or devices, and the pilots and callers can then position their aircraft on the runway to prepare for and begin takeoff procedures.

The pilots will be advised as the clock counts down to the start of the heat. The heat begins when the countdown timer reaches zero and the starter drops the green flag. All aircraft and personnel must be clear of runway prior to 15 seconds remaining on the count down clock. The starter is responsible to verify runway is clear by that time. If a plane or persons are still on runway at fifteen seconds but become airborne, they will be directed to fly high above the race and will be scored as a "did not start". It will be the responsibility of the race CD or promoter, etc., that the countdown timer and 15 second time limit is easily identified, either audibly, visually, or both, to the starter and pilots or callers.

All aircraft are to be to the left of the start/finish line before the countdown clock reaches zero. 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 circle back to the start/finish line. The pilot should take great caution and not fly directly toward the pit area, spectators, or pilot line to avoid a jump-start. Doing so may result in at least a warning and could result in a black flag offense.

### **Heat Racing Procedures:**

The heat will consist of 10 laps in a racetrack pattern flown past each pylon pole without crossing the deadline. Pilots must also keep their aircraft above the top of the pylon poles. Pilots who fly near the deadline, or who briefly drop below the top of the pylon poles, will receive one warning from the starter or assistant starter. Any aircraft crossing the deadline will result in 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 racecourse, before being allowed to fly in any further heats for the event. Victory rolls and other aerobatic 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 a black flag for any reason will be disqualified from the rest of the event.

### **Damaged Aircraft Procedures:**

In the event of a mid-air collision, the starter will indicate the aircraft involved and instruct the pilots to land as quickly and safely as possible. All aircraft involved in a mid-air will be given a zero for that heat. 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 immediately. Before any damaged aircraft is allowed to fly in a subsequent heat, it must be inspected by an approved safety inspector and deemed airworthy.

### **Heat Finish Procedures:**

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 a heat and may complete the heat by gliding across the line. The starter will wave the checkered flag as the lead aircraft crosses the finish line completing the 10th lap. When the heat is finished, the assistant starter will record the finish positions of all aircraft and 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 starter will also obtain the heat time for each aircraft from the timing devices and record those times on the heat card. In the case of "photo finish" the winner will be declared by the starter and is not reviewable. The finish order that the starter sees will override times if the times disagree with the visual order. In this case, the pilot that the starter declares to be ahead will receive their time and the trailing pilot will receive a "No Time" for the heat but will receive the appropriate points for the heat. If both pilots times are under the breakout time for the class, both pilots will be scored as a breakout and will receive zero (0) points for the heat.

### **Landing Procedures:**

Pilots who have completed the heat should pull up, gradually climbing to loitering altitude after crossing the finish line and hold at altitude until all aircraft have finished racing. Callers should advise the starter when their pilot is ready to land and afford the starter an opportunity to affirm landing clearance. Landing of aircraft should be accomplished in a timely manner to expedite the event, and callers will recover aircraft. No aircraft will land or be retrieved without clearance from the starter. For electric aircraft the pilots must disarm (unplug battery) at the flight line before returning to the pit area.

### **Heat Scoring Procedures:**

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 1 less point. For example, with a four-plane maximum heat size within the class, the 1st place finisher receives 4 points, 2nd place will receive 3 points, 3rd place receives 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 the heat receives no (0) points. Any aircraft that did not finish the heat receives no (0) points. Any aircraft that was black flag disqualified receives no (0) points.

**Effect of a Breakout** – Any aircraft that completes the heat in less than the prescribed break out time for its class receives no (0) points, no matter what other factors occur during the heat, (i.e., finish position, cuts, etc). A Breakout will be the first determining factor and will, in every situation, equal zero points for the heat. (See note on last page in the cases where the **NMPRA** matrix software is used for best practice when entering information if a breakout occurs).

**Effect of Cuts on Points Awarded** – Except in the case of a breakout as described above, if an aircraft cuts one pylon, by not flying past it, that aircraft will only receive 1 point, regardless of finish position. Any aircraft cutting more than one pylon will receive no (0) points for that heat. Aircraft finishing without cuts behind aircraft receiving cuts, will have their finish position advanced one place in their standing for each aircraft ahead of them that received cuts. The following four-plane heat example illustrates the point scoring system:

1st place finisher with 1 cut - 1 point  
2nd place finisher with 2 cuts - 0 points  
3rd place finisher with no cuts - 4 points  
4th place finisher with no cuts - 3 points

### **Race Scoring Procedures:**

Race scoring shall be the sum of all heat scores. There will be no rounds thrown out. Ties will be determined by the fastest legal time posted by the planes flown in that class.

If a circumstance arises where a round cannot be completed in any of the classes, only the points and times from the completed rounds will be used for the event points.

It is the responsibility of each pilot to check their heat results immediately after the completion of a heat and discuss any concerns with the starter at that time.

(See note on last page in the cases where the **NMPRA** matrix software is used for best practice when entering information if a breakout occurs).

### **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, the 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 contest director is the only point of contact for protests and their ruling will be final.

### **Safety, Safety Equipment, and Liability Waivers:**

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 & workers participating in any organized racing event, wear helmets (hard hats), that are approved by OSHA, DOT, ANSI, SNELL, NOCSAE, or a comparable standard, while "on the racecourse", in accordance with the AMA's definition of "on the race course". There are absolutely no

exceptions to these policies, and the **SWRA** requires that there be strict compliance and enforcement at all times. Contestants, callers, and crewmembers are required to provide their own helmets (hard hats) that meet these requirements. Willful disregard of these policies will result in ejection from the event. **SWRA** further recommends, that pilots, callers, crewmembers, and event workers in close proximity to areas where engines are started, wear appropriate eye and hearing protection. Safety equipment is the responsibility of the participants and will not be provided by **SWRA**.

#### **Notes on using the NMPRA Matrix and Scoring Software:**

1. The original version of the software was written several years ago and since then, there have been major updates to the Windows operating systems. Because of these changes made in the operating systems, there are times when the software's functionality may be limited. The best way to insure all the features can be utilized is to run the program as an Administrator. This is accomplished by right clicking on the icon to open the **NMPRA** program and from the pop-up menu, select the option that states "Run as Administrator".
2. The program also has an issue with the way the scoring is calculated in certain situations. If a pilot flies a breakout time AND gets 1 cut, the scoring system will still award 1 point for the heat. This is a throwback from when the rules and program were initially introduced. This is easily solved by entering the result of a breakout heat for the pilot as a "Did Not Finish", or "DNF". By doing this, it will ensure the pilot receives zero points for the heat in a breakout situation.
3. Another issue with the program is if there are pilots tied for points at the end of the event, if the "Resolve Ties" section has the "Fast Time" option checked, it will use any breakout times entered as a low time to break the tie. Once again this can be remedied by entering the result of a breakout heat as a "DNF", thus making sure the time is not factored into a tie break situation and giving a zero for the heat.

These items should be practiced until we can get the software update to reflect our current rules.