

2010

CALIFORNIA SPORT WARBIRD RULES

Packet Includes:

2010 Sport Warbird Series Flyer
2010 Individual Race Entry Form
2010 Annual Frequency Registration Form
AMA Release
Aircraft Safety Inspection Forms
General Rules & Guidelines
46 Warbird Class Rules (Modified)
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GENERAL GUIDELINES

Warbird Racing Rules

Modified: 1/25/2010

GENERAL

All guidelines, procedures and individual class rules are to be followed as listed in this package of rules and guidelines. No changes or alterations will be allowed or disqualification may occur if changed.

The Sport Warbird Racing Series event is to provide a **2-pylon** racing format that can be enjoyed by all Sport Warbird Pylon enthusiasts. The individual classes are intended for both entry level and advanced level pilots. There are four individual classes in the Sport Warbird Series.

Classes include:

46 Warbird Class Rules (aka Modified)

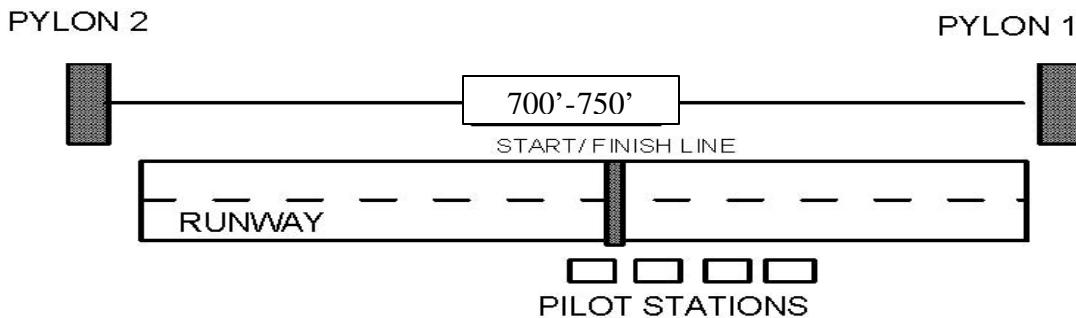
75 Warbird Class Rules (aka Stock)

120 Warbird Class Rules (aka Limited)

Unlimited Class Rules

***Novice pilots may not enter 120 Warbird or Unlimited Warbird

TYPICAL RACE COURSE LAYOUT:



FREQUENCY REGISTRATION

Each pilot, prior to the race season and/or their first race of the season must register a frequency with the Contest Director and/or Series Coordinator. This eliminates any chances of having any frequency duplications within classes. Each pilot must either reserve a numbered channel and/or a 2.4Ghz channel. Frequencies are on a first come, first serve basis. If a pilot is racing multiple aircraft in more than one class, all aircraft must be on the reserved (selected) numbered channel and/or a combination of 2.4Ghz. If a pilot chooses to use multiple numbered channels, he must reserve a second frequency at additional cost. Any pilot showing up the day of the race with a frequency that has been reserved and is used by another pilot, the Contest Director has the right to not allow that pilot to race. If the matrix can be altered to allow no conflicts, the Contest Director may allow the pilot to fly. All final decisions are up to the Contest Director.

The cost for reserving a frequency is \$15.00 per numbered or 2.4Ghz frequency per

racing season. The \$15.00 fee is for Championship Prizes and Trophies that will be issued at the end of the season to the winners of each class.

Once a race frequency has been selected, the pilot will reserve a race number. Returning pilots are given the option to renew their race numbers / frequencies from the previous years if done before March 1st of each racing season. These race numbers can consist of single, double or triple digit numbers only. See the Safety and Marking paragraph for rules and guidelines pertaining to the race numbers.

After all the info has been confirmed by the Race Coordinator, the pilot must fill out the frequency form available and mail or deliver to the Series Coordinator with a check. Also attached to this form should be a copy of the current year AMA card. Please copy your AMA card onto an 8-1/2" X 11" white paper and staple behind your Frequency Registration form. Please make checks out to the name of the person coordinating the frequencies.

In the event a pilot needs to change numbered channels at any point during the season, a pilot may change channels as long as the channel requesting is open. In the event a change is made, the frequency not being used will open to any available pilot unless an additional fee is paid to reserve multiple channels.

EVENT REGISTRATION

All pilots must be AMA insured and show proof by mailing a copy attached to the frequency registration or by presenting at time of registration at each individual event. Pilots will not be allowed to race unless they can prove AMA insures them. All events are AMA sanctioned.

Race registration for each individual race is required. Entry fees are \$20.00 for the first class entered and \$10 for each additional class at each race per pilot. Registration and AMA release forms must be filled out and handed in prior to the start of each event. If a pilot has a helper/caller, please attached their AMA release form as well.

A pilot may only register for one entry in each individual class. A pilot may not fly multiple aircraft within one class at the event.

SAFETY and MARKING

All aircraft must have name and AMA number located inside of aircraft. The best suitable way is to print on paper and glue to inside part of fuse or use a sharpie black pen and label inside of fuse.

AMA racing insurance requires all personal on the flight line to wear hardhats. Hard hats must be of ANSI, DOT, NOCSAE OR SNELL approved. Individuals are required to provide there own hard hats. All pilots, crew members, spotters, callers and helpers that are along the deadline/flight line will be required to wear hard hats. Any individual not in compliance of this will not be allowed on the flight line or staging areas.

Each Pilot can **only have one caller/spotter** at the flight line during the racing event per AMA regulations and guidelines. Pilots may have additional persons to assist in starting/launching of aircraft but they must return to the staging/safety areas prior to the start of the heat race.

All pilots and caller/crew members must sign an AMA Waiver Release at which time they will be issued an armband. Only those workers and contestants wearing armbands will be allowed on the flight line or staging areas. Only course workers who signed AMA release forms will be allowed at the pylons. Spectators, pilots or crew-members are allowed at the pylons during the heat races. Race officials only.

All spectators must be in approved spectator areas.

Aircraft markings and/or color schemes are optional and need not be scale. Bright color schemes are encouraged to allow easier identification. **7" racing numbers on the bottom wing and 3" numbers on rudder and/or fuselage are required.** See diagram attached for details. Black or White numbers in a bold block number format need to be used depending on base color. Warbirds using Military schemes need to make sure numbers are visible from 400-500 feet. Make sure race numbers are set in the proper direction and are not upside down when turning around at the pylons.

BACKUP AIRCRAFT

Back-up aircraft are allowed but must have the **same race number and same frequency** as the primary aircraft unless **authorized** by the Contest Director. Back-up aircraft may be used only if the primary aircraft has been severely damaged or can no longer be used. It is up to the Contest Director to allow back-up aircraft to be entered in replacement of primary aircraft. There is no additional entrance fee to have a back-up aircraft. It is not permitted to allow the original aircraft entered and flown to return to race once the backup aircraft has flown a heat. Parts from back-up aircraft may be interchanged with primary aircraft. Pilots may have as many back up aircraft as desired at individual races. *** It is up to the CD to make the overall decision if other circumstances may apply.**

HEAT RACES

Each heat race will have a scheduled minimum of three and maximum of five scheduled aircraft per heat race depending on entries. Event matrixes will vary due to number of entrants. During the racing event, regardless of the amount of pilots to partake in a heat, each pilot must complete the 8 laps to qualify for points. If the pilot does not complete 8 laps, the pilot will not be rewarded points.

All aircraft will be air started using a twenty-second or 30 second audio countdown. Turn calling will be at the pilots/caller's discretion and there are penalties for cutting pylons and/or crossing the start line prior to the countdown. Protesting of any/all penalties will not be allowed, as all judgment calls are final. Pylon Judges will not assist in judging turns and all turn calling is up to the pilot and/or his caller. There will be no assistance by radios, flags or etc by teams or individuals during the racing event. Each race site has designated deadlines and no fly zones. Pilots will be given one warning and disqualified for second violation. If a pilot continues to demonstrate unsafe flying, the pilot will be grounded. It is up to the pilot at the completion of the heat races to verify with the start judge the amount of cuts, location and overall finish position. Once the next heat begins, the heat race is final.

Points system is as follows: 1st place-5 pnts, 2nd place-4 pnts, 3rd place-3 pnts, 4th place- 2 pnts, and 5th place-1pnt. Pilots obtaining cuts during a heat race will loose a one-lap finish based on their overall finish. Pilots with three or more cuts will be given 1 point overall for the heat regardless of finished position. Pilots not completing 8 laps will be

issued zero points.

The Trophy race will be determined by taking the top five pilots with the highest points accumulated from the heat races generated throughout the racing event. In the case that there is a tie in the standings, the contest coordinator has the option to run a sixth or seventh plane in the trophy race or have a fly-off to determine which pilot goes into the selected trophy race heat. Points are issued like that of a heat race in the trophy race and go to their total points total for the Championship series. If a 6th or 7th aircraft is allowed to race, the finish positions of 5th-7th will be issued one point for their finished position.

CHALLENGES OR PROTEST

The Contest Director and the Series Coordinators have all rights to challenge an entrant's aircraft that may be in question at anytime to the legality at no expense. It is the pilot's responsibility to make sure all aircraft entered meet the rules and expectations of the rules for all races.

If a contestant wishes to challenge another entrant on the legality of the airframe or engine, the challenging pilot must file a \$20 protest fee. In the event the challenged pilot is deemed illegal the result is disqualification for the event and any major violations will result in termination from all races for one year. The \$20 fee will be refunded. If the challenged pilot is found to be legal and has met all the rules and requirements, the \$20.00 fee is turned over to the pilot in question.

Un-sportsman like conduct will result in disqualification for the individual race and/or the entire racing season at the discretion of the Contest Director.

DETERMINING WING THICKNESS PERCENTAGES

Formula for wing root percentage:

$$\frac{\text{(Root) Chord Thickness @ center of wing}}{\text{Root chord width}} \times 100 = \text{percentage}$$

Root chord width

$$\frac{\text{(Tip) Chord Thickness @ center of wing}}{\text{(Tip) chord width}} \times 100 = \text{percentage}$$

(Tip) chord width

46 WARBIRD CLASS

(aka MODIFIED WARBIRD)

TYPE OF AIRCRAFT ALLOWED:

Any scale replica of a piston engine, man carrying, propeller driven fighter aircraft that served in WWII, the Korean conflict, Vietnam or any Reno Racer that raced in an official Unlimited race heat at Reno with a minimum of 475 sq in. and a minimum of 50 inch wingspan will be deemed legal. The fuselage must have a minimum length of 40 inches from the tip of spinner to the back of the rudder. Military Trainers such as AT-6, T-34 and PT-26 are legal. The World Models T-34 Mentor is legal. No twin-engine aircraft, Biplane or Formula I aircraft are allowed. No homebuilt type airplanes such as Lancair or Glasair

The Warbird/ Reno Racer must be a least standoff scale in appearance. They can be built from ARF kits, plans, or may be scratch built from plans or personal design. If they are to be scratch built or modified to resemble a Reno racer or Warbird, you must have all major radiator scoops and vents that extend from the fuselage attached. Gun stacks or Exhaust headers not necessary. This is not a scale contest. Airplanes will not be judged for scale appearance but will not be allowed to race without all necessary scoops or blisters that distinguish the airframes design. You may change the size of the moveable surfaces but the outline of the aircraft must resemble the outline of the full-size. If in doubt, please provide 3-view drawings or official plans of the aircraft.

BASIC RULES:

Aircraft must weigh a minimum of 5.0-lbs. dry weight and no more than 8lbs. Plans or outlines with dimensions of the wing is required as proof of square inches. The wing must have a minimum of 475 sq inches and a minimum of 50" wingspan. Wing and fuselage must be proportional in size. Airfoil thickness shall be no less than 10% from the root and tip cords. Wing must have constant taper. (See formula below). If you have a kit that isn't stock, proof of these dimensions is required. Elliptical wings will be measured four inches from the outer most tip of the wing for the tip chord thickness.

All aircraft must have retractable landing gear or fixed wire/plate gear in the locked down position. If aircraft has retractable landing gear, they must stay in a fixed down position and may not be retracted at any point of the race. You may tape or cover any and all holes to decrease drag on the wheel wells. Carriages, cradles, or hand launching are not permitted. All aircraft are required to have a tail wheel even if the full-size plane didn't. No tailskids allowed. No racing wheels allowed. Main wheels must be at least 1-1/2" tall and 1/2" constant wide. Fixed gear may use wire or plate landing gear struts.

You cannot use any advanced building techniques such as hollow core vacuum-bagged composite wings, goop hinges or skin hinging. Standard knuckle hinges/ CA hinges must be used. (Robart, C.G., DUBRO or etc.....) However additional materials can be added to allow strength to the structure of the aircraft as long as the exterior outline is not affected. Composite fuselages are allowed. You may add tape to the control surfaces to seal joints.

ENGINES ALLOWED:

Any side exhaust, front intake engine with a minimum displacement of .40cu.in. and a maximum displacement of .46 c.i is legal. Carburetors are required and must allow motor to idle with ease. Engines must idle a minimum of 4000 RPM for a 10 second period. Aircraft not meeting this will not be allowed to race. You may use any exhaust system of your choice be a special muffler or tuned pipe. Exhaust must be a minimum of 2 inches to be legal. You cannot use a Nelson, MB, Profi, Flora or Jett engines. You may use any performance pipes supplied by Nelson, MB Profi, Jett, Flora or any other performance-enhancing supplier. Engines may be modified and do not need to be stock.

Any two bladed or three bladed propellers may be used. No single bladed props allowed. No Metal or variable pitch propellers allowed.

No fuel restrictions. Only AMA legal fuel standards may be used. Bladder tanks or conventional tanks are allowed.

RADIO HOOKUP:

Radio hook-up is open with the exception: Servos must have at least 40oz. of torque if one servo is used. In the event two servos are used, a minimum of 25oz of torque is required per moveable surface. Minimum of a 600-mah-battery pack is required. Slip type linkages with setscrew may not be used on Ailerons or Elevator. Z-bend or solder linkages are the best suitable application for major control surfaces. All control linkages must have keepers.

Examples of Aircraft and Engines currently being used or that are legal. This list is just an example of what is being used and is not complete:

Aircraft:

Wing Manufacturing Kits

P-51D Mustang
Machi 202 Folgore
FW-190
F4U Corsair
Zero
P-39 Aircobra
P-40 Warhawk

Phoenix Models Kits

Strega

World Models Mfg

PT-26 Fairchild
T-34 Mentor

The Wings Maker

PT-26 Fairchild

Black Horse Models

Spitfire

Personal Scratch Built Aircraft

Tsunami (Modified Phoenix Models Strega)
T-34 Mentor

Engines:

O.S. Engines .46FX
O.S. Engines .46AX
Tower Hobbies .46
Super Tiger .45
MDS .46
Rossi 45

Exhaust Systems :

Performance Specialties Pipe
Jett Pipe
Mac Products Tuned Pipes
Rossi Pipes

75 WARBIIRD CLASS

(aka STOCK WARBIIRD)

AIRCRAFT SPECIFICATIONS

The following aircraft are legal to race in this class and must retain the stock structure.

The World Models Mfg:

? P-51D Mustang	57''w.s.	585sqin
? P-51 Dago Red	57''w.s.	585sqin
? F4U Corsair	55''w.s.	574sqin
? P-39 Aircobra (both versions)	62.5w.s.	711sqin
? P-40 Warhawk	58.5''w.s.	623sqin
? Spitfire	63''w.s.	704sqin
? Zero	60''w.s.	635sqin

The Wingsmaker Models

? Zero	60''w.s.	635sqin
? P-40 Warhawk	58.5''w.s.	623sqin

VQ Warbirds

? AT-6 Texan	60.5''w.s.	n/a
? P-51D Mustang	58.25''w.s.	597sqin
? P-51B Mustang	58.25''w.s.	597sqin
? ME-109 Messershmidt	60.5''w.s.	625sqin
? Macchi Veltro	62.25''w.s.	620sqin
? Mig 3	62.25''w.s.	618sqin
? Zero	62.25''w.s.	
? P-40 Warhawk	63''w.s.	
? P-39 Aircobra (Kit does not have retracts)	61.25''w.s.	
? KI-61 Tony	60.5''w.s.	604sqin
? FW-190 Focke Wolfe	60''w.s.	622sqin
? Hawker Hurricane	58.5''w.s.	
? P-51 Dago Red	58.25''w.s	597sqin

BASIC RULES:

The aircraft listed above are the only aircraft legal for the Stock Warbird Class. Some aircraft may have an advantage/disadvantage in speed due to increased wing area, wing thickness and/or weight. Not all VQ Warbird ARF kits offer retractable landing gear. Retracts may be installed by modifying the kit for installation purposes only. Gear must duplicate size and height of stock fixed gear. Almost Ready to Cover (ARC) models may be available and are legal as long as the kit isn't modified. (The Series Coordinator at any given time may add new aircraft supplied by both manufacturers that fit the rules.)

No kit modifications will be allowed to the structure of the aircraft such as but not limited to the use of foam wings, clipped wings, airfoil modifications, wing fairings, tail fairings unless supplied in the ARF kits. Incidence modifications to the wing or tail are allowed. Changing engine incidence is acceptable by shimming the motor mount to take out thrust if needed. Lightning holes along fuselage sides/bottom or any other structure of the aircraft not allowed if not supplied in the stock kit. Hidden Battery switch hatches are ok. Sheeting tail with plywood or balsa wood to strengthen tail is recommended for additional strength. Center sections of the wing may be fiber-glassed to add structural strength. The aircraft must be assembled per instructional booklet supplied with kit as to placement of Canopy and/or scoops/attachments. Aircraft may be re-covered in a different color scheme and are encouraged for easier aircraft identification. Cowls may not be altered in outline but air ducts may be sealed. Dihedral of the wing must measure 1/2" minimum or as per the ARF kit. (Dihedral is to be measured by setting one half of the wing on a flat surface and measuring the other wing panel at the lowest part of the outside wing-tip rib. Variances are up to Contest Director to allow legalization. Cockpit detail or pilots not required. Canopies may be tinted, clear or opaque. Cowl and Canopy mounting methods such as tape or screws is optional. Radial Cowls may build a hidden bulkhead to mount direct to firewall is desired. Kit hardware such as linkages, pushrods or screws may be substituted for standard hardware.

Air retracts may be substituted in lieu of mechanical gear as long as no drastic changes such as gear length has been changed. . Tail wheel may be relocated to scale location on fuselage but must be fixed in the down position. Pilots have the option to convert to fixed wire landing gear and cover the holes in the wing where the gear is retracted if desired.

Warning: Failure to strengthen Elevator & Wing may result in flutter or breakage of control surfaces and loss of aircraft may occur. Engine size specified for 75 warbird exceeds mfg. specifications

Most ARF have wheels supplied in kit. Replacement wheels must be of equal size (width and diameter) as the stock wheels or bigger. No racing wheels will be allowed. Wheels should be 2" in height and at least 1/2" constant thickness unless otherwise noted within the ARF kit. If stock kit requires smaller wheels, exceptions will be allowed. Landing gear fairings & Doors or such items may be mounted/taped to the wire that is exposed if supplied in the ARF kit.

Replacement wheels measure 50cm-58cm. (1" = 25.4mm)

Aircraft must weigh a minimum of 6.0 lbs. (dry) and no more than 10lbs (Dry)

ENGINES ALLOWED:

The only engines allowed will be the following:

- ? Tower Hobbies .75
- ? O.S. Engines .75 (**most powerful engine**)
- ? Super Tiger .75

No other engine manufacturer or models will be allowed. Please verify part numbers when choosing engines. The stock in the box muffler supplied with the engines is the

only muffler legal to use. You cannot switch mufflers within the engine manufacturers. You must run the supplied muffler for that particular engine used. Radial engine aircraft may use a stock manufactured spacer (O.S. is accepted) or by the other engine manufacturers to help allow clearance between the muffler and airframe. Removing the internal baffle if supplied within the muffler is legal. Drilling the exhaust exit (muffler exhaust extension must remain in contact or disqualification will occur) is also legal. You cannot drill the baffle and leave installed in muffler. Mufflers may be wire mounted to engine to eliminate loss of mufflers. Tie Straps securing the back half of the muffler also allowed. No muffler deflectors or extensions allowed. Mufflers may be welded to eliminate separation of halves. You may not remove or add any material to the engine or muffler other than head and sleeve shims. Hi Temp Silicon Sealant is allowed on the muffler only. **Engine must remain stock** with no modifications except those listed within the rules.

Front and Rear bearings may be replaced when original bearings are no longer acceptable in quality or performance. Any aftermarket bearing that is non-ceramic will be allowed. You can use sealed or non-sealed bearings.

Motors are randomly checked by Contest Director or appointed individuals. Engine checks are random and may or may not be observed at each and every race. The Contest Director has the option to pull any plane from the race at the end of the day and have them inspected regardless of position /placing at the event. Anyone refusing to have their engine inspected will be deemed illegal and disqualified.

Engines may be mounted upright, sideways or inverted.

Note: It is recommended that an all-thread rod of 4-40 or 6-32 be substituted for the standard bolt that goes through the muffler. Double nut with a lock nut at each end of the rod with lock-tite helps prevent loss of rear half of muffler. This is only a recommendation.

Any Synthetic and/or Castor oil fuel will be allowed with a maximum of 15% Nitro. Individual races may supply fuel if advertised prior to the race.

Gas Tanks are open to any size and manufacturer. **No** bladder tanks or pressurized fuel systems allowed. Check valves or any one-way restrictors are not allowed. Remote Needle Valves or fuel adjustment valves not allowed.

A Pressurized fuel system is any system, other than a simple, continuously open conduit between the fuel tank and a muffler or pipe, by which fuel is delivered to the carburetor or venturi at greater than ambient atmospheric pressure. A fuel tank containing a flexible bladder that prevents bubbling or foaming of the fuel but does not generate pressure is not a pressurized fuel system.

**No fueling devices or canisters allowed in the pits or flight line during the event.*

Any wood, carbon or Composite prop that is two or three bladed will only be allowed if commercially available for under \$15 at any time through mail order or a hobby shop. No single bladed propellers. *Props can be modified in shape and balance but must have equal blades.

The Spinner type is open to any manufacturer and size *(Plastic or Aluminum, brass spinner nuts allowed also). No flywheel spinners. It is highly encouraged to have a spinner that has a single bolt to hold onto the plane that way in the event the propeller becomes loose, the propeller can easily be tightened with little time.

RADIO HOOKUP:

Radio hook-up is open with the exception: No micro servos are allowed. Standard sized servos only. If dual servos are to be used in the wing, standard sized servos must be used. Minimum of a 600-mah-battery pack is required. Radio hardware such as pushrods and linkages may be replaced. *Slip type linkages with setscrew such as supplied in kit may not be used on Ailerons or Elevator. Z-bend or solder linkages are the best suitable application for major control surfaces. All control linkages must have keepers. Any size retract servo is allowed via mechanical gear or air. Micro servos allowed on retract applications only.

120 WARBIRD CLASS

(aka LIMITED WARBIRD)

TYPE OF AIRCRAFT ALLOWED:

Any scale replica of a piston engine, man carrying, propeller driven fighter aircraft that served in WWII, the Korean conflict, Vietnam or any Reno Racer that raced in an official Unlimited race heat at Reno with a minimum of 550 sq in. will be deemed legal. Military Trainers such as AT-6, T-34 and PT-26 are legal. The World Models T-34 Mentor is legal. No twin-engine aircraft, Biplane or Formula I aircraft are allowed. No homebuilt type airplanes such as Lancair or Glasair

The Warbird/ Reno Racer must be a least standoff scale in appearance. They can be built from ARF kits, plans, or may be scratch built from plans or personal design. If they are to be scratch built or modified to resemble a Reno racer or Warbird, you must have all major scoops and vents that extend from the fuselage attached. Gun stacks or Exhaust headers not necessary. This is not a scale contest. Airplanes will not be judged for scale appearance but will not be allowed to race without all necessary scoops or blisters that distinguish the airframes design. You may change the size of the moveable surfaces but the outline of the aircraft must resemble the outline of the full-size.

BASIC RULES:

Aircraft must weigh a minimum of 6.5-lbs. dry weight and no more than 15lbs. Plans or outlines with dimensions of the wing is required as proof of square inches. The wing must have a minimum of 550 sq inches. Wing and fuselage must be proportional in size. Airfoil thickness shall be no less than 11% from the root and tip cords. Wing must have constant taper. (See formula below). If you have a kit that isn't stock, proof of these dimensions is required. Elliptical wings will be measured four inches from the outer most tip of the wing for the tip chord thickness.

All aircraft must have landing gear, fixed or retractable. Carriages, cradles, or hand launching are not permitted. All aircraft are required to have a tail wheel. No tailskids allowed. No racing wheels allowed. Main wheels must be at least 2" tall and 1/2" constant width.

You can use any advanced building techniques such as hollow core vacuum-bagged composite wings; goop hinges or skin hinging. Composite fuselages are allowed.

ENGINES ALLOWED:

The following engines are the only engines allowed:

Any front intake, side exhaust 2-stroke engine with a minimum of .90cu.in and a maximum 1.20 cu.in sized engine or manufacturer may be used. Carburetors are required and must allow motor to idle with ease. Engines must idle a minimum of 4000 RPM for a 10 second period. Aircraft not meeting this will not be allowed to race. You may use any exhaust system of your choice be a special muffler or tuned pipe. Exhaust

must be a minimum of 2 inches to be legal. Ducted fan engines or Helicopter engines not allowed. Modifications are legal.

Any four-stroke .90 to 1.20 engines allowed. You may use any exhaust system of your choice be a special muffler or tuned pipe. Straight header pipes allowed. Exhaust header pipes must be at least 1-1/2" in length

Any two bladed or three bladed propellers may be used. No single bladed props allowed. No Metal or variable pitch propellers allowed. Please make sure propellers used do not exceed maximum RPM limits.

No fuel restrictions. Only AMA legal fuel standards may be used. Bladder tanks or conventional tanks are allowed.

RADIO HOOKUP:

Radio hook-up is open with the exception: Servos must have at least 50oz. of torque for operating control surfaces. Any other functions can use any type of servo. Minimum of a 720-mah-battery pack is required. Slip type linkages with setscrew may not be used on Ailerons or Elevator. Z-bend or solder linkages are the best suitable application for major control surfaces. All control linkages must have keepers. Retractable Servos may be of any size. It is **recommended** for safety purposes to run (2) Elevator servos (one per surface) and (2) Aileron Servos (one per surface).

UNLIMITED WARBIRD CLASS

TYPE OF AIRCRAFT ALLOWED:

Any scale replica of a piston engine, man carrying, propeller driven fighter aircraft that served in WWII, the Korean conflict, Vietnam or any Reno Racer that raced in an official Unlimited race heat at Reno with a minimum of 510 sq in. will be deemed legal. Military Trainers such as AT-6, T-34 and PT-26 are legal. Experimental Warbirds in the 1941-1948 eras are legal. Documentation is required for experimental Warbird aircraft. Please submit to Series Coordinator for approval. The World Models T-34 Mentor is legal. No twin-engine aircraft, Biplane or Formula I aircraft are allowed. No homebuilt type airplanes such as Lancair or Glasair

The Warbird/ Reno Racer must be a least standoff scale in appearance. They can be built from ARF kits, plans, or may be scratch built from plans or personal design. If they are to be scratch built or modified to resemble a Reno racer or Warbird, you must have all major scoops, vents and exhaust headers that extend from the fuselage attached. This pertains to radiator coolers and major air vents. Gun stacks or Exhaust headers not necessary. This is not a scale contest. Airplanes will not be judged for scale appearance but will not be allowed to race without all necessary scoops or blisters that distinguish the airframes design. You may change the size of the moveable surfaces but the outline of the aircraft must resemble the outline of the full-size.

BASIC RULES:

Aircraft must weigh a minimum of 6.5-lbs. dry weight and no more than 15lbs. Plans or outlines with dimensions of the wing is required as proof of square inches. The wing must have a minimum of 510 sq inches. Wing and fuselage must be proportional in size. Airfoil thickness shall be no less than 11% from the root and tip cords. Wing must have constant taper. (See formula below). If you have a kit that isn't stock, proof of these dimensions is required. Elliptical wings will be measured four inches from the outer most tip of the wing for the tip chord thickness.

All aircraft must have landing gear, fixed or retractable. Carriages, cradles, or hand launching are not permitted. All aircraft are required to have a tail wheel. No tailskids allowed. No racing wheels allowed. Main wheels must be at least 2" tall and 1/2" constant width.

You can use any advanced building techniques such as hollow core vacuum-bagged composite wings; goop hinges or skin hinging. Composite fuselages are allowed.

ENGINES ALLOWED:

Any size engine or manufacturer may be used up to a maximum displacement of 1.6 cu.in. For aircraft. Carburetors are required and must allow motor to idle with ease. Engines must idle a minimum of 4000 RPM for a 10 second period. Aircraft not meeting this will not be allowed to race. You may use any exhaust system of your choice be a special muffler or tuned pipe. Exhaust must be a minimum of 2 inches to be legal. 4-strokes may use supplied headers or any exhaust. Side Exhaust, Rear Exhaust, Ducted Fans, and Four-strokes may be used. Modifications are legal.

Any two bladed or three bladed propellers may be used. No single bladed props allowed. No Metal or variable pitch propellers allowed. Please make sure propellers used do not exceed maximum RPM limits.

No fuel restrictions. Only AMA legal fuel standards must be used. Bladder tanks or conventional tanks are allowed.

RADIO HOOKUP:

Radio hook-up is open with the exception: Servos must have at least 50oz. of torque for operating control surfaces. Any other functions can use any type of servo. Minimum of a 600-mah-battery pack is required. Slip type linkages with setscrew may not be used on Ailerons or Elevator. Z-bend or solder linkages are the best suitable application for major control surfaces. All control linkages must have keepers. Retractable Servos may be of any size. It is **recommended** for safety purposes to run (2) Elevator servos (one per surface) and (2) Aileron Servos (one per surface).

RACE DAY RULES

THESE GUIDELINES APPLY FOR ALL RACES PARTICIPATING IN THE SPORT WARBLER SERIES.

Guidelines and Procedures

Frequency Registration should be done prior to the day of the race by the Series Coordinator or the Contest Director. They will be accepted the day of the pilot's first race. All pilots must be registered and paid or they will not be allowed to enter the race.

All aircraft need to be inspected for legality and/or Safety inspected. Inspection starts at 7:15am and closes at 8:00am. Participants are encouraged to have aircraft inspected the weekend prior or week prior to the race by selected individuals in participating areas. Contact the Contest Director for more information.

Individual event registration opens at 7:30am and closed at 8:15am. All aircraft not registered prior to closing will not be allowed to race. For pre-registration of events, contact the Contest Director associated with the individual races. At the time of registration, pilots must have Registration form(s) for each class entered, safety inspection sheets filled out and signed by the pilot and inspector, and the AMA release form for the pilot and crews associated with the racing team.

A pilots meeting will be conducted at 8:45 to go over any safety concerns or formats needed for the day of the race. Frequency control will be highlighted also.

All matrixes and points will be displayed for all pilots & crews to read at the designated area.

Event Procedures:

Any and all engine start-ups will be in the start-up area designated for run-ups and starting before and during the race. There will be no engine run-ups in any area other than what is assigned or designated. Failure to comply will result in disqualification. All pilots must have a helper to start the engine for safety.

All aircraft in the competition will need to be staged prior to their individual heats in the staging areas accordingly. There will be a "Ready Box", "On Deck", and the "Hole". If your aircraft is not staged and your aircraft is called out to race and is not staged ready to go, you will not be able to make up any missed heats. All other aircraft will remain in the pit area until their heat race is called.

* The Contest Director has option to move pilots to another heat or hold a complete heat race for a missing aircraft if needed for any reason.

There are stations for five pilot's with-in a given area, which you may stand with-in. There will be no standing beyond the given area. Pilot's must space themselves out evenly. It is up to the callers to make sure that each pilot is at least 5 feet from the next pilot.

There will be a 90-second starting window. All aircraft must be ready to take-off at the end of 90-seconds. All aircraft are to remain in their start box until the starter or assistant

has called you to the runway to take off. At the end of 90-seconds or when the last aircraft takes off, the time clock will begin. The time clock will start at a thirty or twenty- second countdown. Once the start clock has started, no aircraft will be allowed to take-off. The start judge has the right to delay the start clock if he/she feels the field needs more time to start. Safety is an issue. Do not hurry to the point where you make a mistake and injure yourself.

Pilots are allowed *1 takeoff attempt*. Once the main wheels of the aircraft depart the ground, an attempt has been made. If during the 90-second window an engine dies and the takeoff attempt has not been made, the plane may be restarted. Once an aircraft has taken off, the pilot may not land and adjust his needle valve or re-enter the race.

Contestants may enter the runway area when called by the starter. 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 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. All callers should set the aircraft on the ground and have a sign from the pilot to release the aircraft when ready.

The start clock will start at the starters decision once all aircraft are safely airborne. The announcer will advise as the clock counts down to 20 seconds, 15 seconds, and then countdown from 10 seconds to the start of the heat. The heat begins when the clock reaches zero and the horn sounds. 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.

Aircraft jumping starts will be given a one-lap penalty. During the start of the race, Pilots are required to make the attempt to go around Pylon 2 at the start of the race. *No* 360-degree turns or loops in the start area box (Defined at race) will be allowed and will result in a Pylon cut if done. Pilots are to attempt to fly parallel with the course at the start of the race and not at the pilots or spectators. If a pilot is up at 200' above the course, split S maneuvers will be allowed for starts. Once a pilot crosses the center of Pylon 2 and the start/ finish line with less than 5 seconds on the clock, this is considered an attempt at the start and will be given a start cut if the pilot crosses the line early even if attempts to circle around and go back to the pylon. A pylon cut may also result if the pilot crosses the line and turns around.

Each heat will consist of 8 laps in a racetrack pattern flown past and/or around each pylon pole without crossing the deadline. Pilots must also keep their aircraft above the top of the pylon poles. Pilots do not have to go around but break the plain between the pylon judges and the pylon poles. If a pilot doesn't go past the plain, a cut will be issued.

A dead line will be established at each race event. If a pilot crosses over this dead line, he/she will be given a warning. If continued, the pilot will be asked to pull out of the heat race and given zero points for that heat. Continuous breakage of the rules will result in disqualification for the event.

In the event of a mid-air collision, the starter will decide whether to require the planes to land or continue on with the race. This is a judgment call and cannot be protested. In the

event one aircraft is grounded but the other is not, it is up to the starter to allow the flying aircraft to finish.

Points system is as follows: 1st place-5 pnts, 2nd place-4 pnts, 3rd place-3 pnts, 4th place- 2 pnts, and 5th place-1pnt. Pilots obtaining cuts during a heat race will loose a one-lap finish based on their overall finish. Pilots with three or more cuts will be given 1 points overall for the heat regardless of finished position.

The Trophy race will be determined by taking the top five pilots with the highest points accumulated from the heat races generated throughout the racing event. In the case that there is a tie in the standings, the contest coordinator has the option to run a sixth or seventh plane in the trophy race or have a fly-off to determine which pilot goes into the selected trophy race heat. Points are issued like that of a heat race in the trophy race and go to their total points total for the Championship series. If a 6th or 7th aircraft is allowed to race, the finish positions of 5th -7th will be issued with one point.

During the end of the race, call out your landing approaches. The runway is open for all pilots. There will be no retrieval of aircraft until the last aircraft has landed. If taxing, stay as close to the fence as possible. Do not attempt to land until the race is over. Failure to do so can result in a cut penalty. If an aircraft is low on gas, climb to a safe altitude in case of an emergency.

After each round, there will be a ten-minute window for all retrieval of aircraft in the field in the case of lost aircraft. If the aircraft is beyond a given area and the starting judge feels it will take longer than ten minutes to retrieve, you will be able to retrieve the aircraft at lunch or at the end of the event. This window also is to allow pilots and crews to refuel and do maintenance needed to aircraft.

No aerobatics on the course. You will be given a warning the first time and disqualified thereafter. This includes prior the start of the race, during the race and after the race.

Safety is the # 1 concern. Fly Safe, Think Safe, and Win safe.

RACE NUMBER DIAGRAM

BOTTOM

FUSELAGE NUMBERS-OPTION 1

3" NUMBERS ON FUSE SIDE BETWEEN TRAILING EDGE OF WING AND LEADING EDGE OF TAIL (BOTH SIDES)

FUSELAGE NUMBERS-OPTION 2

3" NUMBERS ON RUDDER (BOTH SIDES)

BOTTOM OF WING NUMBERS

7" NUMBERS BOTTOM WING, HIGH PANEL/LOW PANEL. MAKE SURE THAT FUSE IS POINTED IN SAME DIRECTION AS DRAWING.

