

2019 – 2020 NFFS Competition Rules

NATIONAL FREE FLIGHT SOCIETY
OFFICIAL COMPETITION RULES

2019 – 2020 EDITION
Release 1 - See Page i for Description of Changes/Additions



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Notice:

This Rulebook contains the most current NFFS Competition Rules and supersedes previous editions. Copies of the Rulebook and the Nostalgia Eligible Designs List may be purchased from the NFFS Publications Service or may be downloaded and printed from the NFFS Web site <http://freeflight.org>. Construction plans for the eligible designs may be purchased from the NFFS Plans Service.

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List of Releases

Release 1 - Rule changes and additions for 2019/2020 are as follows.

1. Classic Towline - Section 15.2 subparagraph 3 has been modified and subparagraph 4 added to preclude aggressive zoom launches which are inconsistent with the intent of the Classic Towline event.
2. E Nostalgia - Section 12 having been a provisional for the minimum of 4 years and having received enthusiastic reception E NOS has been upgraded to an "Official" event. This change was approved by both the NFFS BOD and the Competition Committee.
3. Golden Age - Section 19.3 has been updated allowing a flier to enter and fly a gas powered and an electric powered model in the same contest. Also VTO has been eliminated from all flyoff flights for all 3 flight categories. In general the entire section has been reviewed and revised to improve readability.

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1 INTRODUCTION

The intent of the NFFS sponsored events are to maintain and promote interest in Nostalgia Gas and Rubber movement and it's Rules is to perpetuate interest in free-flight power and rubber designs of the January 1, 1943 to December 31, 1956 period, using engines of the period in the gas events. The Society also promotes flying of towline glider models in the Classic Open Towline Glider event, Vintage FAI Power, Small Mulvihill, PAA Load, and Super D, a large power event. In addition the NFFS fields new events to help promote new technologies and ideas which may have wide appeal to the free flight community. AN example of such events are electrical power models such as E NOS which is a provisional event and E-36 which has transitioned from an NFFS Event to an AMA sponsored event. All of the NFFS events are intended to be more casual events than the AMA and FAI formal events for enjoyment of those competing with designs of the respective eras. Consequently, no national records will be maintained

Current AMA free flight and general rules apply to all NFFS events and competitions unless specifically modified by the NFFS Competition Rules presented in the remainder of this document. Some examples of this are having 6 flights to make 3 official flights with any flight of 20 seconds or more being an attempt. The contestant has the option of declaring a flight under 20 seconds as official.

2 THE USNC / USOC CHAMPIONSHIPS

2.1 Points

The NFFS will normally conduct the competitions for determining individual national Champions as part of the annual U.S. Outdoor Championships (USOC) in Muncie, Indiana. Points earned by competitors in the respective category events will determine the individual Champions. Organizers will use the approved Points Table (Appendix B **USOC National Championship Points Table**) to award points for standings in the events.

2.2 Events

USOC officials have the option of including any or all NFFS events as Championship events or may combine or eliminate events from the USOC schedule. Such scheduling decisions will be announced sufficiently in advance in the NFFS Free Flight Digest and NFFS Web site.

2.3 Host and Sponsor

Although the NFFS USOC at Muncie will ordinarily provide the venue for the U.S. Nostalgia Championships (USNC), managers of other major contests may request the right to host the USNC. If the request meets requirements listed below, the Competitions Committee and Nostalgia Subcommittee will poll the committee members for opinions on awarding the USNC to the applicant:

1. Written applications by sponsors must be submitted 12 or more months in advance of the USNC.
 2. Financial arrangements for contest expenses, pre-event publicity and administrative support are assured.
 3. The sponsor will conduct a AAA or larger contest that attracts participants from a wide geographic area.
- The Committees recommendations will be forwarded to the President and Directors for a final decision.

3 COMPETITION EVENTS AND RULES MANAGEMENT

3.1 Purposes of the Rules

The purpose of this Competition Rules and Events Management" section of the NFFS Rule Book is to document the rules and procedures for free flight events ranging from establishing new events, through refining the rules for established events, to deleting an event if it becomes obsolete. Officers of the NFFS and its Competition Committee and Subcommittees are entrusted with administration and interpretation of NFFS Competition Rules. Any proposal for new events or for modification of rules will only be recognized if the person(s) submitting the proposal are current NFFS members.

3.2 Rules Cycle

The rules cycle is in effect for a 2-year period that coincides with the current free-flight rules cycle of the Academy of Model Aeronautics (AMA). NFFS will entertain proposed rule changes and proposed new events from the start of the rule cycle up to 15 March of every even numbered year. All proposals for new events and rule changes shall be submitted by the sponsor in electronic format (.doc) compatible with Microsoft Word.

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3.3 Rule Changes

NFFS will accept proposed rules changes for official events from the start of the rule cycle up to 15 March of every even numbered year. Proposed rule changes for existing events shall be submitted to the Competition Committee Chairman in electronic format. The Competition Committee Chairman will distribute the proposal to the affected subcommittee(s) for review and approval. Proposed changes shall reference the Rule Book paragraph(s), provide complete wording for the change, justification for the change, and recommendations by additional NFFS members. If a proposed rule addition or change is general in nature and affects most if not all events that proposal will be reviewed and accepted/rejected by the Competition Committee. Once enacted, the rules shall be in effect for two years, except for emergency changes deemed to be necessary by NFFS officials. Following review and acceptance a summary of any rule changes will be published in the NFFS Digest and posted on the NFFS web site. All changes will be published in the NFFS Rule Book available for download near the end of the rule cycle in even numbered years.

3.4 New Event Proposal Procedure and NFFS Review

This section outlines the procedures which must be followed by an NFFS Member sponsoring a new event. Not only must the sponsor(s) comply with the necessary documentation requirements but must be willing to promote the event at the local and national level if the event is to earn official status and be offered at NFFS sponsored contests. The sponsor will be requested to form and lead a Competition Committee Subcommittee dedicated to overseeing and updating rules for the event should it become official.

3.4.1 Submitting New Event Proposal

Proposals for new events shall be submitted electronically (email) by a NFFS member to the Competition Committee Chairman in accord with the rule cycle. It is recommended that two documents be submitted.

1. The primary document should only cover the basic rules of the proposed event in a format that is at a minimum similar to that used in the NFFS rule book. It is strongly recommended that the rules be kept as simple as possible and any event rules that are already covered in the NFFS General rules not be repeated. Also note that proposed events should not include those AMA rules which are recognized as applicable to NFFS events. Such rules include snuffer tubes, BOM, AMA identification, and the AMA free flight safety code.
2. A supporting but separate document shall be submitted which outlines the benefits of adding the event. Photos of completed aircraft, recommendations by recognized contest fliers, and participation data from local contest where the event was flown should be included.

3.4.2 Initial Proposal Acceptance

The Competition Committee Chairman will submit the proposal to the NFFS President/Board of Directors (BOD), and the Competition Committee by 15 April for approval or rejection of the event by 15 May. Approval requires a majority acceptance by both the BOD and the Competition Committee. Some factors to be considered are the perceived attractiveness of the event, potential positive and negative effects of this event on existing NFFS and AMA event participation, and compatibility with the ever decreasing availability of flying sites. Approval may be based on incorporation of specific recommendations made by the BOD and Competition Committee.

3.4.3 Proposal Rules Refinement

Assuming that the proposal is accepted it will be returned to the sponsor by 15 June for incorporation of any recommendations. The sponsor shall then prepare an article to be published on the NFFS Digest which briefly outlines the event rules, benefits, and solicits comments from the NFFS members for refinement. This article shall be submitted to the Competition Committee Chairman for review by 15 July. The article will then be submitted to the NFFS Digest and the NFFS web site by the Competition Committee Chairman by 15 August for publishing and solicitation of comments. If comments are received the sponsor and Competition Committee Chairman shall review the comments and incorporate those that are acceptable to all.

3.4.4 Rule Book Incorporation

The event will then be added to the rule book as a provisional event and shall remain provisional for a minimum of two rule cycles or four years. If during that time the sponsor can show significant interest across a wide geographical area the sponsor may apply to have the rule declared an official event. In order for the event to be classified as an "Official" the event must be sponsored at the NATS and shall be flown

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by at least 6 individuals during both the 3rd and 4th years of its provisional status. Sponsoring of the event at the NATS is the responsibility of the original event sponsor or their designee. At this point the NFFS will consider the event for "Official" status. See paragraph 3.7 for a definition of Official and Provisional rules.

3.5 Change To A Existing Event

Proposals for a change to an existing event(s) shall be submitted to the Competition Committee Chairman in accord with the rules cycle and will be submitted to the appropriate subcommittee by the Chairman for approval, approval with reservations based on specific recommendations, or rejected by the members of the subcommittee. If there is no subcommittee tasked to oversee an existing event that proposal shall be reviewed by the Competition Committee.

3.6 Deleting An Event

A provisional or official event may be deleted from the rule book if the event is not generating sufficient interest to continue or presents a safety hazard. Deletion requires a consensus of the BOD and the Competition Committee.

3.7 Rule Classification

All rules presented in this document are official unless noted as provisional. Official rules are subject to the two year rules cycle described in section 3.2. Provisional rules are developmental in nature and can be modified as necessary during the rules cycle to improve their functionality and or appeal. They cannot be made official until the start of a rules cycle. Any changes made to provisional rules during the rule cycle will be published in the NFFS Digest and on the NFFS web site.

4 GENERAL RULES

The General AMA rules and Outdoor Free Flight rules apply to all of the NFFS events unless specifically modified by the rules stated under NFFS event specific sections. Specifically in the definition of attempts, official flights as defined in the 2015 AMA rule book and later applies to all NFFS Outdoor events unless specified otherwise under the specific event rules. The AMA rules currently state the following:

9A. Flight Attempts:

- a) *When the motor run of any powered event exceeds the official category limit or a limit set by the contest director by 0.1 second.*
- b) *When the flight is less than 20 seconds except if set higher in a particular event. A contestant can declare that the flight is official before making another flight.*
- c) *When a mid-air collision occurs with another model. The contestant can declare within 10 seconds if to continue timing the flight; such a choice is irreversible.*
- d) *When part of the model becomes detach in flight.*

5 GENERAL NOSTALGIA POWER/GAS, ELECTRIC, AND RUBBER GUIDELINES

5.1 Model Eligibility

Free-flight power and rubber models suitable for NFFS events that were first available in kit form or as plans that first appeared in a commercial publication between Jan. 1, 1943 and Dec. 31, 1956 are automatically eligible. The NFFS Competition Committees and Nostalgia Subcommittees will consider for acceptance models kitted or published after the 1956 cutoff date, if it can be proved that the model flew competitively in the required timeframe, see Approval Procedures, below. The Committees will also consider models that were not commercially kitted or published, but which otherwise qualify. All towline glider designs that meet NFFS Classic Open Towline Glider rules requirements are eligible

1. Nostalgia Gas and Rubber designs that were kitted or published after 1942 but were also available prior to World War II are not eligible for NFFS competitions. Examples are the Pacer, Comet Zipper A, 1939 Zipper, Sailplane, Interceptor, Strato Streak and Brooklyn Dodger.
2. A Nostalgia Eligible Designs List is available from NFFS Publications Service.
3. Any question of proof regarding eligibility of a model or engine is the responsibility of the contestant.

5.2 Scaling

Scaling up or down of models is permitted except where noted.

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5.3 Approval Procedures

Competitors seeking approval of a gas model design for competition must complete a standard design-information form, available from the NFFS Nostalgia Subcommittee, and submit it, with other supporting documentation, (photos, articles, etc.) to the Chairman. Include a 3-view plan with airfoils and sufficient construction detail. A 3-view measuring 8-1/2 x 11-in., is acceptable, but a full-size plan must be available if requested. If approved, the design and plan will be featured in NFFS Free Flight Digest. Authentication of Nostalgia Rubber and Classic Open Towline Glider designs is the responsibility of the contestants

5.4 Later Modifications & Approval

Changes in an already approved original gas model design made during the Nostalgia timeframe must also be submitted to the design-approval procedure to be eligible for competition. The Nostalgia Subcommittee will consider documentation offered to prove that a design flew with such modifications in competition during the Nostalgia era. Otherwise, the builder should faithfully maintain the dimensions and construction details of the original model, except for minor differences in nose moment and thrust line and the following allowed modifications (see Construction Guidelines below)..

5.5 Model Construction Guidelines

5.5.1 Allowed Modifications

The following changes are allowed in original model plan construction details:

1. Strengthening and reinforcing materials may be added by using gussets, doublers, larger wood sizes, etc.
2. Wing spars may be added at any point in the airfoil (upper and lower surfaces and internal) with the following restriction. In the forward 33% of the wing section only one additional upper surface turbulator type spar, flush with the upper surface, may be added. In addition, use of any other turbulator device is prohibited. Addition of false ribs is permitted, as is strengthening of the wing center section with sheet.
3. Ribs and formers may be added when scaling up and may be reduced in number when scaling down.

5.5.2 Restricted Modifications

Construction restrictions include:

1. No variation in stab location. Changing location from the bottom of the fuselage to the top is prohibited, unless it can be proved that the variation was flown in competition during the Nostalgia timeframe.
2. No geodetic or Warren truss-type construction is allowed unless it is shown on original plans;
3. No addition of sheet to wing and/or stab leading edges is permitted. No substitution of sheet for built-up sections on fuselages is allowed, except in high-stress areas like the engine mounting area, pylon base and stab mounting area;
4. Auto-surfaces are prohibited even if shown on the original plans except movement of the rudder for Classic Open Towline Glider at the time of towline release is allowed.

5.5.3 Covering

Any commercially available covering material is acceptable.

5.5.4 Wheels and Skid

Models must have at least as many wheels and/or skids as shown on the construction plan. When scaling a model up or down, the scaling factor will determine the minimum wheel diameters.

If the original plans show neither wheel nor skid, the option of using wheel, skid or no undercarriage is up to the builder. Some designs had versions with both wheels and skids. If the model is built from or scaled from one of these plans, the builder may use whichever undercarriage is shown on that plan.

6 NOSTALGIA GAS GENERAL RULES

6.1 Official Flights and Scoring

Unless otherwise noted, AMA rules apply to Nostalgia Gas. Contestants are allowed six attempts to make three official flights. The final score is the total time of up to three official flights plus any fly-off flights

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for which the contestant becomes eligible by achieving maximum times in each of the first three official flights.

6.2 Fuel and Fuel Systems

Except for the Ignition Event, Nostalgia Gas rules allow any fuel ingredients permitted by AMA regulations. Fuel feed may be suction or pressure.

6.3 Number of Models Allowed

A contestant is permitted to enter and fly two models in each event. The contestant must declare a model before attempting the first official flight with that model.

6.4 Design Eligibility

Only model designs listed in the Nostalgia Eligible Designs List are eligible for competition. (The Eligible Designs List is available from NFFS Publications and is on the NFFS web site).

6.5 Engine Eligibility

Eligible and specific ineligible engines for use in all Nostalgia Gas events unless otherwise specified under the specific events are listed in Appendix A NOS Gas Engines.

6.5.1 Pre-1957 Engines

Glow or diesel engines produced and made commercially available prior to 1957 are eligible for Standard events. Cox Tee Dee .010 and .020 engines are eligible for 1/4A Nostalgia.

6.5.2 Pre-1963 Engines

Any, plain-bearing, loop-scavenged engine that was produced and commercially available prior to 1963 is also eligible.

Ineligible exceptions are ABC or Perry-ported engines; .049-.152 Cox Tee Dees; all post-1956 ball-bearing Cox engines except 1957 Olympic 15. Perry porting is an early form of schnuerle porting and is evident by added small ports located between the transfer port(s) and the exhaust port(s).

6.5.3 Reproductions

Certain reproduction engines are eligible, but they must first have been approved by the NFFS Nostalgia Committee. Companies considering manufacturing a reproduction engine for potential Nostalgia competition should contact NFFS prior to commercial release of such a product. Currently eligible reproduction engines are shown on the engine list, by name of manufacturer.

6.5.4 Custom-Built

Home-built engines are not eligible. Even those flown during the Nostalgia era must be approved by the NFFS Nostalgia Committee to gain eligibility.

6.5.5 Special Post-1956 Engines

Certain post-1956 engines are eligible for Nostalgia. They are designated with an "SE" suffix on the engine list.

6.5.6 Modifications

Standard engine reworking practices are acceptable, as is substitution of needle-valve assemblies and standard-configuration venturi. Illegal procedures include changing an ineligible ball-bearing engine to plain bearing; changing intake location, or changing from glow to diesel operation (or vice versa) unless the manufacturer supplied such parts for changeover during the Nostalgia timeframe.

6.5.7 Glow Plugs/Heads

This section applies to any Nostalgia engine. In addition to stock items, the following glow plugs and glow heads are acceptable:

1. Any screw-in glow plug, including GloBee and Nelson with a vertical element is legal for use on any Nostalgia engine. Note: the flat-coil GloBee head (insert/button type with flat element and any facsimile thereof) is allowed for use only in the Cox 0.020 family of engines.

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2. Turned-down Cox 325 glow head, for use with a screw-in ring, offered for sale by a commercial source for the Holland Hornet, is acceptable.
3. Modified AME glow head may be used may be used in any 1/2A engine for Nostalgia but not for Early 1/2A Nostalgia.
4. Cox 1702 head is permitted only on the Cox Thermal Hopper and Space Hopper.
5. Otherwise, any other plug/head combination is acceptable, so long as it is commercially available (advertised for sale in letterpress commercial publications—including the classified or display ads in NFFS Digest), and is thus available to anyone.

6.6 Scaling

Scaling of any approved original design to any desired size for flying in Standard and ROW Gas events is permitted. Scaling for PAA, Ignition or Early 1/2A is not permitted, except to other sizes as noted on the original plan or construction article.

6.7 Model Weight

Gas models must weigh at least 100 oz per cu. in. of engine displacement (without fuel).

6.8 Launches

Contestants have the option of hand launching or one-point VTO in Category I and Category II events. Category III flights are hand launched.

6.9 Propellers

Propellers shall be fixed (not folding) for all NOS Power events.

7 STANDARD NOSTALGIA GAS

7.1 Standard NOS Gas Events

Table 1 - Standard NOS Gas Event Classifications

Events	Engine Displacement (cubic in.)
1/4A	.000 -.025
1/2A	.026-.050
A	.051-.199
B	.200-.300
C	.301-.650

7.2 Engine Runs and Flight Maximums

The contest director may establish engine runs and maximum flight times, depending on weather and flying-site conditions. Otherwise, the following times (in seconds) are allowed for all Standard Nostalgia Gas and Early 1/2A Nostalgia Gas events.

Table 2 - Engine Runs and Flight Maximums for Standard NOS Gas

	1st Three Official Flights (sec)	First 2 Fly-off Flights (sec)	Subsequent Flyoff Flights (sec)	Flight Maximums (sec)
Cat I				
Handlaunch	14	8	8	300
VTO	17	12	12	300
Cat II				
Handlaunch	12	8	8	180
VTO	15	11	11	180
Cat III				
Handlaunch	9	6	5	120

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8 EARLY ½ A NOSTALGIA GAS

8.1 Scaling

Not permitted.

8.2 Engine Runs and Flight Maximums

The engine runs and flight maximums are the same as for Standard Nostalgia Gas (above).

8.3 Engine Eligibility

Early 1/2A engines are restricted to OK Cub 049 (Original A, B, and X); Wasp as manufactured by both Atwood and Holland; Anderson (Royal Baby Spitfire 049, Baby Spitfire, Spitzzy and Spitzzy Sr. 045); first K&B Torpedo 049; and Wen-Mac 049. Use of an integral head/glow element (aka Glow Head) in any early NOS engine is not legal for competition.

8.4 Ineligible Engines

OK-Cub reed valves and diesels and any other engine not listed in 6.3.4.

9 IGNITION NOSTALGIA GAS

9.1 Design Eligibility

Designs of the Nostalgia era in the World War II and late 1940's period that were powered by spark-ignition engines are eligible. Plans must show a spark-ignition engine or it must be referenced in a published article. The design must have originally flown with an ignition engine. Nostalgia Eligible Designs are indicated on the Plans List by an asterisk (*) preceding the wingspan.

Plans that indicate the models used either glow or ignition engines (Civy Boy, kitted Zeek, Super Slicker, etc.) are not eligible. However, designs that show both ignition and diesel engines are eligible. Several designs are legal for both Nostalgia Ignition and SAM Old Timer. The Eligible Designs List identifies the latter by an asterisk and a plus sign (*+) preceding the model's wingspan.

9.2 Scaling

Not permitted for Ignition, unless other sizes are noted on the original plan or construction article.

9.3 Classes

Nostalgia Ignition events may be flown in two classes:-

1. Small (.09-.28 cu. in.)
2. Large (.281-1.20 cu. in.)

Combining classes is at the discretion of local Contest Directors or the USNC/USOC contest management.

9.4 Engine Runs and Flight Maximums

The contest director may establish engine runs and maximum flight times depending on weather and flying-site conditions. Otherwise, the following times (in seconds) are allowed for Ignition Nostalgia Gas.

Table 3 - Engine Runs and Flight Maximums for Ignition NOS Gas

	1st Three Official Flights (sec)	Fly-off Flights (sec)	Flight Maximums (sec)
Cat I			
Handlaunch	16	11	300
ROG	20	15	300
Cat II			
Handlaunch	16	11	180
ROG	20	15	180
Cat III			
Handlaunch	16	11	120

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9.5 Ignition Systems

Engine shutoff must be by timer-operated electrical circuit breaker. Use of transistorized components other than for ignition systems is not approved.

9.6 Fuel

Fuels legal for Old Timer Free Flight Ignition events are acceptable for NFFS Nostalgia Ignition.

9.7 Model Weight

Models must weigh at least 8 oz/sq ft of projected wing area, less fuel. If flown in Standard Nostalgia category, an Ignition-powered model will be subject to the same engine-run and power-loading requirements as a glow-powered model.

9.8 Eligible Ignition Engines

1. Pre-1952 original ignition engines;
2. Approved replicas and certain recently manufactured ignition engines. Examples are: Morrill Hornet 19 and Simplex 25; J&J Torpedo 29 and 32; Wahl Bunch Tiger, Brown, Gold Seal and Hurleman; MG and RJI Forster front intake 29 and 35; Orwicks by Dunham and Kustom Kraft; Spielmaker Golden Eagle Megow 19 and Bantam 16; Edco 65, Super Cyclone, 1949 McCoy and Bantam 19 replicas; Remco 29; Shilen K&B Torpedo, Orr.
3. Glow engines produced during the ignition-glow transition period, offered in either version and converted to ignition. Examples: Ohlsson, 1948 Torpedo, Mighty Midget, twin-stack Torpedo Special, Atwood, Bullet, Orwick, Forster, Bantam, McCoy 36 Sportsman Jr. and 55 Sportsman Sr., Anderson Spitfire.

9.9 Ineligible Ignition Engines

Other glow engines converted to ignition; Shilen Old Timer 19.

10 RISE-OFF-WATER NOSTALGIA GAS

Any approved Nostalgia Gas design is acceptable for ROW. Scaling is permitted. Engine eligibility and weight requirements are the same as for Standard Nostalgia. Engine classes are combined. The Contest Director may use site and weather considerations to determine engine runs and flight-time limits.

11 NOSTALGIA RUBBER

11.1 Design Eligibility

The period of eligibility for Nostalgia Rubber Category designs shall be from 1 January, 1943 through 31 December, 1956. To be eligible to compete in Nostalgia Rubber, a model must have been designed and the original plans published or otherwise verified by the contestant to have been drawn and used for construction and flight during the Nostalgia period. Multiple versions of a model design are permitted, providing the above criteria are met with each design modification. Authentication of model designs as eligible for Nostalgia Rubber category competitions shall be the responsibility of the contestant.

11.2 Events

There shall be two Nostalgia Rubber Category events:

1. Small Nostalgia Rubber, models with projected wing areas of 150 square inches or less.
2. Large Nostalgia Rubber, models with projected wing areas greater than 150 square inches (to include Nostalgia Wakefield models). There is no ROG requirement in either category.

11.3 Contest Processing

There shall be no weight requirement for models or restrictions on rubber weight. The name of the model design(s), the designer(s), and the vintage(s) of at least one model shall be declared at initial registration.

11.4 Number of Models

Contestant shall be allowed two models in either event. At least one of the two models shall be declared before attempting an Official flight. The second model may be declared after initial registration but must be declared before making any flight attempt with that model.

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11.5 Scaling

Scaling up or down of model parameters or components for Large NOS Rubber shall not be allowed. For Small NOS Rubber any model eligible for Large NOS Rubber may be scaled to the 150 square inch or less projected wing area requirement.

11.6 Construction

The flying surfaces, airfoils, and propeller shall be the same as the original design. Propeller(s) must be the same type as on the original model (free wheeler, single bladed folder, double bladed folder). Maximum diameter shall be as shown on the plan. In the absence of any specific information or illustration on the model plans indicating whether a model was flown with a freewheeling of a folding propeller, the builder has the choice of utilizing either type of propeller. A design may be modified only sufficiently to allow for a blast tube and a dethermalizer system. This applies to all NOS Rubber designs including NOS Wakefield models.

For NOS Wakefield designs only, any retractable landing gear/takeoff skid shown on the plans or required by rules the may be omitted.

11.7 Launch Requirements

All models may be hand launched. There is no ROG requirement (see Construction above).

11.8 Official Flights and Scoring

The NFFS Nostalgia and General Rules and the AMA Competition Regulations apply to both Nostalgia Rubber events unless otherwise noted. Maximum flight times for Categories I, II, and III shall be: three official flights in the order of 2, 3 and 4 minutes. The CD may shorten the official flight times to suit field and wind conditions. The final score is the total of the 3 official flights plus the recorded time of any flyoff flights for which the contestant becomes eligible by achieving maximum time in each of the 3 official flights.

11.9 Flyoffs

Flyoff flights shall begin at the 4 minute maximums and continue at 4 minutes until the contestant's model fails to achieve the duration limit for that flight. The CD may shorten flyoff flight time to suit wind and field conditions. Only one attempt is permitted for each flyoff flight. All official flyoff flights must be launched prior to the end of the contest as determined and signaled by the Contest Director.

12 E NOSTALGIA

E Nostalgia (E NOS) is a set of four separate events which replace the gas powered engines of the NOS Power events with electric motors. All of the General NOS guidelines (Section 5), the Nostalgia General Rules (Section 6) and the Standard Nostalgia Gas Rules (Section 7) apply to E Nostalgia except as modified in the following paragraphs. All designs eligible for NOS Power (Gas) are eligible for E NOS.

12.1 Classes

The following four E NOS classes are defined:

- 1/2A (up to 250 proj. sq. in. wing area),
- A (251 to 500),
- B (501 to 650) and
- C (651 to 1000).

12.2 Power/ Wing Loading

There are no proposed power or weight/wing loading requirements for E NOS. Any battery chemistry, electric motor technology or cell count may be used.

12.3 Propeller Requirements

Folding propellers may be used in E NOS.

13 E-20 (PROVISIONAL)

13.1 Model Eligibility

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Projected wingspan not to exceed 20" (monoplane only)

No auto-surfaces except dethermalizers

13.2 Model Weight

Model must weigh at least 30 grams

13.3 Motor Eligibility

Models must use an 8.5 mm x 20 mm coreless electric motor (example: a Parkzone PKZ-3616 motor is commonly used). No gear drives are allowed.

13.4 Number of Models Allowed

The contestant is allowed to fly two models in this event. The contestant must declare a model before attempting the first official flight with that model.

13.5 Propeller

The propeller is not to exceed 2.7 inches in diameter.

13.6 Battery

Battery shall not to exceed 160 Mah, single cell lipo.

13.7 Motor timer

Use of an electronic or mechanical timer is acceptable.

13.8 Official flights and scoring:

Three flights of 90 seconds are scored out of six (6) attempts. Motor run is 20 seconds max. The final score is the total time of up to three (3) official flights plus any fly-off flights for which the contestant becomes eligible by achieving maximum times in each of the three official flights.

13.9 Fly-off flights:

For those who score three 90 second maximums, fly-offs will be with a 10 second motor run and 2 minute max until a winner is declared. At the discretion of the CD, fly-offs may be in a mass launch style before the end of the contest

14 PAA-LOAD GAS

14.1 Designs and Scaling

Eligible designs are identified on the Nostalgia Eligible Designs List with a minus sign (-) preceding the wingspan. Scaling is not permitted.

14.2 Classes

Classes are defined by engine displacement: 1/2A (up to .050); A (.051-199); and B (.200-.299). Contest management may opt to combine classes.

14.3 Model Weight

Total weight less dummy must equal a power loading of 100 oz/cu. inch displacement.

14.4 Dummy Specifications

Dummy occupant(s) must be readily removable, and must face forward in an enclosed compartment that provides visibility through a transparent area measuring at least 3/4-in. high for 1/2A or 1-in. high for A/B to the front and to each side of the dummy's head. 1/2A PAA-Load models must carry one 4-oz dummy having a 3/4-in. cubical head centered on a body that is 1-1/2 in. wide x 2 1/4-in. tall x 3/4-in. thick (3-in. total height). Class A PAA-Load models must carry one 8-oz dummy and Class B models two 8-oz dummies with both having the following dimensions: a 1-in. cubical head centered on a body measuring 3-in. wide x 3-in. tall x 1-in. thick (4-in. total height).

14.5 Launches

Unassisted R.O.G. launches from ground level are required unless the available launching area or other provided surface are unsuitable in which case the CD may allow hand launches.

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14.6 Number of Flights, Engine Runs and Flight Maximums.

Six attempts are allowed to make three official flights. The CD may establish engine runs and flight maximums, depending on weather and flying-site conditions. Otherwise, the following times (in seconds) are allowed for PAA-Load Gas.

Table 4 - Engine Runs and Flight Maximums for PAA-Load Gas

	1st Three Official Flights (sec)	Fly-off Flights (sec)	Flight Maximums (sec)
Cat I	17	13	300
Cat II	16	12	180
Cat III	14	10	120

15 CLASSIC OPEN TOWLINE GLIDER

15.1 Model Requirements

Two models allowed per contestant and may be of any design and type of construction.

The combined projected surface areas of the wing and horizontal stabilizer shall not exceed a total of 750 sq. in. (48.39 sq. dm.). No restrictions on model weight.

15.2 Towing, Pennant and Flight Controls

1. Towline maximum length is 164 ft (50 m) when under a 4.41 lb (2 kg) tensile load.
2. Wire towline not allowed.
3. A tow reel or winch is permitted, or the flyer may remove the reel and hold the towline directly. The glider shall fly off the line while the towline or reel/winch is being held by the flier. If the towline or the reel/winch is released or thrown prior to the line releasing from the aircraft the flight shall be recorded as an zero time for that flight. If the towline or reel/winch is released or thrown prior to the line releasing from the glider in order to save the glider from major damage or destruction the flight shall be recorded as an attempt regardless of flight duration.
4. The towhook shall be of fixed geometry and open at all times. The towhook shall not open, close, or shift fore or aft.
5. A pennant with minimum area of 38.75 sq. in. (2.5 sq. dm.) must be attached to the towline below the tow ring.
6. Straight-tow only. Zoom launches are allowed. Circle-tow hook functions and bunting are not allowed. Purposeful and/or intentional circle-towing and/or bunting shall result in a zero flight score for the attempt.
7. Timer-actuated flight settings are not allowed except for purposes of dethermalizing a model.
8. The rudder(s) may be caused to move from a straight tow position to a glide position upon release of the tow ring from the tow hook.

15.3 Official Flights

1. All official and unofficial flights are attempts.
2. Six attempts are allowed to make three official flights.
3. Timing of a flight attempt begins with release of the tow ring from the tow hook signaled by a fallen pennant and ends with termination of the flight.
4. To achieve a flight score, an attempt must be launched, towed and released into free flight during the official clock-time of the contest.
5. Flight maximums for the three official flights shall be 2, 3 and 4 minutes attempted in that order.

15.4 Unofficial Flights

1. After launch, the glider returns to the ground without release of the towline.
2. Glider part(s) are dropped during launch, tow or flight, including fly-off flights.
3. The instant of towline release from the tow hook cannot be established.
4. While towing, the contestant loses contact and control of the towline and fails to regain control, and/or another person takes control of the towline.

15.5 Repeat Flight Attempts

1. Attempts for official or fly-off flights may be repeated if “2”, “3” or “4” below occur prior to the

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end of the contest. However, if the glider continues in flight, the resulting flight time may be recorded as official if requested by the contestant.

2. At launch, the glider collides with a person other than the launcher.
3. During tow, the model collides with another model in free flight (but not with a model being towed or with a towline) and towing cannot continue normally.
4. During free flight, the glider collides with another model or another towline.

15.6 Fly-Off Flights

1. If the sum of a contestant's three official flights equals the maximum allowed (540 seconds), fly-off flight attempts may begin with the maximum time 240 seconds (four minutes) and shall continue at 240 seconds for each attempt until a maximum time is not achieved.
2. One attempt is allowed for each fly-off flight (see also 4.A. above)..

15.7 Weather, Terrain and Other Conditions

Because of actual or predicted adverse weather, terrain, flying conditions or other safety concerns, the Contest Director may modify the flight maximums for official and/or fly-off flights but with appropriate notice and in a manner to protect already recorded flight scores.

16 SUPER D

16.1 Categories

There are two categories for Super D. A VIT category that allows any variable incidence surface construction or geometry as per current AMA rules for AMA Power events and a fixed surface category as per AMA rules for AMA Classic Power.

16.2 Wing Area

For both categories the projected wing area shall be a minimum of 1000 square inches

16.3 Engine Displacement

Engine displacement shall be a minimum of 0.60 cubic inches to a maximum of 0.67 cubic inches.

16.4 Engine Run/Flight Time

Engine run for the VIT category shall be the same as for AMA Power Cat III.

Engine run for the fixed surface category shall be 9seconds engine run and 2 minute maxes for the first 3 flights; 6 second engine run and 2 minute maxes for flights 4 and 5; and 6 second engine run and 2.5 minute maxes for all subsequent flights.

17 ANDRADE RUBBER

17.1 Design Requirements

- Maximum 200 Sq. in. wing area
- Maximum motor weight of 20 grams
- No auto surfaces
- Take off gear is not required

17.2 Maxes

- Category 1 – 4 min, 5 min, 6 min, all following flights at 6 minutes
- Category 2 – 3 min, 4 min, 5 min, all following flights at 5 minutes
- Category 3 – 2 min, 3 min, 4 min, all following flights at 4 minutes

18 VINTAGE FAI RULES

The intent of the vintage FAI event is to build and fly the historic FAI power models as they were originally designed in a competition where the rules have reproduced each time period in such a way as to make one period reasonably competitive with the others. The overriding principal is to reproduce these

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models and competitions without adding modern enhancements that were not part of the history of this event; thereby preserving the historical integrity of the models of the various eras.

Some minor alterations have been made to the rules in order to compensate for current conditions such as field size and availability of some vintage resources. It is the expectation of the framers of this event that these rules are followed carefully so as to make each of these vintage periods enjoyable to fly in competition and to relive our enjoyment of these specialized vintage models.

Any power model (FAI or AMA for example) flown before the cutoff date of a particular vintage is eligible for that and all subsequent vintages. The model/engine combination must also meet all requirements for the vintage in which it is flown summarized in the following Model and Engine Eligibility paragraphs.

18.1 Model Eligibility/FAI Specifications

18.1.1 Vintage Period 1

Models designed to rules in effect 1951- Dec. 31,1955:

- Maximum Engine Displacement: 2.5cc (.15 cu. in.)
- Fuselage Cross Section = No cross section requirement
- Weight: Minimum weight is 200 grams per cubic centimeter. (17.64 oz for .15 cu. in)
- Engine run maximum is 20 Seconds.
- Fuel: No restrictions
- Minimum Surface Loading is 12g/sq. dm. (2.75 oz per 100 sq. in.) All areas are projected totals for wing and stabilizer.
- Launch method: Minimum one point ROG/VTO required (HL optional under certain conditions, see section 5.7 below for specifics).

18.1.2 Vintage Period 2

Models designed to rules in effect Jan. 1,1956-1 Dec. 31, 1957

All rules are per vintage period 1 above, except as stated below:

- Maximum engine run is 13 seconds
- Launch method: VTO/ROG (HL optional)

18.1.3 Vintage Period 3

Models designed to rules in effect Jan. 1, 1958 - Dec. 31, 1960.

- All rules are per vintage periods 1 and 2 above, except as stated below
- Minimum Weight 300 grams per cubic centimeter (173.4 oz per cu. in or 26.4 oz for .15 cu. in engine.)
- Minimum surface loading is: 20 gm/sq. dm. (4.58 oz./100 sq. in.) All areas are projected totals for both wing and stabilizer.
- Maximum engine run is changed to 15 seconds.
- Launch method: Hand launch only.

18.1.4 Vintage Period 4

Models designed to rules in effect Jan.1, 1961- Dec. 31, 1965.

As per Vintage Period 3, all rules apply except engine run decreased to 10 seconds.

18.1.5 Vintage Period 5

Models designed to rules in effect Jan. 1, 1966- Dec. 31, 1970.

As per Vintage Period 4, all rules apply except tuned pipes allowed and 80/20 fuel required.

18.1.6 Vintage Period 6

Models designed to rules in effect Jan. 1, 1971- Dec. 31, 1975.

As per Vintage Period 5, all rules apply except tuned pipes are banned.

18.1.7 Vintage Period 7

Models designed to rules in effect Jan. 1, 1976 - Dec. 31, 1979.

As per Vintage Period 6, all rules apply except engine run decreased to 7 seconds.

18.2 Engine Eligibility

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Any vintage engine may be used in any vintage aircraft design. In such case the Vintage Classification used for competition will be determined by the vintage of the newer item (Engine or Aircraft design). For example a Vintage 6 engine in a Vintage 4 aircraft design would be flown per Vintage 6 rules. Also a Vintage 4 engine in a Vintage 6 aircraft design would be flown per Vintage 6 rules.

*Replica diesels will be allowed in all classes if the original was allowed.

Nelson, VE engines or any other engines produced after 1979 are specifically prohibited.

18.2.1 Vintage Period 1:

Any glow or diesel engine of 2.5 cc displacement or smaller manufactured before the Vintage -1 cutoff date of 31 Dec 1955 is eligible. Some examples of eligible Vintage 1 engines are:

Glow: K&B Green Head 09 & 15; Pre-1958 ST G-20S , OK Cub 14., OS Max 15 Mk 1

Diesel: Elfin 2.49, Elfin 1.49 , ED Racer, AMA 2.47, S.T. G-20 Sport , Oliver Tiger 2.5cc Mk 1, II and III, ED Racer, Webra Winner 2,46, Webra Mach 1 and 2, ED 2.46, Frog 1.5cc, Eifflander 2.46. Other diesels of the period.

18.2.2 Vintage Period 2

Any engine, glow or diesel, which qualifies for the NFFS Nostalgia Event, is automatically eligible for use in Vintage Period 2 competition.

18.2.3 Vintage Period 3

All engines from the period Jan 1, 1958 to Dec. 31, 1960.

Glow: Enya 15 Mk 111, MVVS, ST 15 G-20, Other glow engines from the period.

Diesel: Allbon Rapier 2.5cc, Oliver Tiger Mk IV 2.5cc, Other Diesels from the period.

18.2.4 Vintage Period 4 & 5

Cox TD, TD Special and Mk II Special; ST G-20 (later model) and G-15, K&B .15 Series 61 and 64, K&B .15R, Johnson Bulldog 09.

18.2.5 Vintage Period 6 & 7

Rossi, Super Tigre, Cox Conquest, Cossi, A.D.15, K&B 15 Series 72

18.3 Other Model Specifications

- Motor Mounts - Any motor mount is acceptable (does not have to conform to the original design).
- Glow plugs - Any glow plug may be used on any period model.
- Propellers - Folding propellers are banned as are metal propellers.
- Timers- No restriction shall be placed on the type of timer that may be used.
- Engine stoppage - Flood off may be used. Brakes are not allowed on any except for the Vintage Period 6 & 7 models.
- Fuel Tank - Any type of fuel tank may be used.
- Construction - Wings and Stabs must be tissue/silk covered if original design had open structure and not replaced with sheeting. Sheet must be used on the wing and stabilizer if the original design used it. No restrictions on covering materials. Micafilm or other modern film covering may be used in place of tissue, silk, etc.
- No aluminum/carbon D-box construction will be allowed on the wing or stab. Carbon spars and carbon capped ribs will be allowed. No carbon only TEs will be allowed. Balsa/Carbon TEs will be allowed. This rule applies to all vintage periods.
- Modern fuselage construction will be allowed for any model that used a rolled tail boom on the original model. If the model used a box style construction for the fuselage, then this construction style must be duplicated.
- Bunting - No bunting allowed.
- VIT/AR Prohibition - No model may be equipped with AR/VIT or other device or enhancement unless specifically shown on the source plan.
- Landing Gear/Prop Savers – These items are the choice of the builder, except, if the original had a wheel or wheels, the replica should have a wheel or wheels of identical diameter and characteristics.
- Added Spars/Ribs - Adding spars or false ribs will be allowed for strengthening purposes.
- Two Piece Wings - Two piece wings will be allowed for any design.

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- Identification - Models will be identified by Vintage Period. The identification will be prominently displayed on the wing, and may be displayed on the fuselage and tail, if desired. The identification will be V-1 for Vintage Period 1, V-2 for Vintage Period 2, etc.
- Early era models allowed to be flown in later events. Models designed in an earlier era may be flown in a later era as long as the engine runs, engines and other specification of the latter era are met.

18.4 Competitor Information

18.4.1 Proxy Flying

Proxy flying will be allowed. The builder of the model can make arrangements for a flier of the model/models or arrangements may be made with the CD by agreement with the builder. Models of deceased fliers may be flown according to NFFS rules.

18.4.2 Entry of Multiple Models and Backup Models

A competitor will be allowed to enter more than one model providing it is from a different vintage period. Example: A model from V-1 period and another from the V-2 or other period would be allowed as separate entries. The only requirement is that the contestant must pay another entry fee for each vintage period entered. All flights must be completed in the specified time period for each round. A contestant may use one backup model for each vintage period entered.

18.5 Contest Specifications/CD Requirement

18.5.1 CD Requirement

Prior to the start of the contest, the CD is required to state or post the requirements under which the contest will be conducted. The requirements include: Number of flights required, flights by round or by time frame, length of round or time frame, HL option, max times, and flyoff methodology.

18.5.2 Flight lines

Flight lines will not be used. Flights will be conducted from a 50 meter square box. Flights may be conducted at any location in the box at the discretion of the flier.

18.5.3 Rounds

Flights are to be conducted in rounds whenever possible, with 5 one hour rounds as the standard. At the discretion of the CD, the flights may be flown without rounds, but during a designated time frame; for example: 5 official flights recorded during a 4 hour time frame, etc.

18.5.4 Number of flights

The standard is that the first 5 official flights are for 3 minute maxes. However, at the discretion of the CD, flights may be reduced to 5 flights of 2 minutes max length or some combination of these two options. A chart of specified engine runs and max times follows.

18.5.5 Official Flights

A contestant may have only two attempts to complete each official flight.

18.5.6 Engine Run by Vintage and 3 Minute Max with Preferred Progressive Max Flyoff

<u>Vintage</u>	<u>Engine Run</u>	<u>Max Time</u>	<u>Flyoff Max Progression</u>
1.	20 sec. VTO/ROG	180	4 min., 5 min., 6 min. etc. for all vintage classes, until one flier remains
1. (option)	17 sec. HL	180	
2.	13 sec., VTO/ROG	180	
2. (option)	10 sec. HL	180	
3.	15 sec. HL	180	
4.	10 sec. HL	180	
5.	10 sec. HL	180	
6.	10 sec. HL	180	
7.	07 sec HL	180	

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18.5.7 Engine Run by Vintage and 2 Minute Max with Preferred Progressive Max Flyoff

<u>Vintage</u>	<u>Engine Run</u>	<u>Max Time</u>	<u>Flyoff Max Progression</u>
1.	13 VTO/ROG	120	3 min., 4 min. 5 min. etc. for all vintage classes until one flier remains
1. (option)	11 HL	120	
2.	9 VTO/ROG	120	
2. (option)	7 HL	120	
3.	10 HL	120	
4.	07 HL	120	
5.	07 HL	120	
6.	07 HL	120	
7.	05 HL	120	

Engine Run by Vintage and 3 Min. Max with optional Reduced Engine Run Flyoff

<u>Vintage</u>	<u>Era</u>	<u>Engine Run</u>	<u>Max Time</u>	<u>Engine Run for Flyoffs</u>
1.		20 sec. VTO/ROG	180	13 seconds - continue 3 min. max.
1. (option)		17 sec. HL	180	8 seconds - continue 3 min. max.
2.		13 sec., VTO/ROG	180	8 seconds - continue 3 min. max
2. (option)		10 sec. HL	180	6 seconds- continue 3 min. max
3.		15 sec. HL	180	7 seconds - continue 3 min. max
4.		10 sec. HL	180	7 seconds - continue 3 min. max
5.		10 sec. HL	180	7 seconds - continue 3 min. max
6.		10 sec. HL	180	7 seconds - continue 3 min. max
7.		07 sec HL	180	5 seconds - continue 3 min. max

18.5.8 Engine Run by Vintage and 2 min. max with optional Reduced Engine Run Flyoff.

<u>Vintage</u>	<u>Era</u>	<u>Engine Run</u>	<u>Max Time</u>	<u>Engine Run for Flyoffs</u>
1.		13 VTO/ROG	120	10 seconds - continue 2 min. max
1. (option)		11 HL	120	8 seconds - continue 2 min. max
2.		9 VTO/ROG	120	7 seconds - continue 2 min. max
2. (option)		7 HL	120	5 seconds - continue 2 min. max
3.		10 HL	120	7 seconds - continue 2 min. max
4.		07 HL	120	5 seconds - continue 2 min. max
5.		07 HL	120	5 seconds - continue 2 min. max
6.		07 HL	120	5 seconds - continue 2 min. max
7.		05 HL	120	4 seconds - continue 2 min. max

18.5.9 Hand Launch Option for V-1 and V-2 Models

The standard is that all V-1 and V-2 models are either launched rise of ground or a minimum of one point VTO. However the contest director may declare these period models eligible for hand launch. If the CD announces this option, a contestant may still VTO/ROG if he chooses. The engine runs for all flights can be found in the charts above. VTO/ROG flyoff flights may continue regardless of flyoff methodology listed above. A contestant may choose to mix his flights and flyoffs using HL and ROG/VTO interchangeably, as he determines, with the approval of the CD.

18.5.10 Flyoff requirements for Three Minute Maxes

The CD is empowered to determine the methodology for the flyoffs. Here are his two choices:

- 1 Adding Max Time - Add one minute to each successive flyoff flight until a tie is broken. Flyoff engine runs remain unchanged. An overrun disqualifies.
- 2 Decreasing Engine Run - Decrease engine runs for flyoffs but maintain the 3 minute max. An overrun disqualifies.

18.5.11 Flyoff requirements for Two Minute Maxes

The CD is empowered to determine the methodology for the flyoffs. Here are his two choices:

- 1 Adding Max Time - Add 60 seconds to each successive flyoff flight until a tie is broken. Engine runs remain unchanged from the first five flights. An overrun disqualifies.

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- 2 Decreasing Engine Run - Decrease engine runs for flyoffs but maintain the 2 minute max. Continue flying until tie is broken. An overrun disqualifies.

18.5.12 Flyoffs

Flyoffs are to begin only after all rounds are completed and/or all contestants have completed their 5 official flights. Each flyoff round shall be conducted in a timed manner stated in advance of the flyoffs, for example: "Each flyoff round will be 30 minutes in length."

18.5.13 Other

Refer to the current FAI Code for any questions not covered by this set of rules.

*Note: A CD checklist card with this information summarized is available from NFFS Publications.

18.6 Conversion Measurements

1.0 sq. decimeter is 15.5236 sq/ in. 28.349 grams equal one ounce

19 GOLDEN AGE 1/2A (PROVISIONAL)

19.1 Model Eligibility

Open to any free flight design that had plans dated or published from 1-1-1957 thru 12-31-1969. Designs from other countries are allowed as long as they meet the rules and guidelines. Any model regardless of actual published plan size is eligible. Plans that were only published for a large model can be scaled to 1/2A size for this event. Nostalgia era model designs dating from 1943 thru 12-31-1956 are not eligible for this event. Both gas and electric powered models are allowed and flown in a combined event. The combined event should increase the popularity of electric while honoring the Golden Age Designs and their Designers.

Any question of proof regarding the eligibility of a model is the responsibility of the contestant. A preliminary list of eligible model designs will be posted on the NFFS web site under the Competition section. It is to be used as only a resource tool for contestants looking for a design to build. This list of model design's is not intended to be used by Contest Directors as a definitive guide to a model's eligibility and is merely a guide, meant for educational purposes only. It may not represent the COMPLETE list of Golden Age eligible designs. Responsibility of researching and providing a design's eligibility rests solely with contestants. If you find an eligible design that we missed, please email it to:

< satellite13@outlook.com >

19.2 Construction Guidelines

The following guidelines apply to both gas and electric powered models. Where differences occur separate paragraphs will document those differences.

19.2.1 Scaling of Models

Scaling up or down of model designs is permitted.

19.2.2 Construction Fidelity

Models must be built to actual plan outlines and original construction. For example, if a design showed sliced wing ribs, the model shall have those style of ribs.

19.2.3 Allowed Modifications

The following changes are allowed in original model plan construction details:

1. Strengthening and reinforcing using balsa and plywood materials may be added by using gussets, doublers and larger wood sizes.
2. Wing spars may be added at any point in the airfoil (upper and lower surfaces and internal) with the following restriction. In the forward 33% of the wing section only one additional upper surface turbulator type of spar, flush with the upper surface, may be added. In addition, use of any other turbulator device is prohibited. Addition of false ribs is permitted, as is strengthening of the wing center section with sheet balsa.

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3. Ribs and fuselage former's may be reduced in number when scaling down and added when scaling up.
4. Sidewinder style wooden beam motor mounts may be replaced with radial metal mounts.
5. Any commercially available covering material is acceptable.
6. Wheels and wire skids are not required and are the builders option.

19.2.4 Restricted Modifications

Construction restrictions include:

1. The stab and rudder must be in the same location as on the original plan.
2. No V.I.T, auto surfaces or auto rudders allowed even if on the original plan.
3. No geodetic or Warren truss-type of construction is allowed unless it is shown on the original plan.
4. No addition of sheet to wing and or stab leading edges is permitted.
5. The use of Carbon Fiber or Kevlar material is prohibited in any amount. None of the model designs in the 1957-1969 time frame used this material.

19.2.5 Weight Rule

There is no weight rule.

19.2.6 Wing Area Rule

There is no wing area rule.

19.2.7 Engine Eligibility for Gas Models.

Holland Hornet .049/.051 and Cox T.D. .049/.051 are the only engines permitted.

19.2.8 Power Plant Requirements for Electric Models

The following requirements apply to the electric power system:

1. Motor - Any technology or size of electric motor may be used.
2. Battery Size - Shall not exceed a 2-cell Lipo.
3. Folding Propellers - Permitted in electric only.
4. Electric Advancements in Technology - Future advancements in electric technology may require adjustments in battery size to keep electric performance on the same level as a T.D. .049/.051 or Holland Hornet .049/.051.
5. Battery/ESC Compartment - The fuselage may be enlarged locally on an electric powered model to enclose the battery and ESC.

19.3 **Number of Models Allowed**

A contestant is permitted to enter and fly two models in the event. The two models entered may both be gas or electric powered or a combination of one gas and one electric. The contestant must enter/declare a model before attempting the first official flight with that model.

19.4 **Engine/Motor Runs and Flight Maximums.**

Engine/motor runs summarized in the following table are based on NOS engine runs with the addition of the option for VTO on the first 3 flights for Cat III. VTO is also an option on the first 3 flights for Cat. I and Cat. II. The engine/motor runs and flight maximums are the same for gas and electric powered models.

Table 5 - Engine/Motor Runs and Flight Maximums for Golden Age

	1st Three Official Flights (sec)	Fly-off Flights (sec)	Subsequent Fly-Off Flights (sec)	Flight Maximums (sec)
Cat I				
Hand Launch	14	8	8	300
VTO	17	n/a	n/a	300
Cat II				
Hand Launch	12	8	8	180
VTO	15	n/a	n/a	180
Cat III				
Hand Launch	9	6	5	120

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VTO	12	n/a	n/a	120
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20 INDOOR TOWLINE RULES

20.1 Model Definition

Indoor Towline Glider models are monoplanes designed to be released for gliding flight from a towline of unlimited length or diameter. The towline shall have a flag attached near the release end with an area minimum of four (4) square inches (20.81 square centimeters).

20.2 Dimensional and Weight Requirements

- 1) The wing shall not exceed five (5) inches chord by twenty (20) inches span (12.70 x 50.80 centimeters).
- 2) The dimensions of the horizontal stabilizer shall not exceed four (4) inches chord by 12 inches span (10.16 x 30.48 centimeters).
- 3) The overall length of the glider shall not exceed 24 inches.
- 4) The model shall weigh at least 0.109 ounces (3.10 grams).

20.3 Scoring

Scoring. Timing commences when the towline unhooks from the model. Total of best two of nine official flights determines score. Record scores in tenths of a second--hundredths are dropped. Example: A flight of 55.47 seconds is recorded at 55.4 seconds.

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Appendix A NOS Gas Engines

Eligible Glow Engines

Anderson. All models of 045, 049 and 065 (Spitzzy, Baby and Royal Spitfire); 60 and 65 Spitfires.

Atwood. All 049 and 051 (Signature, Wasp, Atwood, Cadet and Shriek); 49 and 51 Triumph; Champion and Super Champion, GD 60-65 Series.

Cox.

Class 1/4A: All front- and rear-intake .010 and .020 engines (SE)..

Class 1/2A:

1. All rear-intake .049 engines are legal for 1/2A NOS. (Note special restrictions pertain the Early 1/2A NOS.)
2. The reed valve Killer Bee .049, produced in 1995 (SE) is legal and must be flown in stock condition, with no parts interchanged or modified, other than radial mounting or use of a Nelson vertical element plug/head. Any fuel system or tank is acceptable.
3. Medallion .049 (SE), as sold in the early 1990s or earlier Medallions if fitted with the silted cylinder as described below. Legal cylinder contains four small exhaust slits of the same size and two intake bypasses with one boost port per bypass. The engine must be used in stock condition, except for the following modifications:
 - Enlarging the inside diameter of the venturi.
 - Reducing the outside diameter of the stock needle-valve spraybar to increase airflow;
 - Replacing the needle-valve assembly as noted below.
 - Use of a Nelson vertical element plug/head.

Class A: 051 Killer Bee (SE) and Medallion (SE) of the above vintages and with the same restrictions as for 1/2A; Sportsman 15; Olympic 15 (SE).

Cox Parts Restrictions: Use of Tee Dee parts in Killer Bee or Medallion (or in any otherwise legal Nostalgia engine) is not allowed, except for glow-plug use as described above. You can replace the needle-valve assembly used for the Medallion, but the Tee Dee needle-valve assembly, its parts, or a similar assembly with peripheral jets is not an acceptable substitution. For any legal replacement the spray-bar must pass through the venturi at the existing location in the Medallion. A rear NVA assembly would also be legal if a spray bar is used that passes completely through the venturi.

Note to Contest Directors: The Tee Dee cylinder has boost ports in the bypasses, with two open-type exhaust slots; the Medallion has four small exhaust slits.

Dooling. All 29 and 60 models.

Enya. 049; 060; 09 models #3001 and #09-II; 15 models #3101 (15-I) and #15-II; 19 models #4001, #4002, #4003, #4004; 29 models #5001, #5002, #5103; 35 models #5001 and #6001; 45 #6001 plain bearing with smooth head; 60 first model.

ETA. 19 Mk I; 29 Mk I-IV manufactured 1949-1956 (ball bearing).

Forster. All original and MG/JRL reproductions of front and rear intake 29, 301, 31, 35 and 99.

Fox. All 049, 070, 09 rear intake, 10 front intake, 15, 19, 201, 25 29 Stunt/R/X; 35 Stunt; 35 Rocket (red or aluminum head); 35 Combat (black head); 40 Combat/Stunt; 59 with long and short shaft. All 049, 15X, 29 and 35 manufactured post-1962 with plain bearings and cast-on round intakes.

Herkimer. (OK). 025 twin exhaust; all models 039-049, 06, 074, 09, 14, 19, 29, 35; OK Super 60.

Holland. 049 and 051 Hornet; 049 Wasp.

Hornet. 19 and 60.

Johnson. 09 Bulldog; all plain-bearing 29, 32 and 35.

K&B. See Torpedo.

McCoy. All 049s; Testor/McCoy 049; all rear-rotor 19-60; all Stunt and Super Stunt front-rotor 09, 19, 29, 36; Red Head and Blue Head Stunt 19, 29, 35, 40; Testor/McCoy Custom Series 19, 29, 35, 40 (with lightning bolt on crankcase); Solinburger reproduction 29 rear rotor.

Merco. 29 and 35 plain bearing with orange or aluminum head, manufactured prior to 1963.

Ohlsson. All models, 049 through 60.

OK. See Herkimer.

Orwick. All 23, 29, 32, 64 and 73 (73 for ignition only); Dunham/KK/Daniel reproductions.

OS. Plain bearing with steel fins—06, 09 Pet, 19, twin-exhaust 29 and 36; Max Series I, II and III—15, 29, 35; 29X/35X III; last model Pet 09 with aluminum fins.

Super Tigre. All pre-1957 ball-bearing and plain-bearing 15, 29, 35 with vertical and slanted intakes, no removable backplates and no "V" on crankcase; ST G24 .60 rear rotor; 1962 plain-bearing 35 Model C35 with a "V" on the case is legal unless it has Perry porting; plain-bearing 51 and 56 engines produced in

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1962. Perry porting is specifically not allowed and the porting can be seen through the exhaust port as small vertical slots/ports located between the exhaust and transfer ports.

Torpedo. 020, 035, 049; Tornado 049 and 060; all Stallion 049 and 35; all Sky Fury; Torpedo green head and aluminum head 09, 15, 19, 201, 23, 24, 29, 29R/S, 32, 35, 35C, 45; all J&J and Shilen 24, 29 and 32 reproductions.

Veco. All aluminum and gray matte-finish, plain bearing 19, 201, 29, 29R, 31, 35 and 35C models.

Wen Mac. All 049s with standard glow plugs; all Hot Shot series with glow heads.

Other Glow Engines. Arden, Bullet, Cameron, Frog 500, JW Firecracker, Gilbert, Mighty Midget, Pagco, Pogo, Super Hurricane, Torpedo Special.

Ineligible Glow Engines

Cox. All Tee Dee 09 and 15; Medallions with the non-silted exhaust ports; factory prototype 15 with angled rear intake; and Cox engines manufactured after 1995, stock or modified by Cox personnel.

Enya. Series III and IV 09 models, 09 and 09-IV; Series III and IV 15 #3303 and #3304; Series V 19 #4005; Series IV 29 #5224; Series III and IV 35 #5224; first model 45 #6001.

ETA. Mk II 19; Mk V and later 29.

Fox. Square-intake 29, 35, 36, 40 with ball or needle bearings; 1970 36 and 40 Stunt engines; rear rotor 29X, post-1956, ball bearing; post-1962 bolt-on intake models.

Johnson. 35 ball-bearing models.

McCoy. Black head Series 21, front intake with Dykes rings.

Merco. Black head models, manufactured after 1962.

OS. All ball-bearing versions; all aluminum-finned models other than 09 Pet.

Super Tigre. Ball-bearing models, vertical and slanted intakes, with removable backplate and "V" symbol on crankcase; 1960 G20 and G21 ball-bearing models, post-1962 plain-bearing C35 with Perry ports; 1963 plain-bearing 46 (dark matte finish).

Torpedo. Series 61 and 64 ball-bearing models manufactured post-1957 in front and rear intake versions; Series 75 plain bearing model with bright aluminum finish; ignition or glow Shilen 19 repro.

Veco. Ball-bearing 19 and 45 models.

Eligible Diesel Engines

(Note abbreviations: cv, clapper valve; fi, front intake; pb, plain bearing; bb, ball bearing; rv, reed or rotor valve.)

Aero. 150 (1.5 cc, fi, pb); 250 (2.5 cc, fi, pb).

ALAG. (1.5 cc fi, pb) X-3, X-4 and X-5.

Allbon. Dart .54 cc (fi, pb); Javelin MkI and MkII 1.5 cc (pb, fi); 2.8 cc (3 port, pb and bb).

Allen Mercury. (1 cc) green head; (1.5 cc) blue head; (2.5 cc) black head; (3.5 cc) red head; all pb, fi).

AMA. (2.5 cc, fi, pb).

Amco. .87 cc (3 port, pb) MkI and MkII; 3.5 cc bb (slanted ri); 3.5 cc (fi, pb).

Aquila Baby. (1 cc, fi, pb).

Barbini. B38 (1 cc, fi, pb)

BWM. 250D (2.5 cc, fi, pb).

Burford. Sabre 250 MkI and MKII (2.5 cc, fi, pb).

Byra. (2.5 cc and 3.5 cc, rv, bb).

CIE. (.12 cu in. and .16 cu in.)

David Andersen. Satellite (1 cc and 2.5 cc, fi, pb); (2.5 cc, 3 port, pb).

Davies Charlton. Allbon Bambi .015 cc (fi, pb); Dart MkII (.55 cc, fi, pb); DC 350; Manxman 350; (both are 3.5 cc, pb, fi); Merlin (.76 cc, fi, pb); Sabre (1.5 cc, fi, pb); Spitfire (1 cc, fi, pb); Wildcat MkI-III, 5 cc (3 port, pb).

Deezil. (2 cc, 3 port, pb); repros by Gordon Burford and CS.

Drone. (5 cc, fi, pb and bb).

E.D. Baby, MkI and MkII (.047 cc, fi, pb); Bee MkI and MkII (1 cc); MkI, MkII and SeriesII (rv, pb); Cadet 1 cc (3 port, pb); Hornet 1.4 cc (rv, pb); Comp Special 2 cc (3 port, pb); MkIII 2.549 cc (fi and pb, rv and pb); 3.46 Hunter MkI-IV, bb, rr; Pep .8 cc, (fi, pb); CS Hunter reproduction Racer 2.46 cc bb (all Mk).

Elfin. Baby .49 cc; 1.49 cc, 1.8 cc and 2.49 cc fi, pb and bb; 2.49 cc BR MkI and MkII, rr, bb; Reproduction 1949 2.49 cc by Dunham/Argo/ Buford/CS; BR 1.49 (rv, bb); BR 1.8 (rv, bb); BR 2.49 (rv, bb).

Engel. 1 cc (fi, pb); 1.5 cc (fi, pb); 2.5 cc (fi, pb).

Enya. 15 Series I; 15 Series II; .061D 2 cc (rv, pb).

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E.P.C. Moth .85 cc (3 port, pb).

ETA "5" 5 cc (3 port, pb).

Frog 2.49 cc (bb, fi, natural aluminum head); 3.49 cc (rr, pb, white aluminum finish); 50 .5 cc (fi, pb); 100 1 cc (fi, pb); 149 Vibramatic (cv, pb); 150 1.5 cc (fi, pb); 150R 1.5 cc (fi, pb); 250 2.48 cc (fi, pb); 180 1.66 cc (fi, pb).

Jaguar .8cc (fi, pb); "2.5D" 2.47 cc (fi, pb).

Jasolka 2.5 cc (fi, pb).

J.E. Ballard JB Atom 1.5 cc (fi, pb).

K Model Engineering Falcon 2 cc and 2.5 cc (fi, pb); K Hawk .2 cc (fi, pb); Kestral 1.9 cc (fi, pb); Vulture 5 cc (fi, pb).

Kalper .32 cc Series I and Series II (3 port, pb).

Katipo 1.5 cc Series I and Series II (fi, pb).

Letmo .6 cc (3 port, pb); 2.5 cc (3 port, pb); MD 2 7 cc (rv, pb).

Marown Engineering Heron I cc (fi, pb); Snipe 1.5 cc (fi, pb).

McCoy .049 cu in. (fi, pb); .099D (fi, pb); .049D (fi, pb, shaft valve and clapper valve).

McCoy Replica .049 cu in. (fi, pb) produced by Bob Langelius

Meteor 2.47 cc (fi, pb).

Micro 2 cc (3 port, pb).

Miles Spec. 4.9 cc (rv, bb).

Mills .75 cc (3 port, pb) Mk I and Mk II; 1.3 cc 3 port, pb) Mk I and Mk II; 2.4 cc (rv, pb); .75 cc repros by G. Burford, Aurora and Irvine; 1.3 cc repro by Aurora and Irvine.

Mite .09 cu in. fixed compression (fi, pb).

MVVS 2.5 cc Model 25-D

OK Cub 0.049 and 0.09 cu in.

Oliver BattleAxe 2.5 cc 3 port, pb); 1.5 cc Cub Mk I, with removable intake; 2.5 cc Mk I, II, III, pre-1957 bb; CS reproduction 2.5 cc Mk III; Fury 2 cc (3 port, pb); Jaguar 2.5 cc (3 port, pb; also sold as Rayline Panther).

Owat 5 cc (fi, pb);

P.A.W. 2.5 cc (fi and pb); 1.49 cc (pb with vertical fi)

Pepperell 2 cc (fi, pb).

Pfeffer 2.5 cc (rv, bb).

Rawlings 1.8 cc (3 port, bb).

Reeves Goblin 2.5 cc (rv, pb); Goblin 3.4 cc (fi, pb); H18 1.8 cc (pb).

Schlosser 2.5 cc (fi, pb) blue head.

Star 5 cc (fi, pb).

Super Tigre GB .16b 5.65 cc (fi, pb); G19A 4.82 cc (fi, pb); G22 1.23 cc (fi, pb); G23 2.47 cc (fi, pb); G25 1 cc (fi, pb); G26 1.5 cc (fi, pb); G27 3.2 cc (fi, pb); G28 .5 cc (fi, pb); G29 .8cc (fi, pb); G31 1.5 cc (cv, bb).

Taifun Hurrikan 1.5 cc (bb, rv).

Vivell .035 cu in. (fi, pb); .099 cu in rv, pb).

WAF 1 cc (fi, pb); 5 cc (fi, pb).

Webra Bulley 3.5 cc (pb, fi) blue head; Komet 2.5 cc (pb, fi) red head; Mach I, 2.5 cc (bb, rr) green head, small or large intake; Piccolo .8 cc (fi, pb); Record 1.5 cc (fi, pb); Winner 2.5 cc (fi, pb).

Wilo 2.45 cc (crank disk rv, pb).

Ze Engine runs and flight maximums for PAA-Load Gas iss. Jena 2 cc (rv, bb); 2.5 cc (rv, bb).

Ineligible Diesel Engines

E.D. 1.5 cc ball bearing Super Fury 1958; 2.5 cc Racer 5th model, aluminum case, rear rotor.

Elfin. 1950 1.49 cc Russian reproduction with ABC construction.

Fro Engine runs and flight maximums for PAA-Load Gas g. Post-1956 2.49 cc ball bearing, front intake with red head; 3.49 cc rear rotor, plain bearing with white aluminum finish.

Oliver Tiger. Mk II Cub; Mk IV 2.5 cc ball bearing.

P.A.W. All sizes with ball bearings (these models have ball race at aft end and sleeve at front).

Super Tigre G33 1.5 cc.

Webra Mach II 2.5 cc front rotor.

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Appendix B USOC National Championship Points Table

Number of Event Entries that Made an Official Flight																		
Place	1-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	20-21	22-23	24-25	26-27	28-29	30-31	32-33	34-35	36-37	≥38
1	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
4		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
5			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
6				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
7					1	2	3	4	5	6	7	8	9	10	11	12	13	14
8						1	2	3	4	5	6	7	8	9	10	11	12	13
9							1	2	3	4	5	6	7	8	9	10	11	12
10								1	2	3	4	5	6	7	8	9	10	11
11									1	2	3	4	5	6	7	8	9	10
12										1	2	3	4	5	6	7	8	9
13											1	2	3	4	5	6	7	8
14												1	2	3	4	5	6	7
15													1	2	3	4	5	6