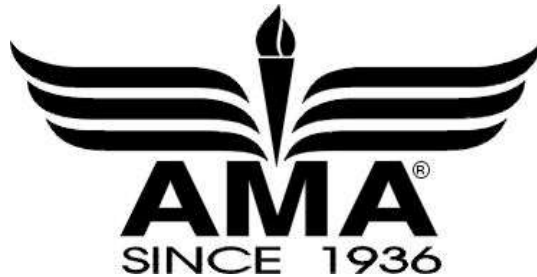


AMA
RADIO CONTROL
LARGE MODEL
AIRPLANE PROGRAM



~ **General Information** ~

- **Model Requirements**
- **Temporary Authorization**
- **Permit to Fly**
- **Inspection Guidelines**
- **Preflight Check List**
- **Inspector Application and Quiz**

For additional information, forms, or a list of inspectors access our website at www.modelaircraft.org. Select *Member Only* and then *Members Only Documents* and review documents 520-B & 520-C or contact

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Approved by AMA Executive Council, **July 16, 2011** (Changes are identified in bold)

LARGE MODEL AIRPLANE PROGRAM

A. General.

1. Large Model **Airplanes** (LMA) are classified as follows:

LMA-1 are **all non-turbine powered** model airplanes weighing 55 pounds (25 kilograms) to 77.2 pounds (35 kilograms), with fuel, ready to fly.

LTMA-1 are turbine-powered model airplanes weighing 55 pounds (25 kilogram) to 77.2 pounds (35 kilograms), with fuel, ready to fly.

LMA-2 are **all non-turbine powered** model airplanes weighing 77.3 pounds (35 kilogram) to 125 pounds (56.7 kilogram) with fuel, ready to fly.

LTMA-2 are turbine-powered model airplanes weighing 77.3 pounds (35 kilogram) to 100 pounds (45.4 kilogram) with fuel, ready to fly.

2. All pertinent regulations from the Federal Communications Commission (FCC), Federal Aviation Administration (FAA) and Academy of Model Aeronautics (AMA) shall be applicable.
3. Individuals interested in qualifying an RC model airplanes to be flown in one of the above categories must obtain the most current version of the program and attain adequate knowledge of all program requirements.
4. Any LMA **airplane** must be certified airworthy through the issuance of a Permit to Fly prior to any demonstration, practice, or general flying.

B. LMA Model Requirements:

1. Wing loading must not exceed 80 ounces per square foot of total wing area, **except for turbine powered models (see Appendix A)**.
2. There shall be no wing span limitation.
3. There shall be no engine cubic inch displacement limitation.
4. Airplanes powered by turbine engines are permitted as outlined in Appendix A
5. Radio equipment must meet the AMA/FCC Guidelines.
6. A dual battery system is required with a minimum of 2300 mah each or sufficient battery power that either one of the two battery packs could safely fly the airplane at least three complete total fuel consumption flying sessions from receiver turn-on to turn-off. The system should be arranged so that both batteries operate together and includes redundant wiring and switching to the receiver. **For sailplanes/gliders, a dual battery system sufficient to power the model for a minimum of one (1) hour of operation is required.**
NOTE: The use of redundant receivers is strongly recommended.
7. **For powered models**, a fail-safe system must be used to retard the throttle in the event of control interruption. **For sailplanes/gliders, a failsafe setting must be used that fully deploys the normal landing mode settings**
8. An engine shut-off system, operable from the transmitter, in addition to normal throttle-kill ability is required.
9. Engine noise must not exceed any standards established by the AMA or rules for the local flying site being used.
10. All wiring harnesses must be made of suitably sized stranded wires (e.g. 22/24 AWG) that have minimal voltage drop. This is a requirement for all "Y" harnesses using two or more servos, the servo-battery wiring, switch harnesses, and extension cables. The

Large Model **Airplane** Program

connectors used in these components will be sized to accommodate the larger wire gauge, NOT spliced into smaller gauge standard wires, or connectors.

11. Dynamically balancing control surfaces and sealing hinge line gaps are highly recommended to prevent flutter. The absence of flutter must be demonstrated at the time of certification by flight through a representative sample of the normal maneuvers and speeds appropriate for the subject model **airplane**.
12. **Self-launching sailplanes must conform to the powered LMA requirements, whether propeller or turbine powered, for the appropriate power type and weight classes.**
13. If the model airplane is built from a commercially available kit, all servos installed must meet or exceed the kit manufacturers' specified torque.

(a) A commercially available kit is defined as:

- Any LMA built or assembled from a set of parts, instructions, specifications and plans that has been tested and subsequently made available to the public in kit form provided by a manufacturer.
- Any LMA built from unaltered commercially published plans, either by parts being cut by the modeler/builder, or from the purchase of a "parts kit" from a commercial "kit cutter".
- Proof of the manufacturer's servo recommendation is required for the Temporary Authorization to Fly. In lieu of that, servo torque calculations must be submitted.

(b) All model airplanes with a Permit to Fly issue date prior to April 25, 2009 are exempt from complying with these requirements and will be grandfathered under the program rule approved by the EC on December 18, 2008.

(c) If the airplane is not built from a commercially available kit then minimum servo torque required for the primary flight control surfaces that control pitch, roll, and yaw need to be computed per the following formula. Exceeding this minimum is always recommended.

(d) The minimum torque requirement formula a conventional control surface is calculated as follows.

$$\text{Minimum torque} = A * \text{Chord} * \text{Span} * \text{Chord}/3 * \text{Servo Arm}/\text{Control Arm}$$

A = Airspeed factor (see Table 1)

Chord = average control surface chord (root chord + tip chord) / 2

Span = control surface span

Servo Arm: the distance from the center of the servo arm to the control linkage attachment.

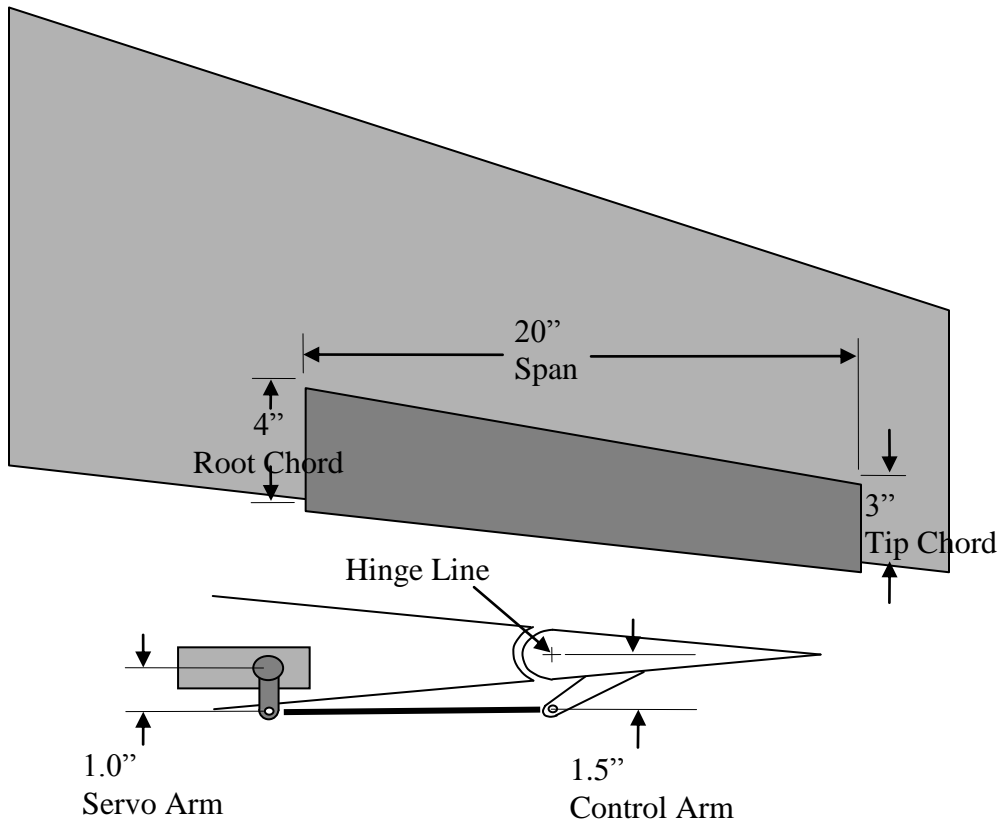
Control Arm: the distance from the hinge line to the control linkage attachment

Airspeed factor for use in both conventional and full flying formulas	
Propeller and soaring/gliding airplane whose flight regime will only include level flight, flat turns, gentle climbs and moderate dives	A = 1.25
Propeller and soaring/gliding airplane whose flight regime includes modest aerobatics, including loops, rolls, inverted flight and spins	A = 1.5
Propeller and soaring/gliding airplane whose flight regime includes unlimited aerobatics	A = 3.0

Airspeed factor for use in both conventional and full flying formulas	
Turbine airplane whose flight regime will only include level flight, flat turns, gentle climbs and moderate dives and whose speed will not exceed 140 mph (Also applies to sailplane/glider models with turbine self-launch systems)	A = 1.75
Turbine airplane whose flight regime includes unlimited aerobatics (Also applies to sailplane/glider models with turbine self-launch systems)	A = 4.0
Full flying control surfaces on airplane whose speed is limited to 140 mph or less (Applies to all LMA)	A = 3.0
Full flying control surfaces on airplane whose speed exceeds 140 mph (Applies to all LMA)	A = 6.0

Table 1

- (e) The following sketch uses an example to show how the measurements are made. Cut outs in control surfaces should be ignored, such as a clearance in an elevator to make room for rudder movement. The calculation should be made as if the clearance had not been made. All measurements are in inches, the minimum torque is in oz-in.



This example uses the airspeed factor for a propeller aircraft whose flight regime includes unlimited aerobatics: A = 3.0

$$\text{Chord} = (4+3)/2 = 3.5$$

$$\text{Minimum torque} = A * \text{Chord} * \text{Span} * \text{Chord}/3 * \text{Servo Arm}/\text{Control Arm}$$

$$\text{Minimum torque} = 3.0 * 3.5 * 20 * (3.5/3) * (1/1.5) = 160.77$$

Large Model **Airplane** Program

- (f) The minimum torque requirements for a full flying control surface is calculated as follows.

$$\text{Minimum torque} = A * \text{Area} * \text{Servo Arm/Control Arm}$$

A = Airspeed factor (see Table 1)

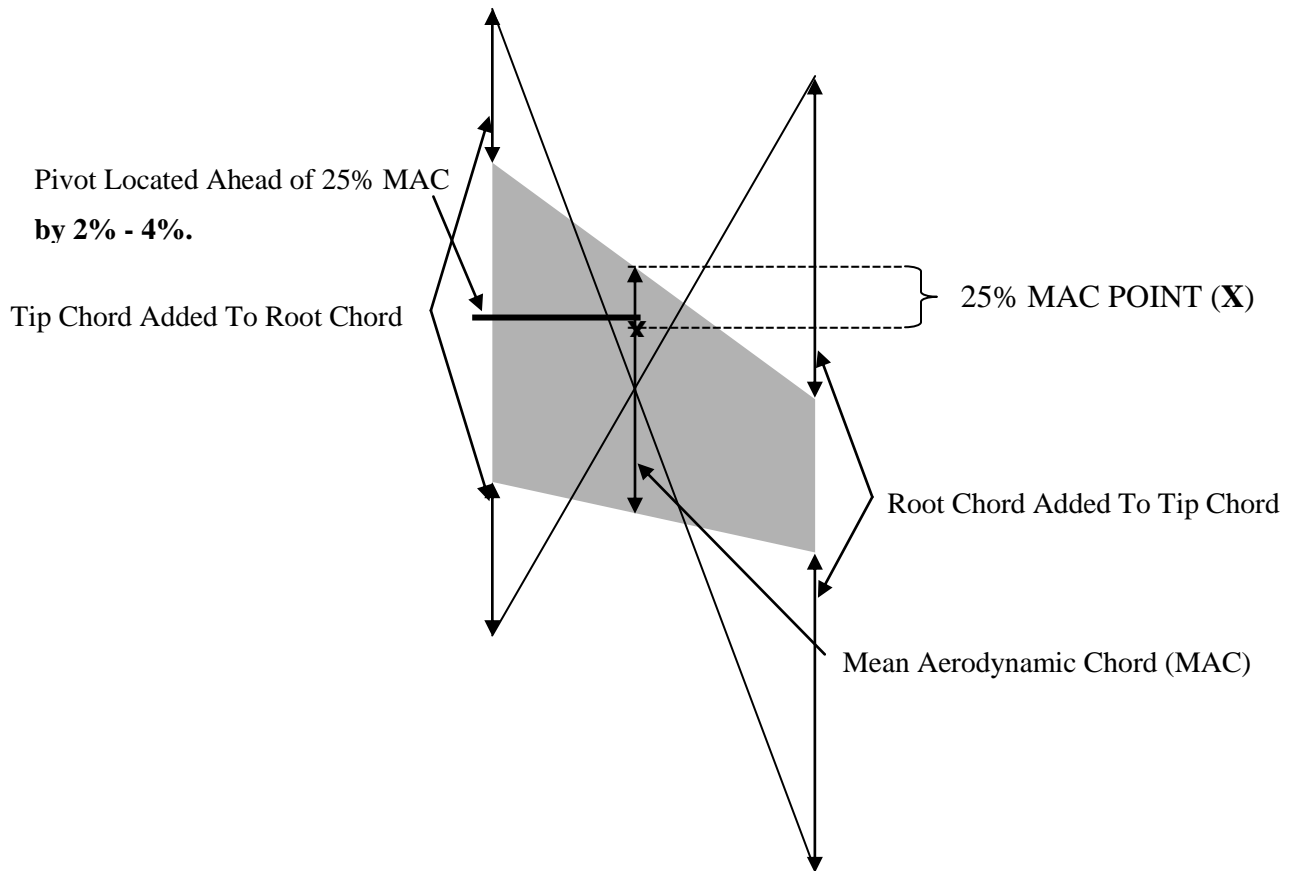
Area = planform area of the control surface

All measurements are in inches, area is in square inches

The minimum torque is in oz-in.

The pivot point for the control surface can be determined using the diagram below as long as the pivot point is ahead of the 25% Mean Aerodynamic Chord (MAC) point by 2%-4%.

Since the servo arm to control arm geometry is very important the builder should be certain that the proper control deflection can be achieved with the geometry described in the paperwork supplied to the examiner. If at all possible the servo travel should be set to the maximum value available, and the control arm and servo arm chosen to achieve the desired control surface deflection.



Large Model **Airplane** Program

C. LMA Permit Procedures

All individuals involved in the permit procedure need to be knowledgeable of the most current program requirements.

1. Test flight permit requirements:

A *Temporary Authorization to Fly* is required for test flights. This authorization is only valid on the day of issue.

The owner (LMA1 and LTMA1)/inspector(LMA2 and LTMA2) shall examine the completed model airplane immediately prior to the test flights, and shall issue a *Temporary Authorization to Fly*, provided that:

- (a) the Builder's Declaration has been signed, and
- (b) all identifying and radio equipment details on the permit form are correct, and
- (c) satisfactory completion of the Inspection Checklist.

LMA-1 and LTMA-1

- a. Inspection of the model airplane in accordance with section *Guidelines for Large Model Airplane Inspection* by either the owner of the LMA or an AMA LMA Inspector (LMAI).
- b. The owner will determine the flight envelope that will consist of at least one of the following items:
 - i. Level maneuvers, flat turns, gentle climbs and dives
 - ii. Looping maneuvers
 - iii. Rolling maneuvers
 - iv. Inverted flight
 - v. Spins
 - vi. Snap maneuvers
 - vii. Unrestricted aerobatics
- c. Two demonstration flights observed by the owner and either an AMA Contest Director (CD), Leader Member (LM) or LMAI are required. A list of current LMAI is available on the AMA Web site under the Member Only Documents section.
 - i. In the event that the owner is also the pilot, then the two demonstration flights will be observed by two CDs, LMs, or a combination thereof. **If the observer is a LMAI, a second witness is not required.**
- d. Upon satisfactory completion of test flights, all required documentation will be filled out and signed by the owner, pilot and CD/LM/LMAI and then immediately forwarded to AMA headquarters.
- e. If for any reason the observers are not completely satisfied with the airworthiness of the model as demonstrated, further test flights must be arranged after rectification of the faults noted.

Large Model **Airplane** Program

LMA-2 and LTMA-2

- a. Inspection of the model **airplane** in accordance with section *Guidelines for Large Model Airplane Inspection* by an AMA Large Model **Airplane** Inspector (LMAI).
 - b. The owner will determine the flight envelope that will consist of at least one of the following items:
 - i. Level maneuvers, flat turns, gentle climbs and dives
 - ii. Looping maneuvers
 - iii. Rolling maneuvers
 - iv. Inverted flight
 - v. Spins
 - vi. Snap maneuvers
 - vii. Unrestricted aerobatics
 - c. Two demonstration flights observed by the LMAI. A list of current LMAI is available on the AMA Web site under the Member Only Documents section.
 - d. If for any reason the LMAI is not completely satisfied with the airworthiness of the model as demonstrated, further test flights must be arranged after rectification of the faults noted.
 - e. Upon satisfactory completion of the test flights all required documentation will be filled out and signed by the owner and LMAI and then immediately forwarded to AMA headquarters.
2. Required documentation:
Copies of all documents have to be submitted to AMA headquarters immediately. The originals must be retained by the owner and will serve as proof of inspection.
- a. Builder's Declaration [model airplanes constructed from scratch, not Almost Ready to Fly (ARF) airplanes]
 - i. The builder of the model requesting a Permit to Fly will be required to sign a declaration that the materials and methods used in its construction are suitable for the intended purpose.
 - ii. In case of ownership change, the declaration should be kept with the model.
 - b. Temporary Authorization to Fly
 - c. Permit to Fly
 - d. Pre-flight checklist
 - e. **Turbine Addendum (if applicable)**
3. Permit to Fly Operation
- a. *Pre-Flight Inspection:*
The operator shall verify all items in the Inspection Checklist before the first flight on any day, and after the model has been disassembled and reassembled. Items marked "*" must also be verified again before EACH flight.
 - b. Possession of a valid *Permit to Fly* allows flights of the subject model by the owner, or by a competent pilot designated by the owner, both of whom must be current AMA members. Designated pilot(s) must comply with the minimum pilot standards of this program. All flights are subject to all limitations applying to their location.

Large Model **Airplane** Program

- c. All required documentation has to be received by AMA HQ no later than 30 days after being issued in order for the *Permit to Fly* to be valid.

4. *Permit to Fly Suspension*

- a. A *Permit to Fly* shall be considered suspended whenever the model for which it is issued:
 - i. suffers damage to its primary structure or any control surface
 - ii. suffers any control malfunction during flight
 - iii. is structurally or aerodynamically modified
 - iv. is fitted with a different type or size of engine or engine mount
 - v. is fitted with a different type or size of servo operating a control surface
 - vi. is fitted with a different type of battery or a battery with a lower capacity
 - vii. is fitted with a different type of radio receiver
 - viii. is fitted with any device which alters the control system
 - ix. has any control surface re-covered or repainted so that its unbalanced weight is increased
 - x. is not routinely inspected before flight
 - xi. has not been flown/**inspected** during a period of twelve months
 - xii. is operated outside the flight envelope defined in its *Permit to Fly*
 - xiii. undergoes a change of ownership
 - xiv. **required documentation is not received at AMA HQ within allotted time.**
- b. AMA headquarters must be notified immediately if a *Permit to Fly* is suspended.
- c. The AMA, through action by the Executive Director or its President, may suspend a *Permit to Fly* at any time.
 - i. The owner shall be notified of the suspension in writing, including a summary for the basis of the suspension. Such a suspension can be predicated on a written complaint by two AMA members.
 - ii. The permit holder may appeal the suspension within thirty (30) days of receipt of the suspension notice. The appeal must be accompanied by all documentation which the appellant believes supports his/her position.
 - iii. The AMA Safety Committee will consider the appeal, including the written documentation supplied by the appellant, and conduct any investigation or hold any hearing it deems appropriate, although it need not hold any formal hearing.
 - iv. The majority decision of the AMA Safety Committee is final and binding.
- d. A suspended *Permit to Fly* may be revalidated:
 - i. Providing repairs and/or modifications causing the suspension have been examined and the model in its modified state is again test flown.
 - ii. If the *Permit to Fly* was suspended due to ownership change, a new *Permit to Fly* must to be issued with the information for the new owner. Model inspection and/or test flights are strongly recommended.
 - iii. If the *Permit to Fly* was suspended by AMA the course for revalidation will be addressed and established on a case by case basis.

Large Model **Airplane** Program

5. *Permit to Fly Cancellation*

- a. A *Permit to Fly* shall be cancelled whenever the model is damaged beyond repair or if modified such that it is no longer accurately described in the *Permit to Fly*.
- b. AMA headquarters must be notified immediately if a *Permit to Fly* is cancelled.

6. *Appeals*

In the event of unresolved disputes, the applicant for a *Permit to Fly* may appeal to the AMA Safety Committee for a ruling and, if unresolved, the AMA Executive Council shall be the final arbiter in all disputes.

7. *Flying Site Standard (All sites must meet this standard for LMA-2 & LTMA rated airplanes)*

- a. The minimum distance between the take-off/landing path and the pilot line shall be 50 feet.
All other flying, including practice flights, shall be performed at a minimum distance of 200 feet to any spectator.
- b. Minimum set-back distances may be reduced at AMA sanctioned events if the Contest Director determines that safety of participants and spectators is maintained.
- c. All other field layout and operation standards will be per the AMA Safety Code, and Membership Manual recommendations.

Large Model **Airplane** Program—Builder’s Declaration & Temporary Authorization

BUILDER’S DECLARATION

I certify that the materials, methods, and standards used in the construction of this model airplane are, to the best of my knowledge and belief, suitable for the intended purpose and are in accordance with the program requirements.

Model Description: i.e. yellow & black, ½ scale Cub

Name (print)

Signature

Date

AMA Number (if applicable)

In case of ownership change, this declaration should be kept with the model.

- - - - -

TEMPORARY AUTHORIZATION TO FLY FOR ALL LMA & LTMA

I have inspected this model airplane in accordance with the current LMA pre-flight inspection outline. To the best of my knowledge and belief the model will be suitable for the intended demonstration flights as in accordance with the program requirements.

Model Description: i.e. yellow & black, ½ scale Cub

Name of owner

Signature of owner

Name of LMAI – required for LMA-2 & LTMA-2 (print)

Signature of LMAI – required for LMA-2 & LTMA-2

Day of issue

AMA Number

This *TEMPORARY AUTHORIZATION TO FLY* is only valid on the day of issue.

Large Model **Airplane** Program—Permit to Fly

PERMIT TO FLY FOR ALL LARGE MODEL AIRPLANE CLASSES

Owner's Name _____ AMA _____

Model Description:

Airplane Type _____

Wingspan _____ Weight _____ CD/LM/LMAI Initials _____

Design by _____

Engine Details _____

Turbine 1 or 2 (if applicable) _____

Color Scheme _____

Construction _____

Radio Equipment (Manufacturer and Model Number) _____

Transmitter _____

Rudder _____

Receiver _____

Throttle _____

Servos _____

Flaps _____

Aileron _____

Retracts _____

Elevator _____

Other _____

Flight Envelope:

Level maneuvers, flat turns, gentle climbs and dives Looping maneuvers

Rolling maneuvers Inverted flight Spins Snap maneuvers

Unrestricted aerobatics

The above described airplane has been inspected for airworthiness and has demonstrated its ability to perform within the designated flight envelope as indicated on this Permit.

Observer 1:

Owner or CD/LM/LMAI Name (print)

Owner or CD/LM/LMAI Signature

Day of Issue

AMA Number

Observer 2:

CD/LM/LMAI Name (print)

CD/LM/LMAI Signature

AMA Number

**Permit to Fly will be invalid if all required documentation is not received
at AMA HQ with 30 days of issuing.**

TURBINE CLASS PERMIT TO FLY ADDENDUM

Addendum is for a LTMA-1 LTMA-2

Owner's Name _____ AMA _____

Model Description: i.e. yellow & black, ½ scale Cub

Owner's Declaration

I affirm that I have verified that any individual operating this turbine powered model has the necessary experience and skill level. In addition, I have confirmed that the individual(s) have a current turbine waiver/affidavit on file with the Academy of Model Aeronautics.

Owner's Signature

Date

GUIDELINES FOR LARGE MODEL AIRPLANE INSPECTIONS

No one can predict equipment failure or pilot error in the flying of radio controlled airplane. However, if the following preliminary precautions are met, equipment and structural failures can be minimized.

Whether you are the owner of a LMA or an appointed LMA Inspector, you will evaluate every aspect of the airplane awaiting certification.

The following is considered the criteria for certification of Large Model Airplane:

Check List for Preflight Inspection

1. UN-ASSEMBLED INSPECTION

1.1 WING GROUP

- () Fuselage attachment points
- () Strut attachment points
- () Rigging wire attachment points
- () Servo mounting
- () Pushrods/cables and actuating links
- () Control horns
- () Control surface hinges and area around hinges
- () Undercarriage integrity and attachment points
- () Structural integrity overall
- () Covering integrity

1.2 FUSELAGE GROUP

- () Wing attachment points
- () Undercarriage integrity and attachment points
- () Servo mounting
- () Pushrods/cables and actuating links
- () Control horns
- () Control surface hinges and area around hinges
- () Fin and rudder assembly
- () Horizontal stabilizer assembly
- () Bracing/strut attachment points
- () Structural integrity overall
- () Covering integrity

Large Model **Airplane** Program—Preflight Checklist

1.3 ENGINE(S)

- * Propeller secure and undamaged
- * Spinner secure and clear of propeller blades
- * Engine mounting and accessories secure
- * Cowling attachment
- * Magneto switch functioning and OFF
- * External servicing points (fuel, plus, etc.)

1.4 RADIO EQUIPMENT

- Receiver installation
- Battery installation
- Antenna installation
- Switch installation
- Wiring and plugs clean, undamaged and secure

2. ASSEMBLED INSPECTION

2.1 GENERAL

- First ensure that all components fit together correctly, and that no undue strain is needed to achieve proper alignment.

2.2 RIGHT WING

- No non-design twists or warps
- Wing tips true
- Wing leading edge
- Struts and rigging secure
- Attachment to fuselage
- Undercarriage attachment
- Alignment of control surfaces

2.3 FUSELAGE AND TAIL GROUP

- Horizontal stabilizer attachment
- Fin and rudder attachment
- Struts and bracing secure
- Alignment of tail group with respect to wing
- Alignment of control surfaces
- Tail wheel assembly
- Canopy

Large Model **Airplane** Program—Preflight Checklist

2.4 LEFT WING

- No non-design twists or warps
- Wing tips true
- Wing leading edge
- Struts and rigging secure
- Attachment to fuselage
- Undercarriage attachment
- Alignment of control surfaces

2.5 MISCELLANEOUS

- Center of gravity
- * Correct movement and centering of all control surfaces
- * Battery charge, fuel, air pressure all sufficient

2.6 CHECKS WITH ENGINE(S) RUNNING

- * Airplane secure before start (tied down preferred)
- * Engine performance and reliability
- * Propeller and spinner balance
- * Minimal airplane vibration
- * Radio reliability
- * Radio range check

The above check list is to be completed by the owner of a LMA or an appointed inspector prior to test flights. All items are to be marked “N/A” if not applicable, checked if passed, or left blank pending re-inspection if failed.

The Check List is subsequently used by the operator of the airplane:

- (a) Once at the beginning of a flying session (all items)
- (b) Before every flight (items marked with an * only)

PREFLIGHT CHECKOUT TEST
(Should be completed prior to each flight)

CONTROL SYSTEM:

() Perform a range check with your radio. Use the recommended range check distances as described by the radio manufacturer as a minimum test range requirement. Perform the range check, without the engine operating, to the maximum range achievable without control degradation.

() Run a similar check with the engine operating at power levels from idle to maximum power. If there is range degradation with an operating engine there is an issue with ignition noise and/or a vibration induced problem. Do not fly until this is resolved. ANY reduction in range means a loss in signal/noise ratio and a chance of control loss in flight.

The engine off/engine on test should be conducted prior to each flying session since degradation of shielding and spark plugs with usage is a historical fact.

() Check servo operating for erratic performance, especially with the engine(s) operating. Be sure they operate smoothly throughout the entire control range. Apply hand load to surfaces while being moved by transmitter action to check for non-flexing of control cables/rods.

() Transmitter battery life **MUST** have been previously established by a discharge test, prior to first flight.

() Keep a daily record of transmitted "ON" time.

() Check the state of charge of the flight battery packs, **UNDER LOAD**, just prior to each flight. Flight battery packs **MUST** have been previously checked for design capacity prior to first flight.

() Check the function of the fail-safe system by turning off the transmitter and observing the results.

VEHICLE:

Thoroughly inspect the airplane and components for assembly and for structural integrity.

() Inspect the wing and tail assembly for signs of structural failure.

() Examine all control surface hinging for design integrity.

() Examine servo mounting and retention screws or bolts.

() Examine all push rods and keepers.

Large Model **Airplane** Program—Preflight Checklist

- () Be SURE there is no looseness or slop in the control components.
- () Check the mounting provision for tightness and security of all components that are removable for transporting to and from the flying site.
- () Inspect fuselage for signs of potential failure or damage during previous flights or transporting.
- () Check servo installation and be sure the servo arm retention screws are tight.
- () Inspect receiver/servo wiring for integrity and see that all plugs connecting the components are taped or in some way protected from vibrating apart. Include battery pack plugs.
- () Check to see that receiver antenna(s) are routed away from servos. Vertical orientation of antenna is preferred.
- () Check for NO STRAIN on antenna/receiver connection.
- () Examine landing gear mounting and function. (retract/steering)
- () Examine fuel tank(s) installation for adequate support, isolation from vibration and ZERO leakage. Special care must be given to gasoline systems in view of the increased fire hazards involved.

ENGINES:

- () Inspect mounting for looseness, cracks or evidence of degradation.
- () Check for loose bolts, muffler looseness, routing and integrity of ignition wiring, etc.
- () Check propeller(s) and installation for tightness. Propellers must have the edges rounded to prevent hand cuts on starting. Always use a glove or engine starter.
- () Check spinner(s) for tightness or cracks. (Loss of a spinner and/or propeller in flight can quickly generate a panic situation).
- () Inspect cowl area for loose nuts and bolts.

Large Model **Airplane** Program—Preflight Checklist

ENGINE RUN-UPS:

() Exercise extreme caution when starting and operating engines. A starter is preferred to avoid hazards to the hands or body.

Securely restrain the vehicle. Do not allow ANYONE to be positioned in the plane of rotation of the propeller(s).

The use of safety glasses is encouraged. Avoid loose clothing, transmitter straps, etc. that might engage the propeller.

() Always have a FIRE EXTINGUISHER available when operating gasoline engines.

() Start the engine(s) and check for proper idle.

() Be sure that the engine(s) operates at desired top end R.P.M. and does not sag with prolonged running, from inadequate cooling.

PILOT STANDARDS:

The inspector will review the pilot's skill level at the same time as the model's qualification flight.

Safe operation is a mixture of several ingredients: design, construction, pre-flight check-out and the pilot. A proficient pilot can often avoid a disaster when power failure, partial loss of control or many other incidents occur. The larger the airplane is, the more it will fly like a full-scale airplane than smaller models. Control and engine(s) response are quite different from smaller airplane.

The following constitutes the standards for pilots of airplanes in the LMA-2 classification:

() At least five years background in model design, construction, and/or piloting of radio controlled model airplane.

() Has demonstrated successful flying experience of LARGE heavy models in excess of 40 pounds.

() A demonstrated ability to recognize stall and loss of aerodynamic control.

Large Model **Airplane** Program—Preflight Checklist

FLIGHT:

All flights will be done in accordance with the current Safety Code, particularly that all pilots shall avoid flying directly over unprotected people, vessels, vehicles or structures and shall avoid endangerment of life and property of others. The model airplane must occupy airspace that will permit safe impact on loss of control. This infers function of the fail-safe system to a limited dispersion impact.

Flight maneuvers shall not exceed the design limits of the vehicle.
Flight velocity shall not exceed 120 mph in level flight for LMA-2.

The flight test program should include the following items during the initial two shake down flights, PRIOR to certification:

- () First flights shall be relatively short in duration and be devoted to checking out the "trim" of the airplane. This should include slow flight and stall characteristics to assist the pilot with first landings. Control limits, roll rates, climb rates and glide rates should also be included.
- () Later flights during testing must be designed to demonstrate control and structural integrity. A little tighter than normal left and right hand turns (in case it may be needed), and a power dive, enough to add a little extra stress to check-out structural integrity. If the original airplane was capable of aerobatics (and they are to be part of the flight demo), then inverted flight, spins, etc. should be included.
- () The final test flight conducted for the Inspector shall demonstrate the entire flight envelope as might be flown at sanctioned event demonstrations.
- () The *Permit to Fly* will be issued to the owner showing that the airplane is airworthy.
- () The *Permit to Fly* **is valid for up to 365 days and** must be renewed ANNUALLY . This will require the same pre-flight inspection, and two check-out flights of 8 to 10 minutes duration.

Please submit a copy of the completed pre-flight checklist, along with the *Permit to Fly*, to AMA.

APPENDIX A

LARGE TURBINE MODEL AIRPLANE CLASS

A Large Turbine Model Airplane (LTMA) is an airplane that is powered by a turbine engine(s). LTMA are manufactured and flown under the strict guidelines and regulations set forth in this program. All LTMAs are also subject to all of the rules and specifications brought forth by AMA's turbine regulations.

Airplane models considered LTMA-1 in design and concept shall weigh no less than 55 pounds nor exceed 77.2 pounds maximum, with fuel, ready to fly.

Airplane models considered LTMA-2 in design and concept, shall weigh no less than 77.2 pounds nor exceed 100 pounds maximum, with fuel, ready to fly.

GENERAL

All regulations from the LMA Class shall be followed unless stated differently here. The regulations stated here are not all inclusive, but only what is required in addition to, or in place of, the LMA Class regulations.

All AMA turbine regulation (AMA website document 510-A) shall be followed in the LMA Turbine Class, unless otherwise specified in this appendix.

The maximum thrust for the LTMA-1 class is 75 pounds.

The maximum thrust for the LTMA-2 class is 90 pounds.

Both airplane and pilot shall be qualified for either LTMA-1, or LTMA-2.

An LTMA-1 model is restricted to a maximum speed of 200 mph.

An LTMA-2 model is restricted to a maximum speed of 140 mph.

To qualify for an LTMA-1 class the pilot shall have completed a minimum of 50 turbine powered flights with a model having a dry weight of 25 pounds or greater.

To qualify for an LTMA-2 class the pilot shall have completed a minimum of 100 turbine powered flights with a model having a dry weight of 25 pounds or greater, and being capable of speeds greater than 140 mph.

A class LTMA-2 pilot may operate either a LTMA-1 or LTMA-2 model.

The builder of the LTMA shall have completely constructed two or more turbine powered models having a dry weight of 25 pounds or greater. Completely constructed meaning built from scratch or from a factory kit.

AIRFRAME INSPECTION

The inspector shall verify that all flight surfaces (wings and tails) are reasonably stiff and solidly attached to the fuselage. With the fuselage held in place (by hand or mechanically) the inspector should hand load the wing from the tip, applying both vertical loads, up and down, and twisting loads, leading edge up and down. The intent is not to determine the ultimate strength of the model, but that under moderate loads there are no unexpected motions, and that there is no evidence of failing joints. The tails shall be tested in the same manner.

The fuselage should also have reasonable stiffness. The tails will be loaded by hand in such a manner as to bend and twist the fuselage. The inspector should be looking for any unexpected motion or evidence of failing joints. All hatches shall be removed for the inspection, and every effort will be made by the builder to insure there is visual access to structural elements of the model.

All control surfaces will be pull-tested to insure that the hinges are secure. With the radio turned on, the inspector will verify that there is no excessive flexing of the control linkage or movement of the servo beyond what the vibration isolators permit.

Once the inspector has verified that both the airframe and the pilot meet the requirements, a Temporary Authorization to Fly will be issued. On the flight day the model, fully fueled, shall be weighed. The CD/LM/LMAI will either provide the scales, or take reasonable effort to check the accuracy of the scales used.

While in test flights the model will be operated as close as practical to the center of the field and initially at moderate speed. Once the pilot is comfortable with the model he shall begin to expand the operating envelope of the model. The initial envelope expansion is to prove load carrying capability and flutter resistance at higher speeds. The pilot will slowly increase the speed of the model and pull progressively tighter turns at field center. The model shall always be turned away from the runway during these maneuvers. Once the CD/LM/LMAI is confident that the model has operated up to a reasonable condition successfully the pilot shall begin working to the nominated flight envelope in order to complete the qualifying test flights. It is important that the model airplane is flown to the full extent of the flight envelope appropriate to the airplane, including full speed level flight, minimal speed level flight in a dirty configuration, and recovery from a dive or split S maneuver.

AIRFRAME REQUIREMENTS

All flight control servos shall have a minimum torque as determined earlier in the program. The builder/owner shall provide a copy of the calculations for each control surface to the inspector. Flaps may be excluded if it can be shown that the servo cannot be back driven with the surface in the up position. An example of this would be a servo that is rigged such that the control linkage is in line with the servo output shaft with the flap extended.

All control linkages shall have a positive lock that prevents the clevis, or similar device, from coming loose under load.

Wing loading shall not exceed 100 ounces per square foot of wing area.

APPENDIX B

FOREIGN PARTICIPANTS – EVENT PERMIT TO FLY

Since the majority of foreign participants attending AMA sanctioned events would find it difficult to comply with the requirements of obtaining a Permit to Fly, the AMA Executive Council has approved the following provision, effective December 18, 2008:

1. Any foreign participant must be an Affiliate AMA member.¹ This requirement also applies to current MAAC members who wish to apply for an event permit and their airplane is between 77.2 and 125 pounds. This is due to discrepancies between the AMA and MAAC safety codes and liability policies.
2. Pilots/Owner must conduct an inspection according to the LMA inspection guidelines, and sign an attestation that the airplane has flown a minimum of three successful flights on previous occasions.
3. An AMA LMA Inspector will conduct an inspection per the LMA Program inspection guidelines for LMA-2 & LTMA-2.

The AMA LMA Inspector will issue an "Event Permit" based on the pilot's attestation and a successful inspection. The issued permit will allow the airplane to be immediately flown at any time during the sanctioned event and AMA's liability coverage would apply.

An "Event Permit" is required for each specific model airplane, and is only valid for the dates of the sanctioned event.

¹Foreign participants must be a current member of their National Aero Club in order to sign up as an AMA Affiliate member.

Large Model **Airplane** Program—Foreign Participants

SANCTIONED EVENT PERMIT TO FLY FOR FOREIGN PARTICIPANTS

Owner's Name _____ AMA _____

Model Description:

Airplane Type _____

Wingspan _____ Weight _____ CD/LM/LMAI Initials _____

Design by _____

Engine Details _____

Turbine 1 or 2 (if applicable) _____

Color Scheme _____

Construction _____

Radio Equipment (Manufacturer and Model Number) _____

Transmitter _____

Rudder _____

Receiver _____

Throttle _____

Servos _____

Flaps _____

Aileron _____

Retracts _____

Elevator _____

Other _____

Flight Envelope:

- Level maneuvers, flat turns, gentle climbs and dives Looping maneuvers
 Rolling maneuvers Inverted flight Spins Snap maneuvers
 Unrestricted aerobatics

The above described airplane has been inspected for airworthiness and has demonstrated its ability to perform within the designated flight envelope as indicated on this Permit.

Owner or CD/LM/LMAI Name (print)

Owner or CD/LM/LMAI Signature

Day of Issue

AMA Number

CD/LM/LMAI Name (print)

CD/LM/LMAI Signature

AMA Number

Permit to Fly is only valid for the dates of the sanctioned event.

Large Model **Airplane** Program—Inspector Application

EVENT PERMIT TO FLY – FOREIGN PARTICIPANT ATTESTATION

Owner/Pilot Attestation:

I, _____, hereby attest that the model airplane,

_____ Model Description
has had a minimum of three (3) successful flights on previous occasions and that it complies with the current AMA LMA program guidelines.

Owner/Pilot Name (print)

Owner/Pilot Signature

Date

AMA Number

APPLICATION FOR LARGE MODEL AIRPLANE INSPECTOR

The Academy of Model Aeronautics (AMA) maintains a pool of potential inspectors for the Authorization Procedure for Large Model Airplane. This procedure is designed to provide insurance for individuals wishing to fly model airplane between 55 and 125 pounds in specific, controlled situations.

Assignment

AMA HQ will maintain a pool of prospective inspectors and post a listing on the AMA website. Individuals desiring to have an airplane inspected can access the list of current inspectors on the AMA website at www.modelaircraft.org. For privacy reasons, the document is located in the Members Only section under the Members & Clubs tab.

Nomination

Individuals desiring appointment to the inspector pool may do so by submitting a complete application with AMA Headquarters. Application involves the passing of a quiz on the program, references from three current Open AMA members, and the supplying of a resume designed to provide details of the individual's qualifications. A majority approval vote of the Safety Committee members will result in the addition of the individual to the inspector pool. Additional names may be added to the pool by the Safety Committee or Executive Council if needed, to adequately maintain the program.

Obligations of an Inspector

In accepting the nomination as an Inspector, a member accepts the responsibility implicit in the appointment and undertakes:

- a) to be available with reasonable notice to attend and observe test flights when requested,
- b) to carry out all duties in accordance with this program,
- c) to not charge for services (compensation for expenses and travel are permissible),
- d) Inspector cannot be the builder, pilot, owner, or buyer/seller of the airplane being inspected,
- e) Inspector has to be a current AMA member when inspecting an airplane.

AMA's member insurance coverage applies to a certified Large Model Airplane Inspector for alleged negligence resulting in a bodily injury or property damage claim or suit arising out of the inspection of an airplane for the purpose of qualifying it for flight approval.

Large Model **Airplane** Program—Inspector Application

Name _____ AMA # _____

Address _____

City _____ State _____ Zip _____

Phone (_____) _____ - days (_____) _____ - evenings

E-mail _____ Fax _____

Number of Years as AMA member _____

Occupation _____

I pledge that if I am granted LMA Inspector status, I will:

- ◆ Maintain a high level of proficiency in the use of materials as well as building and flying techniques for large airplane models.
- ◆ Maintain strict safety standards and adherence to the AMA Safety Code, the AMA Large Model Airplane Program and its authorization documents.
- ◆ Submit all required documentation promptly.

Signature _____ Date _____

Resume:

Please attach a separate sheet with your resume. It is imperative that you include items such as:

- (a) years of modeling experience involving flying and building (if applicable);
- (b) models built/flown,
- (c) full scale experience including type of license held, if any, as well as any background in home building such as EAA activity;
- (d) number of years experience as a Contest Director, if any, and major event(s) administered;
- (e) background in radio, if any;
- (f) ability to travel; articles published; administrative positions held;
- (g) other items pertinent to being selected for position.

Please be as specific as possible. This information is crucial for the Safety Committee to evaluate your application.

Large Model **Airplane** Program—Inspector Application

REFERENCES

(To be completed by three (3) individuals who are current AMA Open Members)

We, the undersigned, consider the applicant fully qualified to act on behalf of the AMA as a Large Model Airplane Inspector.

Name (please print) _____ AMA # _____

Address _____

City _____ State _____ Zip _____

Signature _____ Date _____

Name (please print) _____ AMA # _____

Address _____

City _____ State _____ Zip _____

Signature _____ Date _____

Name (please print) _____ AMA # _____

Address _____

City _____ State _____ Zip _____

Signature _____ Date _____

LARGE MODEL AIRPLANE INSPECTOR QUIZ

Name _____ AMA # _____

Address _____ Date _____

City, State, Zip _____

In qualifying as an inspector for large model airplane, an individual assumes a high level of responsibility. The following questionnaire is designed to test the applicant's understanding of the process for certifying models in this classification. The information required may be found in the AMA Membership Manual (Safety Code and Frequency Information), or the documents associated with the AMA Large Model Airplane program.

Read each statement and locate the page and/or item number that provides information about each statement. Fill in the proper numbers in the spaces on this form. A minimum grade of 83% is required for passing. (Membership Manual is available on our website at www.modelaircraft.org under "Membership.")

Document# 1 = Safety Code

Document# 2 = Frequency Information – current Membership Manual

Document# 3 = Large Model Airplane Programs Requirement and Inspector Information booklet

1. Page ____ Item ____ At all flying sites a safety line or lines must be established, in front of which all flying takes place
Document # _____

2. Page ____ Item ____ The inspector issues temporary authorization to fly, valid only on the day of issue, to allow test flights.
Document # _____

3. Page ____ Item ____ A minimum of two (2) test flights must be made in the presence of the inspector.
Document # _____

4. Page ____ Item ____ A minimum distance of two hundred (200) feet shall be required separating the pilot line and the airplane's flight path.
Document # _____

5. Page ____ Item ____ 53.1 MHz through 53.8 MHz are legal frequencies for radio control events, providing the modeler is properly FCC licensed
Document # _____

Large Model **Airplane** Program—Inspector Application

6. Page ____ Item ____
Document # _____ I will not fly my model aircraft unless it is identified with my name and address, or AMA number, inside or affixed to the outside of the model aircraft.
7. Page ____ Item ____
Document # _____ A maximum wing loading requirement is provided.
8. Page ____ Item ____
Document # _____ Authorization for flights must be renewed annually.
9. Page ____ Item ____
Document # _____ The inspector cannot be the builder of the airplane.
10. Page ____ Item ____
Document # _____ Flight velocity shall not exceed 120 mph
11. Page ____ Item ____
Document # _____ AMA shall be the final arbiter in all unresolved disputes.

FOR AMA HQ USE ONLY

Score _____ %

Passed

Needs to resubmit