



VICTORIAN OLD TIMERS ASSOCIATION INC.

RADIO CONTROL ELECTRIC OLD TIMER

Official Rules Proposal

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COMPETITION DETAILS:

<u>Event</u>	<u>Max Time</u>	<u>Flights counted</u>	<u>Launch Requirements</u>
Electric Texaco	10 min	best 3 of 4	ROG
Electric Duration	10 min	best 3 of 4	ROG
Electric ½A Texaco	10 min	best 3 of 4	ROG optional
Electric Height Limited	7 min	best 3 of 4	ROG
Electric Nostalgia	7 min	best 3 of 4	Hand launch OK

R/C ELECTRIC OLD TIMER RULES

10.4.1 GENERAL

The general requirements set out in this section apply to the specific events described in later sections of these rules.

The terms “shall” and “must” indicate mandatory instructions or requirements whilst the terms “should” and “may” mean recommended but optional.

10.4.1.1 AIRCRAFT CATEGORIES

The following **SAM** approved aircraft categories apply to electric events:

- (a) **ANTIQUE** aircraft are defined as aircraft which were designed, kitted, or published on or before 31st December 1938.
- (b) **OLD TIMER** aircraft are defined as aircraft which were designed, kitted, or published on or before 31st December 1942.
- (c) **NOSTALGIA** aircraft are defined as aircraft which were designed, kitted or published on or after 1st January 1943 and on or before 31st December 1956. A combined wing and horizontal stabiliser area is used in calculating the wing area in clause 10.4.1.2(b).

10.4.1.2 AIRCRAFT GENERAL REQUIREMENTS

- (a) Where the specific rules for an event state that the minimum wing area rules apply as defined in this clause, models used in those events shall comply with the following:

Aircraft must have a minimum of 48 sq in of wing area per volt of motor battery pack (see also specific events for battery limits).

Note: Based on nominal voltage where LiPo = 3.6v/cell and A123 = 3.3v/cell

- (b) The formula to be used to determine the wing area is:

WING AREA = CHORD x WINGSPAN where:

The wingspan is defined as a straight line dimension from wing tip to wing tip, with no allowance being made for tapered or rounded tips, and the Chord is measured half way between the wing tip and the centre-line of the fuselage.

- (c) Models shall comply with the requirements of the M.A.A.A. Manual of Procedures.
- (d) Aircraft models may be modified in the following ways:
- (i) Rudder and elevator are the only flying surface controls allowed.
 - (ii) Minor changes to the thrust line for flight trimming.
 - (iii) The electric motor mounting should retain the thrust line as on the original model.
- (e) Outlines, areas, moments and cross sections may not be changed except for direct scaling. Structures may be strengthened or lightened and provision for control surfaces may be added. Airfoil sections must be the same as on the original model. Landing gear should be in the same location as on the original model; however, single-wheeled main landing gear designs may be modified to dual wheel main landing gear designs, using the same wheel size as the original. All changes must be in the character of the original aeroplane.
- (f) It is the responsibility of the competitor to prove the validity of the model and the fidelity to the original design. The competitor must submit the actual construction plans to the Contest Director upon request.
- (g) No modification shall be made which would prevent the model making a normal, unassisted rise off ground (ROG) take off.
The following are not permitted:- jettisoning undercarriages, vertical take off, or catapult devices.
- (h) It is permissible to scale an approved design up or down, provided a copy of the original plans is used for scaling.
- (i) One reserve model is permitted in each event in contests. A competitor may interchange various parts provided the resulting complete model conforms to the requirements of these rules and that the parts have been checked before the start of the contest.
- (j) All powered R/C aircraft, including $\frac{1}{2}$ A Texaco, must have originally been gas (IC) powered (ie, no rubber model designs).
- (k) Extension to the front of the fuselage may be made to assist the electric Installation (Motor, ESC, Battery etc) and to facilitate balancing the model, provided that the constructor identifies and establishes a relevant compatible I.C. Prop face for the design, and does not extend beyond same.. Where an extension of the fuselage is employed, it shall be in character with the original design.

10.4.1.3 **ELECTRIC MOTOR GENERAL REQUIREMENTS**

- (a) Any DC electric motor (brushed or brushless) is permitted.
- (b) Any motor magnets (ferrite, cobalt or neodymium, etc) are permitted.
- (c) Any single propeller drive system is allowed.
- (d) A means of remotely cutting the power to the motor is mandatory and shall be demonstrated on demand.
- (e) The electric motor must be fitted with a propeller brake function.
- (f) No folding, freewheeling, variable pitch or single bladed propellers shall be permitted (locking a folding prop is permitted).

10.4.1.4 **SAFETY**

Competitors using an Electronic Speed Controller (ESC) with Battery Eliminator Circuit (BEC) in lieu of a separate Rx battery must ensure that there is sufficient energy in the motor battery pack for an extended flight in the event of a fly-off.

10.4.1.5 **CONTEST PROCEDURES**

- (a) In any area where height limitations are likely to occur, event organisers should conduct these contests in accordance with Government regulations.
- (b) Five (5) competitors shall constitute an event at state or national level.
- (c) All models, except Nostalgia, shall rise off ground (ROG). The Contest Director may declare the field unsuitable for ROG of 1/2A Texaco at the start of the competition and allow hand launches.
- (d) Models must be airborne within five (5) seconds of a flight or fly-off being declared open by the Contest Director (radio frequency clashes permitting). Failure to become airborne within five seconds will result in an attempt being awarded. The second attempt shall not be before the next official flight.
- (e) Timing of a flight starts when the model is released with motor running. Timing stops when the model touches the ground and comes to rest. The electric motor must be off (and remain off) before the aircraft touches the ground.

- (f) The competitors score for a flight is calculated by allocating one point for each second of flight time as defined in clause 10.4.1.5 (e) up to the maximum flight time specified for each event. Scoring is to be rounded off to the nearest second. (e.g. 10.5 seconds is 11 seconds, and 10.49 seconds is 10 seconds)
- (g) Should the respective maximum flight time plus two (2) minutes be exceeded, the flight score from then on will be reduced by one (1) point per second of flying time until the model lands. The minimum point score for any flight is zero. Minus scores are not to be used.
- (h) The motor run time for limited motor run events is defined as starting when the model is released with the motor running and ending when the throttle stick is reduced to minimum and the propeller stops. (refer also section 10.4.1.5 (u)).
- (i) Prior to the start of the contest the Contest Director will define an area, which should be 100 x 100 metres or larger, which will become the defined landing area for the contest. Failure to land in the defined landing area after an official flight will result in a zero score for that flight.
- (j) Each competitor shall be entitled to two (2) attempts at each official flight. If a second attempt is made, it shall be the official flight.
- (k) A model may only be used by the one competitor in any one event.
- (l) A competitor may elect to compete with one previously-nominated assistant who may assist in the flying of the model for safety reasons including take-off and/or landing.
- (m) Attempts are defined as follows:
 - (i) Release of model with motor running.
 - (ii) A motor over-run or second start in limited motor run events.
 - (iii) Competitor calls an attempt within the given motor-run time allocated to that particular model in limited motor run events.
 - (iv) The competitor calls an attempt within two (2) minutes of release of model with the motor running in Texaco events.
- (n) Should an attempt be called, timing of the flight ceases.
- (o) Should a motor over-run occur on a second attempt in an official flight of any limited motor run event, the score for that flight is zero.

- (p) Official flights may be conducted in rounds as determined by the Contest Director.
- (q) On-board thermal indicating devices, including real time monitoring/transmitting and receiving devices, are not permitted in any events.
- (r) The contest may be stopped at the Contest Director's discretion if the wind strength exceeds 25 kph (7 metres per second) more than twice in a 15 minute period.
- (s) When, during the conduct of an event, weather conditions alter and render it inadvisable to conform to the contest format stated in these rules or because of M.O.P. Regulations, the Contest Director will call a meeting of all competitors to determine by consensus a contest format which will enable the successful completion of the event. Flight times achieved in rounds not completed by all competitors at the time of the contest Director calling this meeting will not be included in the official scores for that contest.
- (t) Each competitor will have the opportunity to make four (4) official flights of which the best three (3) will count towards the competitor's official score. This system will apply to all events.
- (u) For all events the following safety procedure applies. With the motor running and the competitor standing behind the model, the competitor will demonstrate movement of control surfaces and motor shut-down with brake to the person timing the flight, immediately prior to launch. Failure to do so may incur a penalty of zero score for that flight.

10.4.1.6 FLY-OFF PROCEDURES

- (a) If, on the completion of the official flights, a tie exists that in the opinion of the Contest Director needs to be resolved to determine the results of the contest, a fly-off shall be held involving the tied competitors/models only.
- (b) All models in the fly-off shall commence the task simultaneously. It is each competitor's responsibility to have a minimum of two frequencies available for competition. Where it is impossible to separate the competitors' frequencies, the competitor(s) with the highest score(s) and then the highest dropped flight score shall proceed to the fly-off. Thereafter the matter shall be settled by a toss of a coin.
- (c) Only one opportunity will be given to a competitor to make a fly-off flight. Once the model is released to commence a fly-off flight the result of that flight becomes the competitor's fly-off score.

- (d) A motor overrun in the fly-off of any limited motor run event will result in a zero score being awarded for the fly-off.
- (e) Maximum flight times do not normally apply to fly-offs. However, the CD may, before the fly-off commences, limit the flight time. In the event of a tied score in the fly-off the competitor with the highest dropped flight score shall be the winner. Should the result still be tied the contest shall be settled by the toss of a coin.
- (f) The model must land in the defined landing area in a fly-off flight for the score to count.
- (g) Refer to the specific event rules for additional fly-off requirements for each event.

10.4.2 GUIDELINES FOR CONSTRUCTION OF AIRCRAFT

10.4.2.1 GENERAL

PERMITTED

- (a) Where the original undercarriage moved in slots in the fuselage, a solid attachment may be made at that point.
- (b) Undercarriage fairings, if shown on the original as standard fittings, must be fitted.
- (c) Full or partial wheel spats may be removed to make the model practical for use on grass fields.
- (d) Scaling should be done from the ORIGINAL DRAWINGS (some 1/2 A plans have bulkheads moved for engines - these should not be scaled). The number of ribs in a wing may be increased when enlarging a model to ensure wing integrity. Rib spacing must be at least the same or greater than that shown on the plan.
- (e) The wing and tail may be covered with different materials, e.g. heat shrink for tail and tissue for wing.

10.4.2.2 TAILPLANE AND FIN

PERMITTED

- (a) Addition of necessary structure for R/C controls.
- (b) Bracing may be removed, (e.g. Flying Quaker)
- (c) Alternative methods of attaching tail assembly to fuselage.

NOT PERMITTED

- (d) Added surface sheeting.
- (e) Added cut-outs in tailplane for rudder movement.
- (f) Added cut-outs in fin or rudder for elevator movement.

10.4.2.3 FUSELAGE

PERMITTED

- (a) To increase size of longerons.
- (b) Added surface "warren girder" bracing.
- (c) Added internal sheeting for motor area and undercarriage.
- (d) Cabanes may be strengthened with wire.
- (e) Removable hatch may be fitted for access to R/C gear and/or battery.
- (f) Front end extension to accommodate flight battery pack. Modification should follow original fuselage lines.

NOT PERMITTED

- (g) The addition of surface sheeting, if not shown.
- (h) Reducing, increasing or eliminating cabanes.
- (i) Painting windows on cabin models, unless shown on the original plan as dummy windows.
- (j) Fitting a faired spinner if not shown on the original plan.

10.4.2.4 WINGS

PERMITTED

- (a) Increasing or reducing rib thickness.
- (b) Adding shear webs to spars.
- (c) Adding "warren girder" bracing below the surface.
- (d) Fitting a solid trailing edge instead of a built up trailing edge.
- (e) Adding spars below the surface.

- (f) Increasing the size of the original spars (see MAAA IC OT Rules).
- (g) Substituting hardwood for balsa and vice-versa.
- (h) Wing struts, if shown, must be used.
- (i) Wings may be built in demountable sections to facilitate transport.

NOT PERMITTED

- (j) Adding turbulators.
- (k) Adding surface spars.
- (l) Adding leading edge sheeting.
- (m) Increasing the width of leading edge sheeting.
- (n) Increasing the width of trailing edge sheeting.
- (o) Changing dihedral angles.
- (p) Using bolts to attach the wing unless shown on the original plan.

10.4.2.5 WHEELS

Wheels should, as much as practical, be the same scale as the original model. If the original model had balloon wheels, the competitor may fit commercial wheels of the same diameter or may manufacture similar wheels. The shape of wheels and tyres must conform to the spirit of a model's original design. All non-original wheels shall have a diameter to tyre-width ratio of about 4 to 1 and 6 to 1 (e.g. a wheel 19 mm (3/4 inch) wide should be between 76 mm and 115 mm (3 and 4 1/2 inches) in diameter). Wheel hubs may be slightly thinner than tyre width.

Note: Sliver wheels are not acceptable unless specified on the original plan.

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SPECIFIC EVENT RULES

10.4.3. ELECTRIC TEXACO

Description: This is an energy event where the aim is to achieve a maximum flight time from a limited motor battery pack based on 'dry model' weight.

Note: 'dry weight' is weight of model without the motor battery pack installed.

10.4.3.1 AIRCRAFT ELIGIBILITY.

- (a) This event is for **Antique aircraft only** as described in rule 10.4.1.1. (a)
- (b) The minimum wing area rule as defined in clause 10.4.1.2 (a) does not apply to this event.
- (c) Ballasting is permitted but should be limited to the minimum required to qualify for the next commercially available battery capacity using rule 10.4.3.4.

10.4.3.2 MOTOR ELIGIBILITY.

This event is open to any class of DC electric motor conforming to section 10.4.1.3.

10.4.3.3 MOTOR BATTERY PACK.

The motor battery pack powers the electric motor.

- (a) Li chemistry cells are permitted.
- (b) Motor battery pack cell chemistry cannot be mixed

10.4.3.4 ENERGY ALLOCATION.

- (a) 60 cell.mAh / Oz of dry model weight for LiPo battery
66 cell.mAh / Oz of dry model weight for A123 battery

Note: Based on nominal voltage where LiPo = 3.6v/cell and A123 = 3.3v/cell

- (b) For other cell types, the total energy to drive the electric motor is limited to 0.21 watt.hours / Oz of dry model weight. See appendix for examples of mAh rating and cell count for LiPo batteries).

Electric Old Timer

- (c) The measured dry weight of a model for energy allocation shall be rounded off to the nearest ounce (Oz). (e.g. 40.5 ounces is 41 ounces, and 40.49 ounces is 40 ounces).

Note: One ounce equals 28.35 grams

10.4.3.5 **FLIGHT PROCEDURE**

- (a) Maximum flight time as defined in 10.4.1.5 is 10 minutes (600 points) for all flights except the fly-off (refer 10.4.1.6 (e)).
- (c) The model must land in the defined area for the flight to count towards the score.
- (d) The electric motor may be started and stopped at the competitor's discretion but must be off when the model touches the ground.

10.4.3.6 **FLY-OFF**

- (a) If at the end of official flights a fly-off is necessary, it will be conducted as set out in rule 10.4.1.6.
- (b) For the fly-off refer also to safety clause 10.4.1.4).

10.4.4 **ELECTRIC DURATION**

Description: This is a timed motor run event where competitors attempt to achieve maximum flight times from an allocated motor run time. The battery pack capacity is based on an energy rule which is related to the wing area of the model.

10.4.4.1 **AIRCRAFT ELIGIBILITY**

- (a) This event is open to all Antique and Old Timer aircraft as described in rules 10.4.1.1 (a) and 10.4.1.1 (b).
- (b) The wing area is calculated as defined in clause 10.4.1.2 (b)
- (c) The minimum wing area rule as defined in clause 10.4.1.2 (a) does not apply to this event.

10.4.4.2 **MOTOR ELIGIBILITY**

This event is open to any class of DC electric motor conforming to section 10.4.1.3 of these rules.

10.4.4.3 **MOTOR BATTERY PACK**

The motor battery pack powers the electric motor.

- (a) Li chemistry cells are permitted.
- (b) Motor battery pack cell chemistry cannot be mixed.
- (c) The maximum capacity of the motor battery is defined as follows:

LiPo cells: 1600 cell.mAh/sq ft of wing area
A123 cells: 1745 cell.mAh/sq ft of wing area

See table in appendix for examples of LiPo battery pack combinations for various wing areas or use the following formulae:

LiPo battery capacity: divide wing area in square inches by 144, multiply by 1600 then divide by the number of LiPo cells to be used.

A123 battery capacity: divide wing area in square inches by 144, multiply by 1745 then divide by the number of A123 cells to be used.

10.4.4.4 ALLOWED MOTOR RUN TIME

All models are allowed 35 seconds motor run time.

10.4.4.5 FLIGHT PROCEDURES

- (a) The maximum flight time as defined in 10.4.1.5 (f) is ten (10) minutes (600) points for all flights except the fly-off (refer 10.4.1.6 (e)). This includes the allowed motor run time as above.
- (b) The model must land in the defined area for the flight to count towards the score.
- (c) The electric motor may be started and stopped at the competitor's discretion up to a maximum of 35 seconds total motor run time for the flight. Motor run times over 35 sec will score zero points for the flight.
- (d) Points are deducted from the maximum score for the following:
 - (i) 1 point for each second of flight time under 10 minutes
 - (ii) 1 point for each second of flight time over 12 minutes

10.4.4.6 FLY-OFF

- (a) If at the end of the official flights a fly-off is necessary, it will be conducted as set out in rule 10.4.1.6.
- (b) The motor must not be run over the allowed motor run time otherwise the competitor will be disqualified.
- (c) For the fly-off, refer also to safety clause 10.4.1.4-

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10.4.5 **1/2A ELECTRIC TEXACO**

Description: This is an energy event for small models where the aim is to achieve a maximum flight time from a limited motor battery pack.

10.4.5.1 **AIRCRAFT ELIGIBILITY**

- (a) The event is open to all Antique and Old Timer aircraft as described in rules 10.4.1.1 (a) and 10.4.1.1 (b).
- (b) Models must have less than 450 sq in wing area as defined in section 10.4.1.2(b). The minimum wing area rule as defined in clause 10.4.1.2(a) does not apply to this event.

10.4.5.2 **MOTOR ELIGIBILITY**

This event is open to any class of DC electric motor conforming to section 10.4.1.3.

10.4.5.3 **MOTOR BATTERY PACK**

The motor battery pack powers the electric motor.

- (a) Li chemistry cells are permitted.
- (b) Motor battery pack cell chemistry cannot be mixed.
- (c) The maximum number of cells for the motor battery pack is 3.

10.4.5.4 **ENERGY ALLOCATION**

Energy allocation for Electric 1/2A Texaco is 3.37 watt.hours for all models

Based on nominal cell voltage for LiPo = 3.6v eligible battery packs include the following number and type of cell:

2S 460 mAh LiPo or
3S 300 mAh LiPo

10.4.5.5 FLIGHT PROCEDURE

- (a) The maximum flight time as defined in 10.4.1.5 (f) is ten (10) minutes (600 points) for all flights except the fly off (refer 10.4.1.6 (e)).
- (b) The model must land in the defined area for the flight to count towards the score.
- (c) The electric motor may be started and stopped at the competitor's discretion but must be off when the model touches the ground.

10.4.5.6 FLY-OFF

- (a) If at the end of the official flights a fly-off is necessary, it will be conducted as set out in rule 10.4.1.6.
- (b) For the fly-off, refer also to safety clause 10.4.1.4).

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10.4.6 **ELECTRIC HEIGHT LIMITED OLD TIMER**

DESCRIPTION: This is a height limited event where a competitor attempts to achieve maximum flight time from a single motor run. Models must be fitted with an approved height limiter that cuts the power to the motor.

10.4.6.1 **AIRCRAFT ELIGIBILITY**

- (a) This event is open to all Old Timer and Antique aircraft as described in rules 10.4.1.1 (a) and 10.4.1.1 (b).
- (b) The minimum wing area rule applies to this event as defined in clause 10.4.1.2 (a).

10.4.6.2 **ELECTRIC MOTOR ELIGIBILITY**

This event is open to any class of DC electric motor conforming to 10.4.1.3 of these rules.

10.4.6.3 **MOTOR BATTERY PACK**

The motor battery pack powers the electric motor.

- (a) Li cells are permitted.
- (b) Motor battery pack cell chemistry cannot be mixed.
- (c) The maximum number of cells for the motor battery pack is 4.

10.4.6.4 **HEIGHT/TIME RESTRICTIONS**

Models must be fitted with an approved limiter that cuts the power to the motor at a maximum height of 200 meters. The required height must be attained at constant throttle in less than 30 seconds.

10.4.6.5 **FLIGHT PROCEDURES**

- (a) The maximum flight time as defined in 10.4.1.5 (f) is seven (7) minutes (420) points for all flights except the fly off (refer 10.4.1.6 (e)).
- (b) The height limiter must be set to cut the motor at a maximum of 200m.
- (c) A single constant-throttle motor run to the specified height applies.

- (d) The motor must not be run for more than 30 seconds otherwise the flight will be disqualified.
- (e) The motor must not be run a second time otherwise the flight will be disqualified.
- (f) The model must land in the defined area for the flight to count towards the final score.

10.4.6.6 FLY-OFF

- (a) If at the end of the official flights a fly-off is necessary, it will be conducted as set out in rule 10.4.1.6.
- (b) The motor must not be run a second time otherwise the competitor will be disqualified.

For the fly-off, refer also to safety clause 10.4.1.4.

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10.4.7 **ELECTRIC NOSTALGIA**

DESCRIPTION: This is a limited motor run event where a competitor attempts to achieve maximum flight time from a single motor run.

10.4.7.1 **AIRCRAFT ELIGIBILITY**

- (a) This event is open to all nostalgia aircraft as described in rules 10.4.1.1(c)
- (b) The minimum wing area rule applies to this event as defined in clauses 10.4.1.1(c) and 10.4.1.2(a).

10.4.7.2 **ELECTRIC MOTOR ELIGIBILITY**

The general requirements for electric drive systems under 10.4.1.3 of these rules apply.

10.4.7.3 **MOTOR BATTERY PACK**

The motor battery pack powers the electric motor.

- (a) Li chemistry cells are permitted.
- (b) Motor battery pack cell chemistry cannot be mixed.
- (c) The maximum number of cells for the motor battery pack is 4.

10.4.7.4 **LIMITED MOTOR RUN TIME ALLOCATION**

The maximum motor run time for all aircraft is 35 seconds.

10.4.7.5 **FLIGHT PROCEDURES**

- (a) The maximum flight time as defined in 10.4.1.5 (f) is seven (7) minutes (420) points for all flights except the fly off (refer 10.4.1.6 (e)).
- (b) The model must land in the defined area for the flight to count towards the score.
- (c) A single continuous motor run to a maximum of 35 seconds applies.
- (d) Motor run time over 35 seconds will result in zero score for that flight.
- (e) Hand launching of Nostalgia models is permitted.

10.4.7.6 FLY-OFF

- (a) If at the end of the official flights a fly-off is necessary, it will be conducted as set out in rule 10.4.1.6.
- (b) For the fly-off, the motor must not be run over the free motor run time otherwise the competitor will be disqualified.
- (d) For the fly-off, refer also to safety clause 10.4.1.4-

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APPENDIX 1

ELECTRIC TEXACO BATTERY ENERGY RULE					
60 cell.mAh per Oz for Lithium Polymer Cells					
Dry model Weight Oz	Energy Allocation	Max LiPo battery capacity, mAh			
		2 cells	3 cells	4 cells	5 cells
25	1500	750	500	375	300
26	1560	780	520	390	312
27	1620	810	540	405	324
28	1680	840	560	420	336
29	1740	870	580	435	348
30	1800	900	600	450	360
31	1860	930	620	465	372
32	1920	960	640	480	384
33	1980	990	660	495	396
34	2040	1020	680	510	408
35	2100	1050	700	525	420
36	2160	1080	720	540	432
37	2220	1110	740	555	444
38	2280	1140	760	570	456
39	2340	1170	780	585	468
40	2400	1200	800	600	480
41	2460	1230	820	615	492
42	2520	1260	840	630	504
43	2580	1290	860	645	516
44	2640	1320	880	660	528
45	2700	1350	900	675	540
46	2760	1380	920	690	552
47	2820	1410	940	705	564
48	2880	1440	960	720	576
49	2940	1470	980	735	588
50	3000	1500	1000	750	600
51	3060	1530	1020	765	612
52	3120	1560	1040	780	624
53	3180	1590	1060	795	636
54	3240	1620	1080	810	648
55	3300	1650	1100	825	660
56	3360	1680	1120	840	672
57	3420	1710	1140	855	684
58	3480	1740	1160	870	696
59	3540	1770	1180	885	708
60	3600	1800	1200	900	720
61	3660	1830	1220	915	732
62	3720	1860	1240	930	744
63	3780	1890	1260	945	756
64	3840	1920	1280	960	768
65	3900	1950	1300	975	780
66	3960	1980	1320	990	792
67	4020	2010	1340	1005	804
68	4080	2040	1360	1020	816

Note: 'Dry Weight' is mass of model without the battery that powers the motor.

APPENDIX 2

ELECTRIC DURATION
BATTERY ENERGY RULE: 1600 cell.mAh per sq ft Wing Area

Wing Area (square inches)	Energy Factor	Maximum Lithium Polymer Battery Capacity mAh				
		2 Cells	3 Cells	4 Cells	5 Cells	6 Cells
600	6667	3330	2220	1670	1330	1110
625	6944	3470	2310	1740	1390	1160
650	7222	3610	2410	1810	1440	1200
675	7500	3750	2500	1880	1500	1250
700	7778	3890	2590	1940	1560	1300
725	8056	4030	2690	2010	1610	1340
750	8333	4170	2780	2080	1670	1390
775	8611	4310	2870	2150	1720	1440
800	8889	4440	2960	2220	1780	1480
825	9167	4580	3060	2290	1830	1530
850	9444	4720	3150	2360	1890	1570
875	9722	4860	3240	2430	1940	1620
900	10000	5000	3330	2500	2000	1670
925	10278	5140	3430	2570	2060	1710
950	10556	5280	3520	2640	2110	1760
975	10833	5420	3610	2710	2170	1810
1000	11111	5560	3700	2780	2220	1850
1025	11389	5690	3800	2850	2280	1900
1050	11667	5830	3890	2920	2330	1940
1075	11944	5970	3980	2990	2390	1990
1100	12222	6110	4070	3060	2440	2040
1125	12500	6250	4170	3130	2500	2080
1150	12778	6390	4260	3190	2560	2130
1175	13056	6530	4350	3260	2610	2180
1200	13333	6670	4440	3330	2670	2220