the Ampeer

April The EFO Officers 2014

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No Mailed Ampeer Subscriptions

The Next Meeting:
Thur., April 17, 7:30 p.m., Ken Myers' house (address above)

What's In This Issue:

Measuring Maximum Servo Torque Revised

By Ken Myers

On the afternoon of Feb. 27, the day the March 2014 *Ampeer* was posted, I received the following email from Alan Bedingham in the U.K.

* * * * *

Er, you may want to revise your article on servo torque. Dividing a torque by a length gives a force (in your example oz) not another torque.
"For multiplying, the inverse of 0.5625 = 1.777
55 oz-in (org. measured torque) * 1.777 = 97.8 oz-in" (nope, just oz of force)
"A servo arm of 2" was used next. The inverse of 2 = 0.5. 55 oz-in * 0.5 = 27.5 oz-in of torque" (nope, oz of force).

"The longer the arm, the less the available torque." (nope, the longer the arm, the lower the force available)

The torque remains the same regardless of the arm length.

Regards

Alan Bedingham

* * * * *

After I slapped my head several times and kicked my behind, I did something I'd never done before. I revised and reposted the March 2014 *Ampeer* on March 28 to correct the article.

I thank Alan for his observation and really appreciate him letting me know the 'error of my ways'.

Min-E Mambo Specifications

By Ken Myers

In the March *Ampeer*, I presented my electric powered, tribute and restoration of a 1963 Sterling Models Minnie Mambo, which I call the Min-E Mambo.

Specifications for the Min-E Mambo:
Wing span: 35-9/16" or 903.6mm
Wing area including tips: 217 sq.in. or 14dm^2
Fuselage length including rudder: 24-9/16" or 623.4mm
Ready to Fly Weight: 16 oz. or 453.6g
Wing Area Loading: 10.62 oz./sq.ft.
Wing Cube Loading: 8.6

Watts in using Cox 6x4 Gray: 49.5
RPM: 10,858
Watts in per lb.: 49.5
Center of Gravity (CG): 2-1/16" or 52.4mm from the leading edge as marked on the original plans

Photo shows the fuselage "crackers" and forward wing stop.

The Min-E Mambo plans and construction notes:
http://www.theampeer.org/min-e/min-e.html

Upcoming Keith Shaw Birthday Party Electric Fly-in 2014

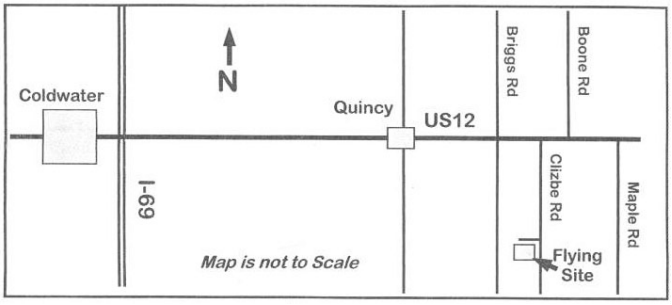
The Balsa Butchers will once again be hosting the "Keith Shaw Birthday Party Electric Fly-In" at their field near Coldwater, MI. The event will take place on May 31 and June 1, 2014.

Contest Director: Dave Grife - E-mail: grifesd@yahoo.com or Phone: 517.279.8445

Please e-mail or call with any questions.

The Flying Field will be open Friday, May 30 for early arrivals
Saturday, May 31, hours are from 9 a.m. 'til 5 p.m.
Sunday, June 1, hours are from 9 a.m. 'til 3 p.m.

Landing Fee is $15 for the weekend.



Directions: Quincy is approximately 4.5 miles east of I-69. Clizbe Road is approximately 1.6 miles east of Quincy. The Flying site is approximately 1.5 miles south of US-12 on the west side of Clizbe Road.

Two Reasons for Scaling Model Airplanes and How I Do It

Ken Myers

On December 27, 2013 a thread was revived on RC Groups.
http://www.rcgroups.com/forums/showthread.php?t=43751&page=2

The thread is called "Model Aviations wing cubed loading article".

Peter Angus brought up the topic of scaling and gave his formulas and thoughts regarding scaling. His Web site is located at http://www.peterangus.pwp.blueyonder.co.uk.

For me, there are two reasons to scale an existing airframe. The first, for the model builder, is to change the size of an existing model and have the scaled version fly the same mission in a similar manner. The second reason to scale is to create a 'scale' model of a full-scale aircraft.

To scale an airframe, model or full-scale, I created an Excel workbook with two spreadsheets. One spreadsheet uses full-scale information to create a scaled model and the other uses an existing electric model to be rescaled.
http://www.theampeer.org/ampeer/ampapr14/Model-Scaling.xls

To scale an airframe, model or full-scale, up or down, requires the use of a linear measurement. If the desire is to produce an airframe one-half the size of the original airframe, the wing area cannot be simply divided by 2.

While a 1/2 size Min-E Mambo would have a wingspan of 35.5625 / 2 = 17.78125 inches, it would have a wing area of 54.25 sq.in.

If I wanted the scaled version to fly in the same manner as the 'full-size' Min-E Mambo it would have to have the following specifications.
Wing Area sq.in. - 54.25
Weight in ounces - 2.00
Wing Span in inches - 17.78
Wing Area Loading - 5.31 oz./sq.ft.
Watts in required - 6.20
Stall Speed MPH - 8.53
Prop Diameter in Inches - 3.00
Prop Pitch in inches - 2.00
Pitch Speed MPH - 29.08
RPM - 15,356

Many of the requirements are not scaled in a linear fashion. The spreadsheet handles all of the variables, so no 'math' is required of the user.

For the curious, if the desire was to build a model with 1/2 the area of the Min-E Mambo, it would have a wing area of 217 sq.in. / 2 = 108.5 sq.in. and wing span would be 25-5/32".

Again, don't worry about the math, just use the spreadsheet.

Scaling the ElectroFlying Fusion

My ElectroFlying Fusion, low-wing, sport plane has a measured wing area of 558.45 sq.in. and wing span of 57.93 inches. The ready to fly weight is 74.615 ounces.

It has a wing area loading (WAL) of 74.615 oz./ (558.45 sq.in. / 144) = 19.24 oz./sq.ft.

It has a wing cube loading (WCL) of 74.615 oz./ (558.45 sq.in. / 144)^1.5 = 9.77

It uses an AXI 4120/18 which provides a maximum of 510 watts in using a 6S "A123" 2300mAh pack and spinning an APC 12x10E at 7750 RPM. The 74.6 oz., or 4.66 lb., plane has 109.38 watts in available for each pound of plane weight. At 7750 RPM the prop has a pitch speed of 73.4 mph [(7750 RPM * 10" pitch)/1056]. It has a stall speed of approximately 16.23 mph. The pitch speed to stall speed ratio is 4.52:1, which provides very good performance in the vertical and loop size.

The data required for the spreadsheet input:
Wing area: 558.45 sq.in.
Ready to fly Weight: 74.615 oz.
Watts in: 510
Prop Diameter in Inches: 12
Prop Pitch in Inches: 10
RPM: 7750

That is all that is required.

I wanted a smaller version that could use a 3S "A123" 2300/2500mAh pack and yet still fly in a similar manner with a similar 'feel'. I also wanted it to present itself in the air in a similar manner.

My 3S "A123" 2300/2500mAh pack planes have wing areas between 325 sq.in. and 415 sq.in.

To arrive at something in that wing area range, I simply input a percentage in the Scaling Factor cell on the spreadsheet to try. When 90% (0.9) was input to the Scaling Factor cell on the spreadsheet, the result was a wing area of 452 sq.in. and weight of 54.4 ounces. Based on my previous experience with S3 "A123" power systems, that was too big and heavy.

When 80% (0.8) was input, the result was 357.4 sq.in. and 38.2 ounces. I could have used that and it would have been fine.

I decided to go with 82% (0.82). It yielded a 375.5 sq.in. wing at about 41.14 ounces.

The results from the spreadsheet for 82%.
Wing Area sq.ft. - 375.50
Weight in ounces - 41.14
Wing Span in inches - 47.50
Wing Area Loading - 15.78 oz./sq.ft.
Watts in required 281.20
Stall Speed MPH - 14.70
Prop Diameter in Inches - 9.84 (round it to 10)
Prop Pitch in inches - 8.20 (round it to 8)
Speed MPH - 66.46
RPM - 8558.44

How did it work out?

The new model, which I named the Fusion 380, has a measured RTF weight of 40.6 oz. I was able to come very close to the target weight and both planes fly in a similar manner and with the same perceived "feel".

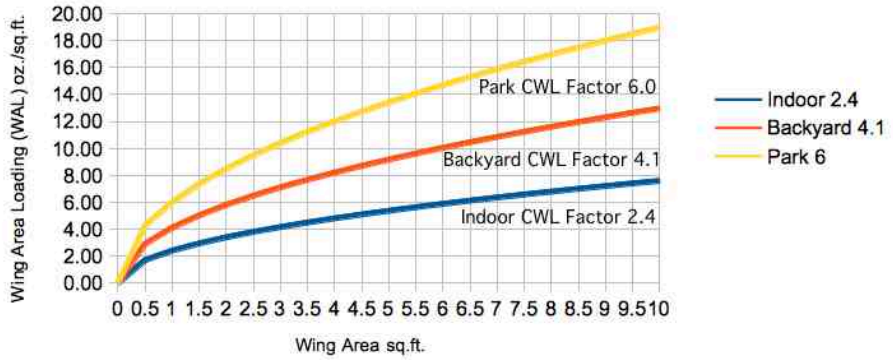
The ElectroFlying Fusion has a WAL of 19.24 oz./sq.ft. and the Fusion 380 has a WAL of 15.68 oz./sq.ft. They both have the same WCL of 9.77. Using the WCL best explains why they fly in such a similar manner.

For me, using the wing area loading (WAL) is not a very good way to compare the ease of flying or flyability of different size models of similar

design as it requires extra math to relate the WAL to the size.

Wing Area Loading (WAL) Compared to Wing Cube Loading (WCL) Factor

Indoor, Backyard & Park



Wing Area Loading (WAL) Compared to Wing Cube Loading (WCL) Factor

Sport, Advanced Sport, Expert Sport & Expert

The graphs show the relationship of the wing area loading (WAL), wing cube loading (WCL) and wing area in square feet.

Using the WAL to compare the flyability of full-scale aircraft works out well because they are all built to the same scale.

Using the WCL for models gives a better flyability indication because the model can be built to any scale and WCL takes this into consideration.

The following full-scale loadings are based on the empty airframe weight. Of course fuel and pilots would need to be added for full-scale flight. The numbers are just for comparison purposes.
Piper J-3 Cub (high-wing) 68.57 oz./sq.ft. WCL 5.13
Stearman PT-17 (biplane) 103.68 oz./sq.ft. WCL 6.01
Fairchild PT-19 (low-wing) 147.60 oz./sq.ft. WCL 10.44
North American AT-6 (low-wing) 262.23 oz./sq.ft. WCL 16.46
North American P-51 (low-wing) 517.63 oz./sq.ft. WCL 33.69

While both the WAL and the WCL indicate the 'ease' of flying, or flyability levels, of these full-scale types, only the WCL transfers well, without extra math, for comparing similar models or these aircraft in various sizes.

For comparison, several WCL were noted in "Aircraft Performance Parameters Revisited" by Roger Jaffe, Model Builder, June 1994.
http://www.theampeer.org/WCL/jaffe.htm

Types of RC Aircraft Based on the Wing Cube Loading

Gliders 4
Trainers 6
Sport Aerobatic 9
Pattern 11
Racers 12
Scale 10-15

My original article on the wing cube loading (WCL), which was updated on January 3, 2014, is still available on the EFO Web site.
http://theampeer.org/M1-outrunners/M1-outrunners.htm#WCL

The following listing only gives an idea of the plane types. An Excel workbook, with much more data is available at:
http://theampeer.org/new-power-theory/metricnewtheory.xls.

Based on the collected data, seven wing cube loading (WCL) levels were created. The level averages, based on the collected data, were used to create graphs 1 and 2.

Level 1, WCL 0.00 - 2.99, includes mostly **indoor** type models and those that can be flown outside in very light winds, only level with no internal combustion powered planes. Avg. WCL 2.39

Level 2, WCL 3.00 - 4.99, includes mostly **backyard** type models that can be flown indoors in

larger venues and outside in low wind conditions, includes a few internal combustion powered planes. Average WCL 4.10 electric, 4.46 internal combustion

Level 3, WCL 5.00 - 6.99, includes **park flyers**, sailplanes, biplanes, 3D planes. Average WCL 5.98 electric, 6.09 internal combustion

Level 4, WCL 7:00 - 9.99, includes **sport types**, biplanes, scale, some 3D planes, and pattern. The greatest number of RC planes are found in this category. Avg. WCL 8.51 electric, 8.60 internal combustion

Level 5, WCL 10.00 - 12.99, includes **advanced sport types**, sport scale and sport scale warbirds, and some twins. Avg. WCL 11.24 electric, 11.44 internal combustion

Level 6, WCL 13.00 - 16.99, includes **expert sport types**, scale, scale warbirds, and some twins. Avg. WCL 14.31 electric, 14.67 internal combustion

Level 7, WCL 17+, includes planes for the **expert fliers only**, heavier twins and other multi-motor, true scale, and true scale warbirds. Avg. WCL 17.50 electric, 18.44 internal combustion

The levels are purely arbitrary. A plane with a WCL on the high end of one level will most likely fly in a similar manner to one on the low level of the next higher WCL level. The Fusions are at the high end of level 4.

When model aircraft kits were being produced, a manufacturer might offer similar high-wing trainer designs in 20, 40 and 60 sizes. The numbers indicated the recommended engine displacement for glow 2-stroke engines; 0.20 cu.in., 0.40 cu.in. and 0.60 cu.in.

Today's ARF suppliers do something very similar.

Horizon Hobby sells, or sold, a series of low-wing sport planes that they called Pulse. The smallest is called the E-flite Mini Pulse XT ARF and largest was the Hangar 9 Pulse 125 ARF. Based on Horizon Hobby's data, using the heaviest weight noted, the Mini Pulse has a wing area loading (WAL) of 11.78 oz./sq.ft. and the Pulse 125 has a WAL of 20.85 oz./sq.ft.

If wing area loading (WAL) is used to compare the flyability of the similarly designed airframes, the capable and experienced RC pilot should find the Mini Pulse 'easier' to fly than the Pulse 125. In reality, the Mini Pulse does not seem 'easier' to fly. The wing cube loading (WCL) does a better job of predicting flyability for a given plane.

The WCL for the Mini Pulse is 7.78 and the WCL for the Pulse 125 is 7.72. The experienced RC pilot should find their flight characteristics quite similar. Of course there will be a bit of a noticeable difference in the air due to the actual physical size difference, but overall, there should be a similar 'feel' to the two airframes. The experienced RC pilot should find both equally 'easy' to fly.

Table 1, at the bottom of this page, shows the data for the rest of the planes in the Pulse series arranged from 'easiest to fly' to 'hardest to fly' using both loading systems. The table also indicates which ones will fly with a similar 'feel' to the pilot. The wing area loading does not suggest the same 'flyability', because of scale, as the WCL. The wing area loading/wingspan is also shown on

	Weight	Wing Area	WCL	WAL	Span	WAL/Span
Plane	Ounces	Sq.In.	Factor	oz./sq.ft.	inches	Factor
Pulse 125	**152**	**1050**	**7.72**	**20.85**	**76**	**0.27**
Mini Pulse	27	330	7.78	11.78	42.5	**0.28**
Pulse 60	**128**	**885**	**8.40**	**20.83**	**70**	**0.30**
Pulse 40	100	667	10.03	21.59	60.7	**0.36**
Pulse 25	**67.2**	**495**	**10.54**	**19.55**	**52**	**0.38**

the table for comparison and does indicate the same 'flyability' in a different presentation.

My flying buddy, Arthur Deane, regularly flies both the Mini Pulse and Pulse 25. I asked him to share some anecdotal information about the two planes.

"I first flew the Mini Pulse. I used the recommended standard set up with an E-Flite 450 motor. The plane flew well and I had many enjoyable flights. It got to the point that I could not stand its blue trim anymore. I ended up changing the shape of the tail surfaces and recovering it in a different color scheme. This winter I am recovering it with a new color scheme and a trying to change the appearance with the revised tail surfaces and an open cockpit. All for a change of appearance. Maybe I will put in a 480 motor.

Overall the plane flew well. It did what I wanted and landed well in calm conditions Landing with a crosswind was more difficult. I had to consistently work the controls to keep it on the glide path.

I finished my Pulse 25e as a 32e version with a 32e equivalent motor. I was very pleased with the plane. It did everything I asked it to do. Landings are a joy. I set the plane up on glide path and leave it alone and enjoy it coming in.

The Mini Pulse is fun to fly particularly in a small field. However, I much prefer the 32e version. The extra weight reduces the effects of gusts and crosswinds. It is a much more enjoyable experience. Just what you would expect.

I have one complaint for both versions. The landing gear attachment in the fuselage is not strong enough. Basically a flaw with all laser cut ARF's. I have a modification for both versions that uses a wood block, small screws and gorilla glue to reinforce the attachment. Over time the fuselage lower longeron's over the wing deteriorate and I have a mod for both versions that reinforces the lower longeron with a hardwood strip."

Table 1 demonstrates some of the 'flyability' differences noted by Arthur.

A Word About Scaling Speed and Power

In reality, the scaling of speed and power is not linear. In a world where we could fly models in 'scale air', 'scale gravity', scale building materials and 'scale power', they could be linear.

A goal in scaling the speed and power is to have the 'changed size' plane present itself in the air in a similar manner as the plane being scaled. In other words, for a sport plane like the Fusion 380, it should appear to have a similar vertical climb and loop size based on its size when compared to the original Fusion.

The equations in the spreadsheets allow for this. Previously noted from spreadsheet for the Fusion 380 were:
Watts in required 281.20
Stall Speed MPH - 14.70
Prop Diameter in Inches - 9.84 (round it to 10)
Prop Pitch in inches - 8.20 (round it to 8)
Speed MPH - 66.46
RPM - 8558.44

The power system actually used in the Fusion 380 consists of a Scorpion S-3020-11 (a special turn wind I had created for this plane), a Scorpion Commander V2 45 amp ESC, a 3S "A123" 2300mAh pack turning a Master Airscrew 10x8 G/F 3 series prop (not a 3-blade prop).

The measured power system data showed 305 watts in at 8715 RPM.

Using the scaling and power system formulas in the spreadsheet created a smaller version of the ElectroFlying Fusion that presents and feels very similar in the air. Except for flying the Fusion 380 a bit closer to the flight line on the far side of the pattern, it "feels" almost identical to flying the larger version in every respect.

Scale Aircraft Based on a Full-Size Version

Many RC pilots enjoy flying a model that looks like a full-size aircraft. It doesn't matter to the majority of them whether it flies or presents like the full-scale version.

A large number of RC models based on full-size aircraft have a lower WCL than the full-size and a higher power to weight ratio. Because of this, the RC pilot can choose to try and fly it in a similar manner to the full-size aircraft or just have 'fun' flying it 'fast' and doing aerobatics that are beyond the capability, or permissibility, of the full-scale aircraft.

The Ubiquitous Piper J-3 Cub

The parkzone Ultra-Mini Cub resembles a full-scale Cub. The Hempel J-3 1/2-scale Cub ARF

with a ZDZ-210 (http://www.youtube.com/watch?v=LvMRswsUeus) also looks like a full-scale Cub (http://www.billhempel.com/cub.html). Neither of the models fly like a full-scale Cub unless the pilot chooses to try to do so. Unless the pilot tries very hard to do so, they do not present or represent themselves in the air like a full-scale Cub.

With a solo pilot and fuel, the flying weight of a Cub is about 1000 lb. yielding a WCL of 6.71.

The parkzone Ultra-Mini Cub has a WCL of 4.15 and the Hempel 1/2-scale has a WCL of 3.76. The pilot can choose to fly either model like a full-scale Cub, but the potential is there to far exceed the flying characteristics of the full-scale.

The Balsa USA 1/4-scale Cub (WCL 5.99), Sig 1/4-scale Cub (WCL 6.91) and Sig 1/5-scale Cub (WCL 6.64) all present and represent a full-scale J-3 Cub quite nicely when the pilot chooses to do so.

Other Cub RC models tend to resemble the full-scale Cub, but actually don't have the same 'ease of flight' as the full-scale Cub.

My friend, Jon Quisenberry, decided to return to RC flying using the E-flite J-3 Cub 25 ARF as his re-trainer.

http://www.e-fliterc.com/Products/Default.aspx?ProdID=EFL4000

This choice proved to be problematic for us. With a WCL of 9.11, it had to fly faster and land faster than a typical Cub. It also had the landing gear positioned in the wrong place. This caused endless problems with ground looping. Even though it looked like a Cub, it didn't fly like one.

After Jon's passing, this plane changed hands and continues to fly. Its new owner still finds it a bit of a challenge to fly. Maybe that is why it was discontinued.

For many RC pilots, flying a 1/4-scale Cub, that represents, and presents, like the full-size Cub would prove to be quite boring, but it is possible. The spreadsheet named "Full-Scale to Model" has the required formulas.

The input data is a little different for the full-scale aircraft. The measuring units are the ones typically used with full-size aircraft and the spreadsheet changes them to equivalent measures to be used for scaling to modeling size. Here's what is needed using a J-3 Cub for the example:
Wing Area sq.ft. - 178.5
Weight in pounds - 1000 (est. based on empty and gross weight for pilot and fuel)
Wing Span in feet - 35.25
Horsepower - 65
Prop Diameter in Inches - 72
Maximum Speed MPH - 87
RPM - 2297

A 1/4-scale model is desired. That is 25% or 0.25.

The results to have a 1/4-scale sized and powered similarly to a full-size J-3 Cub.
Wing Area sq.ft. - 11.16 -1607 sq.in.
Weight in pounds 15.63 - 250 ounces
Wing Span in feet - 8.81 - 106 inches
Wing Area Loading - 22.41 oz./sq.ft.
Watts in required - 757.66
Stall Speed MPH - 17.52
Prop Diameter in Inches - 18.00
Prop Pitch in inches - 10.00
Speed MPH - 43.50
RPM - 4594

What Power System(s) Might Work

Drive Calculator (http://www.drivecalc.de) shows that a Scorpion S 4035 330Kv motor and 5S Li-Po should turn a Metts 18x10E prop at about 5600 RPM while pulling about 40 amps for about 734 watt in. The pitch speed would be about 53 mph.

The Cobra 4130/16 390Kv motor prop table (http://innov8tivedesigns.com/Cobra/Cobra_4130-16_Specs.htm) shows a 5S Li-Po turning an APC 18x10E at 5640 RPM while pulling 42.2 amps for about 780.5 watts in. The pitch speed would be about 53 mph.

Using either the Balsa USA or Sig 1/4-scale Cub, and powering it with either of the electric power systems noted, should produce a reasonable scale-like flying J-3 Cub model. While the 1/4-scale model is capable of covering the ground at about twice the scale speed of the full-scale at its top speed, an experienced RC pilot should find the plane easy to fly and present in a Cub like manner.

I would say that the vast majority of RC Modelers would most likely find a 1/4-scale Cub powered at about 49 watts in per pound under powered, but is it?

Head's Up on a New, Powerful Charger

From Gary Gullikson via email

Hi Ken,

I read high power charger recommendations in the *Ampeer* and noted that chargers with built in power supplies may not the best choice. (Depends)

My Hobbico Accu-Cycle Elite two-port charger just died so I needed to replace it with something that could balance charge up to 6S LiPo packs.

The mail man, minutes ago, just delivered my new Vista Power Quadplay Q3620 charger from Accessory RC, (Evan) that, teamed with my CellPro 10S charger, will satisfy my modest needs for the foreseeable future. It handles all chemistries and has a built in 320 watt power supply and has four charging ports limited to 80 watts each. It will also discharge packs to storage voltage.

Total cost with four charge cables and four "all in one" balance boards was $263.00. It's a little cheaper than the similar Hitec X4 chargers with all extras needed. Accessory RC, Tampa, FL, handles warranty and out of warranty repair support and has a good reputation.

The Q3620 is similar to Hitec X4/ SkyRC chargers with 200 watt built in power supplies and four ports limited to 50 watts each. Both chargers can use an external power supply but you can't increase wattage per port.

My CellPro 10S charger can use a high wattage power supply and charge a single 10S pack or two 5S packs in series at up to a 3C charge rate. I currently use it to balance charge two identical 2200mAh 3S LiPos for my 1/6 scale Cub for 24.8 volts down to 22 volts, as monitored on my Aurora 9 transmitter's screen. My Cub has about 8 flights so far. I can get about 10 minutes duration on two 2200mAh 3S packs in series.

Flying buddy Bob Goff prefers and uses a single port Astro Flight U113ad Synchronous balance charger with it's built in PS plus their old version charger with a high power power supply to charge 2 large 6S packs at a time.

I will be charging 2S 4500mAh LiPos for my new Maxford Gee Bee E (Really a Gee Bee "Y"). Maxford already had a larger model "Y" so they called this one an "E". There are many differences to a Gee Bee nut. See the last few posts in this thread:
http://www.rcgroups.com/forums/showthread.php?t=1825239&page=8

IMHO, there are many choices of chargers and power supplies nowadays and what we choose may suit our individual "needs" for a number of packs, cell counts, battery pack capacities and speed in charging at home and/or at the field, not to mention hobby budgets.

Thanks for making the *Ampeer* available to us.

Gary Gullikson, "E-Challenged", Garden Grove, Ca

30th Annual Mid-America Electric Flies 2014
At the 7 Mile Road MRCS Field
AMA Sanctioned
Saturday, July 12 & Sunday, July 13
Hosted by the:
Ann Arbor Falcons and **Electric Flyers Only**
Flying Site Provided by the:
Midwest R/C Society

Contest Directors are:
Ken Myers phone (248) 669-8124 or
kmyersefo@theampeer.org
http://www.theampeer.org for updates & info
Keith Shaw (734) 973-6309
Flying both days at the Midwest R/C Society Flying Field - 7 Mile Rd., Salem Twp., MI
Registration: 9 A.M. both days
Flying from 10 A.M. to 5 P.M. Sat. & 10 A.M. to 3 P.M. Sunday

Pilot Entry Fee $15 a day or $25 both days
Parking Donation Requested from Spectators

Saturday's Awards
Best Scale
Most Beautiful
Best Ducted Fan
Best Sport Plane
CD's Choice
Sunday's Awards
Best Scale
Most Beautiful
Best Mini-Electric
Best Multi-motor
CD's Choice

Planes Must Fly To Be Considered for Any Award

Saturday's & Sunday's Awards:
Plaques for 1st in each category

Open Flying Possible on Friday
Night Flying Possible, Weather Permitting,
Friday & Saturday Nights
Refreshments available at the field both days.

Potluck picnic at the field on Saturday evening.

Come and join us for two days of fun and relaxed electric flying.

Come, Look, Listen, Learn - Fly Electric - Fly the Future!

Merchandise drawing for ALL entrants

To locate the Midwest R/C Society 7 Mile Rd. flying field, site of the 2013 Mid -America Electric Flies, look near top left corner of the map, where the star marks the spot, near Seven Mile Road and Currie Rd.

The field entrance is on the north side of Seven Mile Road about 1.6 Miles west of Currie Rd. Address: 7419 Seven Mile Road, Salem Twp, MI 48167 - numbers are on the fence.

Because of their convenient location and the easy drive to the flying field, the Comfort Suites and Holiday Inn Express in Wixom, MI have been added to the hotels' listing. They are only 10 miles northwest of the field and located near I-96 and Wixom Road. See the map-hotel .pdf for more details.

http://www.theampeer.org/map-hotels.pdf

Live Wire Rebel Remembered
From Rick Sawicki, EFO member, Via email

Upcoming E-vents

April 4th, 5th, & 6th, The Toledo RC Expo, SeaGate Centre, 401 Jefferson Avenue Toledo, Ohio 43604, Web site information at http://www.toledoshow.com

Thursday, April 17, 7:30 p.m., EFO monthly meeting, Ken Myers, everyone with an interest is welcome

May 18 & 19, Sat. & Sun., CHECK DATES RCCD Watts Over Wetzel (WOW) 8th Annual All Electric Fly-In, Directions and Flyer, contact Mike Pavlock (586)-295-3053 or Email WOW Contest Director at wattsoverwetzel@gmail.com

May 31 & June 1, Keith Shaw Birthday - full details in this issue

July 12 & 13, 30th Annual Mid-America Electric Flies - full details in this issue.

(Live Wire Rebel Continued from page 9)

Hi Ken,

Remembering your Minnie Mambo at the EFO meeting where I had mentioned my prior "Live Wire Rebel", I was cleaning out some old mail and ran across the enclosed pictures of mine and my dads. We built it together, as well as building the RC receiver. The receiver was a Babcock 2 tuber. The Rebel pictures were taken around 1956 or so. I love the past happy memories.

The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390
http://www.theampeer.org

The Next Monthly Meeting:
Date: Thursday, April 17, 2014 **Time:** 7:30 p.m.
Place: Ken Myers' house (address above)