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November

The EFO Officers

2015

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No Mailed Ampeer
Subscriptions

The Next Flying Meeting:
Saturday, Oct. 31, 10 a.m., Midwest RC Society 7 Mi. Rd. Flying Field

What's In This Issue:

Midwest Swap Shop - What Happens to the Amp Draw if a Cell is Added? - More on the Dynam Waco
- Skymasters Indoor Flying at Ultimate Soccer Arenas - Vista Power Quadplay Q3620 update,
Maxford Gee Bee E/Y & Sig 1/6 scale Cub - Maxford Gee Bee Flying Update - Upcoming Events

Midwest RC Society

27th Annual

R/C Swap Meet

Sunday, November 8, 2015

9 a.m. to 12 p.m

location

Northville Senior Community Center

Northville, Michigan

admission charge

\$5.00 per person

(active duty military, kids under 12,
and women are admitted FREE)

vendor table cost

\$20 - \$25 per table - depending on
location

The vendor table costs include one
admission.

Advance table reservations are highly
recommended, last year all tables were
sold in advance

Vendor Set Up time is 8 a.m.

For Information

Call Rudi Reinhard at 248-631-8205 or
email: therudi@icloud.com

directions

Take the 8 Mile Road exit off of I-275

Go west 2.5 miles to Center Street

Go south on Center Street 0.5 miles to
Main Street

Go west on Main Street

The Northville Senior Community
Center is located at 303 Main Street in
downtown Northville

There is free parking in the back of the
building off of Cady Street.

**THIS IS THE BEST AND LARGEST
SWAP MEET IN SOUTHEASTERN
MICHIGAN!**

**What Happens to the Amp Draw if a
Cell is Added to a Battery Pack and the
Same Motor, Prop, and ESC Are Used?**

By Ken Myers

Bert and Ernie are at the flying field.
Bert just landed his new little Zoomer after
a successful maiden.

“Hey Ernie, what did you think about
that flight? I thought it was a little too
slow,” said Bert.

“It looked fine to me. What ya got in it
for power?” asked Ernie.

“It is a Cobra C-2208/26 turning an
APC 7x5E. I’m using a Castle Creations
Thunderbird 9-amp ESC and a 2S 600mAh
LiPo battery,” replied Bert. “I’ve got a 3S

1000mAh LiPo with me. Do you think I ought to try it?"

After a moment of consideration, Ernie said, "If you are going to go up by a cell, you should really decrease your prop diameter, and maybe the pitch, to keep within the safe operating limits of your ESC and motor. How many amps are you drawing on that 2S pack with the 7x5? Do you have a smaller prop with you?"

"Don't know how many amps. I never checked it. I didn't bring a smaller prop with me either," noted Bert. "I think I'll just use that 3S 1000mAh pack. I'm really feeling the need for speed today."

At the other end of the field, Bud just landed his sport plane and taxied back after a successful maiden flight.

"Hey Lou, what did you think about that flight? I didn't think I had quite enough power," said Bud.

"It looked fine to me. What ya got in it for power?" asked Lou.

"It is a Cobra C-4130/20 turning an APC 15x10E. I'm using a Castle Creations Edge 75-amp ESC and a 9S 5000mAh LiPo battery made up of three 3S 5000 packs in series," replied Bert. "I've got a 4S 5000mAh LiPo with me. Do you think I ought to try it in place of one of the 3S packs?"

After a moment of consideration, Lou said, "If you are going to go up by a cell, shouldn't you really decrease your prop diameter, and maybe the pitch, to keep within the safe operating limits of your ESC and motor. How many amps are you drawing on that 9S pack with the 15x10? Do you have a smaller prop with you?"

"If I remember correctly, it was somewhere around 45 amps. Unfortunately, I didn't bring a smaller prop with me," noted Bert. "I think I'll just replace one of the the 3S 5000 packs with the 4S 5000mAh pack to make it a 10S pack. I'm really feeling the need for a bit more power today."

* * * * *

What was the most likely outcome of the day for Bert and Bud?

Ron van Sommeren, of the Netherlands, is a 'for real' motor EXPERT on RC Groups. In just one of his many posts about adding a cell to the power system, he noted that "Motor-current is proportional

to voltage squared (²) and proportional to Kv cubed (³). **This is worst case, because battery voltage will decrease/sag a bit due to more current and voltage losses in the motor will be higher too.**"
<http://www.rcgroups.com/forums/showthread.php?t=2475738>

Ron explains why this should be true here:
<http://www.wattflyer.com/forums/showpost.php?p=591935&postcount=35>

Actually, it became clearer to me when I thought of the proportional voltage increase, as the new expected voltage divided by the original voltage, its ratio, which was then squared.

The following is an example of going from 3 to 4 cells.

Example:

Going from a 3S pack to a 4S pack the amp draw increase, using Ron's formula, would be (4/3)². That is 4 divided by 3 (/ is another way to write divide) - the proportional increase
 $4 / 3 = 1.3333333^2$ (^2 is another way to write squared) = **1.7777778**

That ratio is cells to cells and not voltage, but it doesn't make any difference. Using voltage provides the same result.

A 3S pack's voltage under load might be 11.1V. A 4S pack's voltage under load might be 14.8V. Both voltages are based on 3.7 volts per cell under load.
 $14.8V / 11.1V = 1.3333333$. That is the same as above.

But what if 4 volts per cell under load is used?
 $16V / 12V = 1.3333333$

According to Ron, going from a 3S pack to a 4S pack increases the amperage by a factor of 1.7777778. The noted factor in his table is 1.8. He rounded 1.7777778 to the nearest tenth.

<http://www.rcgroups.com/forums/showthread.php?t=2129796&page=2&pp=10#post27889754>

Example:

3S pack at 25 amps to a 4S pack
 $25 \text{ amps} * 1.7777778 = 44.444444 \text{ amps}$ (* is another way to write multiply or times)
 44.4 amps is the predicted amp draw for the 4S pack

The percent of increase is then;
 $(44.444444 \text{ amps} - 25 \text{ amps}) / 25 \text{ amps} = 0.7777778$

Percentage = $0.7777778 * 100 =$ a 77.8% increase over the original 25 amps, which Ron noted as 80% in the table. Again, his number was rounded.

The percentage increase is always the same for the same cell/voltage ratio. It does not vary with the original amps.

If the prop on the 3S pack was drawing 30 amps then;

$30 \text{ amp} * 1.7777778 = 53.333333$ amps for the 4S pack

$(53.333333 \text{ amps} - 30 \text{ amps}) / 30 \text{ amps} = 0.7777778$ or a 77.8% increase over the original 30 amp draw.

Bert's Cobra 46.5g C-2208/26 at 7.4V (2S pack) with an APC 7x5E pulls 8.56 amps.

http://innov8tivedesigns.com/images/specs/Cobra_2208-26_Specs.htm

That is pretty close to the maximum rating for his 9-amp ESC.

On the same Innov8tive Designs' Web page, an 11.1V (3S pack) with an APC 7x5E is shown to pull **14.93** amps.

According to Ron's formula for going up from a 2S pack to a 3S pack;

$3 / 2 = 1.5^2 = 2.25$ for the multiplying factor
 $8.56 \text{ amps} * 2.25 = 19.26 \text{ amps}$

That is a 4.33 amp difference between the Innov8tive Designs' measured data, 14.93 amps, and Ron's predicted amp draw, 19.26 amps. Why?

Bud's 396g Cobra C-4130/20 at 33.3V (9S pack providing 3.7 volts per cell under load) with an APC 15x10E pulls about 45 amps.

A 37V (10S pack) with an APC 15x10E is shown to pull **53.62** amps.

http://innov8tivedesigns.com/images/specs/Cobra_4130-20_Specs.htm

According to Ron's formula for going to a 10S pack;

$10 / 9 = 1.1111111^2 = 1.235$ for the multiplying factor

$45 \text{ amps} * 1.235 = 55.575 \text{ amps}$

That is only a 1.995 amp difference from the measured amp draw. That appears to be a closer estimate. Why?

Why is one prediction 'quite a bit off' and the other apparently much closer?

After looking at more examples from the Innov8tive Designs' Web site for Cobra Airplane Motors and comparing the results of the measured amperage increase with the results from Drive Calculator, it appeared that Ron's formula was over-estimating the amperage increase.

I posted this observation, and my supporting data, on August 8, 2015 on RC Groups.

<http://www.rcgroups.com/forums/showpost.php?p=32367656&postcount=10>

My post proved to be only 'partially' correct. I had only begun to examine what was going on at that time and didn't have enough data collected for a wide range of motor weights and brands.

These early observations turned into a two month long project of gathering comparative data for ALL of the Cobra and Scorpion Motors and a few of the AXI motors. The results are posted in an Excel workbook of spreadsheets.

<http://www.theampeer.org/ampeer/ampnov15/add-a-cell.xls>

Ron's method of prediction is safe for sure, but...

Why does the voltage or cell count high divided by (/) the voltage or cell count low and then squared (^2) always produce, what I consider, an unacceptable amp increase prediction?

The amp increase prediction is based on RPM, which is based on the final output voltage after all of the voltage drops through the system. It is not based on the input voltage at the ESC, which we can measure with a power meter.

RPM is the final, or output, voltage times the K_v . It is NOT the input voltage times the K_v . Therefore the high RPM divided by the low RPM gives the same ratio as the high final output voltage divided by the low final output voltage.

The following example is in the workbook on the spreadsheet named Proofs. Drive Calculator was used to provide the data. It is not 100% accurate, but good enough for this purpose.

PA Thrust 20 (Precision Aerobatics) The Io (the no load amps) equals 0.89 amps.

3S LiPo at a constant 11.1v, 18.9 amps, 8624 RPM
 4S LiPo at a constant 14.8v, **28.4** amps, 10,645 RPM

$10645 \text{ RPM} / 8624 \text{ RPM} = 1.234346^{\wedge}2 =$

1.5236101 for the multiplication factor

The Io, the no load amps, needs to be subtracted from the loaded amps.

18.9 amps (the measured amp draw) - 0.89 amps (the no load amps) = 18 amps

18 amps * 1.5236101 = 27.4 amps (rounded to the nearest tenth)

The no load amps need to be added back into the equation to yield the system amps.

$27.4 + 0.89 = \mathbf{28.3}$ amps

It is only off by 0.1 (1/10th) of an amp.

This process cannot be used to obtain an estimate. It has an unknown variable, the high RPM.

Using the input voltages (AKA number of cells) with Ron's formula results in a larger margin of error in the estimate.

$14.8\text{V} / 11.1\text{V}$ or 4 cells / 3 cells = $1.3333333^{\wedge}2 =$

1.7777778 for the multiplication factor

18.9 amps * 1.7777778 = 33.6 amps

33.6 amps - 28.4 amps = 5.2 amps

That is an over estimate of

$5.2 \text{ amps} / 28.4 \text{ amps} = 0.183 * 100$ (to change to percent) = 18.3%

That appears to be quite a large over estimate, safe, but large.

After a month of gathering actual, measured data for Cobra, Scorpion and AXI motors, new factors were created for estimating the amp increase when a cell is added to a battery pack. The table shows both Ron's and the new factors. The 1 cell to 2 cell factor has been dropped from Ron's table, as it is a very unusual configuration change.

	Ron's	%		Ken's	%
Cells	Factors	Increase		Factors	Increase
2 to 3	2.250	125.00%		1.771	77.13%
3 to 4	1.778	77.78%		1.594	59.37%
4 to 5	1.563	56.25%		1.461	46.13%
5 to 6	1.440	44.00%		1.363	36.34%
6 to 7	1.361	36.11%		1.300	29.96%
7 to 8	1.306	30.61%		1.255	25.48%
8 to 9	1.266	26.56%		1.222	22.17%
9 to 10	1.235	23.46%		1.196	19.62%

Note that the Factors, and % increase, of the collected data has shifted up approximately one ratio change. For example, Ron's 3 to 4 cell

change, 1.778 and 77.78%, closely matches the collected data 2 to 3 cell change, 1.771 and 77.13%.

Using the collected data factor for going from 3 to 4 cells in the previous example;
18.9 amps * 1.594 (3 to 4 cell factor from the table) = 30.1 amps

The new estimate is off by 30.1 amps - 28.4 amps = 1.7 amps

$1.7 \text{ amps} / 28.4 \text{ amps} = 0.06$ (rounded) = $0.06 * 100$ for a 6% over estimate

Using the collected data factor still produced a predicted over amp estimate, in this case, but it is a bit closer.

There are a lot of variables that make trying to use input voltage or cell count imprecise.

Some of these variables have been taken into consideration with the collected data factors, and some just can't be adjusted for.

The PA Thrust 20 example produced one of the highest percent increase errors using the collected data factor of 1.594 for going from 3 to 4 cells. More of these examples are shown on the Proof spreadsheet in the Excel workbook.

Bert's Cobra C-2208/26 at 7.4V (2S pack) with an APC 7x5E pulls 8.56 amps, according to the Innov8tive Designs' measured data. This is a 2S to 3S change. The collected data factor, shown in the table, is 1.771.

$8.56 \text{ amps} * 1.771 = 15.2 \text{ amps}$ (rounded)

The Innov8tive Designs Web page showed 14.93 amps at 11.1V.

$15.2 \text{ amps} - 14.9 \text{ amps} = 0.3 \text{ amps}$

$0.3 / 14.9 = 0.02 * 100 = 2\%$ error

According to Ron's formula, the estimate would be 19.26 amps, or over by 4.33 amps.

$4.33 / 14.93 = 0.29 * 100 = 29\%$

As a double check, Drive Calculator data was used and predicted 14.9 amps.

Bud's Cobra C-4130/20 at 33.3V (9S pack) with an APC 15x10E pulls 45 amps.

This is a 9S to 10S change. The collected data factor, shown in the table, is 1.196.

$45 \text{ amps} * 1.196$ (new factor) = 53.82 amps

On Innov8tive Designs' Web page, a 37V (10S pack) with an APC 15x10E is shown to pull 53.62 amps.

53.82 amps - 53.62 amps = 0.2 amps
 $0.2 / 53.62 = 0.004$ (rounded) * 100 = 0.4%

Ron's formula estimated 55.575 amps, which is over by about 2 amps. That really is not too bad but...

$1.955 / 53.62 = 0.0365$ (rounded) * 100 = 3.65%

That is not a 'bad' margin of error for an estimate.

How on earth could this information ever be useful?

The review of the Freewing Pandora, in the September and October 2015 *Ampeers*, noted that the folks at Motion RC said that a 4S LiPo could be used with the stock motor, ESC and prop instead of the recommended 3S LiPo.

Using Drive Calculator, and the information gathered during the original 3S bench test, the estimate, using the collected data factor of 1.594, going from a 3S to a 4S pack was;

11.74v (3.91v per cell) showed an amp draw of 24.68 amps.

$24.68 * 1.594 = 39.3$ amps (rounded)

Drive Calculator predicted 36.7 amps at 15.64v, $3.91V * 4$.

39.3 amps - 36.7 amps = 2.6 amps

2.6 amps / 36.7 amps = 0.07 (rounded) * 100 = 7% amps over the Drive Calculator predicted amps.

Ron's formula resulted in an estimate of 43.9 amps (rounded).

43.9 amps - 36.7 amps = 7.2 amps

7.2 amps / 36.7 amps = 0.196 * 100 = 19.6%, a significant difference over the Drive Calculator predicted amps.

Time for a 'Real World' Test

Based on the previous amp draw predictions for a 4S LiPo pack, it was with a bit of trepidation that I decided to test, and possibly sacrifice, the stock power system from the Freewing Pandora using a 4S LiPo pack.

Pete Foss loaned me a Turnigy nano-tech 4S 3000mAh/3.0Ah 25C-50C LiPo battery. He noted that it was 'old' and somewhat "worn out".

The stock Freewing 3536 800K_v motor, the stock Freewing 30-amp ESC and stock Freewing 3-blade 11x6 prop was set up for bench testing using Pete's 4S pack. An Emeter II was used to log the

data. The temperature in the basement was approximately 65° Fahrenheit.

Pete's freshly charged 4S was used to log 3 sets of data for a duration of approximately 10 seconds each, one after the other. The averages, as the pack ran down, were;

14.26 volts - 33.97 amps

14.16 volts - 33.54 amps

14.00 volts - 32.48 amps

The highest instantaneous voltage and amperage recorded in the first run was 14.56 volts and 35.1 amps.

With the pack fully recharged, the second run data was;

14.32 volts - 34.29 amps

14.09 volts - 32.92 amps

14.07 volts - 32.68 amps

The highest instantaneous voltage and amperage recorded in the first run was 14.77 volts, or 3.69 volts per cell, and 36.1 amps. This was well below the 15.64 volts used in the estimation.

The average voltage for the 6 data loggings was 14.15 volts, 3.54 per cell, and the average amp draw was 33.3 amps.

A Surprise? Not Really

The cells that make up a battery have an internal impedance. It is not easy to measure the actual internal impedance, and the result is not really useful for the end user of a battery.

http://batteryuniversity.com/learn/article/how_to_measure_internal_resistance

The equivalent series resistance (ESR) of a battery can be a more useful to the end user. The ESR of the battery is a **calculated**, not measured, value and the result is expressed in ohms, or milliohms. In common usage, it is stated as the battery's internal resistance (IR). With the proper equipment, a cell's IR may also be calculated.

Unlike a true ohmic resistance, a cell's calculated IR, and therefore the battery's ESR, DECREASES as the temperature rises. What this means is that temperature changes have a large affect on a battery's performance.

The ESR for Pete's 4S pack was approximately 2.5 times higher than the 3S pack. Not surprisingly,

the new Glacier 3S was a 'better' pack than the old nano-tech 4S.

The pack's varying Equivalent Series Resistance (ESR), due to heating, is one of the previously noted variables that cannot really be accounted for with simple factor formulas.

When a cell is added to a pack, the pack's resistance goes up slightly, as the pack's resistance is the sum of its cell resistances.

As the capacity of the cells used in the pack increases, in more instances than not, the pack's internal resistance decreases.

Not all cells are created equal. For example, one 2200mAh pack may have a higher, or lower, ESR than another 2200mAh pack at the same temperature.

A higher "C" rated pack SHOULD have a lower internal resistance than a similar capacity pack with a lower "C" rating.

John Julian put it very well on RC Groups. "IR is a **derived number** from voltage drop under load that is a measure of likely pack performance - it is NOT an intrinsic property of the pack." and

- 1) Temperature affects voltage and current delivery
 - 2) Temperature varies with discharge rate...
 - 3) Consequently so does pack voltage and current
 - 4) Pack history affects performance and capacity...
 - 5) Pack chemistry is largely a mystery and so we get anomalous behaviours. Different size cells may be different chemistries. Different production batches may have different cells. Voltage vs. time curves have different shapes.
 - 6) Developments in packs may change the results...
- <http://www.rcgroups.com/forums/showpost.php?p=26632473&postcount=519>

For more information regarding how temperature affects voltage and current delivery, see the May 2007 *Ampeer*. The article is "Lithium Face Off: A Head-to-Head Comparison of Li-Po, M1/A123 & Emoli" and the section is "A Warming Trend?".

<http://theampeer.org/ampeer/ampmay07/ampmay07.htm#COMPARE>

It is those 'darn' variables, again!

Going In the Opposite Direction

The Multiplex Extra 300S is also known as the Hitec Weekender Extra 300S, when sold in the USA. I reviewed it and commented on it in the July 2014 and September 2014 *Ampeers*.

<http://theampeer.org/ampeer/ampjul14/ampjul14.htm>

<http://theampeer.org/ampeer/ampsep14/ampsep14.htm>

Multiplex recommends a 4S LiPo battery and Hitec recommends either a 4S LiPo battery OR a 3S LiPo battery.

On September 1, 2015, RC Groups member LedZepplin posted, "I have 12 flights with stock motor/ESC, 4s lipo and 13x8x2 prop. It pulls about 630 watts."

<http://www.rcgroups.com/forums/showpost.php?p=32579882&postcount=526>

The statement is inaccurate, but the numbers can be used.

Drive Calculator data for the Hitec D3720-630Kv and an APC 13x8E:

15.92V, 39.6A, 630.3 watts in

15.92V / 4 cells = 3.98V per cell (this indicates the LedZepplin data was taken very early in a discharge)

On September 6, RC Groups member ablair asked, "Led have you tried a 3s battery with the 13x8 prop?"

<http://www.rcgroups.com/forums/showpost.php?p=32618787&postcount=527>

To reverse from a 4S pack to a 3S pack, use the factor, from the table, as a divisor. That means divided instead of multiply.

On September 6, LedZipplin responded, "I measure about 290 watts and 6500 rpm with APC 13x8x2E prop."

<http://www.rcgroups.com/forums/showpost.php?p=32619783&postcount=529>

39.6A / 1.594 (calculated factor) = 24.8A (rounded) for the estimate with a 3S pack.

3.98V * 3 cells = 11.94V (keeping the ratio the same as with the 4S pack)

290W / 11.94V = 24.3A (rounded)

That's close enough for me.

To this day, the beginning of October, 2015, there is still NO amp draw data, on the Internet, for

the stock motor, ESC and prop used with either a 3S or 4S LiPo battery. Weird.

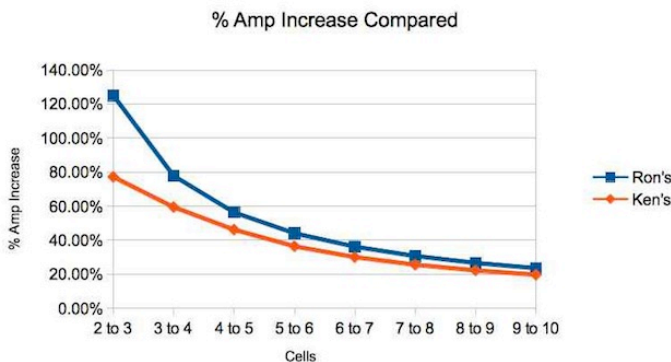
Falling Between the Cracks

Lucien Miller, Mr. Innov8tive Designs, provided only one 6S (22.2V) to 7S (25.9V) example on his Web site for Scorpion and Cobra Airplane motors. The only 7S data on the site is for the Scorpion SII-4025-440. For the larger Cobra Airplane motors, he jumped from 6S (22.2V) to 8S (29.6V) and from 8S (29.6V) to 10S (37V).

It is important to remember that Lucien used a power supply, not batteries to create his tables.

Using 6S to 8S and 8S to 10S saved him a bit of 'work' and a lot of time, but it also makes sense. Going from a 6S to 8S pack gives an amp draw rise that is **approximately** the same percentage increase as going from a 3S to 4S pack, but just slightly higher. Moving up from an 8S to a 10S pack, the expected amp draw increase is approximately the same percentage as going from a 4S to 5S.

Bud's stated amp draw, in the story, was based on an estimation created by Drive Calculator for that motor using 33.3V and the new factor.
 $53.62A / 1.196 \text{ (new factor)} = 44.8A \text{ (rounded)}$



The graph demonstrates why both Ron's factor for the 9S to 10S change and the new factor for the 9S to 10S change are close in their estimations.

Ron noted that his formula, and the resulting chart, are based on a lossless power system and does not take into account the higher losses due to the increased amp draw.

It also does not take into account the differences in the ESR of the two batteries.

So, how did Bert's and Bud's battery changes work out for them? What do you think? I'd love to hear from you.

More on the Dynam Waco

From Gary Gullikson via email

I liked your inclusion of my experiences in assembling the Dynam WACO in the October 2015 *Ampeer*. I would like to add that once you get it assembled properly and paint the cabane and N struts yellow, to match the rest of the model, it looks great and flies wonderfully.

It does all of the basic aerobatics including outside loops and many maneuvers I don't have names for. It is easier than many tail dragger, high wing scale models to take-off and land. I added "rigging wires" to wings and tail feathers using attachment points made from iron wire pushed trough foam, ends bent back and glued, so as not to pull out of foam.

For rigging wires I used stretchy chrome beading cord from the craft store. Eventually it will go slack and be replaced with non-stretch fishing line and small springs for light tensioning. Too tight can warp wings, etc.

It is a great flying, scale foamy, but I will keep watch on Detrum servos.

I am using 4S 3000mAh Admiral LiPo packs and the stock 12x6 prop. It gives plenty of power and about 9 minutes of safe duration with aerobatics. The battery is set forward in the battery compartment about to enter the hole in the foam in my model. I have also used the smaller 2200mAh Admiral LiPo centered in the battery compartment.

I plan to add some washers to give a little motor down thrust. The model wants to climb excessively at $\frac{3}{4}$ to full throttle. The model scoots right along at full throttle.

BTW (by the way) I have a 1/6 scale Williams Bros pilot bust with balsa extension in rear cockpit.

Your WACO's CG may vary.

Gary Gullikson, Garden Grove, CA

**Skymasters Indoor Flying at Ultimate Soccer
Arenas, 867 South Blvd., Pontiac**

From Fred Engelman via email

We have some great news to share. Ultimate Soccer Arenas has extended our flying time by 50% for all 26 flying sessions this season. Each day we will be starting at **10AM** and can fly for 3 hours until **1PM**. That makes a total of 78 hours.

We will begin on Tuesday, November 3rd and will run through Tuesday, April 19th. Skymasters would like to thank George and Tom for extending our flying time. I hope you all will all take the time to thank George and Tom when you see them. Attached you will find a revised schedule with the expanded hours.

NOTE: ONLINE INDOOR REGISTRATION is up and running for a Season Pass and 5-Session Punch Cards. Go to the Skymasters Web page at www.skymasters.org or you can use the direct link:

<http://www.skymasters.org/index.php?page=register&event=indoor>

If you purchase a Season Pass for a \$100 you will get an opportunity to fly for 78 hours this fall, winter and spring at the best indoor facility in the Tri-County Area for less than \$4 bucks per session.

Ultimate Soccer Arenas has a 72 foot high peak and 45 feet at the eaves, comfortably heated, good lighting, bleachers and benches, clean restrooms, and a new restaurant to better serve our needs.

This will be Skymasters 8th year of indoor flying at this magnificent arena.

Thanks to all those who led the way - the Indoor Pilots applaud all you.

One other piece of good news is the Detroit Lion's games only last 60 minutes and there are only 11 games left this season.

Happy flying, hope to see you soon,
Fred E

SKYMASTERS

INDOOR FLYING AT ULTIMATE SOCCER

For the 2015-2016 Winter Season

26-3 Hour Flying Sessions from 10AM-1PM

Season Pass \$100 for 78 hours of flying fun.

5 Session Punch Card \$35 - Single Flying Session \$10

DATES*

Time 10:AM - 1:PM*

NOVEMBER:

Tues. 3rd
Tues. 10th
Tues. 17th
Tues. 24th
Friday 27th

FEBRUARY:

Tues. 2nd
Tues. 9th
Tues. 16th
Tues. 23rd

DECEMBER:

Tues. 1st
Tues. 8th
Tues. 15th
Tues. 22nd
Wednesday 30th

MARCH:

Tues. 1st
Tues. 8th
Tues. 15th
Tues. 22nd
Tues. 29th

JANUARY:

Tues. 5th
Tues. 12th
Monday 18th MLK Day
Tues. 26th

APRIL

Tues. 5th
Tues. 12th
Tues. 19th

*Dates & Times Subject To Change.

**Vista Power Quadplay Q3620 update,
Maxford Gee Bee E/Y & Sig 1/6 scale Cub**
From Gary Gullikson via email

A PS about my new Vista Quadplay Q3620 AC four port charger (phew!) info (April 2014 *Ampeer*), one of the independent ports went bad and I called Evan Chapkis, RC Accessory Inc. I sent it back and got a replacement in time to charge packs for yesterday's flying. Evan also enclosed a check to cover my cost of return shipping for the defective unit. Nice guy, responsive and easy to work with.

I have a minor correction, my new Maxford Gee Bee E/Y. It uses 4S 4500mAh LiPo packs, that sell for only \$39 at the local Hobby People stores. I have been using their \$12, 2200mAh 3S packs with no problems.

Re: Maxford Gee Bee E/Y: As I assembled the rather complex ARF, it slowly dawned on me that it was not a Gee Bee "E" but a Gee Bee model a "Y". The Y version had a longer fuselage, two cockpits with the front covered over for racing, a three piece windshield and different horizontal and



vertical stabilizer bracing/rigging. The model had no provisions for upper wing rigging and tail rigging, which I dutifully added. The black striping on the model is much too wide, but I think I'll leave it that alone. I'll be using the 15x8 APC prop like Greg Gimlick used, a Cobra Scorpion 3525/12 motor and a 60 amp Scorpion speed control, with built-in switch mode BEC, and 4S 4500mAh LiPos.



My recently finished Sig 1/6 scale Cub is flying beautifully with the ancient Astro Flight 25 geared brushed motor and "dumb" AF 211 speed control. It is supplemented by a Li-Saver for LVC, and a UBEC for 5 volt servo power. I'm using the Optima receiver's SPC port to separately power the receiver alone as recommended by Hitec. Using the SPC port has the benefit that the motor/receiver battery voltage reads out on my Aurora 9's touch screen. Optima receivers have a tranceiver function when using the SPC port. Optima receivers can operate on up to 35 volts from the motor battery, mine is getting 22+volts from the two 2200 3S LiPos.



I'm getting around 9 minutes duration with a couple of loops and mostly scale-like cruising flight. The Zen-like pleasures of flying a nice large Cub model should not be overlooked even though Cubs are so common.



My hero, Bob Goff, maidenized his latest Cleveland Plans 1/5 scale conversion model, a FW 190, yesterday at Fairview Park in Costa Mesa. He was doing inverted circles etc. This one only took him six months to build. His Cleveland Plan builds include the Dornier Pfiel Anteaater, Douglas A-20, Spitfire, Jungmeister, Amelia's Lockheed Electra, and a few more that I can't remember.

He uses the plans mainly for outlines and traces parts on tracing paper, redesigning for geared electric power RC and retracts, etc. as he goes along. Some of his models are featured in great YouTube videos. Bob's a master builder and aerobatic flyer.

Keep 'Em Flying
Gary Gullikson, Garden Grove, CA

Upcoming E-vents

Oct. 31, Saturday, EFO Monthly Flying Meeting, 10 a.m., Midwest 7 Mi. Rd. field, proof of AMA membership required to fly, everyone welcome

November 3, Tuesday, starting date for Skymasters RC Indoor Flying at the Ultimate Soccer Arenas in Pontiac, MI. This year includes 26 3 hour sessions, starting at the new, extra hour 10 a.m. to 1 p.m. Indoor registration is on-line.

Nov. 8, Sunday, Midwest RC Society Annual Swap Shop, Northville Senior Center, Main Street, Northville, MI

Maxford Gee Bee Flying Update

From Gary Gullikson via email

I have been struggling with my ARF Maxford Gee Bee E(Y). It is now flying fairly well, but I am remounting the #\$\$%^ wheel leggings/pants with industrial velcro instead of wood screws. My test pilot, Bob Goff, was finally able to get it flying

hands off, but it needs further work to become an easier frequent flyer. It is close-coupled and the CG is critical. It flies like my old Peashooter design. It is not for noobs! Read about it here:

<http://www.rcgroups.com/forums/showthread.php?t=1825239>

Gary Gullikson, E-Challenged
Garden Grove, CA

Gary's MaxFord Gee Bee In Flight



The Ampeer/Ken Myers

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<http://www.theampeer.org>

The Next Monthly Flying Meeting:

Date: Saturday, Oct. 31, 2015 **Time:** 10 a.m.

Place: Midwest RC Society Flying Field