

the

Ampeer

May			The EFO Officers			2013		
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No Mailed Ampeer Subscriptions			The Next Meeting: Saturday, May 4, 11 am, MRCS 7 Mi. Rd. Flying Field					

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Saving Our Hobby

The following is reprinted from the Detroit Aero Modelers March newsletter.

"There has recently been an increase in concern about videos and still photos taken from drones. The problem centers on invasion of privacy. With the proliferation of RTF quadcopters outfitted with cameras, it has become simple for anyone to plunk down some money, and go "window-shopping" in the neighborhood, without any flight training.

If we don't want laws that paint with a wide brush outlawing R/C flight, we should be very outgoing in describing what it is that we do, and emphasize that we are doing it only in public airspace! Now is NOT the time to be posting videos shot from you model as it cruises down the back streets of your neighborhood, and over the neighbor's pool!"

Let's all do it right and share that we are doing it 'right' with everyone we come into contact with. KM

PBY 5-A in the Planning Stages

From Scott Copeland via email

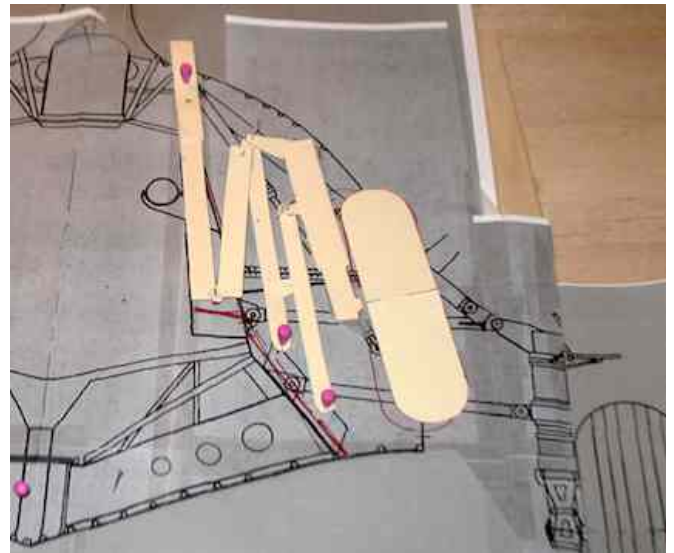
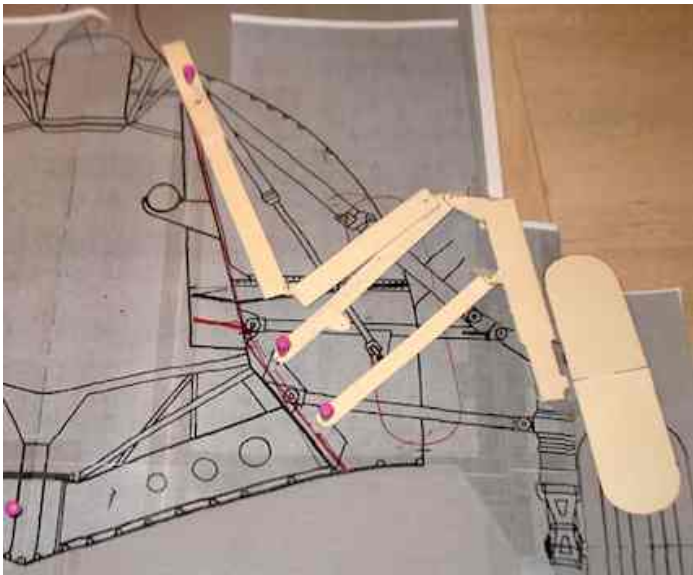
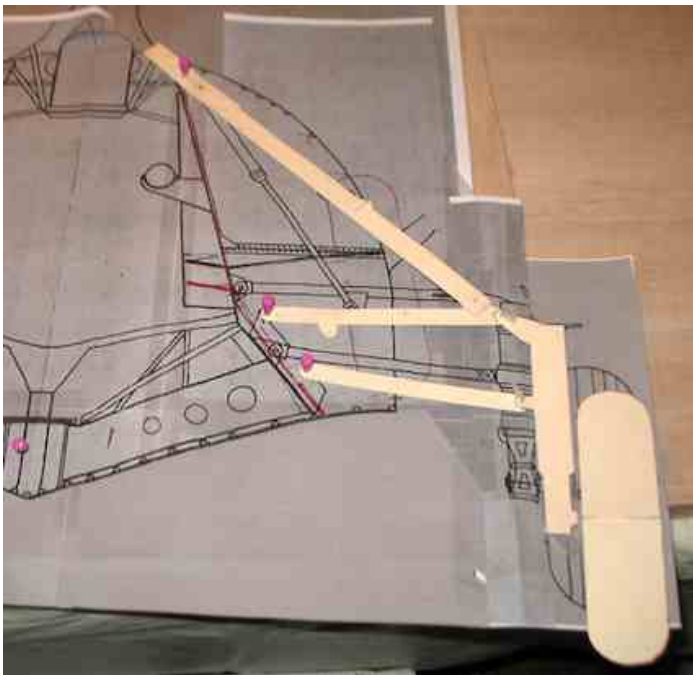
Hello Ken,

I thought you might be interested to hear about a long term project that I've started planning over the last few weeks. I have had a goal for many years to get into competitive scale modeling and I'm finally getting to that point. I'm currently building a Dave Platt Zero (powered by IC) but the next project is a big PBY. The wingspan will be 12 ft. and it will hopefully have the full treatment of details to make it a competitive scale model. It will be powered by 2 Astro 40's with Superboxes (I will use one of the ESC's you sent me- Thanks!) with an estimated weight of 20-30 lb. I plan to build my own retractable landing gear and retractable tip floats. I'm still in the design process but have worked out the landing gear geometry and plan to build that first. This project will be a series of baby steps.

We had previously conversed regarding one of your Ampeer contributors who had questions about power for his PBY and it

sounded like it was a lead sled. I hope that this one will fly prototypically. If I keep the weight within the limits of my calculations, it should have a reasonable thrust to weight ratio to fly in a scale manner. I should be able to swing a scale 3-blade prop!

Here are a few pictures of the landing gear mock-up.



Hello Ken,

How do you decide what battery is the right one for a certain motor?

Thanks,
Phil

Unfortunately, the battery 'size' is only slightly related to a given motor.

The motor is an energy converter and can be used in a lot of different applications. The mission of the aircraft, as well as the aircraft's physical size for prop clearance, determines what battery to use. Also, your personal acceptable flight time comes into play.

I like to use Cobra motors, from Innov8tive Designs, for examples because Lucien Miller has taken a lot of time to create prop charts for them.

For this example, we'll look at the Cobra C-2213 series, since you like smaller aircraft. It is an approximately 60g motor and comes in four different Kvs.

http://www.innov8tivedesigns.com/index.php?cPath=21_120_121&osCsid=376c743543a724ab04b1645af19661a4

The motors are the:

Cobra C-2213/26 Brushless Motor, Kv=950

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=814&osCsid=376c743543a724ab04b1645af19661a4

generic name: Cobra 2828-950, 61g

Rated: 14 amps continuous and 150 watts

in Continuous Power on 3S Li-Po

Cobra C-2213/22 Brushless Motor, Kv=1100

Take care,
Scott

Selecting a Li-Poly Battery for a Given Motor

Question From Phil Alvirez via email

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=813&osCsid=376c743543a724ab04b1645af19661a4
generic name: Cobra 2828-1100, 60g

Rated: 17 amps continuous and 190 watts in

Continuous Power on 3S Li-Po

Cobra C-2213/18 Brushless Motor, Kv=1350

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=812&osCsid=376c743543a724ab04b1645af19661a4

generic name: Cobra 2828-1350, 61g

Rated: 20 amps continuous and 220 watts in

Continuous Power on 3S Li-Po

Cobra C-2213/12 Brushless Motor, Kv=2000

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=811&osCsid=376c743543a724ab04b1645af19661a4

generic name: Cobra 2828-2000, 60g

Rated: 30 amps continuous and 330 watts in

Continuous Power on 3S Li-Po

These are all physically the same motor, but with different winds on the stator arms.

The Cobra C-2213/26 has more winds, of thinner wire, compared to the other three. The smaller gauge wire limits the current handling ability of the wire in the winds and results in the highest resistance.

Conversely, the Cobra C-2213/12 has fewer winds, of thicker wire, compared to the other three. The larger gauge wire allows for a larger current through the winds and results in the lowest resistance of the four examples.

In very simplistic terms, the /26 can swing a larger diameter prop more slowly than the /12, and motor selection of any of them would be **mission and prop based**.

While a 3S Li-Po was noted in the specifications, a 2S Li-Po or 4S Li-Po might be chosen depending on the mission and selected prop for the mission, all the time keeping the amp draw within a 'safe' range.

Battery Sizing

At 7.4v the Cobra C-2213/26 can swing an APC 13x4E at 4950 RPM while drawing 8.8 amps for 65.12 watts in.

http://innov8tivedesigns.com/Cobra/Cobra_2213-26_Specs.htm

Typically I use a constant static 10C discharge rate to determine the battery mAh for the flight time

I desire, but with this large diameter prop and a pitch speed of only 18.75 mph [(4950 RPM * 4 in. pitch)/1056], the prop and pitch speed appear appropriate for some type of indoor/outdoor light breeze 3D-type plane. To keep the weight down and power up on a 3D burst flier, I recommend a constant static 15C discharge rate to determine the battery mAh.

8.8 amps divided by a constant static 15C discharge rate = 0.587Ah or 587mAh, and in this case, it is a 2S Li-Po. For a 'safety margin' a 20C or higher manufacturer/supplier rating would be appropriate.

This same motor could be used with a 4S Li-Po for a much faster plane, which **changes the mission and prop**.

Using an APC 7x6E at 14.8v yields 11,100 RPM with an amp draw of 8.62 amps and a pitch speed of 63 mph. While the amp draw is similar to the APC 13x4E on a 2S Li-Po, the watts in are now 127.6. A constant static 15C discharge rate might again be appropriate to determine the mAh, as this would be a "little zoomer". This time the battery would be a 4S 575mAh manufacturer/supplier 20C or greater to allow for a safety margin.

For a "typical" park flyer a 3S Li-Po and an APC 10x6E prop could be used. A 10x6E at 11.1v yields 7,260 RPM with an amp draw of 12.02 amps and a pitch speed of 41.25 mph. This is where I would use a constant static 10C discharge rate to determine the battery mAh for a flight time that I would find acceptable. 12 amps divided by a constant static 10C discharge rate = 1.2Ah or 1200mAh. The appropriate pack would be a 3S 1200mAh manufacturer/supplier 15C or higher Li-Po. Again this allows for a safety margin.

Hopefully you can see it is not the motor but the amp draw and mission, as well as your personal preference for flight time, that determine the battery 'size'.

Battery weight can be estimated using this formula.

capacity mAh / 35 * number of cells = wt. in grams

The estimated weight for a 2S 587mAh 20C pack would be 587 / 35 * 2 = 33.5g

A Hyperion G3 CX - 2S 550mah 25C Lipo comes close to meeting the requirement and weighs 32.5 oz.

<http://www.rcdude.com/servlet/the-2177/Hyperion-G3-CX--dsh-/Detail>

The estimated weight for a 4S 575mAh 20C pack would be $575 / 35 * 4 = 65.7g$

I only found up to a 3S 550mAh 25 C. To create a 4S, two of the Hyperion 2S 550mAh 25C could be wired in series and the weight would be about 65g.

The estimated weight for a 3S 1200mAh 15C pack would be $1200 / 35 * 3 = 102.9g$

A Zippy-K Flightmax 3S 1200mah 25C Li-Po weighs 103g.

http://www.hobbyking.com/hobbyking/store/_19218_Zippy_K_Flightmax_1200mah_3S1P_25C_Lipoly_Battery.html?strSearch=1200mAh%203S

Even though a 15C manufacturer/supplier rating would have been okay, I used the 25C pack weight as I found that one quickly online.

As you can see from the examples, the formula for pack weight in grams does give a reasonable indication of the battery pack weight.

To answer your original question; is there a way to determine a battery size for a given motor, well not exactly.

Once you determine the mission and amp draw, you certainly can figure the battery size based on the formulas I've given.

One very important thing to keep in mind is that the constant static C rate used to determine the mAh is NOT the C rating of the battery pack by the manufacturer/supplier. For a safety margin, the C rating of the battery pack by the manufacturer/supplier should be higher than the constant static discharge C rate used to determine the battery's weight.

A Quick and Dirty Method

If the specific amp draw information is not available for a given motor, battery, prop combination, there is a 'quick and dirty' method to calculate an acceptable battery mAh. The number of Li-Po cells is the number recommended by the manufacturer/supplier of the motor.

The formula is:
motor weight in grams raised to the 0.6666667 divided by 10. Use a 20C or higher manufacturer/supplier rating battery with this formula.
From the previous example:

$60g \wedge 0.6666667 / 10 = 1.533Ah$ or about 1550mAh.

A pack with a 20C or higher rating would cover all of the acceptable amp draws noted for the Cobra C-2213 series. A 1.55Ah battery at a 20C discharge rate is 31 amps.

Again, the estimated battery weight formula is:
battery mAh / 35 * number of cells = wt. in grams
Estimated weight 3S 1550mAh 20C pack is $1550 / 35 * 3 = 132.9g$

A Hobby King Rhino 3S 1550mAh 30C weighs 136g.

http://www.hobbyking.com/hobbyking/store/_9326_Rhino_1550mAh_3S_11_1v_30C_Lipoly_Pack.html

A Couple More Examples

Heavier:

Cobra C-4130-20 300Kv

Max Continuous Current: 52 amps, wt. 396g

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_124&products_id=856&osCsId=b321a8f2cdc64f7d30ce0511b89a64cd

Cobra C-4130-12 540Kv

Max Continuous Current: 65 amps, wt. 398g

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_124&products_id=853&osCsId=b321a8f2cdc64f7d30ce0511b89a64cd

$397g \wedge 0.6666667 / 10 = 5.4Ah$ or 5400mAh

5400mAh was round to 5500mAh because there are more brands with this capacity. A pack with a 20C or higher rating would cover all of the acceptable amp draws noted for the Cobra C-4130 series. A 5.5Ah battery at a 20C discharge rating is 110 amps. Estimated weight 6S 5500mAh 20C pack is $5500 / 35 * 6 = 942.9g$

A Banana Hobby Genesis Power 6S 5500mAh 55C weighs 886g.

<http://www.bananahobby.com/genesis-power-6s-22-2v-5500mah-55c-rc-lipo-battery-pack.html>

Lighter:

Cobra C-2204/58 1080Kv

Max Continuous Current: 7 amps, wt. 22.5g

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=864&osCsId=99b19cf784c8db58f64a0087b1993b7c

Cobra C-2204/32 1960Kv

Max Continuous Current: 12 amps, wt. 22.5g

http://www.innov8tivedesigns.com/product_info.php?cPath=21_120_121&products_id=862&osCsId=99b19cf784c8db58f64a0087b1993b7c

$22.5g \wedge 0.6666667 / 10 = 0.797Ah$ or 797mAh

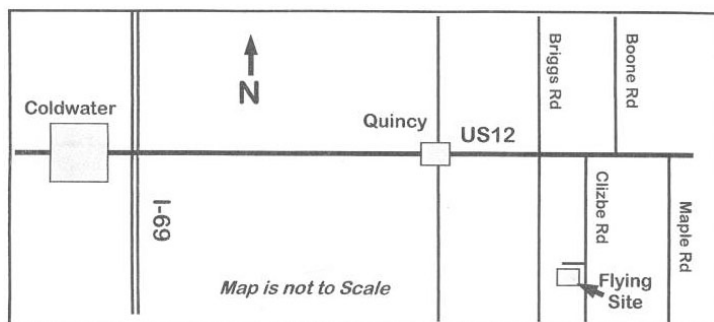
797mAh was rounded to 800mAh, as that is a common pack size. A pack with a 20C or higher rating would cover all of the acceptable amp draws noted for the Cobra C-2204 series. A 0.8Ah battery at a 20C discharge rating is 16 amps.

Estimated weight 3S 800mAh 20C pack is $800 / 35 * 3 = 68.6g$

A Hobby King Turnigy 3S 800mAh 20C weighs 75g.

http://www.hobbyking.com/hobbyking/store/_9173_Turnigy_800mAh_3S_20C_Lipo_Pack.html

Upcoming Keith Shaw Birthday Party Electric Fly-in 2013



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 June 8 and 9, 2013.

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

Please e-mail or call with any questions.

The Flying Field will be open Friday, June 7 for early arrivals

Saturday, June 8, hours are from 9 a.m. 'til 5 p.m.

Sunday, June 9, hours are from 9 a.m. 'til 3 p.m.

Landing Fee is \$10 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.

The March EFO Meeting

The meeting was held on the evening of March 14 at Ken’s house. It was a meeting filled with new planes!

Joe Hass, brought along four new planes.

The first one he shared was his Hangar 9 Meridian 10cc ARF. He had the Evolution Engines 10GX gasoline powered engine installed. The engine uses a 20:1 gasoline to oil ratio mixture for fuel. The reason he brought it to an electric meeting is that Horizon Hobby provides all the information to do an electric conversion.

<http://www.horizonhobby.com/products/meridian-10cc-arf-HAN5015#t1>



The wing area is 880 sq.in. and has a flying weight of between 7 lb. and 8 lb.

He has a review of this plane flying on gasoline power on the Flying Giants Web site.



His second plane was a Hobby Lobby F-35 Lightning II 360 Degree Thrust Vectoring Jet. It is a receiver ready aircraft for only \$199.99. It has a wingspan of 31.25 inches and flying weight of 36 oz. Joe noted that it takes off from grass very easily.

http://www.hobby-lobby.com/f_35_lightning_360_degree_thrust_vectoring_jet.htm?pSearchQueryId=4275997



The Fokker

He also brought along a Great Planes ElectriFly Citabria. He noted that this 33" span, 6 oz. foam plane has carbon fiber reinforcements and pre-made pushrods. He feels that at \$44.99 it is a good value. He said that he could even force it to do some 3D-type maneuvers.

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXBKAL&P=7>

The fourth plane was a Flyzone Fokker Dr.1 WWI Micro EP Tx-R. It uses the Tactic radios or the Tactic Any-Link radio systems.

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXCKWE&P=7>

Joe also passed out an information sheet on the new Flyzone Erazze. He's had a chance to fly one and he likes it.

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXDAER&P=ML>



The Erazze

Tom Bacsanyi brought his Hangar 9 P-51D Blue Nose 60 ARF. He really liked several features of this ARF. It has a large access hatch in the top for accessing the batteries. The spinner is provided and nice done. It blends well into the cowl and has

an aluminum backplate that recesses into the spinner. The optional retracts are operated by a standard retract servo that bolts onto the retract unit. <http://www.horizonhobby.com/products/p-51d-blue-nose-60-arf-HAN2420#t2>



He designed and fitted a strobe light behind the canopy. The very bright strobe blinks 5 times, pauses and repeats 5 times when the battery is near full charge. A four times blink indicates the power battery is running down and a 3 times blink indicates that it is time to land.

He also brought along a 120-amp YGE ESC. It is big, impressive and should do the job. It handles up to 14 Li-Po cells and has a built-in spark arrester. Hobby King sells a similar, if not the same, controller and calls it the YEP. Tom has 3 of the 120-amp and a 180-amp, so hopefully we'll get some feedback on them soon.

Bill Brown brought along his partially completed Wright Model B. An article in the Air & Space magazine got him going on this project.

Jim Young helped Bill with the CAD plans and Mark Freeland, of Retro RC, did the laser cutting. He has had a lot of help on this project and has gathered a huge amount of information on the full-scale plane. It is built to 1/10 scale.

Bill has the basic dummy engine completed, but it still needs more detailing.

His version is based somewhat on the Vin Fiz version. Vin Fiz was a soda pop that sponsored a cross USA flight of this type of aircraft.

Bill has sat in and photographed the full size recreation in Dayton, OH. He has signed up to take

a flight in the replica when the winter weather breaks.



In creating this model, he has spent the most amount of time on research.



Richard Utkan, EFO vice-president, shared his Hobby People Wild Wing. It was a kit from several years ago that he has updated. It has a small

outrunner with 2200Kv. The WOT watts in are 186 and it only weighs 17 oz. The covering is colored packing tape. He made the motor mount for the outrunner. He said that it flies very nicely at both high and low speed.



Denny Sumner brought his completed Gee Bee Y model. It was built from the short kit by Top Notch Products Company.

http://www.topnotchkits.com/index_files/slide0001.htm

The dummy motor came from Park Flyer Plastics. <http://parkflyerplastics.com/cart/>

It has a Hobby King Easy Match 15 size motor and is covered with Ultracote. The graphics are from Callie Graphics. <http://callie-graphics.com>

Jim Cross told us that Nankin Hobby of Farmington, MI has changed the name of its online store to Pro Star Hobby. <http://www.prostarhobby.com>

Ken Myers showed parts of two videos from the Web that demonstrate how NOT to work on electrically powered models.

<http://www.youtube.com/watch?v=GmcUNFnJYug>

http://www.youtube.com/watch?v=Tal-d_W-IZM

He also passed around a get well soon card for all to sign for Rick Sawacki who is recovering from knee surgery. Hope your are doing better by the time you read this, Rick.

Upcoming Lake Orion E-Fly-In

From Pete Foss via email

I'd like to announce the date of the Skymasters Electric fly as June 15th with carryover on the 16th. Like last year, we have made arrangements with the DNR to allow overnight rustic camping at the field (\$13) to facilitate NIGHT FLYING! Fliers can also stay and open fly on Sunday with the club. Hope to see lots of you there.

Electrics' Over Lake Orion E/LO

Saturday, June 15, 2013

Skymasters' Field

Event Flying Starts at 10 a.m. and goes until???

Potluck Dinner at the field, bonfire & NIGHT FLYING

Camp overnight at the field. Open flying on Sunday.

No Landing FEE!!!

Lots of parking

Refreshments available at the event

Pilots' Prizes

94dBa 10 a.m. to 8 p.m.

Night Fliers must be EXTRA quiet

Field is located in the Bald Mountain Recreation Area

About 5 Miles north of the Palace of Auburn Hills on

Scripps Rd. between Lapeer Rd. (M24) and Joslyn Rd.

Vehicles require Recreation Passport

For more info email Pete Foss

petefoss@skymasters.org

Pete Foss - Skymasters RC of Michigan

EFO Member Howard Shorr Passes

Ken Myers received word that longtime EFO member **Howard Shorr** died on April 10th. Many of us were quite surprised to hear this at the April 11 meeting as we'd just seen and talked with him on Friday, April 5th at the Toledo RC Expo.

His good friend Boris Tiraspolksy said, "Howard Shorr was a great American Patriot, U.S. Air force captain (ret.) and decorated combat Vietnam War veteran.

Howard Shorr was a passionate supporter of the model aviation in Michigan."

We will all miss him!



29th Annual Mid-America Electric Flies 2013

At the 7 Mile Road MRCS Field

AMA Sanctioned

Saturday, July 13 & Sunday, July 14

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>



Upcoming E-vents

May 4, Saturday, EFO Flying meeting, 11 a.m., at the Midwest RC Society 7 Mile Rd. flying field, if weather and field conditions allow. Everyone with an interest is welcome. AMA membership required to fly.

May 18 & 19, Sat. & Sun., 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

June 8 & 9, Keith Shaw Birthday Party Electric Fly-in 2013, Balsa Butchers field near Coldwater, MI. Contest Director: Dave Grife - E-mail grifed@yahoo.com or Phone: 517.279.8445, Flying Field will be open Friday, June 7 for early arrivals, Saturday, hours are from 9 a.m. 'til 5 p.m., Sunday, hours are from 9 a.m. 'til 3 p.m., Landing Fee is \$10 for the weekend.

June 15, Saturday, Electrics' Over Lake Orion (E/LO), Skymasters' Field about 5 Miles north of the Palace of Auburn Hills on Scripps Rd. between Lapeer Rd. (M24) and Joslyn Rd., Event Flying Starts at 10 a.m. and goes until???, Field is located in the Bald Mountain Recreation Area and

vehicles require Recreation Passport, No Landing FEE!!!, Refreshments available at the event, Pilots' Prizes, more info Pete Foss petefoss@skymasters.org

July 13 & 14, 29th Annual Mid-America Electric Flies, Midwest RC Society, 7 Mile Rd. Flying Field, contact kmyersefo@theampeer.org or 248-669-8124

July 27, Saturday, Detroit Aero Modelers AMA Sanctioned 2013 Electric Fun Fly, 9 a.m. to 4 p.m., Alex Jefferson Field in River Rouge Park at the corner of Joy Road and Spinoza, NO LANDING FEE! CD: Arden McConnell 313-274-3185 Web site: www.detroitaeromodelers.com



The Ampeer/Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390

<http://www.theampeer.org>

The Next Monthly Meeting:

Date: Saturday, May 4, 2013 **Time:** 11 a.m.

Place: MRCS 7 Mi. Rd. Flying Field