the Ampeer

July The EFO Officers 2017

No Mailed Ampeer Subscriptions

The Flying Next Meeting:
Sat. & Sun., July 8 & 9, 10:00 a.m., The Mid-Am!

What's In This Issue:

Selecting An Electric Power System, Revisited

By Ken Myers

A friend of mine just finished up a kit, a Great Planes RV-4 .40-size Sport Scale Airplane, using an electric power system.
http://www.greatplanes.com/airplanes/gpma0180.html
Pertinent glow **SPECIFICATIONS**
Wing Area: **631.6 in²** (40.8 dm²)
Weight: 5.75-**6.25 lb** (2.6-2.8 kg)
Required: **2-stroke** .40-**.52** cu in engine or **4-stroke** .48-**.70** cu in (8.0-11.5 cu in)

The maiden was done using a 4S A123 2500mAh pack. The plane weighed 7 lb. 4 oz. on the maiden. The motor was an O.S. Motor OMA-5010-810.

That motor was reviewed in the February 2013 *Ampeer*.
http://theampeer.org/ampeer/ampfeb13/ampfeb13.htm#PREVIEW

It flew, but it was apparent that it needed a bit more oomph.

In March of 2017, I did a presentation at the Midwest RC Society. The topic was "Selecting an Electric Outrunner Motor Power System".

At that time, I updated my previous Web page on that topic on the *Ampeer* Web site, but I never included a writeup about it here in the *Ampeer*.

The updated article and Excel workbook are found at:
http://theampeer.org/Select-Pwr2017/Select-Pwr2017.htm

Another link is found on the homepage, and may have been overlooked by many, including myself when I was trying to find it again!!!

The RV-4 is being used to illustrate how to select a power system based on that article. This is kind of a condensed, Cliff Notes, version. Full explanations are in the article.

When doing a glow conversion, the only things that need to be known are; the sizes, in cu.in., of the LARGEST 2-stroke and 4-stroke motors (2-stroke .52 and 4-stroke .70), the maximum weight in pounds (6.25 lb.) the wing area (631.6 sq.in.) and the largest diameter prop to allow for ground clearance (13" according to an email from the pilot).

(The article also describes what data to use, and how to use it, for an airplane

designed for electric power. That is not covered here.)

Name of Plane:	RV-4		
Recommended Largest 2-stroke:	0.52	displacement in cubic inches	
Recommended Largest 4-stroke:	0.70	displacement in cubic inches	
Mfg. Max. Weight:	6.25	lb.	
Mfg. wing area:	631.6	sq.in.	
Desired watts in per pound:	100	If in doubt, use 100	
Number used to calculate WCL:	9.19		
Wing Cube Loading Factor:	10.89		
Average watts in:	83.47	from table	
Median watts in:	76.90	from table	
Suggested Power:	716	watts in	
Lightest Motor:	239	g	
Heaviest Motor:	358	g	
80% watts in:	572	watts out	
Largest Dia. Prop:	13	in.	

The next required input is the prop pitch. There is a table on the spreadsheet that recommends pitches based on the Wing Cube Loading (WCL) level.

Wing Cube Loading and Typical "Type"

Level 1: 0.00 - 2.99, "indoor"
Level 2: 3.00 - 4.99, "Backyard"
Level 3: 5.00 - 6.99, "Park"
Level 4: 7.00 - 9.99, "Sport/Trainer"
Level 5: 10.00 - 12.99, "Advanced Sport"
Level 6: 13.00 - 16.99, "Expert Sport"
Level 7: 17.00 and above, "Expert"

More information on the WCL can be found on the *Ampeer* Web site, Table of Contents page.

http://theampeer.org/sitetoc.html

There are five articles relating to this comparative number under the heading "Wing Cube Loading (WCL)".

Unlike the value for wing area loading, with its units given in ounces per square foot, the WCL value has no units.

A quick calculation of the WCL for the RV-4.

631.6 sq.in. / 144 = 4.386 sq.ft.
6.25 lb. * 16 = 100 oz.
100 / 4.386^1.5 = 10.89 as the WCL

The spreadsheet does the math. This is only presented for those who are curious about how it is derived.

The spreadsheet indicates that with a WCL of 10.89, it is a WCL Level 5 plane.

WCL 1-3 pitches	WCL 4-7 pitches
6.5	9.0
7.0	10.0
8.0	10.5

A 10-inch pitch was chosen for this example.

After the prop pitch has been entered, the completed data looks like this.

Name of Plane:	RV-4		
Recommended Largest 2-stroke:	0.52	displacement in cubic inches	
Recommended Largest 4-stroke:	0.70	displacement in cubic inches	
Mfg. Max. Weight:	6.25	lb.	
Mfg. wing area:	631.6	sq.in.	
Desired watts in per pound:	100	If in doubt, use 100	
Number used to calculate WCL:	9.19		
Wing Cube Loading Factor:	10.89		
Average watts in:	83.47	from table	
Median watts in:	76.90	from table	
Suggested Power:	716	watts in	
Lightest Motor:	239	g	
Heaviest Motor:	358	g	
80% watts in:	572	watts out	
Largest Dia. Prop:	13	in.	
Prop pitch:	10	in.	
Target RPM:	7659		
Pitch Speed:	72.53	mph - verify with pitch speed table	
Stall Speed:	17.67	mph	
Pitch Speed to Stall Speed:	4.11	:1	

If the Target RPM of 7659 can be achieved, the theoretical pitch speed would be 72.53 mph and the pitch speed to stall speed ratio would be an excellent 4:11:1.

	Review		Results are in red cells.				
RTF Wt. Pounds:	6.25	Target Pin:	716	+ Watts In			
Watts in per pound:	100	Pitch/Dia.:	77%		1.30	:1 Diameter to Pitch	
Prop Diameter:	13	Motor Weight:	239	to	358	grams	
Prop Pitch:	10.0						
Desired Flight Time:	6	minutes 5-8 minutes is typical					

The review section has one more input, desired flight time. This input determines the suggested battery capacity.

The review section shows that we are looking for an outrunner motor that can turn an APC 13x10E while requiring about 700ish static watts in. The motor should weigh between 239g and 358g.

The complete article explains why Cobra motors are used during the motor selection process, how to select them by weight, and how to substitute other brands of motors.

Work Area:				Input	Motor	Watts	Prop	Pitch
Motor	Wt. grams	Kv	Io	Voltage	Amps	Input	RPM	Speed
Cobra C3525/18	253	430	0.84	22.2	31.58	701.1	7266	68.8
Cobra C3525/12	253	650	1.48	14.8	45.26	669.9	7081	67.1
Cobra C4120/12	293	850	2.77	11.1	63.2	701.5	7135	67.6

The Work Area is where possible usable motor data is recorded from the Innov8tive Designs Web site. There are more rows than shown here, but these were the only three Cobra motors weighing between 239g and 358g that might possibly turn an APC 13x10E at somewhere near 700 watts in.

	Watts	System	Vout/Vin	ESC	# LiPo	Batt.	Safe
Results:	Output	Eff.	Eff.	Amps	Cells	mAh	C-rate
Cobra C3525/18	519	74%	76%	39	6	2000	20
Cobra C3525/12	477	71%	74%	57	4	2900	20
Cobra C4120/12	507	72%	76%	79	3	4000	20

The Results area shows that the Cobra C3525/18 would be a good choice. It has a good system efficiency and a good ratio of volts out at the motor to volts in at the ESC. A 6S 2000mAh LiPo battery should yield the 6 minutes of desired flying time. An ESC rated for a 6S LiPo packs at 40 amps should be just fine.

2000mAh LiPo cells are not common at this time. A typical pack might be a Glacier 6S 2200mAh 30C.

http://www.buddyrc.com/glacier-30c-2200mah-6s1p.html

My friend wants to use A123 2500mAh cells instead of LiPo cells.

I recommend using A123 2500mAh cells at about a maximum of 35ish static amps. That yields about 100 watts in per cell at the ESC and a flight time of 6 to 7 minutes, depending on throttle management and the pilot's mission.

There is a second spreadsheet in the Excel workbook for A123 2500mAh cells.

Name of Plane:	RV-4		
Recommended Largest 2-stroke:	0.52	displacement in cubic inches	
Recommended Largest 4-stroke:	0.70	displacement in cubic inches	
Mfg. Max. Weight:	6.25	lb.	
Mfg. wing area:	631.6	sq.in.	
Desired watts in per pound:	100	If in doubt, use 100	
RTF Wt. using A123 Cells	6.56	lb.	
Number used to calculate WCL:	9.19		
Wing Cube Loading Factor:	11.43		
Average watts in:	83.51	from table	
Median watts in:	76.90	from table	
Suggested Power:	700	watts in	
Lightest Motor:	233	g	
Heaviest Motor:	350	g	
80% watts in:	560	watts out	
Largest Dia. Prop:	13	in.	
Prop pitch:	10	in.	
Target RPM:	7603		
Pitch Speed:	72.00	mph - verify with pitch speed table	
Stall Speed:	17.67	mph	
Pitch Speed to Stall Speed:	4.08	:1	

The same data was input into the A123 spreadsheet.

Results:	Number	Target	Kv High
Target Volts In	A123 Cells	Kv	+ 10%
20.00	7	507	563
	Wt. in grams		Wt. in grams
Motor Weight Range:	233	to	350

A123 2500mAh Results are presented a bit differently. Only the K_v range and motor weights are shown for selecting a motor.

	Max
Possible Motor Choices	Amps
Cobra C-3525/14 Brushless Motor, Kv=560	45
Cobra C-4120/18 Brushless Motor, Kv=540	54

Either of the two selected motors should be just fine.

As noted in the complete article, motors in the same weight and K_v range can be substituted.

An alternate motor might be a Great Planes Rimfire .80 50-55-500 Outrunner Brushless 298g, K_v 500.

http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXLWV7&P

For any of the motors selected, the prop may have to be adjusted to fine tune the maximum static amp draw of about 35ish for a flight of 6 to 7 minutes.

The whole article goes into a lot more detail, with a lot more explanations.

The RV-4 workbook can be downloaded and used as a template for other projects as well.

http://www.theampeer.org/ampeer/ampjul17/ampjul17.RV4.xls

MODEL AERO SPORTSTER, a Review

By Joe Hass

http://modelaero.com/Merchant5/merchant.mvc?Screen=PROD&Store_Code=M&Product_Code=Sportster&Category_Code=AM

Specifications (from website)

Wingspan: 36"
Length: 29"
AUW: 6-8 oz.
Wing area: 278 Sq. in.
Wing loading: 3.63 oz/sq ft
Motor: 2204
ESC: 10 amp
Battery: 450 (recommended for indoor) to 850 3S Lipo
Prop: APC 6 x 4
Servos: 6 gram (2)
Flight controls: Rudder, elevator, throttle
(*WCL: @ 6 oz. 2.24 and @ 8 oz. 2.98 KM*)

This is my third Sportster. The first appeared in the fall 2015 issue of *Park Pilot* as a review. I had purchased a kit from Scott DeTray, of Model Aero, at the Weak Signals RC Expo in Toledo.

I fell in love with the "Spacewalker" look; long "full" fuselage (made up of laminated foam), included decorations and preformed airfoil wing. The instructions come on a disk that includes all the Model Aero kits. Take a look at their new SPIRIT for something that is fun off grass, water or snow.

http://modelaero.com/Merchant5/merchant.mvc?Screen=PROD&Store_Code=M&Product_Code=Spirit&Category_Code=AM

The instructions call for a typical build and equipment installation. The airframe is completed before the installation of hardware. After looking at everything, I quickly departed from the norm.

Let's start with adhesives. Obviously, foam safe CA has its place, but most of the build can be completed with spray on contact cement, Foam Tac or epoxy.

On the third build I used 30 minute epoxy (thinned with 70% isopropyl alcohol) to laminate the fuselage, wing doublers and wheel pants. Foam Tac, if allowed to migrate to the edges, becomes hard to sand. Contact cement gives you one chance to get it straight. I liked the ability to adjust things. I used the thinned epoxy very sparingly, immediately cleaning up anything that migrated to the edges. While I can't explain it, the thinned 30 minute epoxy sets up in about 10 minutes, so the work went quickly.

The wings are joined with 3 plywood stiffeners. After the adhesive (epoxy) sets, apply the wing decorations. These are made of self adhesive vinyl. Clean the wing with a tac rag or tape to remove all contaminates. Position the vinyl and let it set for about 10 minutes. S L O W L Y remove the carrier tape. You may have to use a blade to keep the edges of the vinyl down as you remove the tape. Set the wing aside to let the vinyl grab unto the foam. I try to allow the vinyl 24 hours of undisturbed time on the foam. You will see how it attaches itself over time.

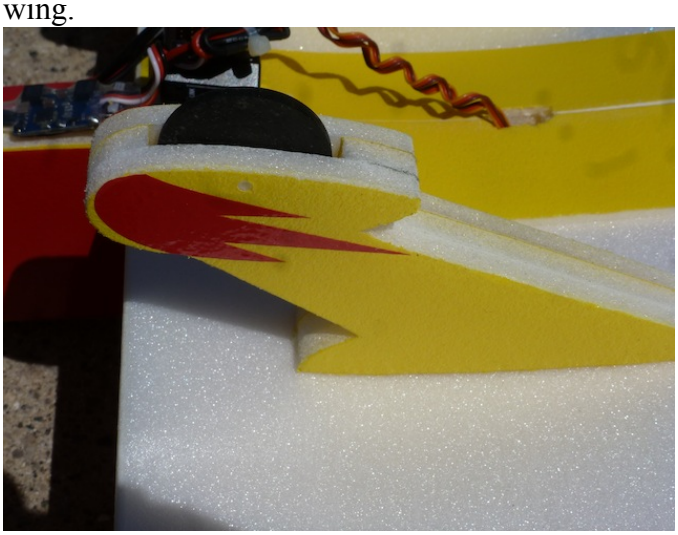
Sand the edges of the top and bottom of the foam fuselage square using some 80 grit paper on a block. Do not round anything yet. Apply the fuselage vinyl using the cockpit area as the primary alignment tool. Make sure you haven't put a twist in the fuselage and set it aside like the wing.

Repeat the process for the wheel pants. I had to trim the wheel pant vinyl to get it to fit correctly on the foam.

I preferred to paint the plywood parts black. Mask the areas that need to be glued. I used quick drying spay black.

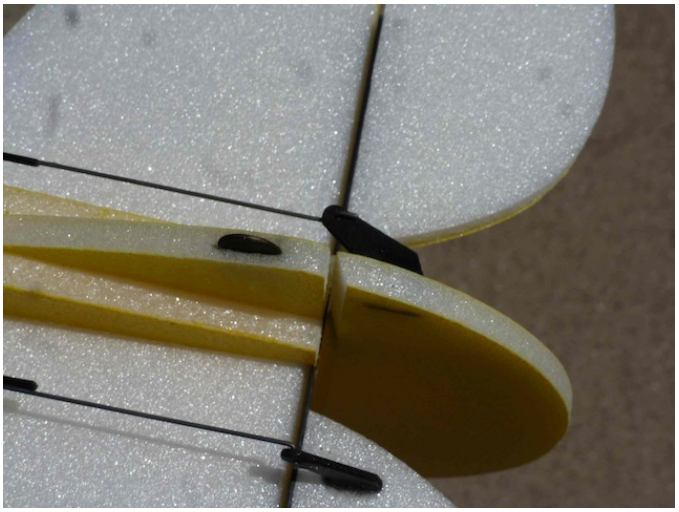
Move on to the horizontal stab and elevators, joining the elevators halves with the carbon fiber joiner and then hinge the surfaces with 3M Blenderm tape. Apply the vinyl decoration to the horizontal stab and let it set.

The instructions call for an exposed radio installation. I wanted to hide as much as I could. Open up a slot in the middle fuselage piece to allow the servo wires to pass through the fuselage and wing.



Cut the vinyl at the servo locations and fold it in. Only cut one side for each servo. Epoxy the servos in place with the servo wires passing out the bottom of the fuselage in the wing cradle area. Remember the wing hasn't been attached yet. Attach the horizontal stab and elevator making sure it is centered and square. I used foam safe CA. Attach the rudder to the vertical stab. This gets tricky as the vertical stab is part of the center of the fuselage. An extra set of hands help or simply prop up the fuselage to allow easy access to the joint. It will take 2 pieces of Blenderm on the rudder, one for above the elevator and one below.

Next create the pushrods and guides and set up all of the control throws. Again, the wing is still not attached. Not much elevator throw is needed. I used the second hole. I used 5 minute epoxy for the control horns.



Pre-drill the holes for motor mount before attaching the mount to the fuselage with epoxy. A little right and down thrust can be can be added before the epoxy sets.

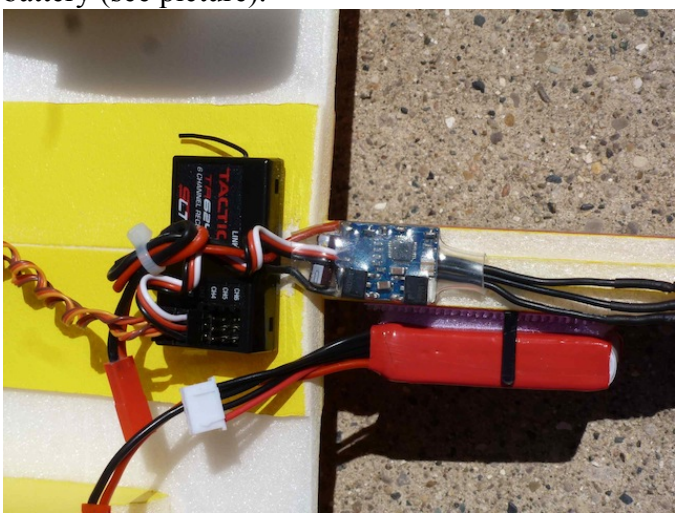
With the motor mounted, the ESC can be double sided foam taped to the bottom of the fuselage.

Test fit the wing to the cradle. Sand as needed. I have used both foam safe CA and epoxy to hold the wing on. Cut a slot for the servo wires and attach the wing, making sure everything is square.

While that is setting, attach the wheels to the wheel pants. Trim off the top of the alignment tabs on the wheel pants so that they just protrude into the wing (otherwise they will protrude up to the vinyl). Attach the wheel pants to the wing. I have used either Foam Tac, 5 minute epoxy or foam safe CA for the wheel pants.

If you have the version of the Sportster with the painted wings, now is a good time to go over the edges with some 120 sandpaper on a flat block. You don't want to sand too much. Just take the edge off the foam creating a small radius on all the edges.

I changed the covering on the 3 cell 450mAh Li Po to red heat shrink that is close to the red on the fuselage. It helps hide the battery. Self adhesive Velcro holds the battery to the side of the fuselage. I added a small carbon fiber strip to help support the battery (see picture).



The receiver is held to the bottom of the wing with double sided tape.

On occasion I fly off of concrete, so I added a skid or wheel to the tail.

The kit includes a "foam" pilot with stickers. I found it better to attach the stickers to some 1/16 plywood. The pilot sticks out a bit and becomes an easy target for hanger rash.

Set the control throws and center of gravity (CG) per the instructions. Moving the battery should get you close.

I did the first flights indoors. Slowly advance the throttle. It should be off at about 1/3 throttle. Cruising around is fun. Lazy Eights are easy. Loops are nothing more than advancing the throttle and gently pulling up elevator. You will need to fly it through the loop, working the throttle a bit. Touch and goes are a breeze. It is so neat to see the wheels on the ground and the tail hanging in the air for what seems like forever on landings. I have done flying circles with one wheel on the ground.

Play with the throws and exponential to suit your style of flying. I programmed the rudder stick to the ailerons in case I forget what I am flying.

I get tired before I run out of battery because so much of the flight is at ¼ throttle.

One local flyer added ailerons to make his 'full house'.

It is just as easy to fly outdoors. Just watch the wind conditions. Resist pulling a lot of up elevator with full power. I have really flexed the wing at times.

This is a fast, easy foam build that gives you the illusion of a home built or vintage era aircraft. It doesn't take a lot of room to fly or store. It is perfect for some schoolyard flying at lunch time.

Joe Hass
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248-321-7934

Denny Sumner's Monocoupe 90A Maiden

On Monday, May 15, **Denny Sumner** maidened his new **Jim Young** designed Monocoupe 90A.

The model was built from the third prototype kit by Jim.

The kit is now available through Manzano Laser Works.
http://www.manzanolaser.com/index.php?main_page=product_info&cPath=75&products_id=576

The specifications from the Manzano site:
Wingspan: 54.9 inches
Area: 390 square inches
Length: 34 inches
Weight: 50 to 60 ounces
Wing loading: 18-22 ounces/square foot
Power: Scorpion 3020-16, 3S 3300 mAH
(*WCL: @ 50 oz. 11.27, @ 60 oz. 13.52 KM*)

With 0.7 oz. of lead in the cowl, Denny's weighs in at 54 ounces.

The maiden flight was very successful. The photo shows Denny getting ready for its second flight of the day.

There is a lot more information on his build and maiden flights in his build thread on RC Groups. There is also a short video of part of the second flight.
https://www.rcgroups.com/forums/showthread.php?2784586

Mark Rittinger's Trishula Flies!

Mark Rittinger's Trishula, far right in the photo, awaits its first flight at the Midwest RC Society 7 Mile Rd. flying on Monday, May 15.

Denny Sumner and Mark discuss the preflight and flight plan for the maiden flight.

The wind was quite gentle and down the runway from the east. Due to the spring rains, Midwest's grass was a bit 'plush' and longer than it should have been.

It turned out that the grass did not hamper the Trishula at all.

The photo shows 'lift off' on the maiden flight.

A lot more information and video of the flight can be found in Mark's build thread on RC Groups.
https://www.rcgroups.com/forums/showthread.php?2771105

The Trishula has a wing area of 576 sq.in. and weighs 87 ounces. The WCL is 10.88.

Mark Rittinger's New P-51

On the same day that Mark maidened his Trishula, he also did a maiden on his new P-51.

Denny Sumner did the hand launch, and flew perfectly from the launch.

This is one of those, "It only took a couple of clicks of aileron trim.", fly it off the building board, planes.

Mark was all smiles, and rightly so. This is one great looking, great flying plane.

Details on this version can be found in the RC Groups thread titled "Mike's 48" P-51B Mustang Build - Vlog".
https://www.rcgroups.com/forums/showthread.php?2808476

Details of Mark's version can be found on page 6 of the thread.
https://www.rcgroups.com/forums/showthread.php?2808476-Mike-s-48-P-51B-Mustang-Build-Vlog/page6

Mark has designed several variants of the P-51 over the years, and this is one of his best looking and best flying.

This version uses and E-flite Power 32 770Kv, APC 14x10E or 14x12E prop and a 3S 2700mAh LiPo pack. The wing area is 350 sq.in. and flying weight is 52 oz. That yields a WCL of 13.5.

Congratulations on another great design Mark!

Upcoming Event
Cards of East Lansing, MI
7th Annual Electric Fly In
from Marvin Thomson

When: Friday August 25 4:00 pm - 9:00pm and Saturday August 26 from 9:00 am to 9:00 pm

Pilot and Aircraft Requirements:

Current AMA — Open to All RC Electric planes, helicopters, and multicopters.

Best two runways in Mid-Michigan

Practice FPV Multicopter Course on N/S runway open on Friday and Saturday from 4:00-9:00 pm
Pilot Raffle on Saturday
Pizza, pop, and water available on Saturday

Spectators Welcome

Landing Fees:
$15 (includes Pilot Pizza & Soda)
CD Marv Thomson 517-8027675 or mthomson@wowway.com
Website: www.cardsrc.com
Address: 8328 Otto Rd, Grand Ledge, Mi 48837

More on the ESC Problem in the FMS SuperEZ

by Ken Myers

I reported in the June 2017 *Ampeer* that the power system in one of my student pilot's FMS SuperEZ trainers was having a problem.

He was told by someone over the phone at Motion RC that the ESC or motor would be replaced, once he knew which one was causing the problem.

Since a new pilot does not have the equipment to determine what the problem might be, he removed the ESC and motor from the plane. I took the motor, ESC and one of his LiPo batteries home to trouble shoot and locate the problem.

I had a 'spare' ESC from a Freewing Pandora that had the correct size bullet connectors on it.

The motor from the SuperEZ ran perfectly with Freewing ESC.

I tried the Freewing motor with the SuperEZ ESC and the motor only 'jumped back and forth', like it was doing with the SuperEZ motor.

Obviously, the ESC was the problem. I removed the shrink tube from the three motor leads on the ESC and resoldered the connections. The problem persisted.

I removed the original bullet connectors, cut the three ESC wires back a little and soldered on new 3.5mm bullet connectors.

The 'jumping' problem still existed with both motors.

There was definitely something wrong in the ESC itself.

My student called Motion RC and reported that it was the ESC. They would not replace the basically new, faulty ESC.

I gave him the Freewing ESC, and he installed it in his SuperEZ. Problem fixed, no thanks to Motion RC.

33rd Annual Mid-America Electric Flies 2017

AMA Sanctioned Event
Saturday, July 8 & Sunday, July 9
Hosted by the:
Ann Arbor Falcons and **Electric Flyers Only**

The 7 Mile Rd. Flying Site, Salem Twp., MI, is
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 4 P.M. Sat. & 10 A.M. to 3 P.M. Sunday

Pilot Entry Fee: 18 and over, $15 Sat. - $10, Sunday, (ask about the family rate),
Under 18, FREE
Parking Donation Requested from Spectators

Saturday's Awards
Best Scale
Most Beautiful
Best Ducted Fan
Best Sport Plane
New Foam Flurry for NCM Aircraft
CD's Choice

Sunday's Awards
Best Scale
Most Beautiful
Best Mini-Electric
Best Multi-motor
New Most Unique NCM Aircraft
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

New Events for this year for NCM (Not Conventional Materials) aircraft.
Traditionally, model aircraft airframes have been mostly constructed from balsa wood, plywood, spruce, and fiberglass. For the purposes of this meet, NCM airframes are mostly constructed from not conventional materials i.e.; sheet foam, foam board, cardboard, block foam, foam insulation material, etc.

Foam Flurry for NCM aircraft: This is a true event. It is based upon the all up/last down event of early electric meets. Any NCM aircraft may be used (no ARF types). Power systems are limited to a maximum of 3S (no paralleling) LiPo batteries or 4S maximum, no paralleling, for A123 packs. All planes qualifying for this event will launch at the same time, and the last one to land will be declared the winner.

Most Unique NCM Aircraft Award: A new award will be given on Sunday to an aircraft in the NCM category that is judged as 'most unique' by the Mid-Am panel of judges.

* * * * *

To locate the Midwest R/C Society 7 Mile Rd. flying field, site of the 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.

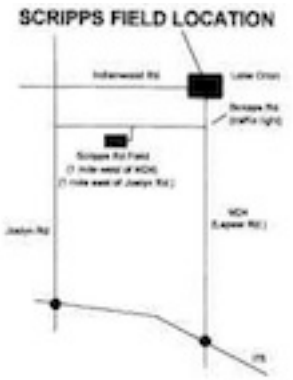
Because of their convenient location and the easy drive to the flying field, the Comfort Suites and Holiday Inn Express in Wixom, MI have been added to the hotels' listing. They are only 10 miles northwest of the field and located near I-96 and Wixom Road. See the map-hotel .pdf for more details.

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

Upcoming E-vents

June 24, Saturday, 8 p.m. - 12 a.m., June 25, Sunday, 8 a.m. - 2 p.m.
Night Fly on Saturday, Skymasters' Electrics Over Lake Orion on Sunday. Bonfire and Night Flying on Saturday evening! Get a plane ready with lights!!! Camp overnight at the field (primitive only). All electric flying on Sunday.
Lots of Parking
No Landing Fee!
Refreshments available at event
Pilots Prizes!
94 dBa 10AM-8PM
Night fliers must be below 80 dBa.
Flying open to all AMA members.
Flying field is located within the Bald Mountain Recreation Area, about 5 miles north of the Palace of Auburn Hills on Scripps Road. Take M-24 exit from I-75 and come 1 mile west off M-24 on Scripps. All vehicles require a Recreation Passport available from Secretary of State or DNR.
For more information email electricfly@skymasters.org

Visit their website at www.skymasters.org



July 8 & 9, 33rd Annual Mid-America Electric Flies - (full details in this issue - also considered EFO July Flying Meetings)

August 25 & 26, Friday and Saturday, Cards of East Lansing, MI 7th Annual Electric Fly In (full details in this

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

The Next Monthly Meeting:
Date: Sat. & Sun. July 8 & 9 **Time:** 10:00 a.m. the Mid-Am
Place: MRCS 7 Mi. Rd. Flying Field, The Mid-Am