the Ampeer

June | The EFO Officers | 2020

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The Next EFO Flying Meeting: To Be Determined
Sat., June ?, 10 a.m., Midwest RC Society 7 Mi. Rd. Field

What's In This Issue:

Radio Brand Usage Research -
Power for a 72" Wingspan Lazy Bee - The March 2020 EFO Meeting - Upcoming Keith Shaw Birthday Party Electric Fly-in Info - Upcoming 36th Annual Mid-America Electric Flies Announcement - Upcoming Events

Power for a 72" Wingspan Lazy Bee

Response to an email question from John Mertz

Introduction

The Andy Clancy Lazy Bee, low-aspect ratio wing design, became quite popular in the mid-1990s. The basic design was quite "flexible" and there were many variations created in many, many different sizes.

Kits for the original size, with the 40" wingspan and the extended 48" wingspan and the Special with a 50" wingspan are once again available from Andy Clancy Designs.
https://www.andyclancydesigns.com/

There were many iterations of this basic design over the years. They ranged from "tiny" to "huge".

The gallery, on the Andy Clancy Design Website, shows many of the different versions including the Lazy Bee, Speedy Bee, Stagger Bee, Lady Bug and Yard Bee.

The following two photos, used to illustrate the size range, appear on the Andy Clancy Design Website.

The Yard Bee

The Super Bee

In October of 1996, Dereck Woodward wrote and article for RC Groups titled "The Clancy Aviation Lazy Bee".
https://www.rcgroups.com/forums/showthread.php?220160-The-Clancy-Aviation-Lazy-Bee

One of the kit versions, produced at that time, was the 72". It was the 60" kit with an extended wing to a span of 72".

John Mertz sent an email and asked if I could recommend a power system for the 72" version

Hi Ken,

My name is John Mertz. I'm a longtime lurker on the *Ampeer*, but I'm not very knowledgeable about electric flight. In fact I'm not very experienced in RC flight period. I spent some time with an instructor in the mid-90s and did well but didn't have enough time to devote.

I happen to have a Big Lazy Bee, stick built plane, that I bought in the mid-90s but never finished putting together. Now that I've retired, I have loads of time and I'm finishing it off.

I'll be connecting with a local flying club near my MN lake house this summer for some flight instruction, but in the meantime, I need some direction on electric components so I can purchase what I need for the Big Lazy Bee.

I've looked through some of the beginner information provided on the *Ampeer* Website, but frankly I am having a hard time translating what's there to Websites offering various products. I've gotten into a lot of different hobbies over the years, but this topic is a bit more daunting!

I contacted Andy Clancy, who developed the original Lazy Bee, and asked him some questions about the build and the components to use. The Big Lazy Bee is a 1.5x version of the original and (my version) has a huge 72" x 21" wing.

Here's what I learned from Andy (from his email back to me)…

"The 72 inch Bee can take a wide range of motors and I have not tested it with the latest motors. Electric powered it will have a flying weight of about 7 to 11 pounds. This weight is affected by the motor system covering and radio gear you use. If you want a docile relaxing flying plane you should go for a lighter weight. The watt rating is the power output of an electric motor. The Big Bee will fly well 50 to 200 watts per pound. A 7 pound Bee will need at least a 3500-watt motor but it will, I think, take a 4500 to 5000-watt motor might give more climb ability yet still keep the weight low. The kV rating is the rpm of the motor under no load. It gives you an idea of how big a prop the motor will use. You need a low kv motor. The Big Bee can use up to a 15-inch prop. Some motor sellers give prop sizes in their motor specifications. The higher the voltage the motor is the higher the efficiency it has, but the more expensive the battery and heavier it will be. Divide the motors voltage by 3.6 and you will know how many cells it will use. I think you will need a battery of about 3500 to 4500 m.a.h."

As I said, I have limited knowledge of electrics. I did inherit a couple of electric motors from my father, but they were in RC boats, so I assume they won't do (a Goldberg Turbo 550 7.2v and a Graupner 500 BB Race 8.4v geared at 2.6:1). I also have 2 unused 1400 7 cell NiCad battery packs that I believe he intended to use in either cars or boats. All of this plus radios from the 90s.

Although I want, and need, to get fully educated on modern electric power, for now I really just need to know what to buy online to fit to the plane. I have looked at various hobby sites for components but am a bit lost on how to wade through it all. I even gather that people don't use NiCads any longer, so I'm obviously way behind.

I need to buy the electric motor, a gear box if needed, a speed controller, prop and battery packs. I have an FM Futaba radio from a GP PT40 trainer I picked up and have installed servos in the Bee already.

Can you help me out please? I'm happy to chat on the phone if you would like.

Thanks Ken, and thanks for all the information and work you've put into the Website and monthly newsletters. I do find it all very interesting and informative.

John

The first thing I did to start to help John out with some useful information was to locate the details for the 72" version online.

I found the following:

72" Lazy Bee

BIG LAZY BEE RC AIRPLANE KIT BY CLANCY AVIATION. EXTENDED WING 72" * NIB
https://www.worthpoint.com/worthopedia/big-lazy-bee-rc-airplane-kit-clancy-15489409

"ORIGINAL CLANCY AVIATION EXTENDED WING BIG LAZY BEE KIT, Brand New Unopened Kit in Pristine Condition, Clancy Aviation used plain boxes to pack their kits so no pictures. The extended wing was designed to reduce the wing loading of the heavier Big Lazy Bees. The wingspan is increased by 12", from 60" to 72". This adds another 252 sq inches (12" x 21") of wing area (20% increase). Only the center section of the wing is changed. The extended wing is more docile, and it glides better. You get all the parts from the standard Big Lazy Bee Kit plus the additional parts and plans required to build the extended wing:

Extended wing plans, additional wing ribs, longer spars, extra sheet balsa for gussets and compression braces, and complete instructions."

I extrapolated the following.

EXTENDED WING BIG LAZY BEE
Wingspan: 72"
Wing Chord: 21"
Length: 39"
Wing Area: 1435 sq.in.
Weight: 5 - 7 lbs.
Wing Loading: 8 - 12 oz/sq.ft.
Motor:.25 - .60 2-stroke/Diesel
.45 - .70 4-stroke
.25 - .45 Electric

With the information provided in John's email, and the information on the Worthpoint Website, I was able to create a spreadsheet based on my article "Selecting an Electric Outrunner Motor Power System for an ARF, Kit or Plans Built Electrically Powered or Glow Conversion Prop Plane".
http://theampeer.org/Select-Pwr2017/Select-Pwr2017.htm

The spreadsheet I created is available here.
http://theampeer.org/ampeer/ampjun20/72in-Bee.xls

The first inputs on the spreadsheet were taken from the Worthpoint information.

5	Name of Plane:	72" Super Bee	
6	Recommended Largest 2-stroke:	0.60	displacement in cubic inches
7	Recommended Largest 4-stroke:	0.70	displacement in cubic inches
8	Mfg. Max. Weight:	7.00	lb.
9	Mfg. wing area:	1435	sq.in.
10	Desired watts in per pound:	100	If in doubt, use 100

The spreadsheet calculated the following results from this input data.

11	Number used to calculate WCL:	31.46	
12	Wing Cube Loading Factor:	3.56	
13	Average watts in:	37.43	selected from watts in/cu.ft. ta
14	Median watts in:	34.13	selected from watts in/cu.ft. ta
15	Suggested Power:	910	watts in
16	Lightest Motor:	303	g
17	Heaviest Motor:	455	g
18	80% watts in:	728	watts out

The second group of required user inputs, for the prop choice, are a bit more subjective.

Prop choices for brushless outrunner electric power motors are more similar to 4-stroke glow motors than 2-stroke glow motors.

There is a 4-stroke prop recommendation chart on the "Selecting an Electric Outrunner…" article.

Prop Chart For Four - Stroke Engines

Engine Size	Standard Propellers	Alternate Propellers
.20 - .21	9x6	9x5,10x5
.40	11x6	10x6,10x7,11x4,11x5.11x7,11x7.5,12x4,12x5
.45 - .48	11x6	10x6,10x7,10x8,11x7,11x7.5,12x4,12x5,12x6
.60 - .65	12x6	11x7.5,11x7.75,11x8,12x8,13x5,13x6,14x5,14x6
.80	13x6	12x8,13x8,14x4,14x6
.90	14x6	13x6,14x8,15x6,16x6
1.20	16x6	14x8,15x6,15x8,16x8,17x6,18x5,18x6
1.60	18x6	15x6,15x8,16x8,18x6,18x8,20x6
2.40	18x10	18x12,20x8,20x10
2.70	20x8	18x10,18x12,20x10
3.00	20x10	18x12,20x10

.70 is the largest 4-stroke recommended in the Worthpoint information. The largest prop diameter for the .60 - .65 and .80 is 14. The email from Andy Clancy noted 15" as the maximum. I chose 14" for the diameter.

The results, noted as the Wing Cube Loading Factor in the spreadsheet's cell B12, was 3.56. You don't need to understand how the results were derived, only that the value is 3.56.

28	WCL 1-3 pitches	WCL 4-7 pitches
29	7.0	10.0
30	7.5	10.5
31	8.5	11.0

There is a chart for recommended pitches on the spreadsheet. For Wing Cube Loading (WCL) values of 1 through 3.99, the recommended pitch values are 7", 7.5" and 8.5". I chose 7".

minutes for the Bee. Selecting the flight time determines the required battery capacity to achieve that flight time.

With the chosen prop, an APC 14x7E, the power in (watts in) needs to be somewhere around 900 watts in and the motor should weigh somewhere between 300 grams and 450 grams. Note that these are approximate weights.

Cobra Airplane Motors	
	Weight
Series	grams
C-2202	15
C-2203	17.5
C-2204	22.5
C-2208	47
C-2213	60
C-2217	74
C-2808	80.5
C-2221	88
C-2814	109
C-2820	139
C-3510	141
C-2826	171
C-3515	178
C-3520	210
C-3525	255
C-4120	290
C-4130	400

There is a chart on the spreadsheet showing the weights of the Cobra line of motors. Lucien Miller, at Innov8tive Designs, has actually tested these motors with various loads (props) and voltages and presented the results for his customers. His tested motor results can be used to narrow down the motor selection.

34	Input only into green cells.	Review		Results are in red cells.			
35	RTF Wt. Pounds:	7.00	Target Pin:	910	+ Watts In		
36	Watts in per pound:	100	Pitch/Dia.:	50%		2.00	:1 Diameter to Pitch
37	Prop Diameter:	14	Motor Weight:	303	to	455	grams
38	Prop Pitch:	7					
39	Desired Flight Time:	8	minutes 5-8 minutes is typical				

The next section on the spreadsheet shows a review of the results. Also, in this section you are asked to input a typical flight time. I chose 8

The C-4120 and C-4130 motors fall within the recommended weight range.

44	Work Area:				Input	Motor	Watts	Prop	Pitch
45	Motor	Wt.	Kv	Io	Voltage	Amps	Input	RPM	Speed
46	Cobra C-4120/14	293	710	1.99	14.8	59.1	897.3	8195	54.3
47									
48									
49									
50									
51									
52									
53									
54									
55									
56		Watts	System	Vout/Vin	ESC	# LiPo	Batt.	Safe	
57	Results:	Output	Eff.	Eff.	Amps	Cells	mAh	C-rate	
58	Cobra C-4120/14	659	73.5%	78.0%	74	4	5000	15	
59									
60									
61									
62									
63									
64									
65									
66									

The C-4120 and C-4130 Cobra motors are found here:
https://innov8tivedesigns.com/products/brushlessmotors/cobraairplanemotors/cobra41mmmotors.html

I started with the Cobra C-4120/12 Brushless Motor, Kv=850
https://innov8tivedesigns.com/cobra-c-4120-12-brushless-motor-kv-850.html

I scrolled down the C-4120/12 page until I saw "Click here for the Cobra C-4120/12 Propeller Data Chart". I clicked on the link to open up the Propeller Data Chart.

I looked for any APC 14x7-E props that, when tested, used about 900 "Watts Input". There were none. The only APC 14x7-E listed used only about 614.1 "Watts Input".

Next I checked the Cobra C-4120/14 Brushless Motor, Kv=710.
https://innov8tivedesigns.com/cobra-c-4120-14-brushless-motor-kv-710.html

I scrolled down the page until I saw "Click here for the Cobra C-4120/14 Propeller Data Chart". I clicked on the link to open up the Propeller Data Chart.

I looked for any APC 14x7-E props with "Watts Input" of about 900. There was one.

I copied the requested information from the Propeller Data Chart on the Innov8tive Designs Website into the Work Area of the spreadsheet.

The screen capture, at the top of the page, shows the information for the C-4120/14 input into green cells of the Work Area.

I continued this method for the remaining four C-4120 motors.

The C-4120/18 had no usable options. The C-4120/20 and C-4120/22 information was not available on the Website at the time of this writing. Fortunately, I had saved the data to my computer, and neither of them, using an APC 14x7-E, had an input of about 900 watts in.

I used the same process to check the four C-4130s.

On the following page are the results for using an APC 14x7E and an alternate APC 14x8.5E.

I "found" three motors that would work with an APC 14x7E prop. That means that any manufacturer's, or supplier's motors, with an approximate weight and similar K_v would work.

Motors that would have similar characteristics to the ones that I found would be:

Work Area:				Input	Motor	Watts	Prop	Pitch
Motor	Wt.	Kv	Io	Voltage	Amps	Input	RPM	Speed
Cobra C-4120/14	293	710	1.99	14.8	59.14	897.3	8195	54.3
Cobra C-4120/16	290	610	1.51	18.5	60.49	1119	8777	58.2
Cobra C-4130/14	400	450	1.46	22.2	39.5	876.9	8354	55.4
Cobra C-4130/14 w/14x8.5E	400	450	1.46	22.2	40.73	904.3	8327	67

Results:	Watts Output	System Eff.	Vout/Vin Eff.	ESC Amps	# LiPo Cells	Batt. mAh	Safe C-rate
Cobra C-4120/14	660	73.5%	78.0%	74	4	5000	15
Cobra C-4120/16	849	75.8%	77.8%	76	5	5100	15
Cobra C-4130/14	706	80.5%	83.6%	49	6	3300	15
Cobra C-4130/14 w/14x8.5E	727	80.4%	83.4%	51	6	3400	15

Motor Choice 1: ~300g with ~700Kv using a 4S 5000mAh LiPo, and 75A ESC
Motor Choice 2: ~300g with ~600 Kv using a 5S 5000mAh LiPo and 75A ESC
Motor Choice 3: ~400g with ~450Kv, using a 6S 3300mAh LiPo and 50A ESC

Personally, I didn't care for the results that were going to draw about 75A at full throttle, so if I had to pick one of those for my project, I'd go with the ~400g with ~450 Kv, and personally I'd select the Cobra C-4130/14. That system can safely use a 50A rated ESC with a 6S LiPo with capacities between 3000mAh and 3500mAh.

While looking at the Propeller Data Chart for the Cobra C-4130/14, I noticed that there was an APC 14x8.5E prop listed.

WCL 1-3 pitches	WCL 4-7 pitches
7.0	10.0
7.5	10.5
8.5	11.0

That pitch was also recommended for the same WCL factor value of 3.56. I entered that into the work area on my spreadsheet.

The Bottom Line

I know that you've been waiting for this information, but I thought that it was important to "teach you how to fish" rather than giving you a "fish to eat".

Personally, I'd use the Cobra C-4130/14, a Cobra 60A ESC with 6A Switching BEC, and a couple of BadAss 45C 3300mah 6S LiPo Batteries and order two each APC 14x7E and APC 14x8.5E props. Everything in that power system can be ordered directly from Innov8tive Designs.

https://innov8tivedesigns.com/

Of course you can look for similar products from other suppliers.

Hope this helps,
Ken

A Follow-up Email from John Had Some Questions

Fantastic, thank you. I really appreciate all the work you have put into this response. I have a couple of follow up questions at this point.

What does Andy's recommendation, to have a low Kv, motor have to do with the function of the plane? Is this about torque or ability to climb, or maybe something else?

For the same weight and style of electric brushless motor, the lower the K_V, the larger the prop it can spin while still keeping within the

motor's amp draw parameter. There is a "tradeoff" though. As the K_v goes down, the amount of amps the motor can handle, also goes down. A lower Kv requires more turns of wire on the stator. The space inside the motor for the wire stays the same. With only the same space available in the motor, that means that the wire "size" has to go down to get more winds on it, which means that less current can be carried by the wire without over-heating it.

Using the Cobra C-4130 series of motors, you can see that the C-4130/12 can handle a current of up to 65 amps, while the C-4130/20, with more turns, can only handle 52 amps.

The number after the / notes the number of winds.

C-4130/12
https://innov8tivedesigns.com/cobra-c-4130-12-brushless-motor-kv-540.html
C-4130/20
https://innov8tivedesigns.com/cobra-c-4130-20-brushless-motor-kv-300.html

In a very, very simplified explanation, the 4130/20 can turn a larger prop for more "pull" and the 4230/12, turning in a smaller prop, can provide more speed.

Everything here is a compromise.

I guess also, speaking only of motors, which of the parameters are most important when looking at potential motors? There is weight, Kv, draw in amps, others specs. If you are out of the range of one or more, which one is worse to be out of range on? Understanding this may help as I look across a range of available motors.

The combination of the prop (load) and number of cells used (voltage) should not cause the motor to exceed its maximum rated amp draw. That is THE most important measure or value.

Always keep in mind that most brushless outrunner motors with nearly the same weight and K_v, will perform in approximately the same way. As with all things though, their are some motors that are built better, or worse, and they fall out of the norm.

Finally, how do enthusiasts figure out what motors / props / battery packs to use in general? Do each of them understand this level of complexity in the math to figure it out? Do they use rules of thumb? Or manufactures recommendations? Or just wing it?

Actually they use all four methods.

The more that folks use the power system "math", the easier it becomes. That is why I recommend using my spreadsheet, as it does all the math for you. For single motor sport and sport scale planes you only need the information, maximum plane flying weight and maximum recommended motor size, provide by the plans, instructions, or packed with an ARF.

There are computer programs that can be used, but they too require some modicum of knowledge.

Rules of thumb are often used and most of them are variations on the ones that Keith Shaw, my flying buddy, presented over 3 decades ago.

Some folks "wing it" by using other folk's successful power systems for planes that are similar to the one they are trying to power.

Thanks again Ken, I really appreciate you trying to help me get educated.

John

The March 2020 EFO Meeting

The March 2020 EFO meeting was held at Ken Myers' house on Wednesday, March 11.

Attendance was low, as this was the beginning of the Covid-19 outbreak.

Keith Shaw shared his modified Blade Inductrix with the Switch Air wing.
https://www.horizonhobby.com/inductrix-switch-switch-air-p-blh8300c

He had made several modifications to it and the results now provide over 6 minutes of flight time. The mods include adding a carbon fibre insert to keep the wing from flattening out, adding reflex to the wing and moving the CG forward. He actually flew it in the living room that evening.

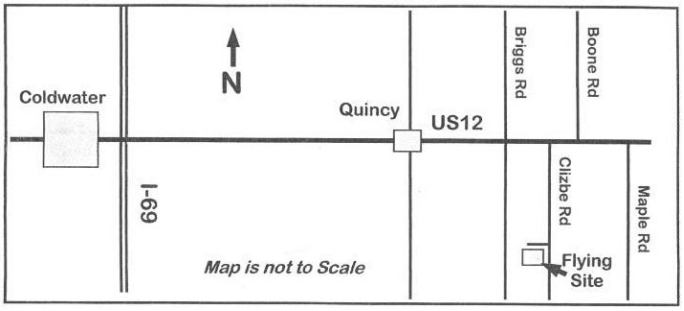
It is shown in the photo of the three planes on the coffee table.

Bob Blau shared his Gym Jets F-22. It uses elevons for control, has a 24" wingspan and weighs 2.5 oz.

He noted that it excels at high alpha flight.

Steve Labuta had Ken bring up photos of his latest design on the TV so that everyone could see how nicely it turned out.
https://www.flickr.com/photos/101835127@N08/sets/72157712464715752/

Ken Myers discussed some of the changes that he's made to modify the FliteTest Simple Cub. A mock-up of Ken's latest version can be seen on the coffee table.



The Upcoming Keith Shaw Birthday Party Electric Fly-in 2020

The Balsa Butchers are hosting the "Keith Shaw Birthday Party Electric Fly-In", for the 18th year, at their field near Coldwater, MI. The event takes place on Saturday, May 30, 2020. It is a one day event again this year.

The event consists of Open Electric Flying with a "Special Guest of Honor Theme", Happy Birthday Keith Shaw [June 6].

Enjoy a day with the "Pioneering Master of Electric R/C Flight". 8 a.m. - 5 p.m., Saturday. NO LANDING FEE! Donations for field maintenance and lunch appreciated.

For additional information contact;
Dave Watson 517-250-6190 or flybuddy619@yahoo.com
Contest Director: Dave Grife - E-mail: grifesd@yahoo.com or Phone: 517-279-8445
Please e-mail or call with any questions.

The field will be open for guests to fly on Sunday as well.

(See Special Note on Last Page)

36th Annual Mid-America Electric Flies 2020
AMA Sanctioned Event (Proof of AMA/MAAC membership required to fly)
Saturday, July 11 & Sunday, July 12, 2020
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 email kmyersefo@mac.org – http://www.theampeer.org for updates & info
Keith Shaw (734) 973-6309
Flying both days is at the Midwest R/C Society Flying Field - 7 Mile Rd., Salem Twp., MI

Registration: 9 A.M. Saturday
Event Flying from 10 A.M. to 4 P.M. Sat. & 10 A.M. Until You Leave Sunday
(Open Flying Saturday after the Event & All Day Sunday, which is just an open electric flying day.)

Pilot Landing Fee - 18 and over, $10 for both days, Under 18, FREE (AMA/MAAC membership required)
No Parking Donation Will Be Requested from Spectators

Awards on Saturday Only
Best Scale
Most Beautiful
Best Mini-Electric
Best Multi-motor
Best Sport Plane
Foam Flurry for NCM aircraft
CDs' Choice
Planes Must Fly To Be Considered for Any Award
Plaques for winner in each category

The Field is Open for Open Flying All Day Friday a Night Flying Possible, Weather Permitting, Friday & Saturday Nights
Field Lunch (hot dogs, chips, water or pop) Available on Saturday
Burgers, Brats and Potluck on Saturday evening for Pilots & Their Guests
Come and join us for two days of fun and relaxed electric flying.

The NCM (Not Conventional Materials) Event
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.

VERY IMPORTANT REMINDER FOR 2020 - THE FLYING FIELD ENTRANCE TO THE MIDWEST FLYING FIELD CHANGED LAST YEAR!

The old entrance to the Midwest RC Society flying field is permanently closed!!! **DO NOT ATTEMPT TO USE IT!!!**

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 1.5 Miles west of Currie Rd.
entrance is on the north side of Seven Mile Road about 1.6 Miles west of Currie Rd.

The address is 7621 Seven Mile Road, Northville, MI 48167. The entrance is through a private residence drive and out past the barn.

Directions from Google Maps to the flying field

https://www.google.com/maps/place/MIDWEST+R%2FC+SOCIETY/@42.422025,-83.6170775,805m/data=!3m1!1e3!4m13!1m7!3m6!1s0x8823559bdf962b57:0xd100df97d9dcebf1!2s7419+7+Mile+Rd,+Northville,+MI+48167!3b1!8m2!3d42.4187058!4d-83.6190072!3m4!1s0x882355a2c9e29cb5:0xaaf592068692b984!8m2!3d42.422025!4d-83.6148888?hl=en

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 northeast 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 30, Keith Shaw Birthday Party Electric Fly-in, Coldwater, MI (details in this issue)

June ???, EFO Flying Meeting, date, place and time to be determined.

Upcoming 2020 36th Annual Mid-America Electric Flies

The 36th Annual Mid-America Electric Flies are scheduled for July 11 and 12, 2020 at the Midwest RC Society 7 Mile Road flying field. (details in this issue)

Special Note: Keith Shaw Birthday Electric Fly-in

Everyone needs to be mindful of other's concerns for social distancing. !VERY IMPORTANT!

We encourage everyone to consider bringing a brown paper bag sack lunch.
We plan on having a small grill and some hotdogs and chips for people that don't get the message.
We will have coolers with water and soda pop. - serve yourself
We will have as much hand sanitizer available as possible, but consider bringing some for your own for personal use.
Bringing and wearing you own Face-masks is encouraged and I hope to have some available if needed
Please bring your own ink pen to use for pilot registration, we will have extra pens as needed
Again, No specific landing fee, but we will have a few plastic coffee cans out for donations for food/soda pop/mowing/expenses etc.
The pilot and spotter distancing should be at least 6 ft, we are recommending both individuals have masks on.
We will have designated pilot pads to stand on while flying (approx. 20ft spacing)
We intend to space the car parking out to allow more spacing between cars.
Because of Covid-19, The Fort Wayne Flying Circuits cancelled the May fun-fly tailgate swap meet, If you have items for tailgate swap please feel free to bring them.

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

The Next Monthly Meeting:
Date: To Be Determined, 10 a.m.
Place: Midwest 7 Mi. Rd. Flying Field