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February		The EFO Officers	2025
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No Mailed Ampeer Subscriptions	Zoom EFO Meeting: Wed., February 12, 2025 Time: 7:30 p.m., Place: On Zoom		

What's In This Issue:
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A Note On Upcoming EFO Meetings

The next EFO meeting will be via Zoom on Wednesday, February 12, at 7:30 p.m. EST.

EFO members will be sent an email with the Zoom link.

If you'd like to join us, send me an email to kmyersefo@mac.com and I'll add you to the meeting notification list.

See you on Zoom in February, Ken

New Lithium Werks Lithium Iron Phosphate LiFePO4 Cells (AKA LFP & LiFe)

<https://lithiumwerks.com/>

By Ken Myers
January 20, 2025

At the November 2024 Midwest RC Society Swap Meet, **Jim Young** asked me about a new Lithium Werks 18650 cell.

I was unaware of it, at that time. I did some quick research, again at that time, and sent Jim an email with the information regarding what I had found out.

I continued my research in January of 2025.

Keith Shaw and I have been using the A123 Systems, cylindrical cells, in the 26650 and 18650 sizes to create our own battery packs for about **two decades now**. Many of our original 26650 size cells were harvested from DEWALT power tool battery packs, and many of those cells are still going strong at this time.

Neither of us use them exclusively. LiPo-type batteries are used when weight or power requirements indicate that LiPo-types are a better choice, but the vast majority of our planes, that are flown outdoors, are powered by LiFe battery packs.

I wrote an article for the November 2006 *Ampeer* titled, "Exploring New Power Sources".

<https://theampeer.org/ampeer/ampnov06/ampnov06.htm#NOTLIPO>

I compared the cells that were available, at that time, which included the "A123" LiFePO4s.

We started using the 26650 size in

appropriate aircraft and then used the 18650 size in even smaller models. These cells are still available today.

ANR26650m1B Power Cell

<https://lithiumwerks.com/products/lithium-ion-26650-cells/>

APR18650m1B Power Cells

<https://lithiumwerks.com/products/lithium-ion-18650-cells/>

Lithium Werks purchased the rights from A123 Systems to continue producing these cells in 2018.

Since then, Lithium Werks has added two other sizes, with the designation of “Energy Cells”, to their LiFePO₄ lineup.

AER18650m2A2 Energy Cells

<https://lithiumwerks.com/products/lithium-ion-lfp-18650-energy-cell/>

AER32140m2A1 Energy Cells

<https://lithiumwerks.com/products/lithium-ion-32140-energy-cell/>

When looking at the following table, please be aware that the word nominal is NOT a value. It is a conventional designation.

A conventional designation for lumber is a 2 by 4. Everyone calls it a 2 by 4, as that is its nominal designation. Its actual size varies, but a 2 by 4 is generally about 1-1/2 inches thick by 3-1/2 inches wide. The actual length is usually an actual value such as 8 feet, etc.

Cell Name	26650 Power	18650 Power	18650 Energy	32140 Energy
Nominal Voltage	3.3	3.3	3.2	3.2
Nominal Capacity	2.6Ah (2.5Ah)	1.2Ah (1.15Ah)	1.8Ah (1.7Ah)	15Ah
Maximum Cont. Discharge Current	52A (20C rate)	30A (25C rate)	5.4A (3C rate)	72A (5C rate)
Charge Termination Voltage	3.6	3.6	3.6	3.65
Recommended Charge Current	3A (1.2C)	1.5A (1C rate)	0.9A (C/2 rate)	7.5A (C/2 rate)
Mass	76g/2.68 oz.	41.5g/1.46 oz.	43.4g/1.53 oz.	275g/9.7 oz.
Impedence	10mOhm	16mOhm	20mOhm	3mOhm

The first hint that the new Energy cells are different is that they have a different nominal voltage.

The 18650 Energy has a bit higher stated capacity, when compared to the 18650 power, but it has a much lower maximum continuous discharge current; 5.4A compared to the power’s 30A. The 5.4A maximum continuous discharge current makes them unusable for our purposes.

At 9.7 ounces per cell, the 32140 size Energy is way too heavy for our purposes.

The 26650 Power and 18650 Power are still the only choices for our purposes.

Lithium Werks cells can be purchased from StorTronics.

<https://stortronics.com/online-store/manufacturers/lithium-werks/?srsltid=AfmBOorUEQ38QkAbDk19YgsqEPSLZv4OtPK0075amQHwWXC14AWbeCSH>

StorTronics®

24581 Crestview Court

Farmington Hills, MI 48335

Phone: 248-912-1200

Cathode chemical safety, ruggedness and longevity are the main reasons that Keith and I have chosen these types of cells for the vast majority of our outdoor planes.

A good review of the various types of cathode Lithium-based cells can be found at Battery University.

<https://batteryuniversity.com/article/bu-205-types-of-lithium-ion>

An ANEC Missel Thrush?

From Keith Shaw via email

The woodwork on the Darmstadt biplane is almost complete. I should start covering next week.

I’m already planning the next project for indoor/calm evening use.

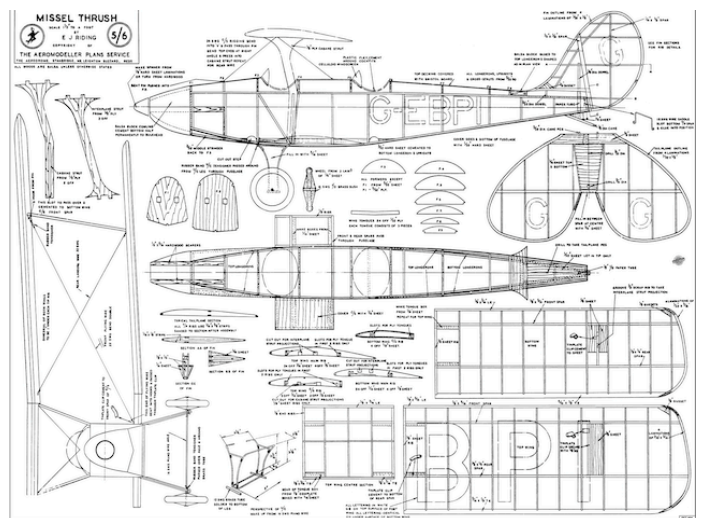
It is a little known British Missel Thrush designed for the low-powered Lympne competition.

I am thinking of doing it with functional folding wings. I always wanted to try that.

The projected span is 42”, which is 1/8th scale.

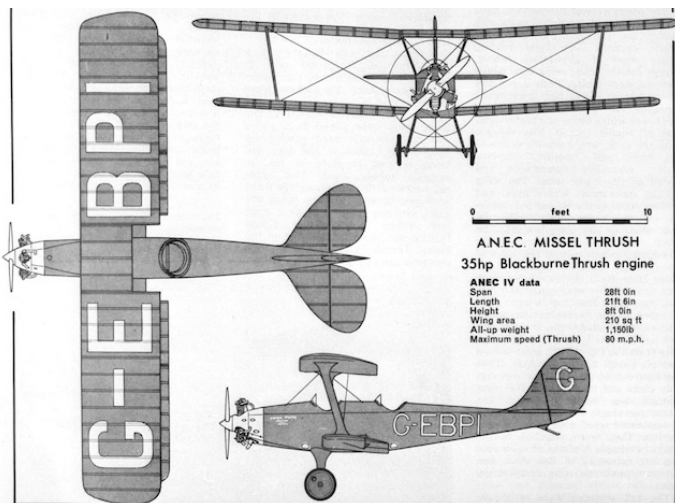
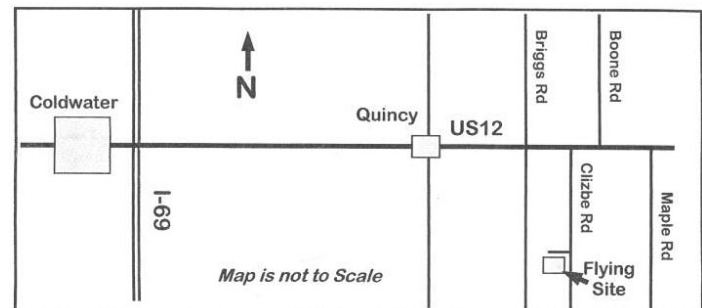
It will be sort of a biplane buddy for the Sig Deperdussin.

I will use 3-view and December 1950 Aeromodeller article/plan for shapes and cross sections.



I will need to make it much lighter for indoor use.

Keith



The Upcoming Keith Shaw Birthday Party Electric Fly-in 2025

The Balsa Butchers are hosting the “Keith Shaw Birthday Party Electric Fly-In”, for the 23rd year, at their field near Coldwater, MI. The event takes place on Saturday, **May 31, 2025**. It is a one day event.

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". 9 a.m. - 4 p.m., Saturday. **NO LANDING FEE!** Donations for field maintenance and lunch appreciated.

For additional information contact;
Contest Director: Dave Grife - E-mail:
grifed@yahoo.com or Phone: 517-677-9978
Please e-mail or call with any questions.

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

Change of Email Address Requested By Ken Myers

A reminder for *Ampeer* subscribers. If you wish
to continue receiving the monthly notice, please
update your email address whenever you change it.

Thanks,
Ken

Checking Over Old Friends and Adding Them to a Newer Transmitter By Ken Myers

I thought I'd share what I'm working on now.
I can't believe this, but, way back in May of
2020 I purchased a new Tactic TTX-660 transmitter.
The reason is given in the Ampeer article.
<https://theampeer.org/ampeer/ampaug20/ampaug20.htm#TTX660>

I can't believe that's it's been five years! Why?
I'd not moved several of my favorite flying planes
to the new transmitter for five years!

When my original Tactic TTX-650 throttle trim
started acting up, I created a spreadsheet with all of
the settings for the planes that I had on that
transmitter.

I used those settings for setting up some, but not
all, of my planes on the TTX-660.

On January 1, 2025, I decided that it was time to
get those hanger queens back into the air again.



	A	B	C	D	E	F	G
1	TTX650 SYSTEM SETUP		This is where the throttle trim failed so anything				
2	USER NAME:	KenMyers					
3	SITCK MODE:	MODE2					
4	CONTRAST:	0					
5	BEEP VOL.:	3					
6	BATT. ALARM:	4.8V					
7							
8	MODEL SETUP MENU						
9	Memory #	Graphic	Name				
10	17	Airplane	v5_3ch				
11							
12	MODEL MANAGEMENT						
13	Type:	Airplane					
14	Name:	v5_3ch					
15	Also includes Copy, Reset & Erase						
16							
17	WING TYPE						
18	FLAP:	1AI					
19	TAIL:	Normal					
20							
21	CHANNEL ASSIGNMENTS						
22	TXCH	OUTPUT					
23	CH1	Output 1					
24	CH2	Output 2					
25	CH3	Output 3					
26	CH4	Output 4					
27	CH5	Output 5					
28	CH6	Output 6					
29							
30	WARNINGS						
31	THRO POS:	ACT					
32	THRO CUT:	ACT					
33	THRO HOLD:	ACT					
34							
35	TRAINER						
	OPEN2:	v5_3ch/v5_4ch					

The Spreadsheet

I started with my Hitec Weekend Extra, which I
had reviewed in the July 2014 Ampeer and further
information about it was presented in the September
2014 Ampeer.

<https://www.theampeer.org/ampeer/ampjul14/ampjul14.htm>
and
<https://theampeer.org/ampeer/ampsep14/ampsep14.htm#ESC>



The first thing I did was set up the plane on the TTX-660 using the settings from the spreadsheet for that plane.

Although the menus for the TTX-650 and TTX-660 are not identical, I was able to do the setup following the the values and other info from the spreadsheet.

With the plane set up on the transmitter, the battery was removed from the plane and physically and voltage checked.



I remembered that the A123 batteries had “lived” in that plane, without being used, for five years.

The voltages were as expected and, while not amazed, because of years of experience with these batteries, I was still very pleasantly surprised when I looked at the voltages.

A full cycling of this pack will be completed soon, but I expect it to be totally useful when spring flying starts. Come on spring!!!

The Tactic TR-624 receiver was easily bound to the TTX-660 transmitter, while securely holding the airframe.



Once bound, the controls and battery kill switch were tested and found to be working properly.

The failsafe was checked by firmly holding the airframe and turning off the transmitter.

The failsafe worked.

Finally the trims were set to the values noted for the TTX-650.

That was one down, and several to go, but it felt good to get this one ready to go back into the air, and I can't believe it took so long to even get back to it.

The January EFO Zoom Meeting

After “hi”, “hello”, waving and “how ya doin'?”, Ken started the meeting by sharing the Lithium Werks table shown in this issue.

Ken and Keith discussed the benefits and the drawbacks of using the Lithium Werks 26650 Power and 18650 Power cells to create battery packs, along with a brief history of these A123 Systems cells. They also noted that the two new Lithium Werks “Energy” cells, the 18650 Energy and 32140 Energy, have no application for electric power.

They answered questions about the charging and care of these types of batteries. They also noted that these types of cells don't have to be “storage charged” and can rest either full or partially charged for extended periods of time.

Since these cells us the LiFePO₄ types, they have an extremely low risk for fire.

To learn more about “Lithium Iron Phosphate (LiFePO₄) — LFP”, scroll down the linked page.

Battery University “BU-205: Types of Lithium-ion”.

<https://batteryuniversity.com/article/bu-205-types-of-lithium-ion>

They were asked why more people don't use these cells for flight batteries. There was no real answer, but it could be that people just don't want to build packs, as it is much easier to purchase LiPos than create packs using these types of cells.

Various types of chargers were discussed and how they might be able to handle charging LiFe batteries.

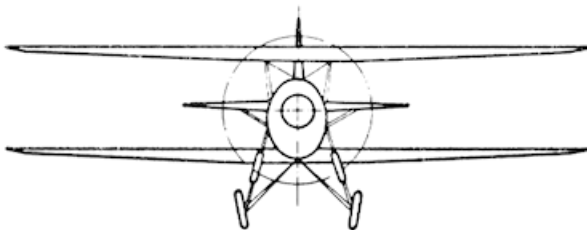
Ken noted that he uses the LiPo setting on his Revolctrix GT-500 and just changes the charge

termination and charging current to charge his LiFe packs.

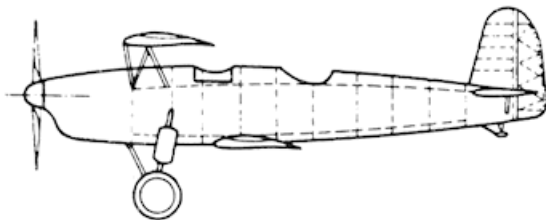
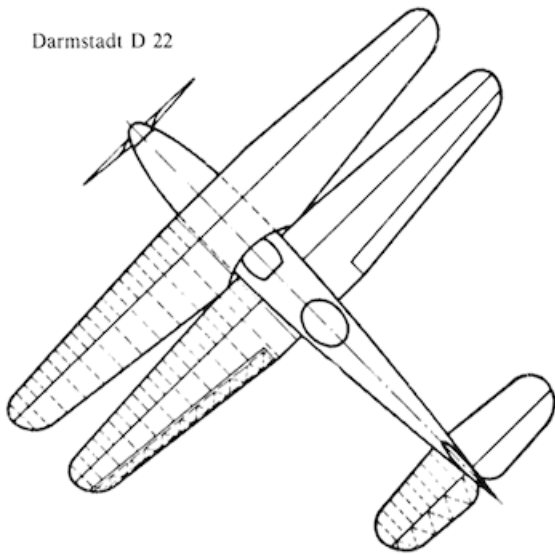


Keith Shaw shared the progress on his Darmstadt biplane.

He noted that the core of the fuselage crutch was created from foam board formers and the outside shell is 3/32" balsa.



Darmstadt D 22



A 3-view of the Darmstadt Biplane

Keith's master building techniques were documented in the article, "Building and Flying Electric Sport Scale", transcribed by Martin Irvin from his talk to the Electric Model Fliers of Southern Ontario General Membership Meeting, March 1992.

<https://theampeer.org/shaw/ShawConstructionNotes.pdf>

The 100% stagger of the Darmstadt led to some interesting discussions about how many wings and how many horizontal stabilizers are too many.



Ken shared an Internet photo of the Caproni Ca 60 Noviplano during the discussion about "how many wings".

After the meeting, Ken also found an online forum with several photos of multi-horizontal stabilizers.

<https://aviation.stackexchange.com/questions/32808/has-there-ever-been-a-sideways-h-tail-on-an-airplane>



The first one that came to mind, during the meeting, was the Wright Flyer.

Other interesting tail assemblies can be found on that forum page link.



This is a photo of a Handley-Page HP42 passenger aircraft from that forum page.

Keith also talked a bit about his previously mentioned **possible** next project, the British Missel Thrush.

There was a lot of discussion regarding ducted fan powered planes and how that type of power system can be made more efficient. Both **Pete Foss**' and Keith's input provided valuable information about designing inlets for these types of planes.



Pete Foss shared information about his flat plate Eurofighter from Multiplex.



Pete Foss photo

The prop on this plane swings through the fuselage and wing, as can be seen in the photo.

The specific prop, that he is using, is a 6 blade, 5" x 4".

<https://www.hqprop.com/https-hqprop-5x4x6-light-grey-2cw2ccw-poly-carbonate-p0336.html>

After the meeting, Pete sent along the following information via email. He included a list of the other components that he used in the Eurofighter, besides the aforementioned six bladed prop.

It weights 213g with a 3S 450mAh LiPo battery.

The other components are 3 HXT500 servos, a Sunny Sky 2204-21k, an 1800kv motor, a donated esc, and a Spektrum AR620 Rx.

There was a lot of useful information exchanged during the remaining of the meeting, which lasted until 9 p.m.

Anyone, who is not an EFO member, but has an interest, can join us for our winter and early spring Zoom meetings. Send me an email. Let me know that you want to be put on the notification list and I'll send the Zoom meeting link to you.

Let's Be Careful Out There, A Follow-up

In the October 2024 issue of the *Ampeer*, I noted two horrific accidents that happened at the flying field.

<https://theampeer.org/ampeer/ampoct24/ampoct24.htm#SAFE>

Since **Joe Hass**' son was involved in one of the accidents, he filled us in with more information about that in the November 2024 issue.

<https://theampeer.org/ampeer/ampnov24/ampnov24.htm#HASS>

Vic Madison was moved by the warning. He commented on it and wrote an article for his club's newsletter. Both his comments and the article appeared in the December issue.

<https://theampeer.org/ampeer/ampdec24/ampdec24.htm#VIC>

I also received the following email from **Gary Gullikson** regarding this topic.

Hi Ken,

I am still flying with my old Hitec Aurora 9 transmitter and Optima receivers.

My transmitter has a "throttle lock" feature on the touch screen.

I try to remember to always set the throttle lock immediately after turning on the transmitter and before connecting the motor battery pack. When I am ready to take off, I carefully release the throttle lock.

Safety Critical: I also try to remember to set the throttle lock (again) immediately after landing from a flight and before carrying the model back to the pits.

I have forgotten to set the throttle lock and brought a model back to the pits. I then took off with a different model, using the correct model memory, and noticed my previously flown model trying to take off in the pits causing some consternation but luckily no damage or injury.

Spectrum transmitters have a "Model Match" feature built in, such that a different model, on a different model memory, will not respond and throttle up. I am not aware which other brands have a "model match" feature.

Accordingly, if your transmitter does not have the "model match" feature, you must always use the throttle lock to protect yourself while handling a model before takeoff and after landing.

You must also remember to make sure the throttle lock is on before disconnecting your motor battery when placing your model back in the pits.

One more thing, you must remember to select the correct memory for the next model you intend to fly.

The above bears repeating especially when you haven't been flying for a number of months and may be getting forgetful.

I just re-upped my AMA and club membership, for what may be the last time, at age 86 with mobility problems.

Good health and good luck to all you northerners,

Gary Gullikson, Garden Grove, CA

Indoor Flying in Brighton Information

Indoor flying started at the Legacy Center on Wednesday October 9th. The flying time is 12:30 to 2:30 p.m. The Legacy Center Website is:

legacycentermichigan.com

Address: Legacy Center, 9299 Goble Dr, Brighton, MI 48116

Indoor Flying in Pontiac Info

Indoor flying in Pontiac started on Tuesday, October 15th and continues on Tuesdays through April 15, 2025.

Full Information can be found at the following link.
<http://www.skymasters.org/index.php?page=events&type=detail&event=indoor>

Join us for indoor flying on Tuesdays throughout the winter! 9AM - 12PM. United Wholesale Mortgage Sports Complex is our host site. Located at 867 South Blvd in Pontiac, the facility features a 365 foot by 260 foot flying area with ceiling heights from 45 to 75 feet!

Weekly Indoor Flying is scheduled for Tuesdays from October 15, 2024 thru April 15, 2025 9:00 a.m. to noon.

A single flying session is \$10 and a 25 session season pass is \$150.

The Skymasters' Indoor Rules for 2024/2025 are linked here.
https://theampeer.org/2024-2025_Indoor_Rules.pdf

As a reminder:

1. Aircraft can weigh no more than 1-1/2 pounds All Up Weight. Helicopters & multi-rotor copters are limited to 250 maximum size. All aircraft must be powered by no more than a single 3 cell (11.1 volt) 1000 mAh battery.

2. First Person View-FPV is limited to micro quadcopters powered by a single cell battery (Max 500 mAh).

A quick reminder that indoor flying starts on Tuesday morning (Oct. 15th)! Remember we will be flying up front in the smaller room for the first two weeks. Please still park in the back.

<http://www.skymasters.org/index.php?page=events&id=16641>

Pete Foss

Upcoming E-vents

Indoor Flying in Brighton on Wednesdays (info in this issue)

Indoor Flying in Pontiac on Tuesdays (info in this issue)

Wednesday, February 12, 7:30 p.m. EFO Zoom meeting, members notified via email notice. Any interested persons can contact me via kmyersefo@mac.com and I will add your name to the meeting list.

Upcoming Toledo R/C Swap Meet & Expo

Friday, April 4 & Saturday, April 5, 2025

9:00AM - 5:00PM FRIDAY

9:00AM - 2:00PM SATURDAY

Glass City Center - Main Floor

401 Jefferson Ave.

Toledo, OH

Admission: \$10

www.ToledoRCSwapMeet.com

www.facebook.com/groups/ToledoRCSwapMeet/

Manufactures, Distributors, and Businesses Welcome!

Questions Contact:

Hank Rauhaus

Phone: 330-419-2029

request info at: info@toledorcswapmeet.com



The Ampeer/Ken Myers

1911 Bradshaw Ct.

Commerce Twp., MI 48390

<http://www.theampeer.org>

Upcoming February Zoom Meeting:

Date: Wednesday, February 12 **Time:** 7:30 p.m.

Place: Zoom