

the

MONITOR

April

The MRCS Officers

2017

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Next Meeting: Date: Wednesday, April 5

Time: 7 pm video, 7:30 Meeting, EAA Building

What's In This Issue:

The March Meeting - Presentation: Selecting an Electric Outrunner Motor Power System - Guest, Joe Hass, Shared Some New Products - The Business Meeting - March Show and Tell - Hobbico Returns to the Ultimate Soccer Arenas - Upcoming 33rd Annual Mid-America - Upcoming Events

The March Meeting

A video titled "Electric Flight in the 90s" was shown. It was created at the end of 1989 and showed where electric flight was at the end of the 80s. Copies of the original video tape were distributed across the USA, Canada and other parts of the world.

Selecting an Electric Outrunner Motor Power System for an ARF, Kit or Plans Built Electrically Powered or Glow Conversion Sport or Sport Scale Prop Plane Using a Spreadsheet

A Presentation by Ken Myers

Ken Myers presented his spreadsheet for selecting electric power systems.

He noted that this is just one way to do it and that there are many other ways to do it as well.

The prerequisites for using his spreadsheet include;

A computer connected to the Internet with a spreadsheet program on like Microsoft's Excel.

It also requires knowing several RC aircraft common terms. The terms include:

1. Ready to fly weight
2. Glow engine displacement terminology (if doing conversion)
3. Wing Area
4. Propeller (Prop) terminology
5. The ability to go to a Web site
6. Ken's spreadsheet workbook

Why is Selecting a Glow Motor Easy Compared to Electric Power?

He noted that selecting a glow engine also selects the power level and the prop.

He showed a table that noted that a typical 40-size (0.40 cu.in. displacement) engine typically turned a 9x8 through 11x5 prop. He noted that the approximate power out depends on the chosen propeller. With the 'right' prop selection, it was not

Helicopter Frequencies

21,27,29,39, 41

Sailplane Frequencies

11, 12

uncommon for a 40 2-stroke to reach approximately 1.1 hp out or about 825 watts in.



He used the motor shown in the photo to illustrate why selecting an electric power systems seems difficult.

This motor can use 3S to 5S LiPo battery with over 25 different props. The usable power levels for this motor range from 275 watts in to 825 watts in. That means that is about equivalent to glow 15-size 2-stroke through a glow 40-size 2-stroke. He noted that it a disservice to the modeling community when a supplier names a motor as being equivalent to a specific glow size motor.

He said that he made every attempt to make the spreadsheets as easy as possible. The user only needs to input the following information.

1. Name of plane
2. 2-stroke cu.in. displacement (conversion only)
3. 4-stroke cu.in. displacement (conversion only)
4. Weight in pounds; ounces/16
5. Wing Area square inches (sq.in.)
6. The number 100
7. Prop Diameter
8. Prop Pitch
9. Desired Flight Time in Minutes

He used an example plane to demonstrate the process. It is a balsa and plywood kit available from Mountain Models and its called the Switchback Senior.

Its specifications are:

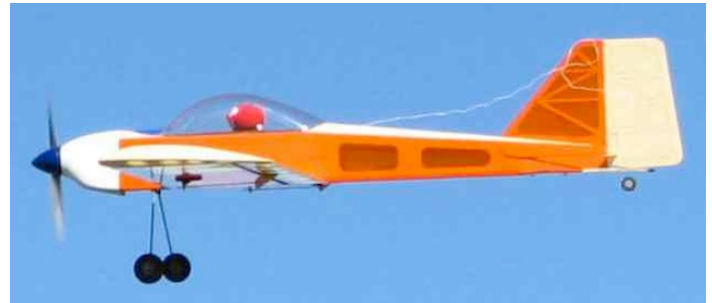
Wingspan: 55.4 in.

Length: 41 in.

Wing Area: 597 sq. in.

Weight (Ready to Fly): 34 to 37 oz.

Wing Loading: 8.2 to 8.9 oz. / sq. ft.



Next he noted the inputs that were used on the spreadsheet:

2. zero (0) 2-stroke max. displacement
3. zero (0) 4-stroke max. displacement (Not a conversion, Designed for Electric Power)
4. Max. wt. 37 oz. (=37/16) result in cell is pounds. = 2.3125 lb.
5. Wing Area: 597 sq.in.
6. 100 (note: If in doubt use 100)
7. Prop Dia. ?
8. Prop Pitch ?
9. Flight Time 6 minutes – 5 to 8 typical

Before explaining how to select the prop diameter and pitch, he noted which props are and are not useful for powering ‘typical’ sport and sport scale models.

He noted the following:

- Zinger – No
- APC Slow Fly & GWS RS – No
- APC E, sport, pattern – Yes
- Master Airscrew wood & G/F – Yes
- Master Airscrew electric – No

He also noted that the props to be used for the motor selection are the APC E (thin electric).

Ken demonstrated how to select the prop diameter and pitch.

He said to choose the largest prop that would allow for ‘good’ ground clearance. It was suggested that 1.5” to 2” was good for conventional landing gear planes and that 2” to 2.25” is better for planes with tricycle landing gear.

The prop size was not noted in the manual for the Switchback Senior. The Internet was used to find

what others had used, especially the largest diameter actually used.

He showed how he used a side photo of the plane and his CAD program to estimate the largest prop diameter with good ground clearance for this conventionally geared plane. He chose a 12" diameter.

Before the pitch was chosen, he noted something called the wing cube loading (WCL) factor and how it relates to selecting the pitch.

It was noted that there are seven WCL factor levels. Airplanes that fall within the WCL Levels of 1 through 3, generally use pitch to diameter ratios of 50% to 60% and for WCL Levels 4 through 7, the pitch to diameter ratios of 70% to 80% are appropriate. He also noted that these numbers are 'not written in stone' but general ballpark figures.

Wing cube loading level factors	Typical Types or Venues
(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 - 16.99)	Expert Sport
(Level 7 17+)	Expert

His table showed that the Switchback Senior, with a WCL factor of 4.38, has a typical WCL factor for a backyard flyer, but warned that because of its size and weight, it should be flown at a 'regular' RC aircraft flying field like Midwest.

Based on a table provided on the spreadsheet, a 6" pitch was chosen. The suggested prop information was then an APC 12x6E.

After the prop size has been selected, the spreadsheet presents a review of the calculations to be used for selecting possible motors.

For the Switchback Senior, using an APC 12x6 prop, the calculations showed a target Power In (Pin)

of 209 watts and motor weights ranging from 70 to 104 grams.

Cobra motors, available on the Innov8tive Designs' Web site are used for locating possible motors for this aircraft.

A table of weights was used to locate Cobra motors between 70g and 104g. There were four possible Cobra motor series to explore.

Ken demonstrated how to use the site to select motors that can turn an APC 12x6E at about 209 watts in or a bit better.

He noted that it may seem like a daunting task at first, but explained how it comes down to just a few motors that are appropriate for this plane. Actually it was only three motors to choose from for the example airframe.

He then gave the reasons for choosing one specific motor from the list of three.

The spreadsheet provides results for what size electronic speed control (ESC) and what capacity LiPo battery to use.

Even though Cobra motors are used to select a motor, he noted that any motor with approximately the same weight an Kv can be substituted for the Cobra.

He also said that his very good experiences with Cobra motors leads him to always choose them when possible.

Using A123 Cells?

A second spreadsheet in the workbook is for choosing Cobra motors to work with A123 2500mAh cells.

While the process is slightly different, the results yield a valid motor choice.

Using Spreadsheets

If a computer does not have a spreadsheet program, the Open Office Suite does. It is a free Office Suite and it is found at, <http://www.openoffice.org>

As an aside to his presentation, he noted that the price of batteries that use Lithium Cobalt will be going up soon.

Ken has a complete article online covering this whole process, along with links to the spreadsheet

workbook and a second workbook for an electric power conversion of a Sig 4-Star Forty. The 4-Star Forty workbook is used as a guide on how to do a conversion when glow motors are recommended.
<http://theampeer.org/Select-Pwr2017/Select-Pwr2017.htm>

Guest, Joe Hass, Shared Some New Products

Joe first reminded us about the upcoming Hobbico visit to the Ultimate Soccer Arenas in Pontiac.



Joe presented the new Hobbico HouseRacer with first person video (FPV).

Its actual name is the RISE Vusion House Racer 125 FPV 5.8G Quad Race Pack RTF.
<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXGLET&P=ML>

For \$179.99 you get everything you need including:

100% Ready-to-Fly Vusion House Racer Indoor FPV Drone.
 600TVL FPV video camera.

25mW VTX 40-channel, 5-band.

Tactic FPV-RM2 40-channel 5.8GHz FPV monitor with 4.3' LCD and external antenna (LXGHAM).

Tactic FPV-G1 goggles (LXGHAR).

RISE J2000 2.4GHz 6-channel radio system with Auto-Flip button and monitor holder.

(3) Flight modes: two gyro-assisted Stability Modes for beginners and Rate Mode for more advanced maneuvers.

1S 3.7V 650mAh LiPo battery delivers 6-8 minutes of flight time.

USB charger.

(4) "AA" alkaline batteries.

Extra blades.

Screwdriver.

Instruction manual.

Joe demonstrated the camera and LCD with a pretty nice picture. He also did a short demonstration flight.



TechOne Hobby's No Gravity 3D EP EPO Foam RR Blue 33.1" is from Tower Hobbies. It features thrust vectoring. With a lot of throw, a pilot can go crazy with it in the air. It is a 'real hoot' to fly.
<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXGHSR&P=ML>

It sells for \$120. Its features include:
 EPO foam in white with blue, black and gray color scheme
 Brushless Motor: 3S compatible 2206, 1500Kv
 Electronic Speed Control: 10A
 Vector System: Servo controlled, motor mounts to vector plate and can be positioned to execute snap flips and controlled flat spins
 Wing: One-piece
 Servos: Four 8g micro

Landing Gear: 0.098" (2.5mm) diameter wire with
1" (25.4mm) diameter foam wheels

Propeller: 8x4" slow flyer, plastic, orange in color

Spinner: White foam, 1.5" diameter (38mm)



Joe had the West Michigan Park Flyers EPP F-22 in the famous Thunderbird scheme. He noted that it went together well with Foam Tac glue. WMPF also offer power packages for this model. It uses differential thrust for the rudder.

http://www.wmparkflyers.com/F-22-Jet_p_199.html

It is made of EPP foam and has a wing span of 30" and a weight without the battery of 11 oz.

Power and radio system information is available on there Web site.

Thanks for sharing all of that information on new products with us Joe.

The March Business Meeting

Arthur Deane first called on club secretary, **Lynn Morgan**. Lynn noted that we have 39 members so far this year, which is a little under the 43 we started with last year. He also noted that March 1st was the deadline for membership renewal with out the \$25 additional fee.

Lynn said that he is planning an after church on Sunday intro-fly for members of his church. He will be looking for some volunteers to help him.

Dave Stacer, club treasurer, has been depositing the membership checks.

Rich Sievert said that there have been no reported safety issues at the flying field.

Ken Myers, vice-president, reminded folks about the new event and award category at this year's Mid-Am. It is scheduled for July 8 and 9 this year.

March Show and Tell

Ken Myers shared two Dollar Tree Foam Board (DTFB) planes that he had built.



The first was a highly modified and enlarged FliteTest Old Fogey. His version is covered with TopFlite EconoKote and uses a Cobra C-2217/20, 72g, 960K_v outrunner with a 3S 1000mAh LiPo battery.

It required a lot of work to get it to fly well, but Ken now uses it as the introductory trainer for the club.

He noted that the FT Old Fogey, as designed and available on the FT Web site, has some serious flaws that lead to many folks not being able to fly it. The flaws include a vertical fin with not enough area and a rudder that is too large. The recommended CG is also incorrect.

There is more information about this plane at:
<http://theampeer.org/ampeer/ampjun16/ampjun16.htm#OF> and
<http://theampeer.org/ampeer/ampjul16/ampjul16.htm#FOGEY>

Videos of why the originally designed Old Fogey is such a failure are at;

<http://theampeer.org/oldfogey-videos.html>

The second plane he shared was his self-designed DTFB Ugly Stik. It uses the proportions of an Ugly

Stik. It features a true Clark-Y airfoil. It flies well and was easy to build.



Airframe Specifications:

Wing area: approximately 340 sq.in.

Wing span: 40.87"

Ready to Fly weight: 23.6 oz. with 3S 1000mAh LiPo Battery*

Wing loading: 10 oz./sq.ft.

Wing Cube Loading Factor: 6.5 (typical park flyer value)

*Weight includes 1.75 ounces of lead in the nose

Power System:

Motor: Cobra C-2217/16 brushless outrunner

<http://innov8tivedesigns.com/parts/brushless-motors/c-2217-16>

Prop: APC 9x4.5E thin electric

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXFGW3&P=7>

ESC: Castle Creations Thunderbird 54

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXUTB2&P=7>

Battery: (various brands) 3S 1000mAh LiPo Batteries

Maximum static amp draw: about 16 amps

Average in flight amp draw: about 8 amps

Flight time for typical aerobatic flight: 6.5 minutes

Radio System:

Tactic TTX650 6-channel transmitter

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

Tactic TR624 receiver

<http://www3.towerhobbies.com/cgi-bin/wti0001p?&I=LXZNR1&P=ML>

Servos: 4 Emax 12g ES08MAII Metal Gear Sub-Micro Servo

http://www.headsuphobby.com/Emax-12g-ES08MAII-Metal-Gear-Sub-Micro-Servo_p_192.html

He brought the planes to encourage folks to build not conventional material planes for the Mid-Am's new event and award, which was noted in last month's Midwest RC Society Monitor.

Roger Wilfong shared two planes he's been working on while recovering from his hip surgery.



The Mountain Models Art Chester Jeep is built from a kit.

http://www.mountainmodels.com/product_info.php?products_id=691

It has a wingspan of 16", wing area: 58 sq.in. and a flying weight of about 1.1 oz. It uses a 'brick' type radio system from an indoor ARF.

It still needs a bit more finishing, but it is mostly done.

His Flying Models Sweet Patootie was built using plans from the June 2001 issue.

https://store.flying-models.com/catalog/product_info.php?products_id=656

The vertical stabilizer is on the fuselage, below the "V" type horizontal stabilizer. Magnets hold on wing. It was originally designed as rubber powered model.

It also uses a 'brick' type radio system from an indoor ARF model.

He noted that it flies pretty well.



Hobbico Returns to the Ultimate Soccer Arenas

From Joe Hass via email

On Monday, April 3, Hobbico will do its Pre-Toledo Show visit at the Ultimate Soccer Arenas from 7 p.m. - 9 p.m. There is no admission and everyone is welcome. On April 4, during the indoor flying from 10 a.m. to 2 p.m., they will do demonstrations. There is no cost if you are not flying. Regular session costs apply to fly.

The program will take place upstairs on the mezzanine of Ultimate Soccer Arenas near Field 2 and the bar. We will be using Field 2 for product demos!

Upcoming 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

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 change your email address contact Ken Myers at kmyersefo@mac.com

The 2017 membership application is available at the club Web site,
<http://www.midwestrcsociety.org>,
for downloading with the link on the homepage.

Upcoming Events:

Tuesdays, Indoor Flying at the Ultimate Soccer Arenas in Pontiac, 10 a.m. to 1 p.m.

Wednesdays, Indoor flying in Brighton at the Legacy Center, 12:30 p.m. to 2:30 p.m.

April 3 & 4, Hobbico Pre-Toledo visit to the Ultimate Soccer Arenas (see this issue for details)

April 5, Wednesday, MRCS meeting, video 7 p.m., meeting 7:30 p.m., Guest Speaker: **Ken Myers**, Topic: Up and Coming Advancements in Batteries and Electric Storage

April 7, 8 & 9 The 63rd Toledo RC Expo, SeaGate Centre, 401 Jefferson Ave, Toledo, OH 43604

June 3, Saturday, Keith Shaw Birthday Electric Fly in (details to follow)

July 8 & 9, Sat. & Sun., 33rd Mid-America Electric Flies (details to follow)

Midwest RC Monitor
Editor: Ken Myers
1911 Bradshaw Ct.
Commerce Twp., MI 48390

The Next Meeting:

Date: Wednesday, April 5, 2017
Time: 7 p.m. Video, 7:30 p.m. Meeting
Place: EAA Building, Mettetal Airport