the Monitor

May | The MRCS Officers | 2015

Next Meeting: Date: Wednesday, May 6
Time: 6 pm or earlier, Midwest 7 Mi. Rd. Flying Field

What's In This Issue:

The April 2015 Meeting

An aviation related video was shown at 7:00.

Ken Myers did a presentation on the items that need to be considered when converting a glow powered kit or almost ready to fly (ARF) to electric power.

Lynn Morgan, club secretary, noted that we have a total of 47 members at this time. That is a bit less than what we had last year at this time, although we did finish out the season with 65 members.

Dave Stacer said that the only current treasury action has been paying the field rent have and several membership checks deposited. He also reminded us that Friends of the Field fund appeal is a major contributor to our financial year.

Rich Seivert, the Field Safety Officer, said that he's looking into the possibly of having someone come out and give us instruction on CPR.

Dave Stacer suggested that someone needs to look at Frequency Board, as the shingles looked to be in sorry shape towards the end of the last flying season.

Arthur Deane, club president, reminded us about Friends of the Field donation again. He also noted that there has been a general decline in many of the local clubs' memberships.

Lynn Morgan noted that we need to keep our reserve funds in good supply because they might be needed for a field move in the future. He suggested that we might raise the dues so as not to deplete the bank account. A dues increase would also makes us less dependent on the Friends of the Field Fund. Since we are already into 2015, we need to think about this possibility for the future and should bring up the topic for further review in the fall.

There were some general discussions about the upcoming Toledo RC Expo and other RC related topics.

Helicopter Frequencies
21,27,29,39, 41
Sailplane Frequencies
11, 12

Some Glow to Electric Conversion Considerations

Ken Myers

What size prop?

Glow kits and ARFs are supplied with a recommended glow motor 'size' range for the model. Older kits only had 2-stroke motor recommendations. Once 4-stroke glow engines became popular, the kit suppliers usually included both a 2-stroke and 4-stroke size range.

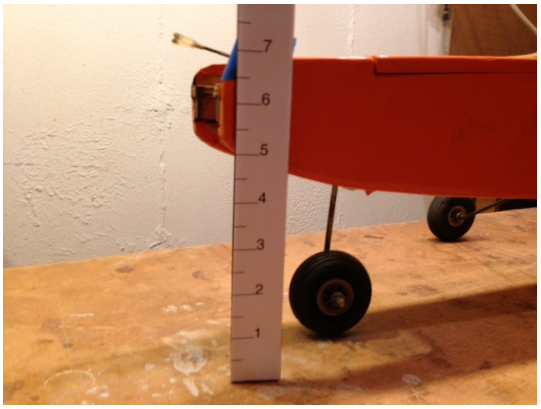
The table shows 'typical' prop diameters for 2-stroke and 4-stroke glow engines. The engine displacement is in cubic inches and has been rounded to the nearest 0.05 cubic inch. The 2-stroke and 4-stroke recommended diameter in inches was taken from Sig's "The Basics of Radio Control" pamphlet, page 16. The pamphlet, copyrighted in 1988, is still supplied in Sig kits.

The 4-stroke engine displacement, in cubic inches, can be used to suggest the power for an electric system. Suggested watts in for the electric motor is the 4-stroke's displacement times 1000. A .40 2-stroke is equivalent to a .60 4-stroke. .60 times 1000 equals 600 watts in.

600 watts in also suggests a motor weight range. The light end of the range is 600 watts in divided by 3 watts in per gram of motor weight equaling 200 grams. The heaviest end of the range is 600 watts in divided by 1.5 watts in per gram of motor weight equaling 400 grams. A good place to start looking for motors is mid-range, or 300 grams, in this instance.

Glow 2-stroke	Diameter Inches	Equivalent 4-Stroke	Diameter Inches	Diameter Electric	or	Diameter Electric
0.05	6	0.08	7	8		9
0.10	**7**	**0.15**	**8**	**9**		**10**
0.15	8	0.23	10	11		12
0.20	**9**	**0.30**	**11**	**12**		**13**
0.25	9	0.38	11	12		13
0.30	**9**	**0.45**	**11**	**12**		**13**
0.35	10	0.53	12	13		14
0.40	**10**	**0.60**	**12**	**13**		**14**
0.45	10	0.68	12	13		14
0.50	**11**	**0.75**	**13**	**14**		**15**
0.55	11	0.83	13	14		15
0.60	**11**	**0.90**	**13**	**14**		**15**
0.65	12	0.98	14	15		16
0.70	**12**	**1.05**	**14**	**15**		**16**
0.75	13	1.13	16	17		18
0.80	**13**	**1.20**	**16**	**17**		**18**
0.85	13	1.28	16	17		18
0.90	**14**	**1.35**	**17**	**18**		**19**
0.95	14	1.43	17	18		19
1.00	**16**	**1.50**	**19**	**20**		**21**
1.05	16	1.58	19	20		21
1.10	**16**	**1.65**	**19**	**20**		**21**

The .40 2-stroke/.60 4-stroke indicates props of 13 or even 14 inches in diameter are typically used for electric power systems in planes recommended for those glow engines.



The photos show a Falcon 56 Mk II. It was built from a kit in about 1980 by former Midwest RC Society member, Bill Yeager. It can be seen that a 13" or 14" diameter prop cannot be used on this plane. The kit recommended .19 through .40 2-

stroke engines as appropriate. (300 watts in to 600 watts in - check the table to see why)

The largest diameter prop for a conversion of this plane is 10". This indicates that the motor has to have a higher rpm per volt (K_v) than typically used on a .40 2-stroke size plane electric power converson.

Examples:

Typical 13" prop at about 600 watts in
Cobra C4120/18 290g **540** RPM/Volt (K_v)
http://innov8tivedesigns.com/images/specs/Cobra_4120-18_Specs.htm
5S LiPo (18.5V), APC 13x8E, 37.61A, 695.7W, 8306 RPM

Smaller than typical, 10" prop at about 600 watts in
Cobra C4120/14 293g **710** RPM/Volt (K_v)
http://innov8tivedesigns.com/images/specs/Cobra_4120-14_Specs.htm
5S LiPo (18.5V), APC 10x7E, 34.79A, 643W, 11,381 RPM

Note the large difference in the RPM/Volt (K_v) numbers. The 10" diameter prop requires a much higher K_v.

Many conventional gear (tail dragger) planes can use the suggested electric prop diameter by changing to a taller main landing gear.

Pitch speeds of 50 mph to 75 mph were/are common for these types of planes. A quick method for approximating the pitch speed is to multiply the pitch in inches times the RPM in thousands.

Examples from above:

13x8 prop with 8" pitch times 8.3 thousand RPM equals approximately 66 mph
10x7 prop with 7" pitch times 11.4 thousand RPM equals approximately 80 mph

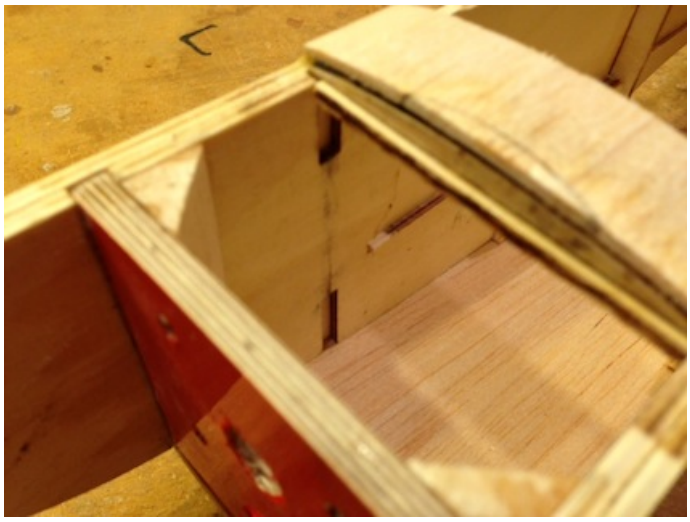
The prop pitch should be appropriate to pitch speeds in the 50 mph to 75 mph range.

Mounting the Motor

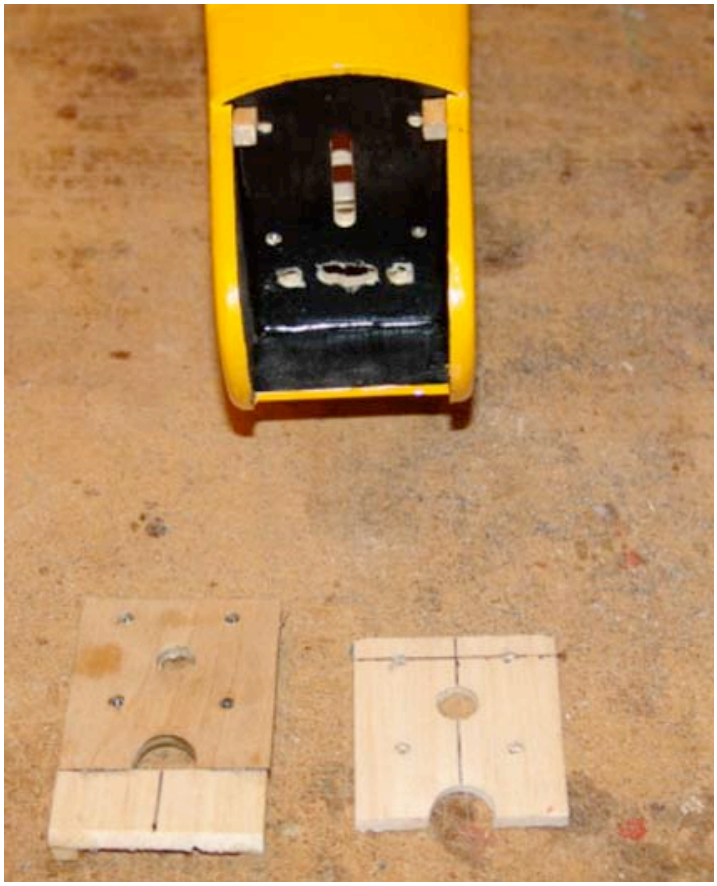
Today, the most commonly used electric motor in glow conversions is the outrunner type. The most frequently used method is to mount the outrunner using a crossmount bolted to a firewall.

Because of the way that glow engines were mounted and the physical size of an electric motor compared to a glow engine, the electric motor needs to be mounted further forward than the supplied firewall in the kit or ARF.

Method 1: Move the original firewall ahead. This works expecially well with kits. The photo shows a Sig Four-Star Forty with the the firewall loacted 1-3/4" ahead of its original location.



Method 2: Mount a new firewall ahead of the 'old' firewall. This works well with ARF type planes.



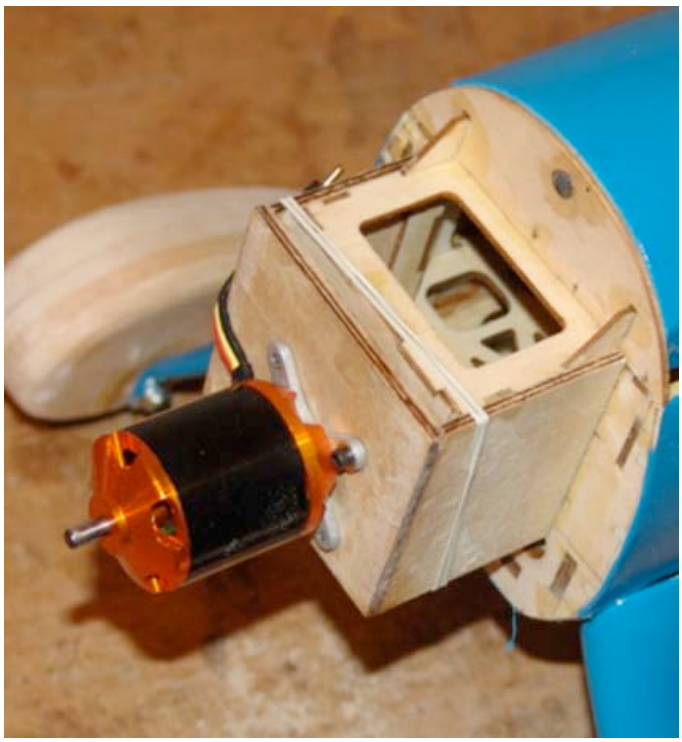
The first photos shows a prototype firewall and spacer made of balsa wood and the final birch plywood firewall for a Tunder Tiger Lazy Tiger Cub. The second photo shows the new firewall, painted and in its final position.

Method 3: The Box

A plywood box can be constructed and mounted in front of the original firewall.

Method 4: Extend an existing box

Sometimes there is already and extension box for the motor in an ARF, especially one with a cowl. Birch plywood can be glued to the sides of the existing box and a new birch plywood firewall created.



Method 5: Nylon or metal standoffs with the mounting bolts runnning through them can be used. The standoffs in the photo are Hillman Nylon Spacers, which can be found at Lowes in the parts drawers.

Method 6: Commercial metal mounts are also available. The mount on the Sig LT-40 ARF in the photo was purchased from Tower Hobbies.

Access Hatches

Easy access to the battery is MUST for electric powered aircraft.

Method 1: The Spring Latch

A latch can be fabricated using a piece of wire and spring from a ballpoint pen. NOTE the Velcro on the battery tray and the Velcro strap of Denny Sumner's Four-Star Forty conversion.

Method 2: Rare Earth Magnets

Dowel pins or a tab can be used to hold and align the front of the hatch and rare earth magents can hold down the back of the hatch.

Method 3: A rubberband hold down.

Dowel pins or a tab can be used to hold and align the front of the hatch. A 'tongue' is created on the rear of the battery tray floor and a piece of plywood wood cut like a C can be glued to the hatch. Rubber bands are looped though the C and around the tongue.

NOTE the Velcro strap around the battery. Securing the battery is extremely important, but it must be removeable for charging.

The receiver and ESC can be held by Velcro.

(Continued on page 7)

Ken was assisted in his presentation by Bob McDonald and Denny Sumner.

They brought in their versions of the Sig Four-Star Forty and shared info on their conversions.

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

The 2015 membership application is available at the club Web site, http://www.midwestrcsociety.org, for downloading with the link on the homepage.

IMPORTANT: Channels 36 & 56 May NOT be used at the 7 Mile Rd. Field

Upcoming Events

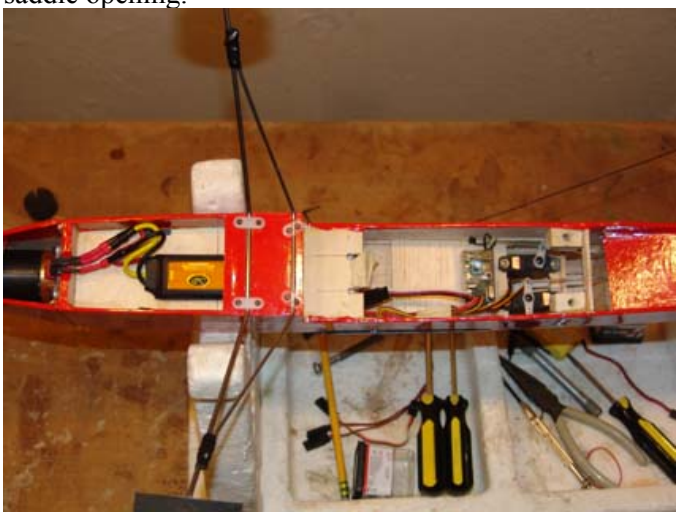
April 25, Saturday, **All About Tactic Radio Systems**, Presenter: Joe Hass with guest presenter, Ken Myers, Tactic transmitters, receivers, servos and Tx-R ready planes will be discussed. At Flightline Hobby, 1192 S. Lapeer Rd., Lake Orion, MI, 11 a.m. starting time

May 6, Wednesday, 1st Midwest flying meeting of the year, 6 p.m. or earlier for best parking, 7 Mile Rd. Flying Field (weather permitting) - you'll be notified via email if there is a change in time or venue

July 11 & 12, 31st Annual Mid-America Electric Flies, 7 Mile Rd. Flying field, 10 am to about 5 each day

Cont. from page 5 - Conversions

Sometimes ESC can be strapped to motor mount. Standard servo mounting is used. Sometimes it is 'best' to move the rudder and elevator servo behind the wing saddle opening.



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