

THE FLYER



Middlesex County
R-C Fliers, Inc.

April 2012



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F4s In Formation

War Bird Wednesday. At the Field Photo by Jim Orsborn

President's Message, by Jerry Crowley

Greetings to all our Club members. It's April and we are enjoying some good weather.

Well April is a busy month for the Club. Normally I would have had a BOD meeting and scheduled a date for our field clean-up day and we would have discussed field maintenance. It has been very busy for me with little time to have the BOD meeting. So I am going to go ahead and schedule a date and we'll work out the details.

At this week's meeting, I will propose that our Spring Clean-up day be held on the third Saturday this month, April, 21st. In the event of rain or foul weather, the

event will be postponed one week for the following Saturday, April, 28th. We will meet at the field around 9:00AM. Please if you can bring rakes and shovels, we need items to pick up paper and trash. The Club will supply trash bags. If time permits we may get started on replacing some siding on the Gabel end on the Gazebo. We'll make any repairs to the benches surrounding the pit area.

The more people we have working, the sooner we can begin to fly. The Club will furnish coffee and donuts for all that come to help.

It should be noted that the field is still closed to vehicle access until fur-

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President's Message (Cont.)

ther notice due to muddy conditions. The ruts caused by driving on the entrance a lot of work to fix so please respect the signs that have been posted.

Reminder..... Nobody is allowed to instruct training pilots except certified Club Instructors. This especially pertains to non-members looking to get into the hobby.

Adam Harte was the winner of our monthly raffle at the March meeting — a nice Lanier Stinger II ARF.

I hope everyone will enjoy a great flying season and hope to see you at the monthly Club Meeting on this Wednesday, April 11th.

Don't forget that Wednesday's are "WAR-BIRD Wednesday". Bring your War Bird to the field and enjoy some buddy flying, maybe even some simulated combat.

In closing I hope to see you at the Field. Good safe flying.

Thanks,
Jerry Crowley,
President MCRCF

Electric Powered LT-40 Trainer Update

Over the past several months, we've seen several articles on how to setup SIG's new Kadet LT-40EG with electric versus glow power. The articles have explained how to select motors, batteries and ESCs. And I had hoped to conclude the series this month with one final article on testing that we did with Maxx Prod's motor. Sorry, but we're not quite ready, so this is just a brief status update.

We did finish some testing with the Maxx Prod motor that Sig recommended. Basically the Maxx Prod motor produced the required 500 watts with a smaller prop that did not require extra nose wheel clearance. In addition, the tests showed that the current draw for cruise flight would give us 12 to 15 minute flights.

Based on all of the tests, I've started writing a Special Edition of **The Flyer** that will provide specific recommendations on how to configure an LT-40EG for Electric Power. When finished, copies of this Special Edition will be made available to local hobby shops and we'll offer it to new pilots who may be interested in trying to build an electric powered LT-40.

***South Shore R/C Club, OTIS Model Aero Club
and Wingbusters Model Aircraft Club***

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Contact: Ken Crane 508-560-5667 or Carl Vogel 508-783-7055

or visit ***WWW.SSRCC.ORG*** for details

Servo Brownout and Solution

by Peter Lu

Recently I have been working on my FPV Raptor from Hobby King. I am planning to install a flight stabilization system and one of my friends advised me that I should upgrade all servos with metal gear servos, due to the control surfaces will be very busily adjusted by the automated system. So I installed 4 metal gear servos from Hobby King (HK939MG). After I hooked up my receiver and all servos, everything seems working fine. However, when I moved the aileron stick a bit faster, suddenly all servos moved simultaneously like crazy for a few seconds then quiet down. I thought there was something wrong with my receiver which might be not compatible with those metal gear servos.

I consulted a friend of mine and he suggested it might be the ESC issue. My BEC might be too wimpy for heavy current draw by those metal gear servos. I do not have the spec of the ESC and it only has a small label of "30A". The spec of those servos states that each one will draw 240mA and it will be under 1A in total. Most of the 25A+ ESC with BEC should provide at least 2A capacity. To further identify the problem, I disconnect one of the aileron servos and everything went normally. I replaced with two 9 gram nylon gear servos and it was OK as well. Furthermore, I tried to disconnect the BEC and use a pack of battery from my nitro plane. It behaved well too. Now I have my conclusion. The BEC is not strong enough to support those metal gear servos – a typical Servo Brownout problem.

How to address the problem? I can upgrade my ESC to have a more powerful BEC, or use a dedicated BEC to drive the servos. After quite a long thinking, I thought that the ESC does provide enough energy but the instant current surge pulls down the power. A large capacitor should be able to ease or eliminate the situation.

First, I connected a 470 μ F 16V electrolytic capacitor between the ground wire and the middle (power) wire. I had found the brownout was eased but not eliminated. Then I used a 2200 μ F 16V. This time, no matter how I move both sticks, no brownout occurred. Problem solved.

Over the week end, a friend of mine loaned me an oscilloscope so I can validate the situation and find out how bad was the brownout.

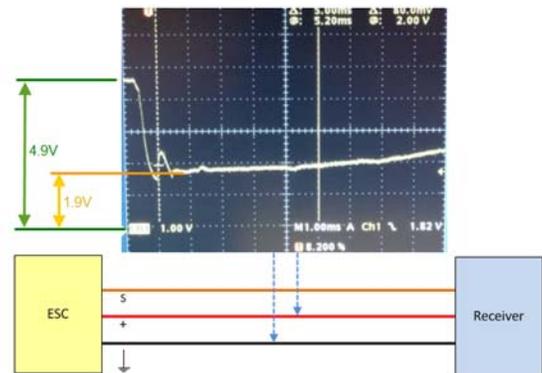


Fig 1. Original setup

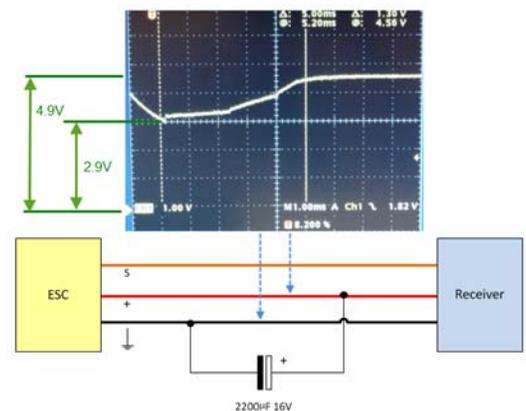


Fig 2. Surge Suppressor

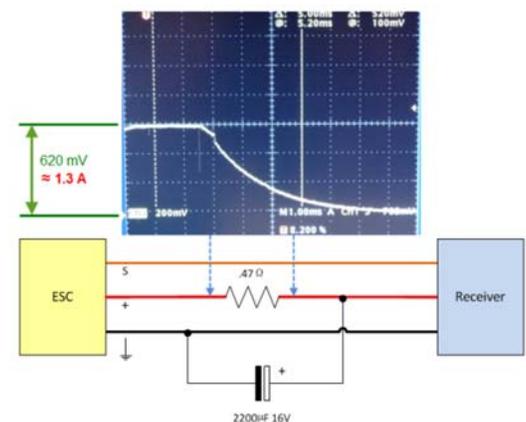


Fig 3. Current Measurement

Fig 1 illustrates the original brownout situation. When I moved the sticks quickly, the voltage dropped down to 1.9V. Certainly it was a big problem. Not only that, the recovery time was very long. It took more than 10ms to get back to around 3V.

Fig 2 illustrates the effect of the surge suppressor. I did the same stick movement and the voltage only dropped by 2V and the recovery time was a lot shorter.

Furthermore, I did another research to measure the exact current draw. Fig 3 illustrates the schematic and the result. I inserted a 0.47Ω resistor between the BEC and the receiver and used the oscilloscope to monitor the voltage drop over this transistor to reveal the current. The result indicates that the maximum current draw was about 1.3A.

Fig 4 shows my test connection. Fig 5 shows the actual assembly. There are two shapes of electrolytic capacitors: Axial (leads from both ends) or Radial (both leads on one end). It happened that I had an axial type, bought from Radio Shack years ago (20 assorted electrolytic capacitors, 10 μF to 3300 μF , for \$2.49). So I soldered it in a servo extension, between the red and black wires and installed it between the ESC and the receiver. Radial capacitor can be soldered to wires with only the receiver connector (Fig 6), then plug it into any open port of the receiver. This configuration requires an open port on the receiver. One thing need to be aware: Electrolytic capacitors are polar devices. Make sure the positive lead goes to the red wire.

I am not sure you have noticed that March 2012 issue of the Model Aviation magazine has an article in the Product Spotlight section (page 20) talking about a product called Glitch Buster. It is just an electrolytic capacitor. The article did not mention the exact capacity but I guess it is about 2200 μF 16V. It is a very simple solution to address the servo brownout problem. It sells at \$5.99 + S&H.

By the way, what about other control system? I cut off the ESC power line and used a NiMh battery pack (4.8V 1650mAh) to drive the servos. With the capacitor, the power drop was about 0.5V. Without the capacitor, the power drop was about 0.75V and last a bit longer for recovery (1.5ms vs 2ms). Then I tested my Cherokee. It has an 85A ESC with 5A built-in BEC and 6 standard servos. Without extra capacitor, when I moved the sticks rapidly, the peak current draw was almost 3A, but the voltage drop was barely noticeable from the oscilloscope. No brownout what so ever! I also tested Turnigy 3A UBEC on FPV Raptor and it worked very well. Less than 0.2 V voltage drop was observed even without external capacitor.

For more information, please watch my video:

<https://www.youtube.com/watch?v=kJPH4orWBRy>



Fig. 4

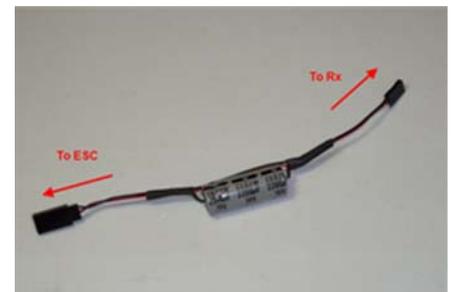


Fig. 5



Fig. 6



Fig. 7

Official Publication of the Middlesex County R-C Fliers, Inc.

The FLYER is the official publication of the Middlesex County R-C Fliers, Inc., a non-profit organization chartered for the promotion of radio controlled model aircraft building and flying. The club operates a flying field located on Treble Cove Road, Billerica, MA. The club offers free flight instruction to any member provided they have a current membership with the Academy of Model Aeronautics. Contact any club member for details. Meetings are held on the second Wednesday of every month between September and June in the Billerica Recreation Dept building at 248 Boston Road in Billerica, starting at 7:30 PM.

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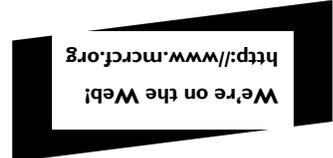
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