THE FLYER

Middlesex County R-C Fliers, Inc.

March 2012

Alternate MCRCF Runway Recent dead stick landing occurred at this intersection, about 3 miles north of the field.. Believe it or not, we were on-site when the plane came in. Read the full story starting on page 2. *Photo by Jim Orsborn*

Inside this issue:

President's Message, *by Jerry Crowley*

Greetings to all our Club members. It's February and we are enjoying some exceptionally mild weather. As I write this message it is snowing finally. Some of us can get a chance to try out those new ski's.

For those of you who have frequented the field you may have had the opportunity to enjoy the gazebo that has been wrapped in plastic to shield from the wind. Some members bring portable heaters that make it quite comfy. Thanks to Ray and Paul and others that helped erect the protection.

The final results are in for the Auction held in January. Jeff Ward reported that we took in almost $1,500.00 for the event. That is a record for us. It seems the Auction is getting more and more popular every year. I would like to thank once again all those who helped make it such a huge success.

You may have seen a notice from the AMA announcing that the Senate joined the House in passing a bill with an exemption for aeromodeling from any FAA rules. This is a major accomplishment by the AMA in working with FAA representatives and encouraging members to write to their respective Senators and Representatives to support our hobby without employing unnecessary regulations. Make sure you check the government area of the AMA web-site for updates. The FAA will be releasing new regu-

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An Amazing First Flight

by Jim Orsborn

On Tuesday, Feb. 14th Shane Goyette and his father, Daniel, showed up at the field for Training Night and their first flight on a brand new Kadet LT-40EG. Little did we all know that the afternoon flight was going to be so exciting.

Final Pre-flight adjustments to Shane's LT-40

Ray was already working on the plane when I showed up about 3:30. I had left work early expecting to see Ray make the maiden flight on his new Electric LT-40EG, but I fully understood what he was doing to get Shane's plane ready first.

Ray's pre-flight inspection of Shane's plane suggested a few minor adjustments were needed. The flight battery needed to be moved to the rear to correct for a slight nose heavy situation. And once we had the correct placement, we needed to secure the battery to the floor so that it would not move in flight.

A check of the control throws showed that the aileron and the elevator servos were reversed? We were not sure why, because Ray thought this had been checked during an earlier pre-flight inspection. That inspection had identified some major changes that were needed, so Shane and his Dad had been sent home to make the changes before the planes maiden flight. Dan mentioned that they had charged the batteries for over 24 hours in anticipation of this first flight

With everything working, Ray fueled the plane and we had the engine running in no time. The engine was a new OS .46AX, so it was going to be ready for a great flight. We'd do a rich run, but let the engine break in during the maiden flight.

As we do with every first flight, Ray and I took the plane to the runway expecting to take it up for a trim flight, land it and make the minor adjustments and then get airborne again for the student's first lesson.

As we went to the runway, Ray had me walk ahead so that he could do a range check. He also asked Shane again to confirm that the battery had been fully charged. Nose up, full throttle confirmed the engine was not too rich and the clunk was not fouled. Final control throw check and we were set.

Takeoff was dead straight down the runway, followed by a nice steady power climb to altitude. Ray checked the plane for hands-off trim and commented that it needed two clicks of left trim, but was already flying hands off. So we called Shane down to see for himself how the new plane was flying.

Shane had already demonstrated his skill level, by flying both left and right turns on the Club's plane and buddy box. So Ray handed the transmitter to Shane.

It looked like Shane was making nice left turns. The plane was easy to see and he was able to maintain a constant altitude. As the plane continued making a left turn, it started to drift out over the big pine tree. So I asked Shane to bring it closer to the field. His reaction was that he was giving full right stick, but the plane was not responding! I glanced at the sticks to confirm his inputs. At that point, Ray took the transmitter from Shane and tried to correct the plane as well. No response.

I told Ray to cut power, again there was no response. — We've now got a runaway plane, doing gradual left turns and drifting with the wind to the north.

Everyone at the field was called into action. Paul Sullivan grabbed the transmitter and started running north. Paul got into Bob Prescott's truck and they tried to follow the plane. Their search went over Rt 3 and down River Street towards Billerica Center.

Shane headed out with Ray and noticed that his father had gotten their truck and was on Treble Cove road. Shane and Ray joined Daniel and headed north on Treble Cove Road.

I stayed on the runway, thinking someone should get a last known position when it disappeared. I watched the plane continue to make left circles and drift north. I last saw the plane miles north of the field.

It was 4:25 PM when I saw the plane make a lower altitude turn. It had apparently run out of fuel and was headed down. The heading from our runway was about 10 degrees east of the tall pine tree.

I called Bob Prescott who came back to the field with his i-phone and GPS map. The terrain map showed that the heading was towards Hobby Fever, and my distance estimate was that it was well past there, probably over the old mill area of Billerica or maybe south Lowell. Neither Bob or I knew where the others were, but we were pretty certain that the plane was a goner, because it had flown so far away.

It's really hard to get a distance measure from the ground. But it is usually a good idea to get an accurate heading to a downed plane.

Post-flight recovery of Shane's LT-40

A cell phone call to Ray confirmed that he was now headed back towards the field. When he got to the field, with Shane and his father. I told them that I had seen the plane fly out of sight, north of the field. Ray didn't want to listen. I thought he was upset over losing the plane, but he wanted me to stop talking and come with him. There, in the back of Dan's truck was the missing LT-40! How could it be?

The LT-40's Runaway Flight Path:

As he left the field, Dan had picked up Ray and Shane on Treble Cove Road. He drove off following the flyaway LT-40 that was headed north. They drove up Treble

Cove Road and crossed Rt. 3. With Ray and Shane as spotters, they confirmed it was still going north.

At times, the plane was in clear sight, but then it would circle behind trees and they would have to stop and locate it again. They stayed on Treble Cove all the way to Boston Road.

As they approached the traffic light on Boston Road, Ray saw the plane fly over Dunkin Donuts. I guess Ray told Dan he had better not stop at the red light, for fear of loosing sight of the plane that was continuing to make lazy circles to the left. So they crossed Boston Road and continued following the plane.

First they were ahead of it, then it was behind them. Shane and Dan were worried about losing the plane in a tall tree, or the Concord river. Ray was apparently worried about the number of houses in the area. But there was nothing they could do except watch it make lazy left turns. Apparently Ray had done a pretty good job setting the trims. By now the plane was over 2 miles from the field and had easily done 15 or 20 large circles, but it was still at the same altitude.

Their travels continued across the Concord river and past the Old Mill area where they turned left onto Letchworth Ave. towards Hughes Lumber. Daniel stopped at 7 Oaks Rd. and Ray got out to try and locate the plane again.

The plane was less that a block away when it came between some trees headed straight down 7 Oaks Road towards the truck. Ray thought the LT-40 was going to actually hit the truck, but it hit a power line (left wing) instead. Unfazed by the airborne collision, the LT-40 continued to fly and made a slightly nose first landing on the main street! The photo confirms only minor damage to the wing, a bent nose gear and a loose firewall. Minor repairs and it will be ready for another adventure.

Post-mortem:

The receiver battery was still connected, but it was confirmed as DEAD upon return to the field. The servos were locked up in the last good position — left turn at mid throttle setting. The plane had switched to auto pilot mode shortly after Ray finished making his trim adjustments.

Why was the battery dead? High current drain? Defective battery? None of these seemed reasonable, so suspicions immediately turned to the battery charger. Further discussion confirmed that the wrong charger had been sold to Dan. The charge light never came on, so the battery's initial charge had simply run out in mid flight.

BTY, when Ray took Paul Sullivan to show him the recovery site, a lady came out to ask what they were doing. She said that her mother had seen them before and she was worried that they were terrorists!

This little LT-40EG (its owner and instructors too) survived its maiden flight. Shane's plane has been repaired and he has flown it again. Wind conditions limited us to a single flight, but the plane will go on to make an excellent trainer. All is well that ends well.

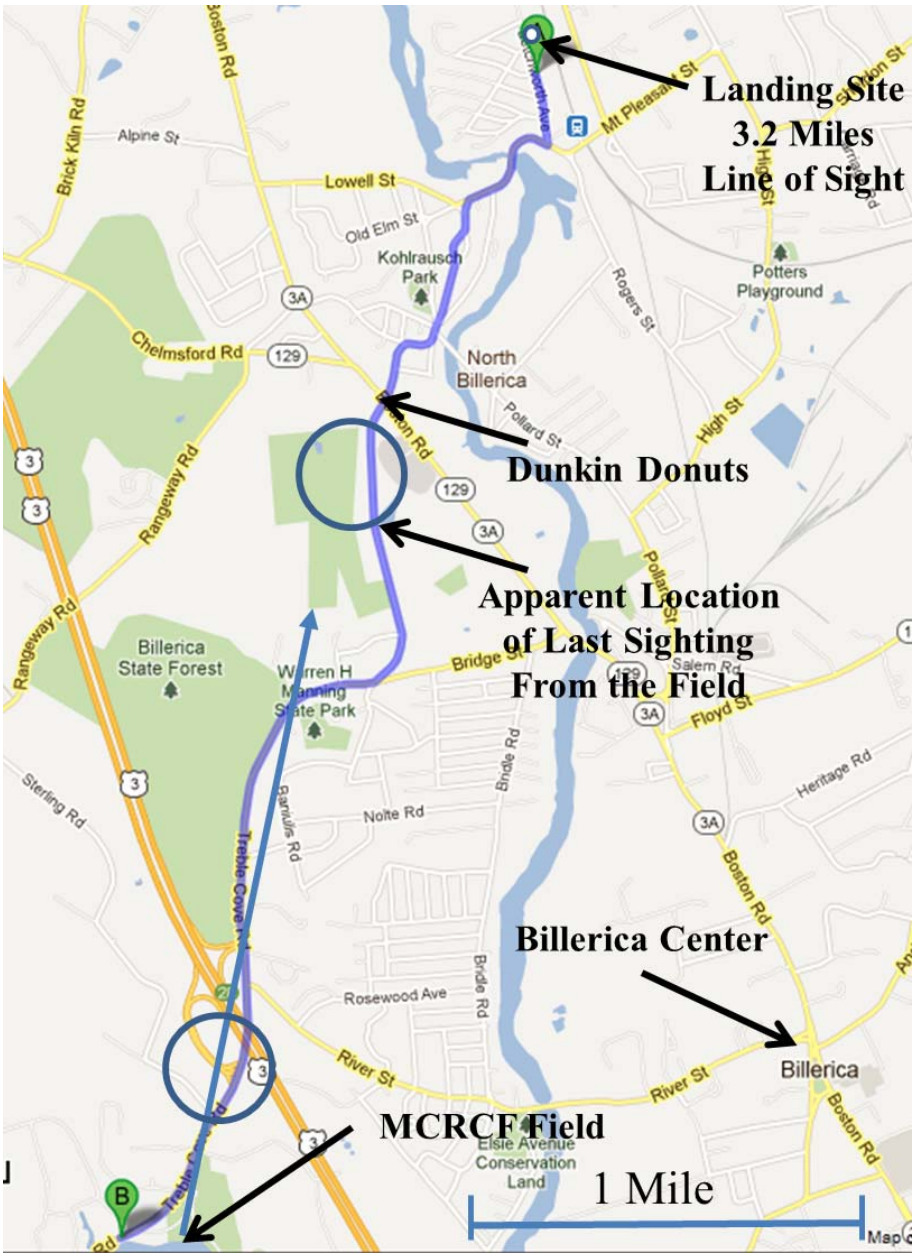
Shane's LT-40 Flight Path

This Google Map view shows the path that Shane's LT-40 took. The small circles suggest that the plane was doing left turns that were probably about 1/4 mile in diameter.

The map shows how Treble Cove Road crossed from left to right over the center of the plane's travel north from the field.

Trees along the road made it difficult to see the plane much of the time, but there are clear spots along the way where they could see it easily.

One such location was near Dunkin Donuts where it was headed north, on the right side of the circle.



Bob Prescott and Paul Sullivan had turned right onto River street after crossing Rt. 3. They had lost sight of the plane and thought it might be down that close to the field.

As seen by the final landing spot, the plane made it over 3 miles away from the field. If the plane made thirty (30), 1/4 mile circles, then it actually flew about 20 miles before running out of fuel.

Electric LT-40EG's First Flight

by Jim Orsborn

The new LT-40EG that Ray has been working on made its maiden flight on Tuesday, February 14th. I was at the field and Bob Prescott joined us to see how things went. The flight was uneventful; but it has helped us confirm many of the points that we've covered in the past few articles.

Ray double and triple checked everything in preparation for the flight. We'd just finished recovering Shane's LT-40, so everyone was a bit anxious about this new electric powered version.

There was virtually no wind, so Ray took the southerly heading towards the parking lot. It was a straight rollout, about 1/3 down the runway, followed by a scale like climb to altitude. Ray had not used full power for the takeoff, but said he was going to full power during the left turn away from the runway. Things looked smooth and pretty normal. The only thing unusual was the absolutely quite flight.

Ray performed a loop, but I noticed that the plane labored on the climb and sort of floated over the top. The next maneuver was a landing from the left side that was smooth and pretty normal. Ray maintained some throttle during the approach, and was able to set the main gear down in the middle of the runway.

Everything looked pretty good, so Ray decided to make a full power takeoff to the left, towards the tall pine. After getting settled in the pattern, Ray commented that the takeoff was a bit under powered and he had diverted to the right to avoid the tree.

So with the maiden flight complete, I need to report on some technical aspects of the setup and performance. Ray had initially been told that he should put an E-Flite Power 60 in the plane. Before he installed this motor, Bob and I convinced him that a Power 52 would be more than enough power for the plane. During construction, the Power 52 resulted in a slight nose heavy CG, so the battery had to be moved inside the main cabin. We needed to know if this was the right motor or not.

With a 12x6E prop on the motor, we determined that 1/2 throttle gave us 5,800 RPM and was drawing about 10 A from the battery. At full throttle, the prop was spinning at 8,100 RPM and the motor was drawing about 25 A. Considering that the motor is rated for 65 A; we were only getting about 400 watts of power at full throttle. Why were we so under powered, when we were using a big motor?

The Power 52 motor has a Kv rating of 590. So with a 4S battery, this motor is going to try and spin a prop (any prop) at about 8500 RPM (e.g. 590 x 14.8). More power is available from the motor, but we'd have to go with a bigger 13" or 14" prop — probably not reasonable with the LT-40's typical ground clearance.

The baseline model with an OS .46AX

will typically spin a 10x6 or 11x7 prop at about 10,000 RPM. The only way to get this higher RPM with an electric motor is to use a motor with a higher Kv rating.

The Power 60 has an even lower, 400 Kv rating, so it will not help the situation. The Power 46 has a 670 Kv rating that is a bit better, but the Power 32 has a 770 Kv rating. It is also rated for up to 800 watts, so it is much more in line with our needs.

A trip back to RC Buyers was in order to discuss our findings. Joe Marrone reviewed our findings and confirmed that a higher Kv rating was the direction to go. The Power 60, Power 52 and Power 46 were all ruled out as a suitable option for the LT-40EG. The Power 32 looks to be quite suitable, but we all decided to take a look at the Maxx Prod motor that Sig has recommended in their instruction manual.

The Maxx Prod HC-3528 comes in either an 800 or a 1000 Kv model. Sig & Maxx Prod suggest using the 1000 Kv motor with a 3S battery, and the 800 Kv motor with a 4S battery. So we've got the HC-3528-800 motor on special order. The Sig instruction manual says that the Maxx Prod motor with a 4S battery will power a 10x6 prop and deliver performance similar to an OS .46 engine.

What have we learned thus far?

CG: Initial calculations were that the Power 52 and Power 46 would be nose heavy, unless the battery is located inside the main cabin — confirmed with the Power 52.

AUG Wattage: Calculations suggested that the LT-40 with a Power 52 would come in at 6.5 Lb. (confirmed) and would need 470 to 530 watts to fly as a trainer. At 25 A, the 12x6E was giving us about 400 watts, but the plane felt like it was underpowered.

Flight time: At half throttle, we were drawing less than half the full power amperage. We still don't have a final configuration, but it looks like something around 200 watts is all that we need for gentle, trainer flight once we are airborne. 10 A on a 5000 mAh battery should give us 15 to 20 minute flights.

What comes first, the motor or the prop? It looks like we might have to re-think the answer to this question. We've been looking at how to make a motor and battery choice first. But we ended up in a situation where we would have to use a totally unsuitable prop to get full power from the motor.

Starting with the prop, we get a whole different perspective on the motor choice. Let's consider Bob's excel table with specs for the Cobra motors. Begin by sorting the motors by Kv rating. Scan the max current, wattage and recommended prop choices for motors with a Kv between 800 and 1000. The C-3515-14 stands out.

Motor:	Cobra C-3515-14
Kv Rating:	950
Max. Current:	44 A
4S Prop data:	10x7E, 35 A, 515 watts
4S max wattage:	810 watts

This suggests that our 10x6 prop will be spinning at 12 to 13,000 RPM and draw 35A during takeoff — much like an OS .46 and will probably draw about 15 to 18A for cruise flight — should last 12 minutes with our 5000 mAh battery.

LT-40 Ground Measurements

by Jim Orsborn

By now you already know that we have built a Sig LT-40EG and installed an electric motor. Sig recently introduced the redesigned LT-40 with an optional electric power configuration. Several new pilots have recently asked about electric power trainers, so we decided to try the conversion ourselves.

Ground power measurements will help us understand the plane's flight performance and should provide information on how to adjust the configuration for better performance while still meeting our objective for a long flight duration.

Ground Power Measurements

Motor w/ Prop	Power 52 w/ 12 x 6E	Power 52 w/ 12 x 6E	Power 52 w/ 13 x 8E
Date:	Feb. 14th	Feb. 19th	Feb. 19th
RPM	5,800 8,100	5,100 8,400	5,250 8,010
Current (A)	10 25	7.0 27.4	9.6 33.1
Voltage (V)	16.0 est. 16.0 est.	16.4 15.4	16.1 14.9
Wattage (w)	160 est. 400 est.	113 417	153 490

To make these measurements, we installed a power meter (combination of voltage, current and wattage readings) between the LiPo battery and the speed control (ESC). We also used a tachometer to get RPM readings for the prop. To date, we've made three sets of readings that are recorded in the following table. Note that the first set of readings on Feb 14th recorded only the current and RPM values.

The first set of measurements confirmed that the LT-40 was flying with about 400 watts of power on its maiden flight. This would be under the estimated 500 watts that we predicted would be needed to mimic an OS .46 AX glow engine. The repeat measurements for the 12x6E prop confirmed the power and RPM readings seen earlier.

To see how the motor would react to a different prop, Ray installed a larger, 13x6E prop and we repeated the measurements. With this bigger prop, the RPM numbers dropped slightly. The primary factors that control RPM are the applied voltage and the motor's Kv rating.

The larger prop resulted in a 20% increase in both the 1/2 and full throttle current readings. The increased current allows the motor to maintain the same RPM for the bigger prop.

The larger prop is now producing the required 500 watts that we predicted was needed to fly this model correctly. Ray will surely notice a difference in the two configurations when he gets a chance to flight test the new prop.

The larger prop required that we raise the front nose gear to allow for adequate ground clearance. We've now had to move the battery into the main cabin and raise the nose gear in order to use the Power 52 motor.

NOT FINISHED YET.

Power measurements with the Maxx Prod motor.

Simplified motor selection process.

Construction notes and final cost summary.

Jim

President's Message (Cont.)

lations for review and comment some time this spring. It should be noted that over 90,000 members wrote letters to their respective representatives in Government. It shows that this works so be prepared to help in the future if needed.

The Recreation Committee, Friends of Billerica hosted an EXPO at the Billerica Elks February 12th. Our club sponsored a booth to promote interest in our hobby. The event was manned by Ray Capobianco, Dave Varrell, Jeff Ward, Paul Sullivan, and myself. We had two simulators running and supporting literature outlining club objectives and membership applications. The simulators were a big draw for kids of all ages and parents alike. We had a fair amount of interest and hopefully will realize a few new members as a result. Overall I think it went quite well and was worth the effort.

It should be noted that the field is closed to vehicle access until further notice due to muddy conditions. The ruts caused by driving on the entrance areas are 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.

The Web-site has been updated to reflect our new slate of Officers and Directors.

Adam Harte was the winner of our monthly raffle last month. He won a nice Spektrum AR8000X (8-Channel) Receiver.

I hope everyone will enjoy a great flying season.

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

Thanks,

Jerry Crowley,
President MCRCF

Notes From The Field

Membership Renewals:

2011 Frequency Pins have expired. If you are flying at the field, you should be displaying a new, 2012 Frequency Pin. If you received a pin that does not have a red club stamp on it, then we don't have a record of you qualifying as a Solo Pilot. Please stop by the field and someone will explain how to get your pin stamped.

MCRCF Pilot Training:

Tuesday is still pilot Training night. Instructors are there to help; even experienced pilots.

Soccer and Horse Corral:

Club rules strictly prohibit flying over these areas whenever there is an event. If the parking lot is active, avoid the area.

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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