



Annual Fall Outing at the Benjamin's

# Short CIRCuits

## October 2018

SERVING CENTRAL ILLINOIS AMATEUR RADIO SINCE 1921

IN THIS ISSUE

## From The President

by Jim Baker WB9EDL

Mid October is the time for my annual fall fishing/camping trip to south central Mo. The location is Montauk State Park near Salem, Mo. I have been camping and fishing there for more than 35 years. My ham radio has been a frequent accessory on my trips. Some of the antennas and set-up equipment that we use at Field Day have been derived from my camping trips. My equipment this year is Elecraft K3s, 80m, 40m dipoles. Antenna height is 28' center and 15' at the

ends. 80m and 40m wires cross pattern and helped guy the mast. Signal reports were very good. Reports from traffic nets I check into were as good if not better than from home. QSO's from the east, west, gulf coasts were made on both ssb and cw. There were many people that inquired about my antenna set-up. It was a great opportunity to share about ham radio.

Jim WB9EDL



### Print your own parts!

Submitted by Jeff Lovell KC9QQM



### A Shack Update

Submitted by Dennis Mills KE9UA

## Print your own parts

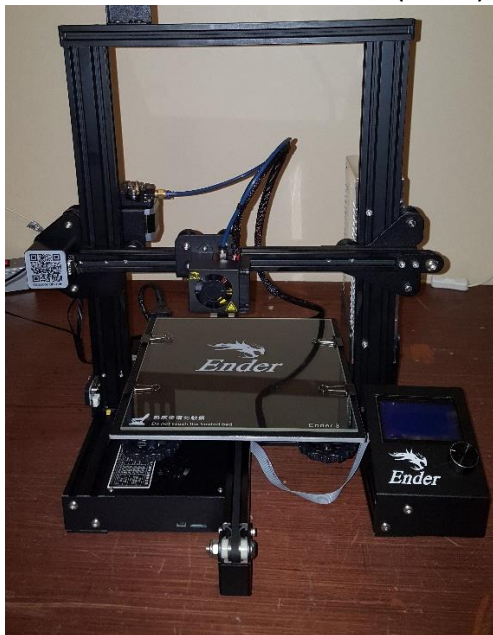
Article and photos by Jeff Lovell KC9QQM

With the ability of building your own 3D printer now available for less than \$200, I made up my mind to save and purchase one. After a lot of research on line and reading reviews, I settled on the Creality Ender 3. This is a Chinese made unit that comes needing assembly, which I wanted so I could increase the learning I needed to do.



Everything was packaged nicely and orderly. The assembly instructions leave a lot to the imagination so it was good I watched a few assembly videos before.

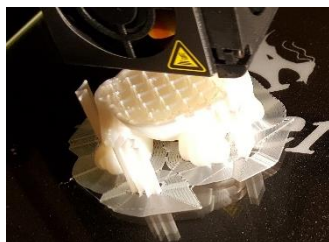
The frame forms a space for the up/down movement (Z axis), left/right (X axis) and the bed where the print is done moves back and forth (Y axis).



### Initial tests and print

The ability of the first layer of the filament to adhere to the bed is very, very important. If this layer moves or anything the rest of the print will fail. This is why there are lots of ways and various products to help this happen. The first layer must be at a precise distance to “squish” again the bed. So there are adjustments for each corner of the bed to level it to the print nozzle.

The controller is basically a beefy Arduino type microcontroller with a dedicated program to run everything, more on this later. The LCD display shows the nozzle temp, bed temp, fan speed in percent and other items. On the supplied microSD card came a 3D model of a dog as an initial test print. So I turned it on, set the correct temps for the time of filament I was using, inserted the card and selected that file to be printed and off it went!!!



You will notice what looks like extra put down around the bottom of the dog and some vertical pieces. The print around the bottom is called a skirt, it is one of the ways to help anchor the model to the bed. Here was the finished print cleaned up. This took over 5 hours to complete. You’ll notice that it looks like two different filaments where used, one shiny and one matte and that actually was the case. The kit came with a small spool of filament and I had ordered a large one, the first ran out and I then fed in the other. Believe it or not, this model which is only 3” high, used over 13 meters of filament! Wow I had my first 3D print.

Next I wanted to print some modifications for this specific printer I saw on line. There are many sites where you can download free 3D models to print. This leads into what the process is to actually have 3D

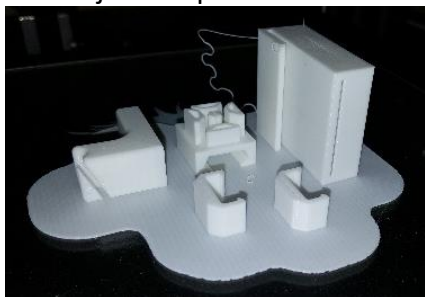
model file that is ready to put in or send to the printer to make.

You need 2 applications or programs. First is a 3D modeler where you actually create your model using shapes. Many are free and I have used both TinkerCad, an online modeler and Blender, which is a rather high end package used for much more than 3D printing. After you make your model, it is saved as a STL file, (stereo lithography). The STL file is then brought into a slicer application. As the printer lays down the filament in many, many layers, the model has to be "sliced up". One of the main freebies out there is called CURA by a company that makes its own 3D printer, Ultimaker. When you import the STL file it is displayed as it will be printed on the printer. The Slicer program is set up with the needed specs for your printer such as bed dimensions, nozzle and bed temps, etc. The 3D model is then processed and you can view the individual layers

via a slider. Most 3D printers actually read what is called G-Code, which are line by line instructions on what and how to print something. G-Code files are actually just text files. Here is an example of the start of a G-Code file to print something;

```
G21 ;metric values
G90 ;absolute positioning
M82 ;set extruder to absolute mode
M107 ;start with the fan off
M109 S180 B210 F1;activate auto temp min 180
max 210 scaling factor 1 (for PLA)
G28 ;Home Axis
G29 ;Z-Probe the bed (requires Z-Probe!)
G1 Z5.0 F9000 ;move the head 5mm up for CYA
clearance
G92 E0 ;zero the extruded length
M117 Cleaning. ;Put Cleaning message on
screen
```

Back to my build. Next step was to print some items to actually modify the printer itself. I placed a number of models all on the project in the slicer to make 1 print and here is the result. The large bottom is called a raft, for obvious reasons, again for sticking to the bed. It just snaps off.



Since the prints can take many many hours to complete I wanted a way of remotely viewing and monitor the progress of the print.



Open the curtain to Octoprint!! This is another freeware application made for a Raspberry Pi that allows remote control and monitoring of your 3D printer at home on your own network as well as, if you set it up, from anywhere! There is also the ability to remotely turn on and off the printer using one of the GPIO pins on the Pi to a relay wired into the AC cord to the printer.



There is much more I could go over from the variety of filaments, in both color and properties, to multi-color printing and more. I already have paid more attention to it than my wife would like.

Jeff Lovell  
 KC9QQM  
 kc9qqm@gmail.com



## A Shack Update

Article and photos by Dennis Mills KE9UA

I thought I would send over a few photos of my new radio shack desk showing the empty room and after photos plus my new lightning arrestor panel outside the house where all my antenna cables come in.



The photo of the panel when I first installed it still shows the original cables just going into the house through holes big enough to pass the coax. Then came the panel with peace of mind on stopping lightning outside even though I have many ground rods in place, more is better and two more right at the bottom of the lightning arrestor panel attached to these two ground rods by three inch copper strap from the copper back plate inside the panel and this is all bonded to my other ground rod system around the tower and out in the yard.





Jim WB9EDL Advertising his mobile shack



Jim's radio setup in the camper



Jim's antenna setup



And dinner for the evening!

## AREA NETS

Tuesday 8:30 P.M. 28.450  
CIRC Open 10 meter Net

Tuesday 9:00 P.M. 146.940 (103.5PL)  
CIRC Open Net

Thursday 8:00 P.M. 28.450  
Vertical polarization is encouraged but not required

Sunday 08:15 A.M. 1.915  
Open 160 meter AM net

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If you are wondering where all the nets are, it was brought to my attention that many of these are no longer in operation. I have left the ones the CIRC handles directly.

If you want another net listed, please send me an email directly and please verify it is a current net and I will add it to the list.

Jeff KC9QQM

Kc9qqm@gmail.com

Have an upcoming event that the club might be interested in attending or supporting?

CONTACT JIM BAKER WB9EDL  
Or bring it up at the next club meeting

## AREA EXAM DATES

Following is the schedule for W5YI-VEC Amateur Radio exams for the year 2018. At the Community Room of the Bloomington Public Library located at the intersection of E. Olive St. and S. East ST. Entrance off of S. East St.

Setup is from Noon to 1:00 normally. Exams begin at 1:00 P.M.

Please bring two forms of identification. You must have a Social Security Number. We cannot administer a test without your SSN. You will need a copy of your Current license plus any CSCE you want to apply.

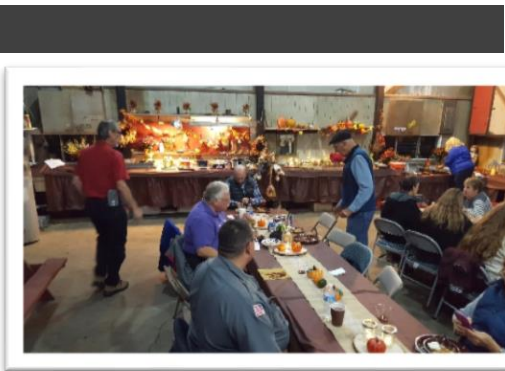
2018 dates;

11/10 tba

Exams' in Morton are held at the Morton Public Library, 315 West Pershing at 12:00 Noon the third Saturday of even numbered months and. Sep 21 (Superfest),

# Regular Calendar of Events

CIRC Meeting  
Fourth Wednesdays of the month at 7:00  
p.m. at the  
American Red Cross  
1 Westport Dr.  
Bloomington, IL 61704



CENTRAL ILLINOIS RADIO CLUB  
P.O. BOX 993 BLOOMINGTON, IL  
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WEB PAGE

[HTTP://WWW.QLS.NET/W9AML/](http://www.qls.net/W9AML/)

*President: Jim Baker  
(WB9EDL)*

*Vice-President: Rick Suhadolc  
(N9CKL)*

*Secretary: Keith Hanson  
(AC9S)*

*Treasurer: Greg Kellermen  
(KC9WVR)*

*Newsletter Editor: Jeff Lovell  
(KC9QQM)*

Daily Coffee Klatch Monday thru Friday  
9:00 a.m. at Dairy Queen Veterans at Cub's  
XYL's Join the OM's Monday and Friday

Weekly 10 Meter Net  
Every Tuesday evening at 28.450 MHz- at  
8:30 p.m.

Weekly 2 Meter Net  
Every Tuesday evening on the 146.940-  
repeater at 9:00 p.m.

Weekly 6 Meter Net  
Every Thursday evening at 50.135 MHz at  
7:00 P.M.

Weekly 160 Meter AM Net  
Every Sunday morning at 1.915 MHz at 8:15  
A.M.

*The CIRC is a not-for-profit ARRL special service club whose purpose is to advance the service of Amateur Radio. Located in Central Illinois, the CIRC and its members welcome all to use the 146.94 repeater and to attend club meetings.*

*Submissions for the newsletter should be received by the 15th of the month and may be emailed to: Jeff Lovell  
e-mail [kc9qqm@gmail.com](mailto:kc9qqm@gmail.com)*

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# Short CIRCUITS

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