

SERVING CENTRAL ILLINOIS AMATEUR RADIO SINCE 1921

Short CIRCuits

January 2021

IN THIS ISSUE

From The President

by Rick Suhadolc NgCKL

New Year's Day 2021 Ice Storm will go down in History of Central Illinois as one of our worst. I have lived in Bloomington since 1980 and have never seen an Ice Storm as bad in Bloomington/Normal.

I believe the reported official ice was half of an inch, however some of our Amateurs reported more. The melting of the ice didn't occur for over a week. We were so lucky that the winds were very light during the week after the Ice Storm and allowed the Ice to melt slowly off the antennas and trees.

I believe most of our local Amateurs escaped without much damage except for the falling trees and tree limbs. I was most concerned of being outside under my trees and have a tree limb snap. A very dangerous situation.

Solar Cycle 25 is upon us. Reports say it could have a magnitude that rivals the records. There is a 95% chance that Solar Cycle 25 amplitude will fall between 153 and 305 Sun Spots and with 68% confidence that the amplitude will be 233 Sun Spots.

That will mean making DX Contacts at many hours of the day. Being retired now, that means a lot more of HF radio operation. Maybe portable this summer outdoors, while fishing at Holiday Lake, Comalara Park and Dawson Lake.

I hope your 2021 is a Safe One.

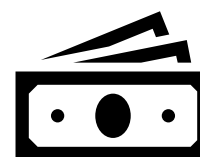
Rick NgCKL

Active Battery Checker

Article by Jeff Lovell KC9QQM

Tuning A T-Tuner

Article provided by Gary Huber AB9M



**Reminder to everyone, 2021 dues are due January 31st. Membership form and address to mail it in is on the website at www.qsl.net/wgaml

If you have question please contact Larry Gibson WB9BJG

Active Battery Checker

Article by Jeff Lovell KC9QQM

It seems that I am always in need of a battery checker ,either at home or in my case, at church for batteries going in the wireless microphones. I don't want to go get my DVM all the time and for those other myself that need to check a battery, it should be simple to use. So then I needed a battery checker that would work quickly, give an accurate reading under load and would work on both 9v and AA batteries.

Description

To accomplish these 3 requirements, I decided to use an Arduino Nano Every micro controller. The Nano has multiple analog to digital (A/D) converters that would allow the direct reading of the battery's voltage to the hundredth of a volt. Since the Nano is a 5v device, the most any of the A/D inputs would handle was 5 volts. This would be ok for the checking of the AA battery but not for the 9v battery.

For the 9v battery I used a second A/D input and used (2) 10k resistors to form a voltage divider, where the 9v positive would connect to the 'top' of the divider and negative to the 'bottom' and the tap or connection of the 2 resistors would be for the A/D input. Each A/D input would also have a resistor to ground or negative for the actual load. From my research most wireless transmitters draw about 30-50ma, so I calculated the approximate value based on that current and the 2 source voltages. For 9 volts the load was 270 ohms and for the AA it was 50 ohms.

There would be 3 indicator LED's to show the voltage level of the battery for bad, fair and good. I went with a half volt range for the 9v battery and quarter for the AA. The LED's, red, blue and white, would light at the following voltages;

	<u>9v battery</u>	<u>AA battery</u>	<u>Status</u>
Red	> 8.75v	>1.4v	Bad
Blue	>9.0v	>1.48v	Fair
White	>9.25v	>1.52v	Good

The code would read the input voltage level and enable the appropriate LED for .5 seconds then turn them off, wait another .5 second and check again. The LED's are accumulative so a 9v battery with a 9.5v reading would light all 3 LED's.

The Nano is self-contained and only needs a battery to run it once the initial programming has been done via the onboard USB connector. The battery checker would house its own 9v battery to run the Nano then would be portable. A power switch was added to remove power from the Nano when not checking batteries.



I designed and 3D printed the enclosure. The bottom half would hold the Arduino and the 9v battery that powers it and the top half would hold the LED's and power switch and provide the place for the batteries to be held while testing.

The following is the code loaded in the Arduino.

Code

```
//Init LED pins
int redLED = 12;
int blueLED = 10;
int whiteLED = 9;

void setup() {
  // initialize serial communication at 9600 bits per
  second:
  Serial.begin(9600);

  pinMode (redLED, OUTPUT);
  pinMode (blueLED, OUTPUT);
  pinMode (whiteLED, OUTPUT);
}

// the loop routine runs over and over again forever:
void loop() {
```

```

// read the input on analog pin 0:
int sensorValue = analogRead(A0)
; //input for > 5v
int sensor2Value = analogRead(A1)
; //input for < 5v
// Convert the analog reading (which goes from 0 -
1023) to a voltage (0 - 5V):
float voltage = sensorValue * (5.0 / 1023.0);
float voltage2 = sensor2Value * (5.0 / 1023.0);
// print out the value you read:
Serial.println((voltage * 2));
Serial.println(voltage2);
delay(150);

if ((voltage * 2) > 9.25){digitalWrite (whiteLED,
HIGH);}
if ((voltage * 2) > 9.0){digitalWrite (blueLED, HIGH);}
if ((voltage * 2) > 8.75){digitalWrite (redLED, HIGH);}

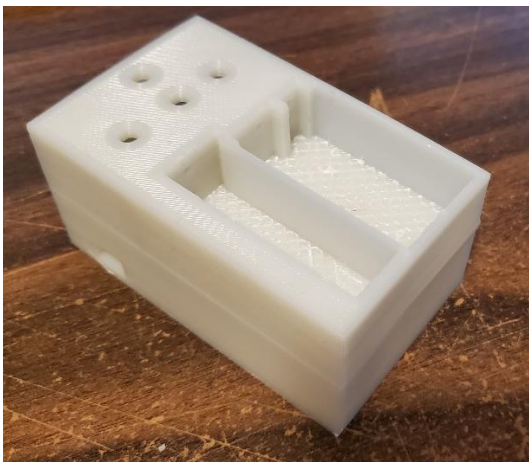
delay(150);
digitalWrite (whiteLED, LOW);
digitalWrite (blueLED, LOW);
digitalWrite (redLED, LOW);

if ((voltage2) > 1.52){digitalWrite (whiteLED, HIGH);}
if ((voltage2) > 1.48){digitalWrite (blueLED, HIGH);}
if ((voltage2) > 1.4){digitalWrite (redLED, HIGH);}

delay(150);
digitalWrite (whiteLED, LOW);
digitalWrite (blueLED, LOW);
digitalWrite (redLED, LOW);
}

```

My initial design for the case was for the top and bottom to slide together but the wiring that is between the 2 was in the way. My next revision was to design a way for them to snap together. Thanks to a tutorial on YouTube, I was able to do this and the white case was the end result.



Tuning A T-Tuner

Article provided by Gary Huber AB9M

PRESETS:

Input Capacitor (TX Side): 75% of MAX CAPACITANCE
Output Capacitor (ANT Side): MAXIMUM CAPACITANCE*
Roller Inductor (or Switch): MINIMUM INDUCTANCE**

* **CAUTION:** You MUST choose **MAXIMUM** capacitance for C-OUT - not maximum on the front panel scale. SOMETIMES MAXIMUM is when the front panel dial says "o" and sometimes it is when it says "10". To be sure, remove the cover and LOOK. Make sure you do this right. I have repeated what I wrote above because **THIS IS VERY IMPORTANT!**

** **CAUTION:** You MUST choose **MINIMUM** inductance. SOMETIMES MINIMUM is at "o" and sometimes it is at "the highest number". To be sure, remove the cover and look at the inductor. One end of the inductor will have a wire connected to it, the other end does not. MINIMUM is when the roller is at the end which has a wire connected to it.

TUNING:

START with the Inductor.

1. Use an antenna analyzer if you have one; if not, then apply a low amount of power (5 to 10w).
2. Tune the Inductor for minimum SWR.

NOTE: if you do not have any dip in the SWR, then rotate the Input Capacitors 25% and then adjust the Inductor for minimum SWR.

If it does not find a dip, rotate this capacitor the other direction. If it still does not find a dip in SWR, rotate the OUTPUT Capacitor to 75% of max and try again all of the above again.

Once minimum SWR is found with the Inductor, continue with the Input Capacitor.

3. Tune the C-In for minimum SWR. Note whether you are tuning lower or higher on the front panel scale.
4. After finding the lowest SWR, re-tune the L slightly, making sure it is set for the lowest SWR.
5. Next slightly move the INPUT CAPACITOR farther in the direction you moved it before. This will cause the SWR to go up.
6. Now re-tune the inductor for minimum SWR. Determine if it is lower or higher than the previous setting of C-IN.

If it is lower, then move C-IN slightly farther in the same direction. But if the SWR is now higher, move C-IN back in the other direction, just past its previous point, and re-dip the Inductor for minimum SWR.

Once again, if the SWR is lower, continue moving the capacitor in that direction in tiny increments, each time adjusting the Inductor for minimum SWR.

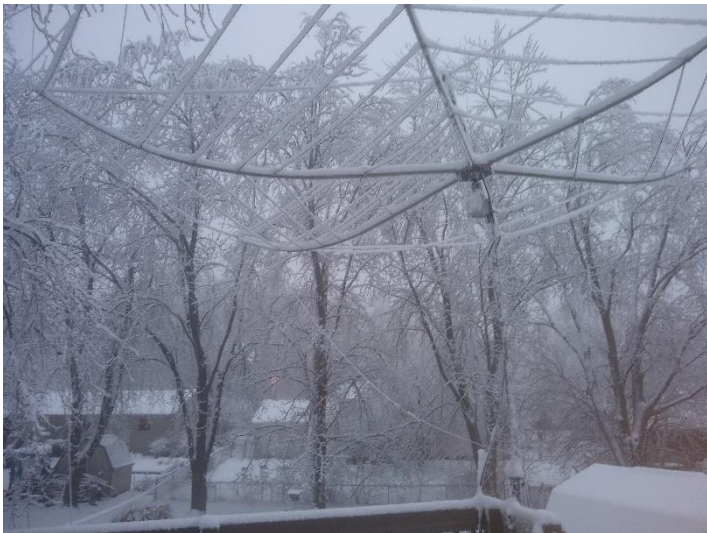
7. Determine the setting where the SWR is lowest when adjusting just C-IN and the Inductor.
8. **FINALLY**, note the level of minimum SWR and then reduce the capacitance of the OUTPUT CAPACITOR slightly.
9. Then re-tune the inductor for minimum SWR.
10. Also tweak the C-IN for minimum SWR.

If the SWR is now lower than before tuning C-OUT, then reduce (or increase) its capacitance slightly again and repeat the tuning steps for the Inductor and C-IN.

THE GOAL IS TO FIND THE POINT OF LOWEST SWR WHILE C-OUT IS AT THE HIGHEST POSSIBLE CAPACITANCE.
WHEN FINISHED, RECORD YOUR SETTINGS ON PAPER.
This was cut and paste from Ham Radio Site - <Tuning the T-Network> (djoip.de)

Ice Storm!!

Photos provided by CIRC members



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Central Illinois Radio Club
<http://www.qsl.net/wqam/>
Bloomington, Illinois

AREA NETS

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

Tuesday 9:00 P.M. 146.640 (156.7PL)
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

AREA EXAM DATES

Following is the schedule for W5YI-VEC Amateur Radio exams for the year 2020. 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.

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

2021 dates;

TBD

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 at the Peoria Superfest.

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

Bloomington, IL 61704

** Until further notice the meetings are virtual and only for members. We are sorry for any inconvenience. **

Calendar of Events

Daily Coffee Klatch Monday thru Friday

**** The weekly Coffee Klatch has been moved to the 146.64 repeater for the time being. Remember the new PL is 156.7hz *****

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 146.640-repeater at 9:00 p.m.

Weekly 6 Meter Net

Every Wednesday evening at 50.135 MHz at 8:00 P.M.

Weekly 160 Meter AM Net

Every Sunday morning at 1.915 MHz at 8:15 A.M.

75 Meter HF Traffic handling nets

NET / TIME	FREQ khz
NORTH CENTRAL PHONE NET	
M-F 7:00 A.M. central time	3912
ILL. PHONE NET	
M-F 4:45 P.M. central time	3857
SUN. 8:00 A.M. central time	3940
ILLINOIS SIDEBAND NET	
M-SAT. 6:00 P.M. central time	3905
75 METER INTERSTATE SIDEBAND NET	
DAILY 0100 UTC	3985
ITN INDIANA TRAFFIC NET	
DAILY 1230 UTC	OR
2200 UTC	3912

CENTRAL ILLINOIS RADIO CLUB
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WEB PAGE

[HTTP://WWW.QSL.NET/W9AML/](http://www.qsl.net/w9aml/)

President: Rick Suhadolc (N9CKL)
Vice-President: John Payne (AC9TN)
Secretary: Rob Cherry (N9TO)
Treasurer: Larry Gibson (W9BJG)
Member at large: Grant Zehr (AA9LC)
Newsletter/Web Editor: Jeff Lovell (KC9QQM)

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 146.64 repeater and to attend club meetings.

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Short CIRCUITS

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