



FEEDBACK

The Official Newsletter of the Georgian Bay Amateur Radio Club

May 2020

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This Month

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2020 Executive

PresidentTom VA3TVA
Vice-President... Frank VA3GUF
Treasurer.....Bobby VE3PAV
Secretary.....Peter VE3BBN



The May Meeting is cancelled

President's Message



Tom VA3TVA

VA3TVA: What day is it?

XYL : Thursday . . .

VA3TVA: Awe crap, I'm late

XYL: Um. you do know that you didn't come with the right bits to be late right?

VA3TVA: Don't start that sillyness now, I've got a presidents message to write, Tom will be waiting on me,

XYL: HE HE HE HE

Yep, our news letter comes a little late again, because of me. Sorry. I don't know how you retired folks do it. The past couple of weeks, I haven't been able to keep my day or dates straight. I can see that when I retire, I'll be marking the days off on the calendar like a little kid counting down to Christmas, And now that I'm back to work, I'm falling asleep at the dinner table. This to shall pass.

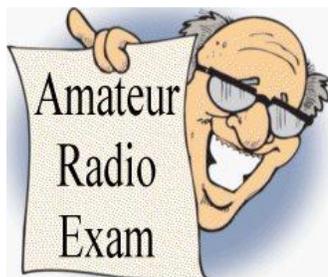
It's great that restrictions are starting to ease. And I'm like a ground hog coming out of hibernation. Sun burnt and the whole bit. When I was asked last week about a meeting for this month, I simply said no. I didn't consult with any of the executive, I went and go all Presidential and just said no. Looks like our next meeting will be September. . . . I hope.

FIELD DAY!!! No decisions have been made. Frank and I have had a few discussions. We've talked about 2 or 3 private locations, out of a private property, but not in a home. Operators would sign up for a time slot, time would be left between time slots to wipe/clean up space and equipment between operators. Another option, weather permitting, is a private land owner. If things stay dry, cars can drive to the back field, campers can drive to the back field. And we set up much as we have at any other field day. Ofcourse observing social distancing and such. We never really have a big crowd to field day, and being out of sight for the most part, would not draw a crowd. I would love to have every ones thoughts and idea's on the matter. I havn't heard anything from RAC or AARL about field day. I think it would be great if they would nudge it out of early August. But that is all up to them.

I do hope that every one is staying safe and healthy. And now that the nice weather has returned, Go get some fresh air. Go play out side. You all look a little pale and pastie as thought you've been too focused on late night rare DX.

Best wishes all, 73

Tom



Would you like to write the amateur radio exam

or upgrade the qualification you have? The pass mark for a written examination is 70%. However, a pass mark of 80% provides the candidate with additional HF operating privileges (< 30 MHz). This is referred to as "Basic with Honours" or "basic +.". Just send an email and we will get back to you... 73 Tom VA3TS (*Delegated Examiner*)



Congratulations to Rob Walker VE3RWY who has recently passed the exam.

Friends of GBARC weekly get together ... On the Air

The club meets each Wednesday evening on VE3OSR 146.940 T97.4 hz at 7:30 pm local time and on 3.783 Mhz +/- immediately following.



How to Build and Use a Ground Tuning Unit *John Corby, VA3KOT*

What is a Ground Tuning Unit (GTU)?

Imagine being able to make the entire planet resonant on your HF operating frequency. Well maybe not as an antenna but this device enables you to create a good resonant ground for your station. It is essentially a series L-C tuned circuit with a meter to indicate current flow through the device. It is a very simple device to build although, if you are not a builder, you can buy one from MFJ (mfjenterprises.com/products/mfj-931).

How to Use a GTU?

If you are operating from a location where it is not possible to create a good permanent RF ground – e.g. in an apartment or a trailer – a GTU will simulate RF ground and can be used to tame stray RF in the shack.

I like to operate a portable field station, either in my trailer or in a park or on a trail. My

This is a device that replaces the radials or counterpoise. Can be tuned to allow the maximum grounding current to flow thus ensuring maximum antenna radiation.

home-brewed GTU acts as “the other half” (ground-side) of a quarter-wave vertical antenna. The GTU is tuned for maximum current flow and the radio sees a simulated

resonant quarter-wave on the ground side. When the ground current is maximized so is the radiated energy from the antenna.

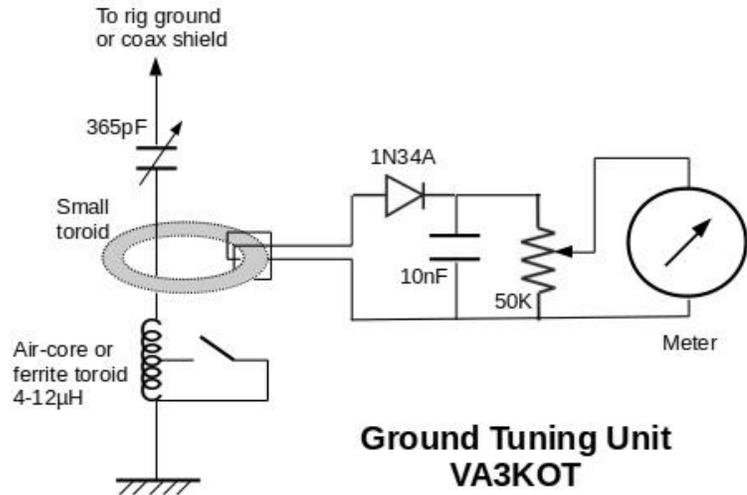
A radio connects to one end of the series L-C tuned circuit while the other end is connected to a short counterpoise wire laid on the ground. Alternatively, the other end of the tuned circuit can be capacitively coupled to



ground using a vehicle body or even a small metal plate. A detector circuit rectifies the RF current and feeds a small DC signal to a meter.

How to Build a GTU?

My inspiration came from G4AKC (<https://www.g4akc.co.uk/ground-tuning-units-gtus/>) but I simplified his design. I replaced G4AKC's variable inductor with a fixed inductance wound on a toroidal core. Using a spreadsheet I calculated the values of L and C that I needed for the bands I like to operate. My fixed inductor has one tap that can be shorted to one end of the coil using a simple switch. With this arrangement I can tune 20m and 40m with some of the inductor windings shorted, and 80m with the full inductance.



Switch open – 80m, switch closed – 40/20m
Adjust meter pot for any reading while transmitting
Adjust variable cap for max reading on the meter

How Does It Perform?

My GTU actually performs amazingly well. I have used it on many field trips, even making DX contacts. I am a builder by nature and built my GTU out of components I had in my junk box. It is doubly satisfying when you operate using equipment you built yourself.

Solid-State Pilot Lamps By Phil Salas – AD5X

Introduction As I'm sure you know, many old and even new brands of ham gear use the popular #44, #47, and #51 pilot lamps. My latest restoration project, a Johnson Ranger, has five 6.3VAC pilot lamps, each drawing 250 milliamps, for a total of 8-watts dissipated power. And three of the pilot lamps are enclosed in impossible to replace items on the Ranger – namely the dial (two lamps) and the meter (one lamp). Long-term exposure to the approximately 1.5 watts per lamp of heat in these enclosed places was a concern to me.

All Electronics (www.allelectronics.com) sells 5 mm 3000 mcd white LEDs for \$2 each

(LED-75). These are three times brighter than the original Ranger pilot lamps. However, LEDs do have a narrow viewing range so they can normally only be used when the lamp is mounted such that the LED faces forward. In the three enclosed pilot lamps of the Ranger, the pilot lamps do face forward so these would be perfect for LED replacements.



Making the LED Pilot Lamps

First of all, most of the ultra-bright LEDs have normal operating currents of about 20 milliamps. In order to properly set this current, I put a 500-ohm pot in series with a 6.3VAC source and measured the current on a multi-meter. Remember that LEDs are diodes, so they rectify the AC voltage and therefore LED polarity doesn't matter (obviously polarity does matter if the LED is driven from a DC voltage source). Using this methodology, I determined the series resistors necessary to provide 20 milliamps from a 6.3VAC source for most ultra-bright LEDs is as shown in Table 1 below:

Table 1

<u>LED</u>	<u>Fwd Voltage</u>	<u>Series Resistor</u>
White	4V	82 ohms
Green	3V	100 ohms
Amber	3V	100 ohms
Blue	3V	100 ohms
Red	2V	120 ohms

Depending on your particular LEDs, LED current, and voltage sources, you should probably make this same measurement to ensure that you pick the correct dropping resistor for your application. Incidentally, when using AC sources, it is best to either put a second LED reversed across the first LED, or connect a diode across the LED as shown in the schematics. The reason is that the maximum reverse voltage is only around 5-6 volts, and most AC sources can exceed this. So a second LED (which will double the output) or a diode will restrict the reverse voltage applied to the LED to a safe value. I didn't worry about this for my 6.3VAC source and haven't had any problems, but I would certainly do it for higher AC voltages.

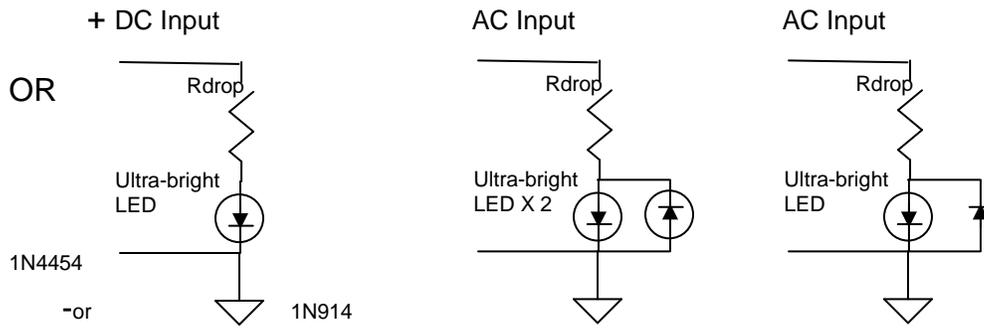
Building a pilot lamp substitute is easily done if you can build the ultra-bright LED and dropping resistor directly into the associated pilot lamp socket. In my case, the pilot lamps all used bayonet bases. I chose to purchase some #47 bulbs (All Electronics #LP47 @ 2/\$1.00) and sacrifice them for this purpose.

To prepare the LED-lamp base, do the following:

- 1) Put on safety glasses!
- 2) Wrap the pilot lamp in a small plastic sandwich bag and gently crush the glass part with pliers.
- 3) Using the pliers, gently squeeze and rotate the base. This should break up the remainder of the glass in the base. When through, ensure that the base is as round as possible.
- 4) Shake out the glass, and then use a solder-sucker to remove the solder from the tip of the base.
- 5) Using needle nose pliers, pull the remaining pieces of bulb and wiring out of the base. If necessary, re-use the solder-sucker to clear out any remaining solder.

The schematic circuits are pretty simple.





Gather up the necessary parts. In my case, I used the 3000 mcd ultra-bright white LEDs discussed earlier with a ¼-watt 82-ohm series resistor. Refer to the first photo.

Now, cut one lead of the resistor, and one lead of the LED to 1/8-inch. Overlap these short leads and solder them together. The use of one of those desk-top “helping hands” is great for holding these parts together while soldering. Now bend the remaining LED lead over and up as seen in the second photo.

Insert the long resistor lead through the hole in the base until the body of the resistor bottoms out in the base. Solder the resistor lead in place. Now solder the bent-up LED lead to the side of the lamp



base. If you'd like, you can fill the base with epoxy or hotglue to give it some stability. I didn't find this necessary. Clip off excess lead lengths and you're done. Refer to the last photo. Now you can just insert these LED Pilot Lamps into the original pilot lamp sockets. You've decreased the current drain by at least a factor of 10, and significantly increased the reliability of the lamp. In most cases, the intensity will be noticeably brighter.



The Other Two Ranger Lamps

The remaining two lamps (“ON” and “TRANSMIT”) used in the Johnson Ranger mount vertically behind the front panel, and the light is actually picked up from the side of the lamps and transmitted through two jewel assemblies to the front. These jewel assemblies have an inside diameter of 5 mm, therefore the 5 mm ultra-bright LEDs would fit tightly into these assemblies. Since the jewels have red lenses, I went ahead and used lower cost ultra-bright red LEDs for these two locations (All Electronics LED-94 @ \$0.75 ea). As it turned out, these LEDs were too bright at the full 20 milliamps of current! To get the brightness to that of the original pilot lamps, I soldered a 1K-ohm series resistor from the applicable 6.3VAC source to one lead of each LED, and a ground wire to the other lead of each LED.



Conclusion

Building LED replacement lamps for normal incandescent pilot lamps is not difficult, and no longer expensive due to the improved prices on ultra-bright LEDs. You'll probably never have to replace a pilot lamp again after making this conversion.

A Hobbyists Hobbyist ... editor

For some time now, I have been friends with Don VE3IDS and am always impressed with the skills and abilities exhibited by Don.

Here is a small record of a few projects that Don has recently completed, I'm sure you will agree they are all top notch and a fine example of a hobbyists hobbyist. The text below is from Don
Tom VA3TS

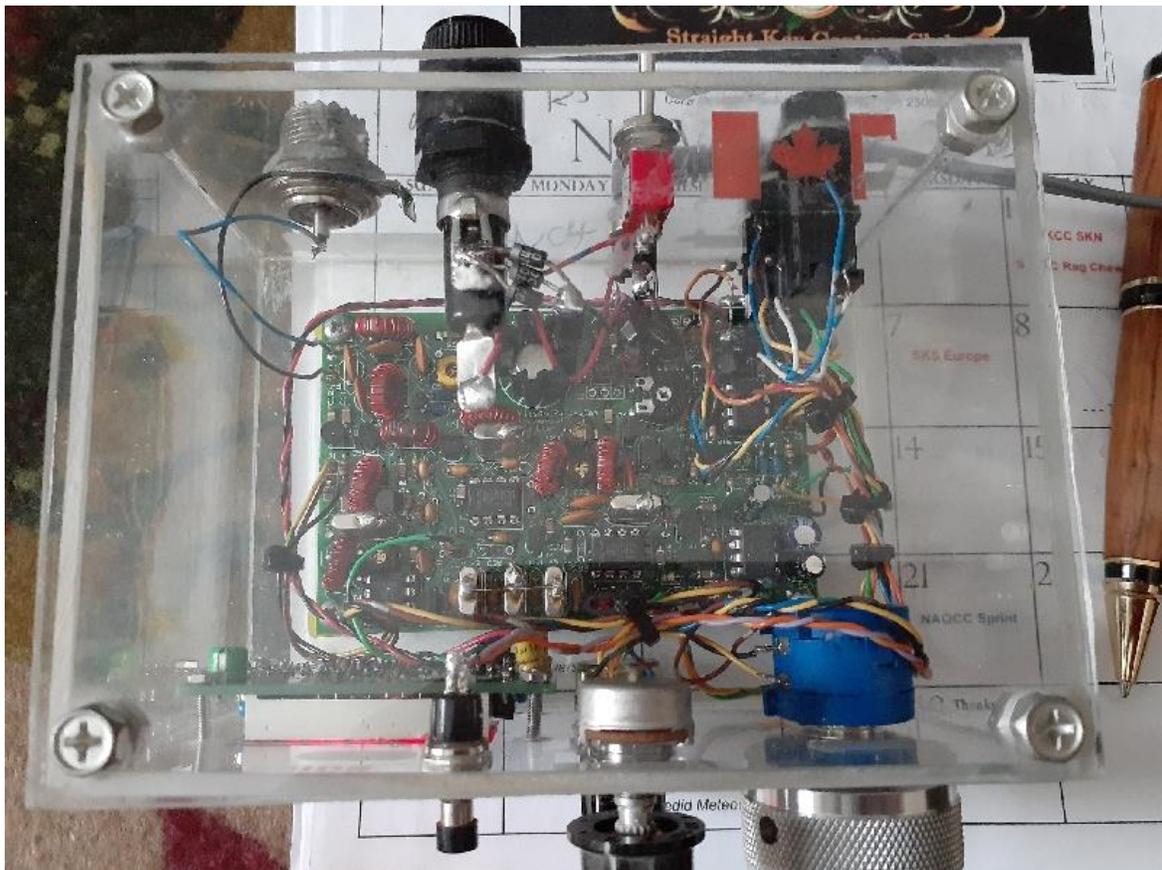


A replica of an old time telephone mic





I hooked up my one watter QRP rig today for fun and worked France. Who says the bands are dead?



Here is what I've been working on. I just finished the build of this bug this week. It is oak with Osage Orange finger pieces. I used magnets instead of springs for the dot lever return and between the two pivot arms. There is a reed switch inside the end cross piece that is actuated by another magnet at the end of the pendulum arm. The pivot arms have ball bearings top and



bottom. I used a sub mini pushbutton switch for the dash contact. The sliding weight ranges from 17-45 wpm. No lock is needed on the weight, it stays put on its own.

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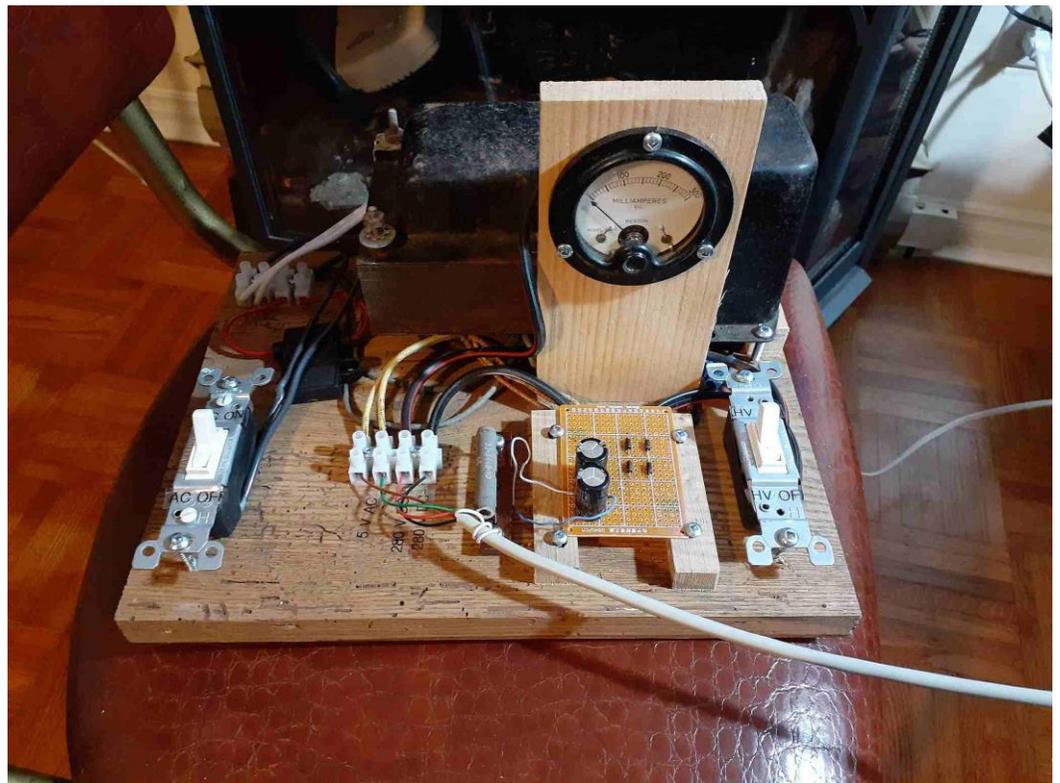




With the spare time at home, I have been playing on the bench. I built a '29 era transmitter from a 1934 QST. It uses a pair of #245 tubes in a push pull collpits design. It runs on 80 and 40 metres with a maximum of 3 watts output. The coils are wound from some heavy square copper wire that I think was for large transformer

winding. Even the board is vintage, it was in the scrap heap in the old barn. It cleaned up in the planer. A very enjoyable project with lots of learning along the way.

I have had a successful on air test of the transmitter. Last night I had a group of friends from around the province listen to it. It had a very bad growl, I likened it to a bad sore throat, others said it sounded like their cat when it was very mad hi hi. I made a recording of it and will attach it here. Today I converted the heater supply to DC and it is much better. The rig will tune 80 and 40 metres as well. The main cap I ended up using was only 205-205pf and I paralleled a couple single sections of 150pf



on each side. With the extra caps meshed, I get 80 meter coverage and with them opened up I get 40 with the same tank coils. I haven't tried it on 60, but I expect it works work there as well. It seems pretty stable, I was pounding on the hand key right beside it on the same table during the tests. The second clip is after the heaters are on DC. One question for the group, this is from a 1934 QST, is it considered a '29 rig for the BK?

Websites of Interest Copy/Paste the urls below into your browser

Handy On-Line Calculators

[Toroid Coil Winding Calculator](#)

[Inductance Calculator](#)

[Various Useful Calculators](#)

[Elsie Filter Design & Analysis Software](#)

[Return Loss and Mismatch Loss Calculator](#)

[L/C Impedance Matching Calculator](#)

[Coil-Shortened Dipole Antenna Calculator](#)

Ham Radio Museum

<http://www.radioing.com/museum/index.html>

Lightning Maps

http://en.blitzortung.org/live_lightning_maps.php?map=30

Voicemeeter Potato Audio Mixer

<https://www.vb-audio.com/Voicemeeter/potato.htm>

Made in Canada

<https://madeinca.ca/>

Finally: Native USB Boot without SD card for the Raspberry Pi4 (SSD Boot)

<https://youtu.be/zVhYvvrGhMU>

Minutes of Meeting

Due to covid-19, the April meeting was cancelled

See the March newsletter for thye last minutes

<https://gbarc.ca/archive/nl2020mar.pdf>



The Last Word

A few words of appreciation to those that contribute to this newsletter by submitting news stories or interesting web links or ideas. If you have something then send it to <https://gbarc.ca/mailus.php> , any format, any size, anytime, but if you want it to appear in the current months newsletter, then send it by the 3rd Tuesday of the month.



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Membership for details regarding membership in the club go to:
<https://www.gbarc.ca/gbarcmembers.php>



The next newsletter will be in June.

