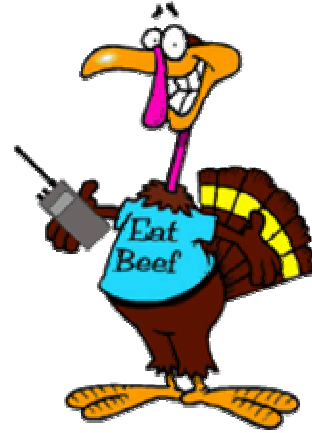


# MERCURY AMATEUR RADIO ASSOCIATION

## MARA - NORTH AMERICA - NORTH EAST

# November 2007

# Newsletter



A time of giving thanks for all of the many things with which we have been blessed, for being able to worship as we choose, and for living in a country where freedom is a right and not a privilege.

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### MESSAGE FROM THE TOP

Question: So Why are we doing this?

Answer: We do not know, except we have been counseled.

One of the more difficult things we do in the church is to field questions about why we do the things we do. Sometimes there are relatively clear scriptural mandates which guide our actions. In other instances, we can cite church authorities' council. But there are times when we act based upon personal revelation, the promptings of the spirit, or something we have learned to trust by personal experience.

We who have accepted callings or personal prompting to build electronic

communications skills and organize operational areas may have to answer questions about our plans and actions from those both inside and outside the church. My first response is often that our church leaders have indicated that this is needed; not superseding other council and direction, but as appropriately applied, supportive of that counsel. Given the much more robust communications infrastructure of the world today, cell phones and the Internet, we could easily be seen as duplicative and unnecessary. We may even be questioned by local church leaders; why is this needed in our day? Under what conditions would you expect this technology to be used? The short answer is, we do not know, any more than we can speculate on the need for being out of debt, or having a one year supply.

Spinning scenarios of gloom and doom are not generally helpful, except to illustrate where there may be vulnerabilities. Our services may not even be employed in any manner or location we currently think likely. But prepare we must. We are not unlike the guard on the watchtower; waiting and waiting, not feeling like we are

accomplishing anything of consequence in the kingdom. But when Priesthood authorities sound a warning, we must be ready to light the signal fires and raise the alarm.

I encourage all to participate in the Saturday morning net as a rehearsal for the time when the messages exchanged will have dire consequences attached, always caring for and supporting each other, and operating under proper authority.

In this season of thanksgiving, let's remember to thank our Heavenly Father for the opportunity to know and to serve.

73  
Bruce, N3IA

--- MARA NE ---

### IN THE DECEMBER ISSUE...

QSL CARDS – COMMERCIAL OR ROLL YOUR OWN?

## TECH STUFF

### SIMPLE FIELD STRENGTH METERS

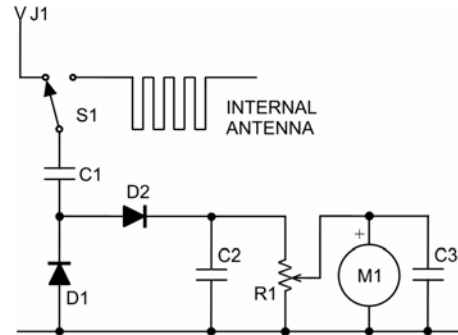
#### PART 2 – CONSTRUCTION OF ONE VERSION

Over the years I've had a half dozen or more field strength meters built from various designs.

With a few modifications to the circuit OF figure 3 in last month's newsletter, the one shown in figure 1 above is the one I use for now.

Capacitor C1 couples the RF (radio frequency) from the antenna to the diodes.

It also provides some protection for the diodes against excessive DC (direct current) voltage when using a probe (instead of an antenna) to



C1, C2, C3 - Capacitor - .001  $\mu$ F  
D1, D2 - Diode - 1N34A  
J1 - Jack - antenna, BNC  
M1 - Meter - 50  $\mu$ A  
R1 - Resistor, variable - 820K  
S1 - Switch - SPDT

Figure 1 – VE1VQ's latest version

detect RF in oscillator circuits. Diodes D1 and D2 are configured as a voltage doubling circuit to rectify the incoming RF from AC (alternating current) into a DC voltage. Capacitor C2 filters or smooths this voltage further before presenting it to the meter via the sensitivity control, variable resistor R1.

A toggle switch was added to select between the internal and external antennas. Most of the time I use the internal one, but the jack is there for such things as comparing 'rubber duck' and other antennas, or for more sensitivity.

Another .001  $\mu$ F capacitor (C3) got added across the meter terminals to eliminate possible RF pickup by the meter itself.

Several of the parts came from an old defunct Radio Shack SWR (standing wave ratio) meter (meter movement, variable resistor, and the germanium diodes). The perf board and the plastic case came from the local Radio Shack store. The rest of the parts were from the junk box.

I use an older version of the drawing program XARA to do all my cutting templates (and all of the drawings in the newsletters). They are printed out at actual size and glued to the surface using rubber cement. This not only provides me with

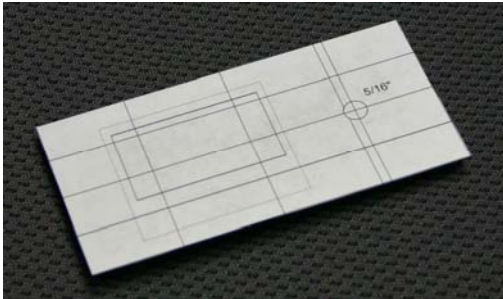


Photo 1 - The cover with the template in place ready for material removal

accurate cutting lines but also gives the surface some protection against scuffs and scrapes.

For this job, where the cover is made of plastic, I used a quarter inch router bit chucked in a drill press to remove material for the meter hole. I briefly considered a router and router table arrangement until I remembered how fast the cutter turned, picturing my injured fingers. After the course material removal, I used a flat file to carefully cut the plastic back to the lines on the template.

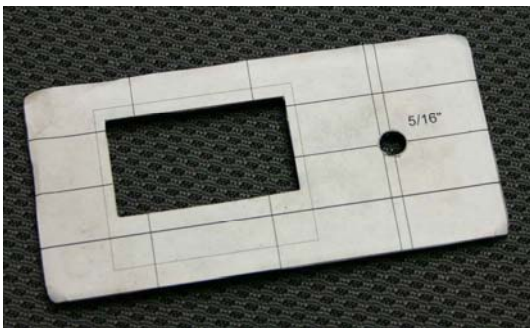


Photo 2 - Holes cut for the meter and for the sensitivity control.

Starting with a 1/8" bit in the drill press, I increased the bit size until I had a smooth 5/16" hole for the sensitivity control. I also drilled a locating pin hole to keep the control from turning. Once the cutting and drilling is complete, remove the paper and clean off the rubber cement residue by rubbing with your finger.



Photo 3 – Inside cover showing studs for meter mounting.

The meter is mounted with the old bracket from the SWR meter and a pair of computer D-type connector stand-offs fastened with super glue to the back of the cover. This glue will not take much lateral strain but is fine for the job intended.

I could have left the meter face in its original state but I thought a new one might look better. I removed the plastic front and



Photo 4 – Old meter as it came from the SWR meter.

levelled the meter face on my flat bed scanner, taking care not to damage the pointer.

Importing the scanned image into my drawing software allowed me to accurately overlay the meter arc line with a wider blue one. I could then figure out the degree spacing required for the lines and the larger numbers. While the lines were placed exactly, the numbers were set by eye until they looked good. Once satisfied with the artwork, I used an ink-jet printer to transfer it to photo paper. With rubber cement, I glued the new scale in place over the old one.



Photo 5 – New meter scale in place.

The few components are mounted on a small perf board. I could have made a printed circuit board but the pre-drilled experimenter board from Radio Shack was more convenient and less time consuming.

The circuit board is tucked in a handy slot at the end of the case. I had thought about using standoffs or double-sided tape but decided in the end to go with simple.

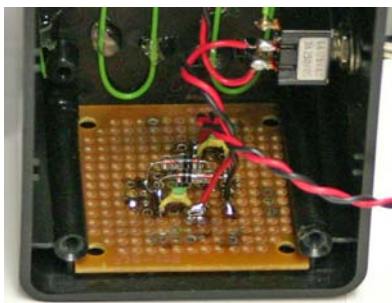


Photo 6 — The few parts mounted on the copper side of a Radio Shack experimenter board.

A length of hook-up wire for an internal antenna was attached to the inside bottom of the case with a dab of hot glue at various points. The toggle switch on the top chooses either the internal or the external antenna.

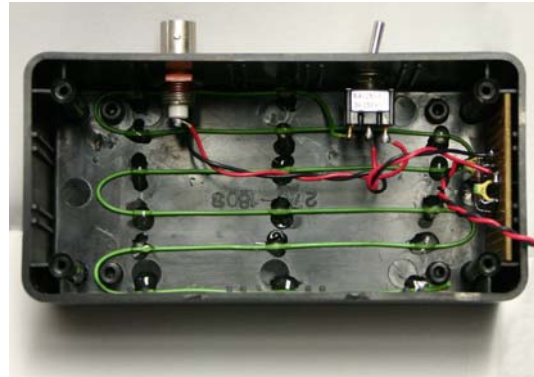


Photo 7 – Inside of the case showing the internal antenna (green wire) and selector switch, and the circuit board placement.

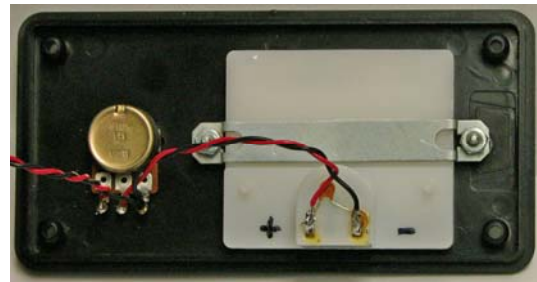


Photo 8 – Inside of the cover showing the sensitivity control and the meter with mounting strap.

There is an increase in the meter reading when the external antenna is plugged into the FSM and the input is switched to the internal antenna. This is due to the external antenna being in proximity and coupling to the internal one. The same effect can be seen by bringing your hand near the box when using the internal unit.

The internal antenna is somewhat directional with maximum meter deflection being when the front or back of the case is toward the antenna. This is most noticeable

with a handheld and a small antenna as the source.

Four rubber feet on the bottom of the case and it's ready to use. An alternative for the rubber feet are the cork or felt pieces used to reduce the noise of cupboard doors closing.

So, that's it for this month. I hope this project has given you some ideas that you can use to build a field strength meter, or that you can incorporate into something else you build yourself.



Photo 9 – Finished field strength meter.

--- MARA NE ---

## DI-DAH-DI-DAH-DIT

### STUFF

Attempting to reduce the number of carry-on bags down to the maximum two for a recent commercial flight made me wonder why I needed to travel with all this stuff. A couple of years ago I bought a student backpack to make it easier. Everything in one bag – should be simple! But now a few years later and it's full! It hasn't any more room to expand! I used to be able to take a change of clothing or two, a razor, toothbrush, and a camera. Now, besides the afore mentioned things, I've got extra re-chargeable batteries, storage cards, card reader to download and store, and an assortment of many cables to go with it all. I also have a couple of books for the flight that I can't read because of motion sickness, motion sickness pills, a handheld GPS and cables (so I can know where the plane is?), trip reservation documents and passport, 2m handheld, and a laptop computer (with more cables). Is it any wonder airport security use my bags as a training exercise?

That and last months scribble on junk boxes got me to thinking about the stuff I've gathered, collected, acquired, etc., over the years.

What requirement does all this "stuff" fulfil? Is it, "this will make my life so much easier" kind of stuff? Is it "I really need this stuff now" kind of stuff? Or perhaps it is "I might need this some day" kind of stuff? Or is it like some kinds of food are for some people – comfort stuff.

And isn't it interesting how others don't value my stuff like I do. My daughters have informed me that if I don't clean out my office, that after I die, they will come in and throw it all away.

I don't know the answers. I just know my backpack is getting much too heavy and my

office much too cluttered. But I also know that I can't bear to throw anything out because I just know that I will need it again some day.

Until next month,

Dave  
VE1VQ



**YOUR QSL CARD COULD BE  
UP IN LIGHTS!** 

**How about scanning your QSL  
card and sending us a copy for  
inclusion in the newsletter?**