

# NEWSLETTER

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Mercury Amateur Radio Association - MARA - North America - North East



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E-mail your comments, ideas, or submissions to [marane@mara.net](mailto:marane@mara.net)

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**VIEW** from the

# FEATURE ARTICLE

by VE1VQ

## WHAT'S ALL THIS STUFF ABOUT GENERATORS?

or

## WHAT TO DO *BEFORE* THE LIGHTS GO OUT

This article is adapted from a presentation to my Stake Bishop's Council several years ago.

## PART ONE

### BASIC GENERATOR 101

Generators come in various sizes, ranging from small portable units you can lug with one hand to large commercial plants on trailers. Generally what you need for residential emergency backup is something in between. Your needs (and your pocket book), rather than your wants, should determine what you buy for a generator. You won't have to run your generator twenty-four hours a day. You only have to run it during waking hours and most likely not even for all that if you have an alternate heat source or the temperature is moderate. Units suitable for an average house range from 4000 watts to 6500 watts if you lower your wants to your needs. Prices tend to take a jump over the 6500 watt level. Note that this size of generator will not power the electrical needs of an entire house. An average house (non-electric heat) will require somewhere in the 15-20Kw range to operate everything at once. In reality the smaller ones, such as the 2500 watt level, device operation will have to be staggered (run the refrigerator for a while, disconnect and run the freezer). Larger ones will support more devices at once and will be built heavier.

### HOW LARGE A GENERATOR DO I NEED?

The answer to this question is like the reason for providing someone with Fast Offering – to sustain life and not to maintain lifestyle. Operating your entire house can be done but not within the budget of most of us.

Start by listing, on a piece of paper, what you really must have to keep reasonably comfortable during a prolonged power outage. Things like freezer and/or refrigerator to keep your food from spoiling, furnace for heat, microwave to cook with, water pump if you live in a rural area, limited amount of house lighting, television and/or radio to keep posted on local news & weather bulletins, your ham gear, and perhaps the electric water heater. Once you have all the things listed you need take your piece of paper and pencil and look for the plate on each item giving the power in watts or kilowatts (1 kilowatt = 1000 watts, 1.5 kilowatts = 1500 watts). This is the wattage. By each device on your list, write down the figure. Items like freezers or furnaces will have two wattages although they may not be shown. They have motors, which will require more power (watts) to start, and less once the startup is complete and they are into normal running operation. Use the start or surge wattage for your calculations. If you can't find the plate then use the figures from Appendix B (in next month's newsletter). Add all of the individual wattages for the total wattage required. This will show you what the ideal generator is for your needs. See Appen-

dix A, in next months newsletter, for examples of calculating your generator requirements.

## HOW DO I CONNECT THE GENERATOR TO MY HOUSE?

Buying a generator and getting it home is not all you need to do to prepare for the next power failure. The middle of a stormy night without lights is not the best time to be looking for the manual. Safely connecting and operating the generator are the next steps. There are several ways to connect your generator. Some of them are not only illegal, but also highly dangerous. Always observe safety precautions and local electrical codes.

**Don't wait until the lights go out before unpacking your generator.**

### CONNECTION

Connect the generator to the house only by approved methods. Never feed the output of the generator into a

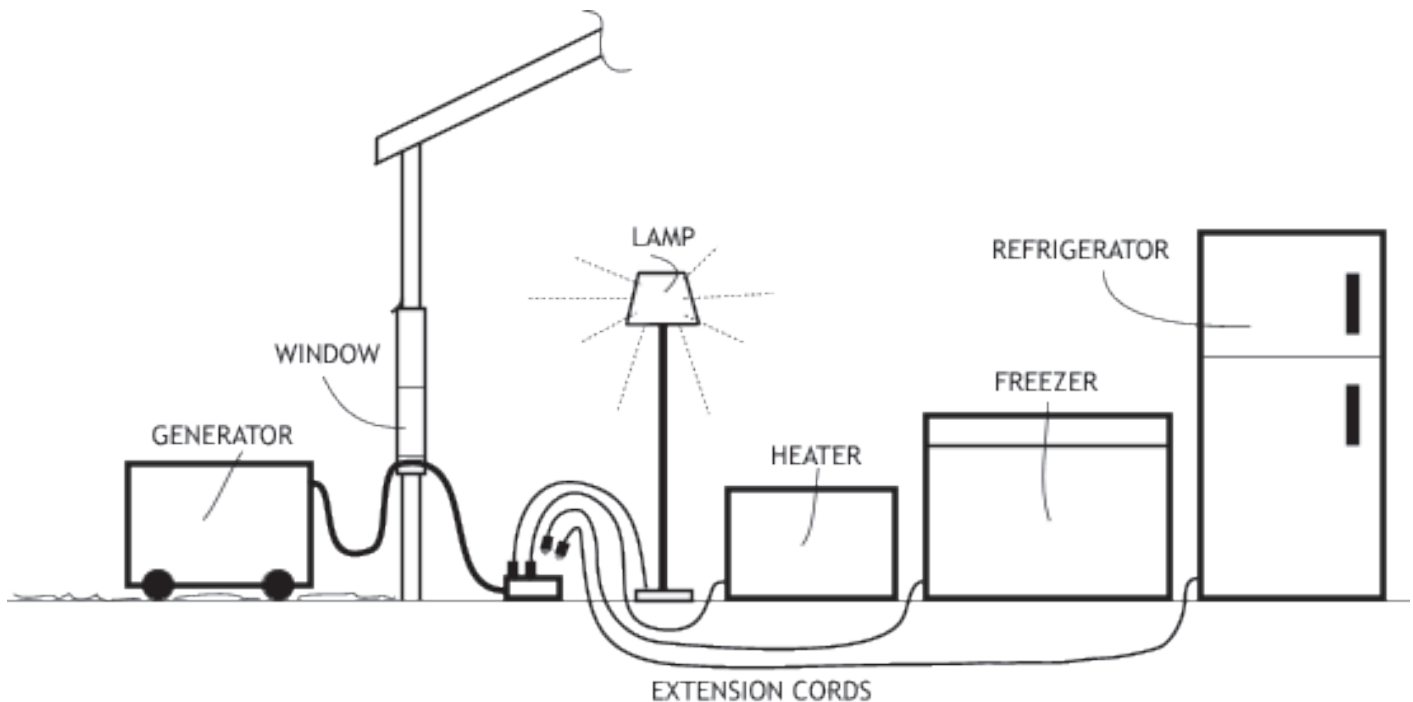
“dead” line. Should the main power source come back on while your generator is providing power, you may be lucky in having only the generator’s protective breaker open. On the other hand, you may not be so lucky and have a destroyed generator.

### DIRECT CONNECTION

The first and simplest is a direct connection to your appliances with extension cords. If you are mainly interested in keeping the food in your refrigerator and freezer from spoiling, buy good quality extension cords of a sufficiently heavy gauge wire. Unplug the appliance from the wall and, using the extension cord, plug into the generator outlet. This method will also let you keep warm with a space heater powered from the generator and provide light from lamps. It will not let you run your furnace or any other item permanently wired into your house electrical panel. See example #3 in Appendix A for more information.

### TRANSFER SWITCH PANEL

The transfer switch (or generator) panel connects the back-up generator with the electrical system of your home. It is the either/or switching system that allows



## DIRECT GENERATOR CONNECTION METHOD

wall or dryer socket. Doing it in this manner may feed power out of your house, through the transformer and into the power lines (known as “back-feeding”). This can injure or kill a power company employee working on a

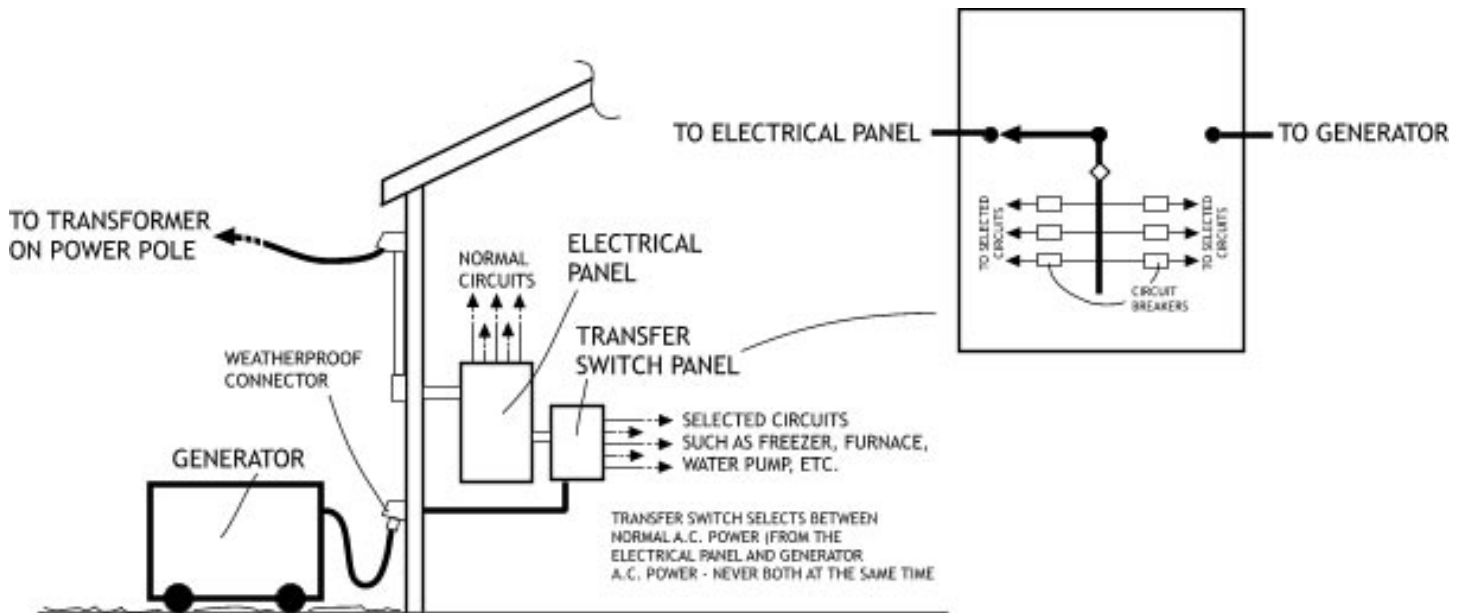
the homeowner to switch between power provided by the electrical utility and the generator. A properly installed transfer switch panel allows selected appliances to be powered from your generator. They come in

manual and automatic. The manual one requires that a switch be physically thrown to select the power source (from the power company to the generator) and the generator manually started. The automatic version waits for a short period of time (just in case the power comes back on) before starting the generator and transferring the source. The automatic switch will cost you more for the convenience, but if you have sensitive stuff that you must keep powered then the automatic is the only way to go.

Unless you know exactly what you are doing<sup>1</sup>, have a qualified electrician install the transfer panel and make the necessary wiring changes. Power from the main elec-

Gasoline will start to break down into engine clogging components after a couple of months unless a stabilizer such as [STA-BIL](#) is added. According to the manufacturer, with this additive, gasoline shelf life can be extended to fifteen months. Diesel may be stored for up to two years without additives.

If you use gas, rotate it every month by dumping it into your vehicle and refilling the container/s with the correct grade. Use an approved container and clearly mark it "FOR GENERATOR USE ONLY" or something similar. Use only the gasoline fuel grade recommended by the manufacturer.



## GENERATOR CONNECTION WITH TRANSFER SWITCH

trical panel is fed via a dedicated double-pole breaker of the appropriate amperage rating. If your transfer switch panel has a 30 amp capacity then your main panel breaker should be a 30 amp unit (similarly, if your transfer switch panel is rated for 60 amps then you would use a double pole 60 amp breaker). If you are considering this for new construction, panels are available which combine a transfer switch and circuit breakers with a residential electrical panel, all in the same box.

### WHAT KIND OF FUEL?

The most commonly available fuels in my area (Atlantic Canada) are gasoline, diesel and propane, with the first two being the better choices in times of trouble. Of the two fuels, gasoline is the most easily obtained but the hardest to store. For those of you in other areas, propane or natural gas may be a more attractive alternative.

Generally, gas powered generators are lower in purchase price than diesel. On the other hand, diesel units are heavier built and should last longer. Generators under 10,000 watts are usually gas powered, while those over 10,000 watts are commonly diesel.

If you have an oil furnace then this fuel may be used instead of diesel from the service station pump. You save money by not having to pay highway taxes. You also have larger storage capability with your oil tank. Have your furnace service people install a tap to draw off fuel as required. There are diesel additives<sup>2</sup> on the market that compensate for low sulphur and lubrication content.

### SAFETY

#### OPERATING LOCATION

Never operate a generator inside the house or garage.

# Grandma Mara's RAMBLINGS

Exhaust gasses are produced which will kill. Maintain a ten foot distance between your generator and house or garage. If the operation site is susceptible to theft then chain and padlock the generator to a solid point. Generators are prime targets during a power outage. Consider installing a wheel kit to make the generator easier to move if you plan to store it in a different location than where you will operate it. Never operate the generator in a wet environment. Electricity produced by any size generator can kill.

## FUEL STORAGE

Store the fuel only in approved containers and apart from the generator. It is easier to store fuel in several smaller containers than in one large one, in that it is easier to lift the small one to refill the generator.

## REFILLING

Never refill the generator while it is running or hot. Allow 5 –10 minutes for the unit to cool off after shut down. Fill with clean fuel through a strainer. Use the fuel grade recommended by the generator manufacturer.

## MATCHING VOLTAGES

If your generator has outlet sockets for both 120 and 240 volts and you wire your own cables, make sure you plug your devices into the correct socket. Failing to do so will damage either the generator or the appliance/s. Also, be aware that you cannot take the maximum rated current from both the 120-volt outlet/s and the 240-volt outlet/s at the same time. The total current (and hence, the total power) from all outlets must not exceed the maximum generator rating. See Appendix A, Example #3, in next month's newsletter, for the formula giving the relationship between current and power.

## MANUAL OR ELECTRIC START?

Generators are available with manual (pull cord) or electric start (and sometimes both). The choice is up to you and may depend somewhat on your upper body strength. Electric start models typically cost a bit more and there is the additional care of the battery to consider.

<sup>1</sup> If you want to [install your own transfer switch](#), check out a how-to reprint from the March 1998 Popular Mechanics magazine.

<sup>2</sup> <http://www.ask.com/questions-about/Diesel-Fuel-Additive>

Next month - Generators (Part 2)

After the run-in with the bikers described in last month's column it seemed to me that it might be time to begin the leg for home. The nights were cooling off, although the days were still warm. Home seemed to be calling. Or perhaps it was the e-mails from the grand children telling me what was going on in their lives that I was missing, making me sort of homesick.

I'd made a lot of friends on this trip. I've always noticed that you find good people wherever you go. You find bad people too but more good than bad, in my experience. And they were right - I didn't need a personal sidearm to feel safe north of the 49th parallel.

There were still some Church historical sites I'd missed on the way out that I wanted to see. At my age, I might not be riding a bike for much longer, and since I was already having to go back by them (more or less!), I guessed it would be a good time to do it.

My Bishop had recently e-mailed me wondering how I was doing with my emergency communications calling and I had to confess that I hadn't done much, other than to get my antenna and coax installed before I left. That needed to be tested and adjusted before cold weather set in. So, regretfully, I got out my maps and programmed my GPS for the return trip.

Crossing the border back into the States was not the same easy task as it had been crossing into Canada. No friendly smiles I can tell you! The folks on our side inspected every vehicle, inside and out; sometimes using mirrors to check the undersides. They were rather suspicious of a post middle age lady on a Harley but since there aren't a lot of hiding places, they finally (reluctantly it seemed) had to let me continue. Welcome back to the land of the free, Grandma.

*Grandma Mara*

# CULTURED CORNER

by ANØNMS

## Chocolate

*Some say a box of chocolates  
Will surely melt the heart  
Of that special one you chose  
To make your family start.*

*Some say a fancy card will do  
The same as chocolate,  
But ask your special one to choose  
And see which one she gets.*

*Some say a ring with stone so bright  
Will make her smile as such  
As that big box of chocolates -  
People say way too much!*

*A box of fancy chocolates  
Will always make her smile  
Unless she has some pounds to lose  
In which case she'll be wild!*

# TECH STUFF

by VE1VQ

This time of the year is not the best season to be working on antennas in the great out-or-doors, unless you are reading this from some place a lot warmer than the MARA NE. Despite what they say about antennas working better the colder the temperature at time of building, research shows that this is another one of those urban myths that get repeated at club meetings to new and susceptible hams. Being as the snow is one to two feet deep under my loop antenna, out there in the back field, any work can wait until warmer weather in the spring.

So, what's a ham to do, if you don't have ham things

to do? There's always the honey-do list, if you can't put that off, to occupy your free evenings and weekend time. There's always the internet...

Does your family keep telling you that you spend too much time on line and not enough time with them. Well, here's a site ([http://www.netaddiction.com/index.php?option=com\\_bfquiz&view=onepage&catid=46&Itemid=106](http://www.netaddiction.com/index.php?option=com_bfquiz&view=onepage&catid=46&Itemid=106)) to prove them wrong (...or right). There may be a site to tell you if you spend too much time on the air, if there is then I couldn't find it.

If you are still repairing your own equipment or into restoring stuff you find at flea markets, you can find most any manual to aid you in your efforts at <http://www2.faculty.sbc.edu/kgrimm/boatanchor/> or at the mirrow site <http://bama.edebris.com/manuals/>.

Not sure if your internet provider is giving you the connection speed you are paying for; check things out at <http://www.speedtest.net/>. The site will select the site nearest to you - all you have to do is hit 'Begin Test'.

Have you talked with an astronaut lately? Go to <http://spaceflight.nasa.gov/station/reference/radio/> for frequencies and other information on contacting the Space Station.



For another view of ham radio from across the pond, check out the [Royal Society of Great Britain's](#) website.



They have their problems with interference and interfering equipment sanctioned by their regulator (OFCOM) - sound familiar?

And from north of the border, check out the [Radio Amateurs of Canada](#) site. We may be cousins but we're different. Some of you will remember when we were the Canadian Division of the ARRL, then we were the Canadian Radio Relay League (CRRL), and now we are the Radio Amateurs of Canada.



## OPEN WIRE LINE MODIFICATION

Last summer I noticed some of the spacers on my [open wire line](#) had shifted out of position. Closer inspection found most of them were loose. The glue used had not maintained its bond between the plastic spacers and the wire covering. What to do?

A simple solution was [LIQUID TAPE](#), a product I've used in the past to seal the open ends of coax and outside antenna electrical connections. Coat the wire covering and wiggle the spacer into place, then coat the other side of the spacer and wire. It stays flexible and holds the spacers in place. Drying time is overnight.

## QUOTE OF THE MONTH

*The one thing we can never get enough of is love. And the one thing we can never give enough of is love.*

- Henry Miller

## DI-DAH-DI-DAH-DIT

### WITH WHAT WE'VE GOT!

Most of us don't have the luxury of having the kind of loose change lying around the house to be able to put in the kind of ham station we see in the pages of QST or CQ Magazine and can only dream about. We usually have to make do with whatever we can afford out of the family budget, or what we can scrounge by collecting and selling empties, or accumulate from that part-time job.

Typically we start out our HF career, the ink still damp on our ticket, with a low-cost used transceiver or a loaner from a friend. We squirrel away those nickels and dimes as best we can, with the occasional dip into the fund for braces for the kids, or to pay a plumber's bill. Eventually we have enough in the kitty, even without selling our first born, to afford that new rig. We've looked at every rig on line, read all the reviews, talked with all of our ham friends about their thoughts (and a few friends who don't know the first thing about ham radio - but now avoid us whenever possible) and narrowed it down to a couple of models. Finally, with our spouses threatening imminent divorce if we don't decide, we flip a coin, and call a 1-800 number with the order.

We have a rig, and we have an antenna of some kind. Perhaps limited by space or wife or local area restrictions. Perhaps we are lucky enough to have as much space as we need. Whichever, we put up some wire in a configuration we think will be the magic bullet - the antenna that will do everything for local and dx. Never happens but we like to think it will.

Most of us are not professional radio engineers. Most of us are not even in the electronics field. The wire antennas that we commonly use are really not understood by many hams even after all these years. The relationship between length to frequency is calculated in a simple formula (for those of us who can still remember our basic high school

math) but the relationship between frequency and height above the ground is not. For most amateurs it falls in the realm of magic. We cut the wire to the length derived in the formula and then wonder why the SWR is way off. Maybe we ask someone, maybe we read or search on-line and maybe we find out something.

What I'm trying to say here is that we seem to be able to communicate with what we've got. Our stations are hardly ever at their peak, and most likely far down the curve of being perfect. The first station I ever had was a homebrew CW transmitter that produced more power in heat than RF output, but work it did. We don't have the big bucks to hire someone to build us a super station. A lot of time the stuff works and we're not really sure why! But work it does. And we manage to get the message through!

Until next month,  
VE1VQ



PS. Remember, it's Valentine's Day on the 14th. Don't forget a card for your sweetheart. Do so at your own peril!