

The NEWSLETTER

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



Do you remember those valentines you used to cut out and the envelopes you glued together to hold them? The ones you took to school on Valentine's Day and hoped that special little girl or boy liked your card?

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E-mail your comments, ideas, or submissions to marane@mara.net or to ve1vq@eastlink.ca

Grandma Mara's RAMBLINGS

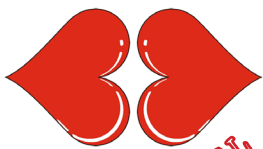
When Grandpa was alive, he was never the romantic kind of man who gave presents to the mail delivery lady or the barber just because the big companies said he should be doing so! And just because Hallmark figured he should send a ton of Valentine's Day cards to fatten the bottom line of their financial statement, that wasn't a good enough reason for him. It wasn't like he didn't love his family and his friends; he most certainly did, just that he showed it in many other ways. He'd give little things to people when he saw that they needed something to help them out. Sometimes it would be money, sometimes it would be a tool, and sometimes it was an encouraging word or a quiet hand on a shoulder.

He always seemed to know what somebody needed or wanted, even if they didn't know themselves at the time. More than once the other person would later tell him, "I don't know how you knew I just really needed someone to listen to me last week". Another common comment was, "I thought you must be crazy buying me that *frammerstrat* but the next day it was exactly what I needed for that sudden panic job I had".

Not only was he good at giving, he was also gracious when anyone gave him something! He always made the giver feel like they had presented him with exactly the right gift. Aunt Martha, who had the reputation as the family crank, and gave everyone hand knit sweaters in strange colors, patterns, and sizes that seldom fit, would always beam around Grandpa when he would thank her for yet another sweater. I think it was because he sincerely meant what he said.

I, on the other hand, can't resist the corporate pleas (TV, radio and internet advertisements) to get those cards in the mail early so that my loved ones will be sure and know that I truly love them.

A lot of the same qualities that Grandpa displayed, I see in Walter. There's a lot to like about him. Plus, that man solders a mean PL-259 connector - and, he really enjoys my chocolate cake!



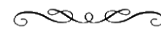
Be my **SPECIAL** Valentine

CULTURED CORNER

by ANØNMS

We looked far and wide (at least four pages into a GOOGLE search) to find a good Valentine's Day poem. Most of these sites want money for stuff that wasn't worth printing on here, even if it had been free! Fortunately we found this one by Elizabeth Barrett Browning. The old girl seems to have quite a way with words, she does! We figured it must be available at no cost, seeing as she's been gone for some years now.

*How do I love thee? Let me count the ways.
I love thee to the depth and breadth and height
My soul can reach, when feeling out of sight
For the ends of being and ideal grace.
I love thee to the level of every day's
Most quiet need, by sun and candle-light.
I love thee freely, as men strive for right.
I love thee purely, as they turn from praise.
I love thee with the passion put to use
In my old griefs, and with my childhood's faith.
I love thee with a love I seemed to lose
With my lost saints. I love thee with the breath,
Smiles, tears, of all my life; and, if God choose,
I shall but love thee better after death.*



**ARRL Field Day is
June 23-24,
2012**

ARRL Field Day is the largest on-the-air operating event in Amateur Radio. It draws tens of thousands to the airwaves each year, bringing both new and experienced amateur radio operators together for a weekend of fun!

TECHSTUFF

By VE1VQ

Working in the electronics service industry, first in the two-way radio communications field, and now in both computer and related hardware repair and the alarm/security field, I've run into a lot of situations which require the application of trouble shooting skills. I don't remember ever taking any course about logical trouble shooting in any place of higher learning I ever attended, it was just something I picked up along the way. One thing I've noticed over the years is that a lot of people who work in this and other technical areas do not have or have never learned these talents. They jump from guess to guess and hope they strike it right. When they don't, they become frustrated with the problem equipment and cranky at the people around them.

It used to be that most hams built their own equipment, and by so doing had a basic understanding of how these things worked, and so were generally able to perform repairs when failures occurred. Now with surface mount technology, I suspect most hams would be very reluctant to remove the screws holding the covers in place. Even though the equipment we use today is more complicated there are still things that we can do! Using basic skills, we can still solve problems around the shack and our home.

Recently, I was looking at [Fluke's test equipment web site](#) and happened across their publication called Frontline LAN Troubleshooting Guide. As the name suggests, it deals with local area network problem solving, but the basic steps they mention are applicable to any problem situation.

The situation...

You walk into the shack still half asleep but in plenty of time for the Saturday morning net. As usual you switch on the power supply first, then the rig. You turn your antenna selector switch from dummy load to your dipole. And then you realize there is no sound issuing forth from the speaker!

My radio is broken! I'm going to have to send it off to the repair center and wait for months and pay a huge repair bill and, and...

Just take a deep breath and let it out slowly. Is the rig's display lit up or are any of the normally "on" lights on?

No - well then what about the power supply; are its indicators showing it to be "on". They are? We're not done, so don't panic yet! Check the power supply's own meter. Does it show everything to be OK. Break out your digital volt meter and check the voltage on the power supply terminals. It should be around 13.8VDC for modern rigs. Do you have the correct voltage and polarity (red terminal is positive with respect to the black terminal)? Now measure the voltage on the red and black (positive and negative) wires themselves (the ones going to the rig). What's this - no voltage or it's varying all over the place? Take a closer look at the way the wires are fastened to the connectors. Hey, why is this terminal loose? Maybe if I tighten it down firmly. Now when I repeat the measurement across the actual wire ends, I have my proper voltage. The power switch for the rig is turned on. I hear sounds. What's this - net control is closing the net!

Your first thought was that you would have to box up the rig and send it off. The next thought was that the power supply is **wonky!** The reality of trouble shooting is to proceed in logical steps to find and fix the problem as fast and with as little stress as possible, and not introduce any additional issues while doing so.

Step 1. Identify the exact issue or problem

It should be obvious that the number one thing you do in troubleshooting a problem is to identify what the exact problem is! In spite of the obvious however, I've seen some technicians jump all around the issue, even if you try to pin them down.

In our earlier problem, there was no sound of signals coming out of the speaker. Possible problems could be:

1. Major rig problem - big \$\$ to fix.
2. Speaker defective or disconnected.
3. Headphone jack contacts for speaker are dirty.
4. Fuse blown in rig.
5. Antenna selector switch in wrong position
6. Antenna disconnected.
7. Antenna laying on the ground.
8. Someone stole the antenna for the copper.
9. Power leads to power supply disconnected at rig or power supply.
10. No power from power supply (defective).
11. Power supply unplugged from wall AC.
12. Fuse in power supply is open circuit.

Can you see why you have to identify the problem before you can fix it. If you start to panic and introduce more problems into the situation, you make it much more difficult (and perhaps much more costly) than was necessary. Most problems with our stations are fairly simple to fix once we've traced things out.

In the back pages of a lot of device manuals, there are

pages listing troubles and their possible causes/solutions. Most of them are very obvious. Manufacturers have found that most troubles are caused by those very obvious things and are easily solved. Many, many electronic and electric devices returned as defective, *are not*.

Step 2. Recreate the problem if possible

In our previous example the problem was a solid one and easily found, as opposed to most electronic troubles these days which tend to be intermittent. Let's say when you turn your rig on instead of no signals you have both low signals and lower than normal background or band noise. While you're standing there scratching your head it comes back to normal. Just when you figure Murphy has passed you by this one time down go the signals again. Over a period of a minute this happens several times. But then it comes back to normal. And stays that way. However, you know that ol' Murph will return, and probably at the time you really need things to work.

What we have is a "sometimes" or intermittent problem! We have two choices here. We can ignore the trouble and hope it won't return or we can try to recreate it.

Realizing that most signal problems are antenna and feed line related caused by the effects of the heat and ultraviolet from the sun, physical movement/vibration caused by wind, and from rain/moisture ingress, there are a couple of quick tests to do before you head outside.

The first thing to do is to thump the rig on the top and side covers with the palm of your hand. Not too hard, but hard enough to slightly jar the unit, in case the intermittent is in the rig. This is a test usually not mentioned in any text on equipment repair, but none the less is widely practised. Next, bypass any tuner or antenna switch by moving the feed line (if coax) directly to the rig's input connector. Wiggle the feed line vigorously. If doing these two things does not recreate the problem then it's time to visit the great outdoors.

You may have to open a window in the shack and turn up the rig's volume so you can hear any change you might cause. I use a baby monitor transmitter and battery powered receiver for things like this. Visually examine the feed line where it exits the house. If you have feed through connections through the wall or in a window spacer, wiggle those. Inspect the feed line for cuts or breaks in the outer covering (coax). Usually [anything allowing water to get into the coaxial braid](#) will cause a gradual decrease in signal level over time, as the copper corrodes and the strands making

The "thump test" is a test usually not mentioned in any text on equipment repair, but none the less is widely practised.

up the braid lose electrical contact with each other. If you're using coax to the antenna and you haven't weather-proofed the coaxial fittings and other connections then you probably need to replace the entire run of feed line. Lower the antenna to a convenient working height and wiggle the electrical and mechanical connections at the feed point. If the movement makes received signal levels "pop and drop", you've found the problem.

Step 3. Localize and Isolate the cause

Using our antenna example above we've used the next step in our trouble shooting procedure of localizing and isolating the cause. By wiggling/shaking the feed line at the feed point we've found the source of the trouble.

Step 4. Formulate a plan for solving the problem

In wire antennas like dipoles, this is the typical failure point. It is always good practice to loosen and re-tighten electrical connections that are made mechanically and to closely visually inspect the soldered ones on a regular schedule. Don't wait for it to fail on the wettest or coldest day of the year!

Step 5. Implement the plan.

Again using our antenna example, use the proper tools; wrenches or socket drivers, or screwdrivers that fit, not vice-grips that mar and deform the hardware. Unless it is an emergency and that's all you have, using tools that scratch and scar the repair is a sign of a poor technician.

...using tools that scratch and scar the repair is a sign of a poor technician.

Step 6. Test to verify that the problem has been resolved

Once you've made the repairs that you think should fix the problem, don't just walk away patting yourself on the back. Wiggle and jiggle those same connections that caused your intermittent signal levels before. Still have trouble? Then you need to look further until you find it. No more signal level changes? Then you have verified that the problem has been resolved.

Step 7. Document the problem and solution

Once you have found and repaired the thing causing your problem, you should, while the whole affair is still fresh in your mind, document both the problem and the solution. Keep a three-ring binder with these things written down. A few years from now you may have the same situation arise, and these notes may save you a lot of time and trouble shooting.

Step 8. Provide feedback to the user

This one obviously doesn't apply in your own ham shack, but is very important if you are doing work for someone else. You don't just fix the problem, pack up your tools and test gear and drive away. You need to let the user know what you found, and what you did. If the problem repeats itself, the end user needs this information to better describe the situation to you (assuming they ever call you back again!).

Another situation

Again you turn on your gear in readiness for the Saturday morning net. You have the same popping and dropping (1) in signal level audio. But this time (2) the mild thump test causes the signal level to recover and fail, recover and fail. You check to make sure the coax cable to the rig's antenna connector is tight and not the problem. Now what do you do because your notes only cover the antenna problem from the previous situation. The next step is to remove the covers. Spread a towel on your desk or workbench to protect the rig's finish. Use a proper fitting screwdriver to remove the screws and place them in a cup off to the side. Hardware has an annoying habit of getting lost. Once the rig is open and the innards exposed, power it up. If it has a built-in supply be aware that there are lethal voltages that may be exposed, so keep one hand in your pocket if your other hand is in the radio. Gently tap (3) the components, wires and connectors with a stiff plastic drinking straw or other insulated tool (a solid plastic rod of 1/8 to 3/16 inch diameter and 8 to 12 inches long is ideal). Once you find an area that causes the intermittent problem, lessen the tapping force. You will find that you can eventually zero in (4 and 5) on a single part or two, soldered wire or solder joint, or a connector.

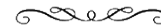
Most current rig intermittent problems will be connector contact oxidation problems. Often, simply removing and re-seating the connector will cure the trouble. (Make sure you power off the rig before disconnecting any connector.) A better solution is a drop of [DEOXIT](#) on each of the pins and mating sockets, then re-seat the connector pair.

Once you've done the above, switch the rig back on and try the tap and wiggle test again (6). The signal stays up - your problem is solved. You're ready for next Saturday's net. And lastly, don't forget to document your findings (7)!

So the next time you have a problem of a techie nature,



stop and think about it before you allow yourself to panic. You might just save yourself some money, and at the same time bask in the pride of fixing your own equipment or something else around the house.



ALL ABOUT POWER SUPPLIES PART 1 by JEFF - A17D recently retired from Acopian Technical Company

Some years ago, it seems that I told Dave, VE1VQ, that I would write some articles about power supplies. Well, it now happens that I am retired, having been an engineer in the power supply field for over 40 years.

I started as a kid making power supplies in the basement for various electronic projects. It seems to have affected my life; wow, to think I could have been musician instead. (I have been playing piano for the Stroudsburg PA Ward for a year and a half now. HIHI)

I was first licensed in 1962 as WV2YYI, and while mostly inactive in radio, maybe I can get back in a bit now?

What is a power supply?

A "power supply" is a device that supplies [[electrical]] [[energy]] to one or more [[external electric load|electric loads]]. The term is most commonly applied to devices that convert one form of electrical energy to another, though it may also refer to devices that convert another form of energy (e.g., mechanical, chemical, solar) to electrical energy. - Wikipedia

A power supply is also known as "Rectifier" or "Power Adapter" or "Fuente de Poder" in Spanish.

Four common types come to mind:

AC/DC
DC/DC
AC/AC
DC/AC

AC/DC – Typically has an AC input for AC line voltage, here in North America, 120V at 60Hz. Output is frequently regulated, with minimal voltage change for various output loading currents.

Type	Linear	Switcher	Unregulated	Phase Control	Ferros	Magnetic Amp
Size	Bigger	Smaller	Medium	Bigger	Bigger	Bigger
Weight	High	Lowest	Medium	Medium	High	Higher
Efficiency	Low	High	Medium	High	Medium	Medium
Heating	High	Low	Medium	Medium	Medium	Medium
Noise	Lowest	High	High	Medium	Medium	Medium
Cost	Medium	Medium	Low	Medium	Medium	Rare

DC/DC – The input can be low voltage or high, and this is generally regulated for constant voltage.

AC/AC – Also called an “Inverter”, this is used for frequency changing, test equipment, and other uses. A UPS, (uninterruptable power supply) combines this with a battery and charger for computer backup and other uses.

DC/AC – Frequently seen for 12V vehicle input voltage, and an output of 120V 60Hz to operate different types of electronic equipment in a truck or car.

DC/DC converters have to be switching type, with transformers, inductors and sometimes using only capacitors and rectifiers for “charge pump” techniques. These can be isolated or non-isolated switching regulators. For example, if unit only has three terminals, it must be non-isolated.

Since at [Acopian Technical Company](#), we only made DC output models, I will talk about those at this point.

AC/DC power supplies, or converters, or “rectifiers” have quite a variety of types, and are what are normally what you think of when you hear the term “Power Supply.”

The two types of AC/DC power supplies are **unregulated** and **regulated**. Unregulated units are commonly used for relays, motors, some lighting, and valves. These units might consist of a fuse, isolation transformer, rectifier, and filter capacitor. A bleeder resistor across the output is used for safety, and to prevent wide voltage swings with no loading. Voltage Regulated units (also just called regulated) are perhaps the most common type. The output resistance or impedance is electronically regulated to be zero. This means that there is no voltage change (or very minimal change) for any allowable load conditions. This is of great advantage when powering various types of electronic equipment, as the voltage can be controlled, and will stay put. Besides supplies to regulate output voltage there are units designed to maintain a constant output current. These are sometimes combined with constant voltage wide adjustment variable controls and can be used for battery charging, LED lighting, electroplating and many other uses.

Types of regulation and power conversion

Linear Regulation (Linears)

Switchmode Regulation (Switchers)

Phase Control Regulation

Ferroresonant Regulation (Ferros, not King Tut the Pharaoh)

Magnetic Amplifier Regulation

Most common types? Google (verb, not proper noun) the word *power supply*, and what do you see? Mostly multi-output computer switcher units. In the 21st century, these are certainly the most popular types, because of small size, high efficiencies, and these days, lower cost than linears.

Which type to use?

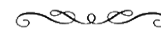
- For ultra low electrical noise – use a linear unit
- For lower dissipated heat, small size, reasonable price, use a switching supply.
- For lower cost, use unregulated.
- You can almost forget the other types these days, depends on application.
- Low band rig - a linear might be large and pricey, but no “birdies” will appear masquerading as received signals.
- Some switching power supplies are advertised as OK. Good luck on funny harmonics appearing in different places in the receiver.

Any questions or suggestions would be appreciated.

73,

Jeff - AI7D

Jeff can be reached at ai7djeff@ptd.net



QUOTE OF THE MONTH

Stuff is the junk we keep. Junk is the stuff we throw away.

~ Unknown

DI-DAH-DI-DAH^D

Some of you know how I hate to throw anything out! And since it seems fashionable nowadays to blame all of one's shortcomings and problems on one's parents, I'll lay the fault on their doorstep. They came through the depression where you fixed things or made do without. If something was broken and "unfixable", you saved it until you found a part *from* something else or you kept it for parts *for* something else!

My office with the ham shack in the corner is becoming filled with stuff once again, and once again I will have to overcome my upbringing, my natural inclinations, and my habits, and throw it out. It will be difficult, but I can do it. I have to or I'll be forced to open another office. Like the Man's Prayer from the Red Green Show, *"I'm a man, but I can change, if I have to, I guess."*

At least it will make a good pile of "stuff" at the end of my driveway for the spring garbage pick-up event!

Until next month,
VE1VQ

Pictures and Words

How about sending a picture of you and your station? If so inclined, send me a bit of a write-up about your ham radio career. And if you have one, send me a copy of your QSL card.

You're thinking, "no one wants to hear about me!" That's not true because everyone has an interesting story to tell.

Send it to VE1VQ@eastlink.ca in whatever format you want - even scribbled in pencil on a piece of paper.

LDS AMATEUR RADIO PIONEER DAY JULY 21, 2012

There's been some talk on the reflector about a Field Day contest of sorts. The suggested date is 21 July (Saturday prior to Pioneer Day on the 24th) and the suggested operating time is a four hour block out of the seven hours total.

This will be open to all LDS radio amateurs.

Frequencies and rules will be published when they are finalized.