# ECA Newsletter

**Volume 23, Issue 4** **October 2022**

## *Introduction*

It's been a HOT summer and now we look forward to fall and winter. As you receive this newsletter, we should be preparing for Simulated Emergency Test (SET) and other fall/winter activities. It's been a busy summer. You would think a retired guy would be happy for something to do but I've not had a single day when I wasn't busy doing something. Since the ECA Newsletter is one of those things, let's get to the action…Try to keep the weekend of 1 October open for SET. The scenario has not been determined as of this writing but should be by the time you receive this newsletter. It will doubtless be discussed in the meetings and nets.

There are some interesting articles in this issue including another segment from Ken Humbertson on Skills Development. With the new skills book in circulation and some folks really jumping on board, Ken's articles are very timely. Remember, we are always looking for articles from the membership – especially a feature on yourselves and your stations, how you use them, etc. They always make for interesting reading. Tell us what you can bring to the table in an emergency.

In this newsletter, you will see a quick and easy power distribution and monitoring box built into an old computer data switch that looks decent and has an effective purpose in the shack or in the field. The "EMCOMM and You" article discussed how to pick team members for field and EOC teams – what skills to look for and how to get the most from your team.

Ken Humbertson (W0KAH) has a great article on skills training related to power systems. Check it out.

If you haven't been on our new website, check it out at www.w0eca.org. The content is much better than before and it is being kept up to date with newsletters, programs and general information about our organization. There are downloads available and links to other relevant websites including FEMA's Emergency Management Institute (EMI) for skills development.

Remember that our nets are according to the following schedule:

**Regional Emergency Management Net** – every Monday night at 1900 hrs on DEM-VHF-1 repeater.

**ARES® Net** – 2000 hrs on the 145.490(-) CTCSS 141.3 Hz repeater

**ARES Traveler's Assistance Net** – As required in the event of a winter storm warning issued by the National Weather Service.

Our meetings are on the second Thursday of the month at 1900 hrs at the County EOC on TR Hughes Blvd near Tom Ginnever behind the County Police building. All are welcome to attend our meetings and all radio amateurs are welcome to check in to our ARES® nets.

## *EMCOMM and You*

### *Picking Your Team for Maximum Effectiveness*

Having a roster of members with the skill levels for each is helpful. Most ECs and emcomm managers know the relative skills of their volunteers and when choosing a team, it is important to mix your skill levels to ensure you have the appropriate leadership and the folks that need skills development are able to get it. Emergencies where ECA/ARES® are activated may be few and far between but keeping the skills mix in mind is important. It is good to send a new person out with a well seasoned volunteer. The emcomm manager or EC should brief both prior to departure. A safety briefing is critical to ensure the more seasoned volunteer does not bring the new person into a potentially dangerous situation that they may not be adequately trained or prepared for.

Remember that not all volunteer "jobs" will be amateur radio - related. It may be manning a phone bank, paperwork or errand running. It may be taking out a boat for levee recon or managing a sandbagging operation. Whatever the job, it is important that it is done right. Since these occurrences are relatively rare, it is good to have a talent mix to ensure others know how to do it next time. According to the EC-001 manual:

*"In general, emcomm groups should be prepared to perform jobs for their served agency that include the need to communicate. Here are a few of the many possible job descriptions:*
*Radio operator, using Amateur or served agency radio systems. Dispatcher, organizing the flow of personnel, vehicles and supplies; resource coordinator, organizing the assignments of disaster relief volunteers; field observer, watching and reporting weather or other conditions; damage assessor, evaluating and reporting damage conditions; van driver, moving people or supplies from location to location; Searcher, also providing communication for a search and rescue team."*

In a field operation, it is important to have an experienced, cool headed person handle the management and leadership functions. Inexperienced volunteers can be useful in logging the net activities, documenting the event, etc. and most importantly – observing and learning.

Since the Net Control Station (NCS) is the main hub of operations, it is important to pick the right people for the job. It can be very stressful or very boring at the NCS depending on the scenario. The boring times can be used for training in the systems, protocols and general operating procedures. Giving a new person a chance at the microphone when it isn't "too busy" is a good opportunity to teach these concepts.

Exercises are a great opportunity to mix the well seasoned with the fresher folks – no real pressure, no life or death situations (although it may sound like it and should be treated as you would a real scenario). These opportunities arise a couple of times a year at least. There is the Police Open House in September which is an opportunity to set up and operate equipment. There is Simulated Emergency Test (SET) in October where we exercise in a scenario-based operation, and of course Field Day in June where we operate "off the grid" so to speak. These are all great opportunities for training and skills development for ARES and Regional Emergency Management as well.

- DE N0PNP

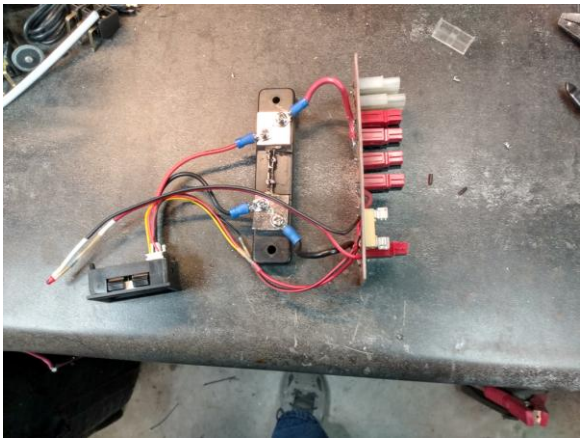
Return to TOC

We need articles for the ECA newsletter. Please send any articles to william.a.grimsbo@charter.net. If you need some help pulling together an article, let us know and we can help. Text (.txt) and Document (.doc or .docx) files are fine.

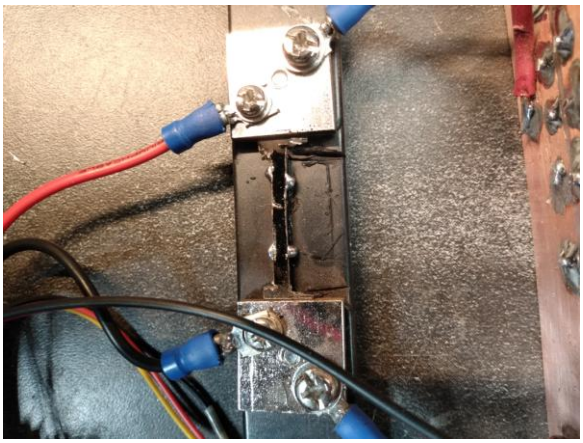
## Technical Articles

### Power Supply Monitor

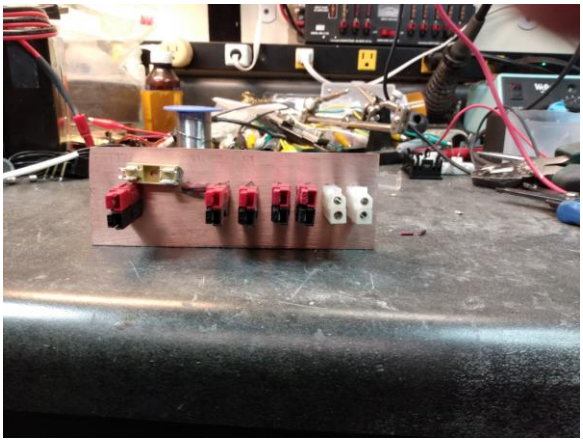
For those that have a MFJ-4125 power supply bare bones, you don't have a voltage or current meter on the unit. Usually not necessary since it is a 25 Amp power supply and will run most of your dual bander VHF/UHF radios built in the last 20 years without breaking a sweat. I run a lot of radios on the single power supply with battery back-up. I like to see what is happening with the power so I built a stand-alone power monitor. I decided that there may be a situation where I may want to take it mobile so I put a couple of the older Molex connectors on it as outputs and four of the newer ARES® standard Anderson Powerpole connectors. I decided to keep it as simple as possible and still get the voltage and current readings I needed. The photo below is where it started. You can see in the photo the shunt (tuned to 30 Amps with the digital meter I used – more on that later), the digital meter and the IN/OUT board for the power distribution. The LED monitors the fuse. If the fuse blows, the LED lights up.



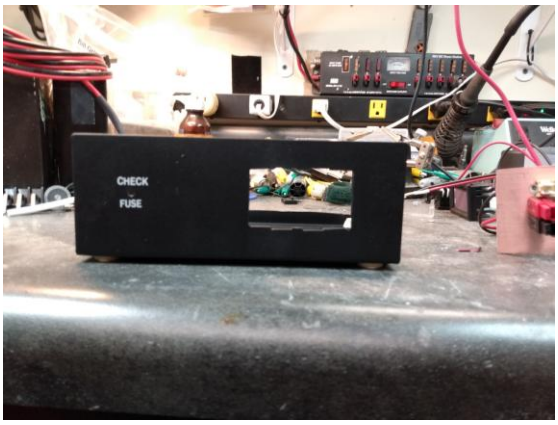
In the photo below, you will see some solder blobs on the shunt. The original shunt had a metal strip about 3/8 inch wide. That shunt was for a different meter. I rough cut the shunt thinner (slightly increasing its resistance) to increase the voltage drop across it and fine tuned it with blobs of solder to get it (the correct current reading) about the center of the fine adjustment range of the meter.



The In/Out power distribution board looks like the photo below.



I had an old A/B data switch enclosure that I picked up at ReStore (Habitat for Humanity) and used some epoxy to plug holes and re-drilled for the LED and cut out the meter hole with a Dremmel® tool and cut out the back of the case to mount the power distribution board.




The guts are pretty simple as shown in the photo below.

My dog was bored with the whole endeavor as you can see below. Poor critter – he just doesn't know how to have a good time…

Anyways, back to business. With the guts in, the front looked as shown below.


I epoxied the power distribution board to the chassis – got tired of drilling and cutting. I use the JB Weld® epoxy and I've never had it break loose. If it does, I'll just have to drill a few more holes. The photo below shows it in a more finished state. I calibrated the current to my bench power supply with a known load.

I painted the lower part of the chassis with self-etching automotive primer and flat black spray paint. I then applied the lettering for the "CHECK FUSE" and sprayed a matte clear coat over it. It fits my station layout (if you can call it a layout – sometimes more like an exercise in chaos theory) and has a decent look to it. It is a simple and straight-forward project that makes a nice power distribution and metering box. The parts are relatively cheap and all you need for a case is an old data switch.

I have one more data switch case like the one used in this project. I plan to build a dual zone digital clock in the same data switch case, painted and lettered the same way. That will be a later project. These boxes are getting harder to find so if you have them and don't want them, please let me know at william.a.grimsbo@charter.net.

- 73 DE N0PNP

**Christmas Party**

ECA will have its annual Christmas party at Bandanna's on Veteran's Memorial Parkway by Cave Springs on 8 December (our normal meeting Thursday night) at 6:30 pm.

We look forward to seeing all of the membership in attendance. This is usually a great time so come on out!

## ECA OFFICERS (2021-2022):

Following is the officers as of the July 2022 meeting:

- Bill Moss, KE0RXS as President
- Mark Hall, AE0ME as Vice President
- Jeff Young, KB3HF as Secretary/Treasurer
- Ken Humbertson, W0KAH as Director
- Wayne Garrison, KB0BZR as Director
- Wayne Ault, WD6EZQ as Past President Director

Return to TOC

## *Just a Note:*

All of the long term predictions thus far indicate a cold and snowy winter (for all the good long term predictions are) so check your winter go-kits. Think about what to keep in the car in the event you are stuck on the highway for hours. Sometimes it happens even when we don't have that much snow – all it takes is one careless driver and we all know that they are not that rare. Do you keep your gas tank above the half-tank marker at all times in the winter? When the weather gets cold, I try to always have at least a half tank before leaving home. I also keep a shovel and boots in my trunk just in case. What about a spare jacket and gloves? Be ready, don't be sorry. If it looks bad on the highway, don't go out - seems simple enough doesn't it?

- Editor

## *Skills Training*

**Skills Training 2 – Power Systems**

One of the essential skills is being prepared for deployment, and also being able to maintain radio communications at home. This requires a source of power separate from the AC Mains. Common equipment choices could be batteries, a generator, solar panels, or maybe a wind driven generator,

usually a combination of these. All of these are possible in the home case. Some are less deployable than others. Let's look at some possibilities for both cases:

| Equipment | AC Mains | Generator | Battery | Solar | Wind |
|---|---|---|---|---|---|
| Portable | N | Y up to 2KW | Y up to 100AH | Maybe – size | N |
| Power Radio & Laptop | Y | PS for Radio, Y for Laptop | Y for Radio, Inverter for Laptop | With Battery | With Battery |
| Lights, fan | Y | Y | If DC, otherwise Inverter | | |

Batteries come in a variety of types and sizes and uses. The batteries used to start gasoline & diesel vehicle are commonly referred to as "Starting" batteries because that is their main purpose in those vehicles. The most common type of those is the Lead Acid battery. They are usually the heaviest in weight and toward the least expensive to purchase and need to be periodically checked to make sure that all cells have at least the minimum about of fluid in them. They are best topped off with either distilled or at least demineralized water.

Some newer vehicles have a sealed/maintenance free battery. These are typically Absorbed Glass Matt (AGM) batteries. The battery acid in these saturates the glass matt material between the plates, so there is no liquid to boil off or spill out. These can be used in positions other than with the terminals facing up .Frequently they are rated/advertised by their Cold Cranking Amp (CCA) capacity. Yes, more is bigger/higher capacity. They are usually identified by Group Number as well. The Group Numbers, which refer to physical dimensions of a battery. These numbers are used by auto manufacturers to specify what size battery will fit in a vehicle. These numbers have no bearing on battery capacity; for example Group 38 is smaller than Group 24 and being smaller would have less capacity.

We're more interested in powering equipment for a time with at least a minimum voltage of 11.7V DC, the bottom of the range most manufacturers specify for their radio equipment. Keep that number in mind because frequently battery manufacturers spec their battery capacity in Amp Hours (AH) down to a voltage of 10.5 V DC.

Also pay attention to how the manufacturer rates the capacity and the discharge rate they use. Some use C10, meaning their capacity is measured at a 10 Hr. rate of discharge down to 10.5V. Some others may use C20, meaning they are measured using 20 Hr. rate of discharge down to 10.5V. So C10 is 10% of rated capacity and C20 is only 5% of rated capacity.

Since we typically use the batteries away from a vehicle charging system, we need to include the ability to recharge our batteries. There are a plethora of chargers available for Lead Acid/AGM batteries. Many of us already have them.

My favorite battery type since their introduction a few years ago is the LFP battery. They are similar voltage wise to Lead Acid & AGM batteries but have cycle life many time the Lead Acid batteries, meaning you don't need to replace them nearly as often. However they cost twice as much as a quality AGM Deep Cycle battery, so I understand why not everyone would have them at the top of their shopping list. The table below shows a couple of quality AGM Deep Cycle batteries as well as two sizes of LFP batteries from Ampere Time, purchased from Amazon. I have one of the 100 AH model and it comes in at 92 AH when discharged at C10 rate to 11.7V. AGM batteries I've tested don't get anywhere near that percentage at C10 rate.

Actually a LFP 50 AH battery provides close to the same capacity down to 11.7V as

an AGM when the AGM is new. After a few years the AGM will lose capacity faster than the LFP in my experience. I did a test on a 3 year old 28AH AGM at C10 down to 11.7V and its capacity was 15.3 AH a little over 50%. It would have had a little more down to 10.5V but it drops rapidly after 11.7. The LFP 100 AH battery did 94AH down to 11.7V and did 100.5 down to 10.5V.

Note also that the LFP batteries have a built in Battery Management System (BMS) which controls charge and discharge protection for the battery and manages spreading the charge across all cells to maximize life. AGM batteries do not use a BMS, it's up to the user.

| Battery Type | Manufacturer | Model | Amp Hours | Weight | *Cost$ |
|---|---|---|---|---|---|
| AGM | Optima | Yellow D31T | 75 | 62 Lbs | $230 |
| AGM | RENOGY | Deep Cycle | 100 AH | 64 Lbs | $250 |
| LFP | Ampere Time | LiFePO4 | 100 AH | 25 Lbs | $400 |
| LFP | Ampere Time | LiFePO4 | 50 AH | 12 Lbs | $270 |

Sources used for the above table:

Optima Yellow Top D31T - BatteriesAreUS.com free shipping

RENOGY - Deep Cycle AGM 12V 100 AH free shipping

Ampere Time LiFePO4 (LFP) 12V 100 AH - Amazon - Ampere Time 12V 100 AH free shipping

Ampere Time LiFePO4 (LFP) 12V 50 AH - Amazon - Ampere Time 12V 50 AH free shipping

There are as ton of videos on You Tube on building your own Lithium battery packs of various types, some using recycled batteries, some buying new and anything in between. Your mileage may vary. If you like to build and you have the time & skills (and money), go for it!

A battery of some type will power your radio(s) for some period of time. Essentially any battery that will power you radio(s) for a few hours will get you through "normal" power outages, i.e. those not related to a major disaster of some type. A portable power source that can provide AC to a laptop for charging is highly desirable as we are expected to be able to operate using Winlink in emergencies.

The next step up from that is larger battery that will last longer, and some means of charging it. You should also have a means of charging the battery, possibly an AC charger that connects to the AC Mains, possibly an AC charger and a portable generator to power it and a few key appliances, refrigerator, freezer and a few lights at least.

After that, making a deployable kit that can get you going at a remote site for up to 10 hours minimum would be a goal. In some cases you

might be able to use your vehicle for DC power, but don't count on that.

Long term having one or more solar panels to charge the batteries would be a good addition.

Earlier I mentioned the use of an inverter to convert 12V DC to 110 VAC for a laptop charger, or other AC devices. Small cheap ones abound, but they are of the modified sine wave variety. Meaning they approximate a sine wave by stepping the voltage up and down, many times only a couple steps in each direction, which look like a stair-step on an oscilloscope and they have spikes as a free addition. The left pic is a modfied sine wave, the right pic is a real sine wave. As you might imagine, electronic devices do not tolerate modified sine waves well and in some cases have been damaged. Pure sine wave inverters are more expensive because it takes more components to generate the sine wave, but they are safe for electronics.

So, take your preparations seriously but do it in steps. Get together a supply for home and short outages first. Then expand to deployable for a few hours and then widen the scope for home & deployable to cover longer periods while being portable. Most of us started small and expanded over the years…

**Be prepared!**
**Ken**
**WØKAH**

***Editor's Note:*** *OBTW, if you use a Battery Booster for your system, be careful to set the booster to cut out at about 11.0V, not 9V (typical selections) to prevent damage to the battery. Also, many chargers are designed for SLA, AGM or Lead-Acid batteries, not Lithium batteries. DO NOT use a lead-acid charger with Lithium batteries. Lithium batteries are a very energetic chemistry and they can experience thermal runaway if they are not properly charged. The result could be lethal to the battery and the shack.*

Return to TOC

## *Items For Sale*

**We have a few items for sale including the following:**

- Three element beam antenna kits for DF'ing - $10. Four available
- TDoA DF'ing kits (Time Direction of Arrival) - $12. Two available
- **Sinclair Labs Duplexer Model Q-202GR. Set up for 145.490 TX and 144.890 RX. Four cavity Q-circuit (pass/reject) rack mount unit. Looking to get $200 for the unit. Spec sheet is available online.** I'd really like to get this one out of my basement.
- Various meters and test equipment including frequency counters, capacitance and inductance meter, see below:
  - 50 MHz B&K Model 1801 Freq Meter for $25
  - Heathkit 2240 LC Bridge for $20
  - Heathkit IT-121 FET/Transistor Tester for $10 with the manual
  - RF Applications Model D-144 VHF Deviation Monitor with manual for $20
  - Antennas, power supplies, etc. for various prices depending on the unit
  - Small stereo amplifiers (10 to 15 Watts) for around $20
  - Two -10dB *TX RX Systems Inc.* Taps for station output monitoring with N connectors for IN/OUT and a BNC for the tap - $25 ea.
  - VHF Amplifiers, etc.

I also have a 102 pin SMD PIC development kit if anyone is interested for **$50**. This kit is brand new and is the EasyPIC V7 for the 102 pin SMD PICs. That's less than half the price if ordered directly from Mikroelektronika. Software tools and library examples are free online and compilers for PIC Basic and C are available online.

If you have interest in any of these things, send an e-mail to william.a.grimsbo@charter.net and I will get back to you. If you have any items you would like to advertise for sale send in an e-mail and we will try to get them in the next newsletter. Please keep these things to radio or emergency-related items in keeping with the intent of the newsletter. Thanks.

**Return to TOC**

***Editor's Note:*** *There is an interesting YouTube video on tuning resonant cavities (band pass, reject and notch) using the Rigol DSA-815 at https://www.youtube.com/watch?v=rvKB0UlVvQ8. The video is just under 30 minutes (28:39).*

## *Horseflies, Tractors and Mr. Kirchhoff*

***7 volts and 7 volts can add up to 10 volts!***

**By WAYNE LEMONS (Reprinted from Radio Electronics March 1968)**

"I'M A LITTLE SHOOK ABOUT MR. Kirchhoff* this morning," Jerry Whipple told his high school electronics instructor. "Did Mr. Kirchhoff know about AC circuits?"

The instructor - a short, balding, plump man named Bean – scratched his head and looked at the student.

Jerry was a glasses - wearing, baseball - pitching senior who sometimes asked embarrassingly complex questions.

"I suppose you mean the Kirchhoff who developed some laws for electrical circuits?" said Mr. Bean.

"That's right," Jerry said, "the guy we studied about in dc circuits. Do his ideas hold water in AC circuits?"

"Far as I know." Mr. Bean grinned. "What'd you have in mind?"

"See this circuit here?" Jerry pointed to an inductor and a resistor: "It's a 10,000 - ohm resistor and a 10 - millihenry RF choke in series. The experiment calls for putting a 160 - kHz, 10 - volt peak - to -peak signal across the circuit."

"Fine, so what's your problem?" "Well, according to Mr. Kirchhoff the individual voltage drops across the components in a series circuit are equal to the source voltage. Isn't that so?"

"That's right."

"Then Mr. Kirchhoff better come up with something new, 'cause I think this circuit just repealed his law."

Mr. Bean chuckled. "Don't think Mr. Kirchhoff can do that; he died, I believe, in 1887. But I can't recall anyone ever disputing his conclusions about circuits. What makes you think you've found a flaw in Kirchhoff's rule?"

"I'll demonstrate. With an RF detector probe on the VTVM I measure across the inductor and resistor and I find 10 volts. See?"

"Yes."

"Now," Jerry said, "I'll measure the voltage across the resistor. The meter reads about 7.1 volts. And according to Mr. Kirchhoff I ought to have 2.9 volts across the coil. Right?"

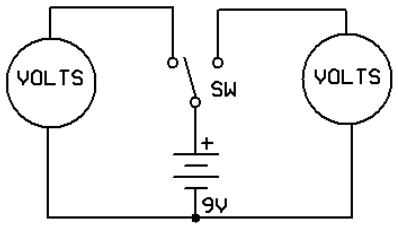
Mr. Bean avoided an answer by asking a question, "How much do you have?"

Jerry didn't reply. He moved the VTVM leads across the coil and the meter came to rest reading again just over 7 volts. "Look at that - just about the same as across the resistor."

"So what's wrong?" Mr. Bean appeared puzzled.

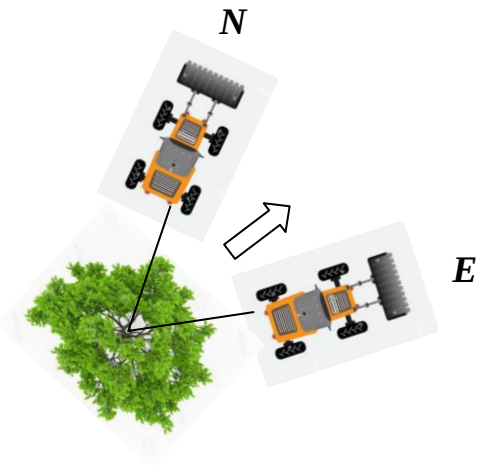
"Wrong?" Jerry blurted. "What's wrong is that 7 volts and 7 volts add up to 14 volts - not 10

volts. And that proves that Mr. Kirchhoff, may he rest in peace, was all wet."
"Interesting," Mr. Bean bantered. "I've made a quick check in your addition, and 7 and 7 are 14 if you're adding 7 and 7 of the same thing. But, if you'll excuse my farm - boy upbringing, 7 horses and 7 flies don't make 14 horseflies.
"I understand that," said the boy. "But I'm measuring volts and volts and 7 and 7 ought to be 14."
"But obviously it isn't," said the instructor. "You said yourself that you had only 10 volts to start with. How do you explain that? Maybe we shouldn't be too hard on Kirchhoff until we look a little further into the matter."
"But how is it possible that the component voltage drops add up to more than the source voltage?"
Mr. Bean went to the blackboard, motioning Jerry to follow him. He drew a battery symbol, connected one end to an SPDT switch, and drew two circles to represent meters.
"Look at this circuit," he said. "Assume this is a 9 - volt battery. If I move the switch to the left, the left – hand meter will read 9 volts. Agreed?"
Jerry nodded.
"If I move the switch to the right, the right - hand voltmeter will read 9 volts. "Okay?"




Mr. Bean grinned a little and continued: "Now if I move the switch rapidly I will have both meters reading.
Because the pointer can't return to zero very fast I will have both meters reading, let's say, 6 volts. Right?"
"I see that," said Jerry, "but I don't see what you're driving at."
"The point is this," said Mr. Bean. "Just because both meters can be made to read 6 volts doesn't mean that the battery voltage is 12 – even though 6 and 6 are 12. Does it?"
"I think maybe I'm beginning to get a twinkle," Jerry said. "Has it got anything to do with the timing in the circuit? Could that current trailing along behind the voltage, you've been talking about, have anything to do with what we see on the meters?"
"Just about everything," the instructor said. "And if you understand just how, you'll have gone a long way toward mastering AC circuits."
"Do you mean to say that the voltages in my circuit are being switched around and fooling the meter?"
"Right." Mr. Bean smiled. "Nobody can say that a meter has a lot of sense - it can be fooled."
"How?"
"If you put a certain voltage on a resistor, the current will go up at the same time the voltage goes up. Agreed?"
Jerry nodded.
"What do we say the phase angle of a resistor is then?"
"Zero degrees?"
"That's right - we say that because there is zero delay between the rise time of the voltage and current. Now what about an inductor?"
"In class yesterday you said the current lags the voltage by about 90°."
"And just what does that mean to you?"
"It means, I guess, that the current does not start until after the voltage has already been on the coil a little while."
"And, as I pointed out yesterday, the reason for that is that a coil tries to oppose any change in voltage across it by developing a `back' voltage - called a counterelectromotive force - so long as the voltage is changing. The AC voltage starts to reverse after a quarter of a cycle - or 90° - and when that happens, the

current starts to flow in the coil. So, in a perfect coil, the current lag is 90°."
"But what happens when there's a resistor in series?"
"Just what happened to you. The phase angle shifts to somewhere between 0° and 90°. In your case the voltage drops are almost identical across the resistor and the coil, so the phase angle is approximately 45°."
"How do you know that?" Jerry asked.
"I'm afraid my farm - boy upbringing is still showing, but in one way or another you've been dealing with this phenomenon all your life," said Mr. Bean. "Suppose two tractors with the same power pull cables attached to the same tree. One tractor pulls north and the other, east. Where will the tree fall?"
"Halfway between the tractors,"
Jerry said. "To the northeast."




"Right," agreed Mr. Bean, "and if we consider the tractor heading east to be at zero phase angle, then the tree will fall at a 45° angle to it. Agreed?"
"Yes, I'm beginning to see. If one of the tractors went farther or faster than the other, then the tree would fall toward it and that would change the phase angle."
"Yes. And that's what happens in an electrical circuit when the voltages aren't pulling in the same direction. If the circuit has more voltage across the resistor than across the inductor then the circuit phase angle will be less than 45°. If there is more voltage across the inductor then the phase angle will be more than 45°."

**Mr. Pythagoras**

"But," mused Jerry, "I'm still not sure I understand how to figure the total voltage in the circuit."
"Sure you do," said Mr. Bean. "You probably learned it several times in elementary school. Ever hear of Mr. Pythagoras and his theorem?"
"You mean the one about a right triangle where the square of the hypotenuse is equal to the sum of the squares of the other two sides?"
"That's exactly what I mean. And in our example here if these tractors each had 7.1 pounds of pull on the treetop then the total pull would be:

$$\sqrt{7.1^2 + 7.1^2} = \sqrt{50 + 50} = 10 \text{ lb.}$$

Does that suggest anything? "Unfortunately it looks like you're going to get Mr. Kirchhoff out of my dilemma," laughed Jerry. "Anyway it seems that my roughly 7.1 volts across each component is going to have a hypotenuse of 10 volts. I'm still not sure, though, why the meters don't tell me."
"Remember the switch analogy I used earlier?" Mr. Bean asked.
"You mean this circuit is a kind of electronic switch?"
"You might call it that," said Mr. Bean. "You see your meter can't respond to that 160 kHz signal, so it just finds the peak voltage across the component and stays there."
"Then you mean I really never have 7.1 volts across either the coil or the resistor?"
"No, I don't mean that." Mr. Bean grinned. "It's just that if you want Kirchhoff's law - or for that matter Ohm's law - to work in AC circuits, you have sometimes to be concerned

with instantaneous values, and not with values taken over a period of time.
"The meter reads the highest voltage that is ever across the circuit components but at the very instant that the voltage is 7.1 on one component, at that very instant it is only 2.9 across the other."
"In other words," Jerry said, "the meter can't fall back to 2.9 volts that fast, so it just stays up at the peak."
"That's pretty close," said Mr. Bean. "So we have to let Pythagoras take over and do the mathematics, but rest assured that Kirchhoff knew what it was all about."
"But what about Pythagoras?"
Jerry demanded. "He must have been in his grave a long time before anyone discovered electricity."
"Yes, as far as anybody knows, Pythagoras never dreamed of such a thing as electricity. But like a lot of other people who discover basic truths, he supplied the answers before we invented the problems."
"And you can't hardly get smarter than that," Jerry said and headed for the door as the class bell rang.
Mr. Bean grinned affectionately after his best student. It was nice to have someone who cared enough to question other people's conclusions . . . even his own. R -E

***Editor's Note:*** *I could not find anyone to ask permission of to reprint this article. RE has been out of print for over 20 years. Here's hoping I don't get sued for all the profit I'm making off this newsletter – I'd hate to lose it all. I couldn't get the art copied over so I had to try to remake it. You all might have to use your imagination a bit.*

## *Feedback from the Last Newsletter*

Jay Underdown had some feedback from the articles on generators in our last newsletter. Here's input from Jay:

### *Generator Comments*

Great article on generators.
I would like to add a few suggestions.
Back in the 1960's Bell Labs did a study on generator reliability for the Bell Telephone system.
For maximum reliability, we were required to reprogram the routining clock in the generator control panel to have the generators run 1 hour every week UNDER LOAD! At my microwave site, the Collins microwave ran on A.C. and whenever the power switched, it would cause a failure on one of the transmitters or receivers. To solve this, they built an artificial load (big bank of large resistors) on the back of the building. The goal was to get the oil hot enough that all of the moisture and acids would evaporate.
I don't do that on mine, but I try to run them every month or two. I use a couple bathroom heaters for a load. Both together give about 2500 watts of load.
Having good fuel is important. Diesel fuel has an algae that lives in the fuel. There is an additive that can be added to stop this. You can buy fuel with the additive already in it if you ask.
Since most of us use gasoline, add Stabil to all of the gasoline that will set. This includes lawn mowers, garden tractors, etc. I have stored gasoline for over 2 years with good luck. I also add a little fuel injector/carburetor cleaner to the fuel which seems to help the carburetor jet from gumming up. When I run the tanks dry for long term storage, I add a little more carb cleaner to the last few ounces of gas.
I used to have a transfer switch installed by an electrician but now back feed like most have to. I have a 240v socket in the garage. The previous owner had an electric welder and I use it.
I painted the main breakers in the load center, the breakers that feed this outlet, and the outlet itself with yellow model paint. That way I, or one of my sons will quickly see which breakers to use.
My youngest son Dave KB0DYP, has my old WW2 surplus Onan W3M generator I got through A.F. MARS years ago. It has a 2 cylinder, 1800 rpm water cooled engine. It

still works fine but has lost its natural magnetism.
The generator needs some magnetism to self-excite its field. Dave has added a couple wires and after the engine is running, sparks the field winding with a flashlight battery which gives the field winding enough voltage to start generating. I have used it for field day and run it 27 hours strait with no problems.
I hope this helps in keeping your generator running reliability.
73, Jay W0PS.

*Thanks for the input Jay. Good tips on generator care and maintenance from a man with many years of experience. Oh, by the way, above is a photo of one of the old Onan W3M generators. It was state of the art back in 1944.*

## *MOU Update:*

ECA is in the process of negotiating our MOU with County Government. The MOU is over 20 years old and has not been touched in all of those years. It seems like a good time to update it to how things work today as opposed to when Emergency Management consisted of two staff members and 50 volunteers. Stand by for more information as it becomes available. When completed, we will include it in a newsletter or it will be distributed to the membership at a meeting. For now, stand by…

***Future Articles:*** In the next few newsletters, there will be some DIY articles on the data switch accessories. These include the power monitor in this article, a dual time zone clock in the next newsletter and a two-tone decoder update with an LCD display for those that want to see the nature of an activation rather than just hear an alert and see a blinky light, a tester for two-tone sequential paging decoders – much more to come so keep reading. If anyone is interested in these DIY projects, contact the author at william.a.grimsbo@charter.net.

*Ham Radio is all about DIY so enjoy building some of the projects in this newsletter.*

This area is for your material. If you have done something interesting in Amateur Radio or you have a DIY project, sketch up an article and some photos and we'll publish it in the ECA Newsletter. It can be Amateur Radio related, public safety related or just something useful to other folks. If you need help putting an article together, send an e-mail to william.a.grimsbo@charter.net.

# Net Control Roster

| Week | NCO | Callsign |
|---|---|---|
| 1 | Paul Orf | AD0YL |
| 2 | Ken Humbertson | W0KAH |
| 3 | Jeff Young | KB3HF |
| 4 | Bill Grimsbo | N0PNP |
| 5 (Floater) | Wayne Ault | WD6EZQ |

The scheduled Net Control Operator is responsible for finding a replacement if he/she is unavailable for their scheduled net or paging. Any EMA volunteer interested in becoming a Net Control Operator on either the EMA Training Net or the ARES® Net should contact Bill Grimsbo (N0PNP) at william.a.grimsbo@charter.net.

**Some things to remember:**

**NCOs** - If someone does not open the net by 5 min after the designated time, one of the other NCOs are requested to open the net, take check-ins and handle any traffic as appropriate.

**NCOs** - If you are unavailable to run the net, please make arrangements – in advance – to have one of the other NCOs run the net in your place.

**Membership** - The net is a very important method of keeping involved with what is happening with the Association and ARES® - Please consider it part of your weekly calendar (i.e., check in and let us know you are still out there).

Return to TOC

# *Calendars*

## October 2022

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 25 | 26 | 27 | 28 | 29 | 30 | 1 |
| 2 | 3<br>EM Net at 1900<br>ARES Net at 2000 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10<br>EM Net at 1900<br>ARES Net at 2000 | 11 | 12 | 13<br>ECA Meeting 1900 hrs | 14 | 15 |
| 16 | 17<br>EM Net at 1900<br>ARES Net at 2000 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24<br>EM Net at 1900<br>ARES Net at 2000 | 25 | 26 | 27 | 28 | 29 |
| 30<br>EM Net at 1900<br>ARES Net at 2000 | HALLOWEEN 31<br>  | | | | | |

***Notes:***

1 All meeting locations are subject to change depending on room availability. Tune into nets for latest information.
2 DEM Net is on DEM-VHF-1
3 ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz
**4 There will be normal nets on the 31st**

[Return to TOC]

# November 2022

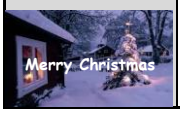
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 30 | 31<br>EM Net at 1900<br>ARES Net at 2000 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7<br>EM Net at 1900<br>ARES Net at 2000 | 8 | 9 | 10<br>ECA Meeting 1900 hrs | 11 | 12 |
| 13 | 14<br>EM Net at 1900<br>ARES Net at 2000 | 15 | 16 | 17 | 18 | 19 |
| 20 | 12<br>EM Net at 1900<br>ARES Net at 2000 | 22 | 23 | THANKSGIVING 24<br>  | 25 | 26 |
| 27 | 28<br>EM Net at 1900<br>ARES Net at 2000 | 29 | 30 | 1 | 2 | 3 |

***Notes:***

1 All meeting locations are subject to change depending on availability. Tune into nets for latest information.
2 DEM Net is on DEM-VHF-1
3 ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz
**4 Have a Safe and Happy Thanksgiving**

[Return to TOC]

# December 2022

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| 29 | 30<br>EM Net at 1900<br>ARES Net at 2000 | 31 | 1 | 1 | 2 | 3 |
| 4 | 5<br>EM Net at 1900<br>ARES Net at 2000 | 6 | 7 | 8<br>ECA Meeting 1900 hrs | 9 | 10 |
| | 12<br>EM Net at 1900<br>ARES Net at 2000 | 13 | 14 | 15 | 16 | 17 |
| 11 | 19<br>EM Net at 1900<br>ARES Net at 2000 | 20 | 21 | 22 | 23 | 24 |
| CHRISTMAS 25<br>  | 26<br>EM Net at 1900<br>ARES Net at 2000 | 27 | 28 | 29 | 30 | New Year's Eve 31<br>  |

***Notes:***

1 All meeting locations are subject to change depending on availability. Tune into nets for latest information.
2 DEM Net is on DEM-VHF-1
3 ARES Net is on 145.490(-) MHz. CTCSS: 141.3Hz
**4 Merry Christmas and Happy New Year to all**

[Return to TOC]