



THE SCOPE



The Central Michigan Amateur Radio Club and Lansing Civil Defense Repeater Association

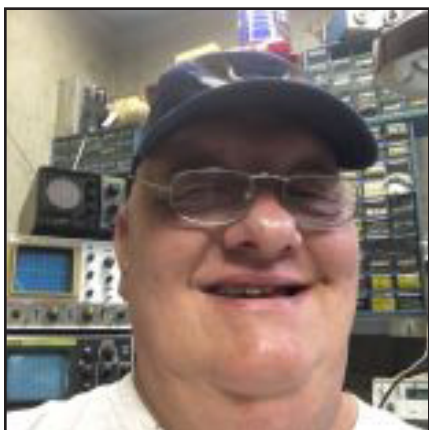
VOLUME 20, ISSUE 7

NOVEMBER / DECEMBER

CENTRALMIARC.COM

Congratulations to our newly elected CMARC Board!

New Board positions will be chosen at the January 2nd Board meeting. Stay tuned to the website and the next issue of the Scope for an update of any changes in positions.



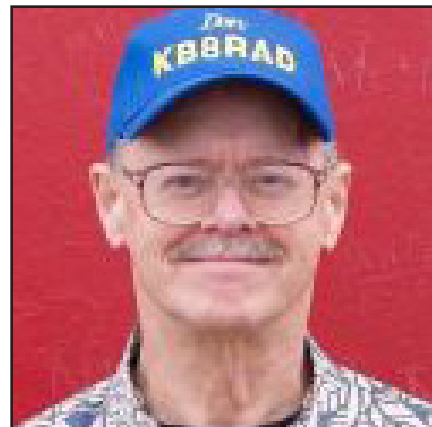
◀ Gordy Smith / KE8JKS



Shannon Ranes / WA2NVK ▶



◀ Kelly Fitzgerald / N9PC



Don McLain / KB8RAD ▶

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CMARC OFFICERS

PRESIDENT: Gordy Smith / KE8JKS
VICE PRESIDENT: Dan Dembinski / KD8YDE
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SECRETARY: Dave Vick / W8ZZX
UNDER 22 DIRECTOR: Don McLain / KB8RAD
DIRECTOR: Kelly Fitzgerald / N9PC
DIRECTOR: Gregg Mulder / WB8LZG

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MEMBERSHIP CHAIR:

John Doornhaag / KD8NNQ

CARDS & FLOWERS: Jane Hosford / KC8FSK

CLUB CONTACT: Don McLain / KB8RAD

CLUB HISTORIAN: William Cote / WD8NYW

ANTENNA PROJECTS CHAIRMAN:

Gregg Mulder / WB8LZG

LANSING ARPSCLIAISON:

Jim Hannahs / KC8QWH

**SCOPE EDITOR, QSL/AWARDS MANAGER,
CLUB STATION MANAGER:**

Chris Ranes / NS8Q

CLUB PHOTOGRAPHER:

Kenneth Hazlett / N8BVV

W8PLP TRUSTEE: Chris Ranes / NS8Q

W8MAA TRUSTEE: Dan Harger / WD8BCS



LCDRA OFFICERS & APPOINTEES

PRESIDENT: John Imeson / N8JI

VICE PRESIDENT: Don Tilliston / WB8NUS

SECRETARY: Ron Harger / WD8BCS

TREASURER, MEMBERSHIP CHAIR:

Michael Boensch / W8MKB

DIRECTOR: John Winn / KE8CYC

DIRECTOR: Don McLain / KB8RAD

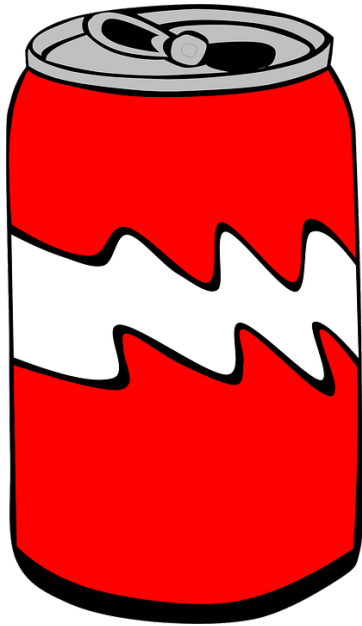
REPEATER TRUSTEE: Dennis Boone / KB8ZQZ

The Scope is a bi-monthly joint publication of the Central Michigan Amateur Radio Club and the Lansing Civil Defense Repeater Association.

Please send any articles, classified ads, or other items to the Editor, Chris Ranes, NS8Q at cmarcscope@gmail.com. Pictures should be mailed in .jpeg format, and articles in Microsoft Word or TXT format.

The views and opinions expressed by our contributing authors do not necessarily reflect the views of the Central Michigan Amateur Radio Club or the Lansing Civil Defense Repeater Association.

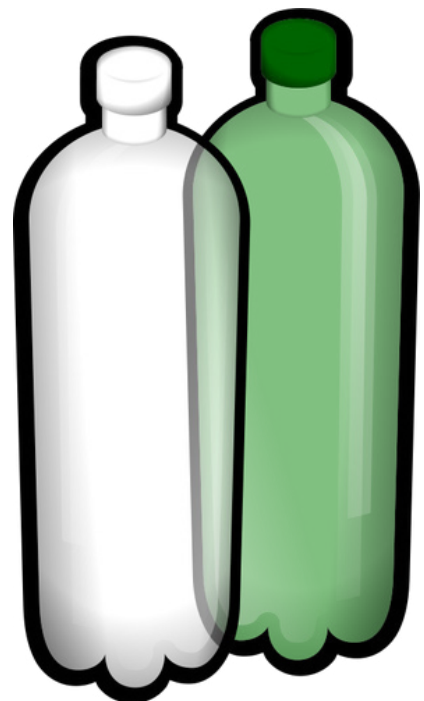
Central Michigan Amateur Radio Club's



CAN & BOTTLE DRIVE

An effort is underway to raise money for CMARC's Building Fund. The Building Fund has been designated by the Board to be used for the purpose of moving our club house / club station.

If you would like to participate, please return the bottles and cans you have been accumulating at home. Then consider mailing your check or money order to our Treasurer, and made out to CMARC.



Shannon Ranes, WA2NVK
1728 Cooper Ave
Lansing, MI 48910

WFD 2021



When : JANUARY 30 / 31 , 2021

**Times : SAT 1900 UTC (2 PM EST) to
SUN 1900 UTC (2 PM EST)**

Where : WORLDWIDE

Website : WWW.WINTERFIELDDAY.COM

EMAIL : WFDA@WINTERFIELDDAY.COM

**If you are serious about emergency communications
As we are; we welcome you to join us for our yearly
event. We are sure you will find this event a
pleasant change and challenge to that of a normal
Summer FieldDay.**

Happy Holidays,

We would like to wish you and your family a warm greeting from the Central Michigan Amateur Radio Club. This year has been tough on all of us. I have missed the in-person aspect of our family-style Club meetings and enjoying the food and fellowship of being together. This pandemic has affected all of us in so many different ways.



As the new year approaches, your Board of Directors has been looking into several things to improve our Club and have new and exciting things for you to participate in.

Daniel Dembinski (KD8YDE) will be hosting a new net called "The Morning Drive" on Mondays, Wednesdays, and Fridays from 7 am to 9 am on the 145.390 Repeater.

I will be hosting a "Technical Net" for those interested in discussing topics related to the hobby's technical side.

We have formed a building steering committee to look into planning in the event of losing our Club's building. We are currently putting the final touches on sending out a membership survey to understand better how we may be of better service to our members. Please consider what you are looking for in your Club. We hope to gather some information to help make CMARC a Club of doing, teaching, learning, and of course, fellowship.

Several new people contacted me expressing interest in joining, and I want everyone to make them feel welcome to our family.

We have started a building fund to help us put together a small nest egg in the event we need to use some of it to fund unexpected things, for example, if we lose our building or need to relocate.

With the lack of meeting in person, reduced membership, the loss of our hamfest, and inability to fundraise in a usual fashion, I would like to ask all of you to help out your Club this season.

I'm asking all of our members to consider making a \$5 donation to the Club. We really would like to fund some extra things this year, and your monetary donation would be much appreciated. Remember, we are a 501c3 non-profit, and 100% of your donation is tax-deductible. Please consider donating to our building fund as well.

"A Club is only as good as the sum of all of its members." If we even have modest participation, it would go a long way. Please consider helping out. It benefits all of us!

Our Mailing Address is:

Central Michigan Amateur Radio Club
P. O. Box 54
Mason, Michigan 48854

Have a safe and wonderful holiday season!

Sincerely,

Gordy Smith (KE8JKS)
President, CMARC

Treasurer's Report 2020

Shannon Ranes / WA2NVK- CMARC Treasurer

Bank Balances for October	
Beginning Balance	\$3,493.47
Total Monthly Income	\$335.00
Total Monthly Expenditures	(\$84.23)
Total Business Checking	\$3,744.24
Petty Cash	\$1.00
Outstanding Checks	(\$80.00)
Sub Total + Petty Cash	\$3,665.24
Primary Share Accounts	
Humphrey's Fund	\$384.39
Club Station	\$19.09
Building Fund	\$100.00
Field Day	\$178.88
Total Net Worth	\$4,247.60
Youth Fund Balance*	\$254.80
* Separate from CMARC Funds	

October 2020 Summary:

- ~ We deposited \$335 in Dues.
- ~ We paid \$20 for our yearly non-profit filing fee + \$64.23 for the membership mailing.
- ~ A \$40 memorial check (written in January) has not cleared.
- ~ A \$40 memorial check (written in May) has not cleared.

Treasurer's Report 2020

Shannon Ranes / WA2NVK- CMARC Treasurer

Bank Balances for November	
Beginning Balance	\$3,744.24
Total Monthly Income	\$240.00
Total Monthly Expenditures	(\$0.00)
Total Business Checking	\$3,984.24
Petty Cash	\$1.00
Outstanding Checks	(\$144.23)
Sub Total + Petty Cash	\$3,841.01
Primary Share Accounts	
Humphrey's Fund	\$384.41
Building Fund (Club Station)	\$19.09
Building Fund	\$150.01
Field Day	\$178.89
Total Net Worth	\$4,423.40
Youth Fund Balance*	\$254.83
* Separate from CMARC Funds	

November 2020 Summary:

- ~ Checking - Deposited \$240 in Dues.
- ~ Building - Deposited \$50.00 + \$0.01 interest.
- ~ A \$40 memorial check (written in January) has not cleared.
- ~ A \$40 memorial check (written in May) has not cleared.
- ~ A \$64.23 check (written in October) has not cleared.

Let Your Voice Be Heard!!!

An online survey was recently sent via ListServ email with questions to aid the CMARC Board and newly formed Building Committee in making decisions for the coming year. It should only take a few minutes of your time. Please be sure to fill it out and submit it so your voice can be heard.

https://docs.google.com/forms/d/e/1FAIpQLSfJK4MFXBV2Js8xBWtvc0zcl7Ar4e3NzQ5bSt_PoiHeNpl8g/viewform

Make a Tax-Deductible Donation.

Did you know you can make a tax-deductible donation to CMARC because we are a 501(c)3?

Checks can be made out and mailed to:

CMARC
PO Box 54
Mason, MI 48854-0054.

Please include your email address so our Treasurer can email a receipt to you for your records.

Upcoming Meetings Held on the Zoom Platform

CMARC General Meeting held on the second Friday of each month at 7 pm.

<https://us02web.zoom.us/j/89916190971?pwd=bWh4V2lVQXZLTlMeFBmaWVGK3haZz09>

Meeting ID: 899 1619 0971 Password: 891964

LCDRA Meeting held on January 21st at 7 pm.

<https://us02web.zoom.us/j/82349525177?pwd=TlRYTkJNUUNEbnNIWFY5ZlhzVII2QT09>

Meeting ID: 823 4952 5177 Password: LCDRA

Vibroplex Challenge

By: Gregg Mulder, WB8LZG

As many of you know, for many years I have refurbished keys and paddles as a side hobby for my enjoyment in the fine art of Morse code. Many Vibroplex's have passed through the shack restoration process and operate as new when I finish.

What most of you CMARC members may not know is, for years now I have given away Vibroplex paddles and bugs to worthy recipients. 9 of them so far in a 20 year period. "Given away, no fooling" you say. Wow! That's a bunch of Vibroplexes. "How do I get one" You ask?

"When will I be worthy"?

Well here's the scoop.

From now until Field Day 2021 you must convince me that you're a "worthy recipient". No you don't have to impress me with 20WPM speed. Just show that you are learning and using Morse code "on the air". With a little practice you can master CW in as little as 3 or 4 months. Show me that you are learning and enjoying the art of CW by Summer Field Day 2021, and a beautiful Vibroplex Vibrokeyer can be yours! **FREE.**

I CHALLENGE YOU ALL !

What's in your go-pack?

By Gregg Mulder , WB8LZG

Many new Hams read articles in QST about adventures with POTA (Parks On The Air) and SOTA (Summits On The Air). Many of you may be thinking of trying one of these special portable operations yourself. You can have loads of fun activating one of the local parks, “Field Day” style. I’ve done a few of these portable operations now from various locations across the country, so I have literally “found out the hard way” what works and what doesn’t. Here are a few hints.

The first thing in any operation is a good antenna. If you have tall trees to string a dipole up high, so much the better. But what if you don’t have trees? What if there are open areas, like the desert or the shoreline? Such places have no supports for a good dipole.

I gave the CMARC group a glimpse of my go-pack at the October ZOOM meeting, but I’ll go into it a bit more here. I carry a dipole along if I know there will be tall supports, but now I always take a vertical package that works reasonably well for its small size. It’s a “Ham Stick” mobile cobble job, with three separate sticks for 80,40 and 20 meters. I have a mount that is adaptable to many places. The key to this, and any vertical, is the radial pack. In the go-pack is a set of radials made of #18 Ga. wire, with two radials per band for a total of 6. Then, if I’m at a semi-permanent location and not backpacking the gear in, I add another “radial kit” with an additional four radials per band for 40 and 20 and two radials for 80M, for a total of 16. I have had some very satisfying QSOs with it for how small it is. Of course, some of these operations have been right on the ocean, which can enhance that ground plane. However, I’ve also had good luck in an open field, with only the radials spread out.

The “clamp” is adaptable to many different mounts. (fences, railings, car racks, etc.) and I also carry a small variety of screws to mount it to a 2by4 or any spare lumber to get the feed point off the ground.

The current Go-pack. An old mobile telephone bag. Small, light, and carries just enough stuff to get on the air from just about anywhere.

What’s in the sack, Jack, you may wonder? Well, here’s the list:

- Yaesu FT-817 transceiver, microphone, rubber ducky
- Elecraft T1 QRP antenna tuner with various coax adapters
- Thirty feet of RG-174u coax (the small stuff). Yes, I know all about the losses! On 80 and 40 meters, 30 feet is not too bad. It WORKS, and the weight ratio is right.
- I DO also carry 60-feet of RG58u rolled up neatly in the car.
- Radial package (18-ga wire with yellow insulation for visibility.)
- Very tiny magnetic key (the bulldog TM) - For emergencies only.
- Two hundred feet of braided twine and sinkers - for any occasions where needed.
- Several small lengths coax jumpers with various ends.
- Various power and lighter adapters to power the radio.
- Variety of alligator clips and BNC combo connectors for wire antennas.
- Pencils and paper. (for logging all those DX OSOs!)
- Magic Dust (yes, we QRP types will try anything for an edge!)

When I know I’m going to be at a more permanent location, like at my parents’ home in the Fla. Keys; I bring along an additional medium-sized Priority Mail box full of extra stuff to make life as a QRP’er a little easier. I use Postal boxes because they’re the right size, and I can often mail the stuff ahead of time to save room in the car or on a plane.

The box contains the following:

- A 65-foot roll of larger coax.
- Rolled up twin-lead J-Pole for 2 meters.
- Full-size Vibroplex Key.
- A spare W5JH paddle.

See GO PACK, Page 9

■ **GO PACK**, from Page 8

- A large radial kit (the more, the better).
- Yaesu power supply.
- Wall-wart for extended AC operation and charging.
- Various power plug/cable combos to keep me on the air with battery.
- 12-volt, 2.8 AH gel-cell battery to supplement the Yaesu internal pack.
- A foldable solar panel to charge the gel-cell battery.
- A small box with many small tools, nuts, bolts, screws, and spare FUSES.

You never know what “Murphy” will have waiting for you, so it’s best to have some “back-up” stuff just in case. The critical thing to remember is preparation. Do your homework before you try a portable operation. Prepare ahead, and you will have much more fun with fewer problems and frustrations. After all, that’s what it’s all about, right? More QSO’s in the log equals more fun!

Many of you noticed that I also put in a microphone. (oh, the shame) Even a stalwart CW op like me realizes that the local 2m repeater may be the best thing to communicate with in a REAL emergency. Yes, I put in the mic, and I will also pack along a 2m HT nearly everywhere I go. This is just a sample of what you can put in your own Go-Kit. Mine is still changing on the fly and getting better with every portable operation I go on. ■



A close-up of the feedpoint and the radial wires.



Nice and compact for travelling!



A view of the 40-meter “Ham Stick” and small radial package



Portable Florida Ops 2020

By Gregg Mulder , WB8LZG

This year will undoubtedly go down as one of the most disruptive years ever for everyone. Unable to reliably plan anything, the XYL and I finally decided to spend some time out of the cold. At the end of November, we rented a place in Florida and packed up the car. I had intended to bring along a “big rig,” but we were loaded to the hilt by the time all was packed, and the only room left was for my QRP “go pack.” Having never seen the place we were renting, I threw in a variety of antenna items. My mobile whip setup was 1st. Then a bunch of precut radials for 20 and 40, and a 40-meter dipole. At the last minute, I removed the 40M dipole, as it took up lots of space with all the coax, insulators, rope, etc., which turned out to be a big mistake. Our lot had a very nice tall pine tree that would do nicely as a center support. I still have a small spool of wire, and I’m contemplating an EFHW wire for 40 or 80.

Upon arrival and unpacking the car, I began scouting a good spot for my vertical. I did not ask permission from the HOA police, so I wanted to keep it hidden if possible. I found a good spot near the corner of the porch that had several short palm trees to hide it from the street view. I mounted the base to a 2x2 and guyed it to the nearby



Go Bag contents, FT817, T1, QRP gear, coax, adapters, wire, etc.

palms with thin “invisible” nylon guys. Then attached the eight radials in my “radial kit” and strung them out to the palms and down the edge of the porch. I lifted the radials up into the palm branches to hide them even better.

The antenna was reasonably hidden, but some of the radials stuck out pretty good. Fortunately, many of the other neighbors were stringing up Christmas decorations, so my antenna stuff went mostly unnoticed. I did tell the next-door neighbor I was a ham and what I was doing, and he had no objection to the temporary setup. I ran the coax into the porch and was ready to set up the radio shack. So Far, So Good. Enter my old friend Murphy!

I unpacked the “go bag” and set up the trusty FT-817 on the operating table, connected the key, TI tuner, and Yaesu power supply to the rig. Power up showed signals,



See FLORIDA OPS, Page 11

and the rig was doing fine. However, the Yaesu wall-wart power supply was not. A quick check with a VOM confirmed my fear. DEAD. This meant that I had to power everything from my folding solar panel and small gel-cel. The sun was shining, so I patched in the solar panel and was soon charging my battery while listening to the band activity on 40-meters. I answered a CQ SKCC and was quickly rewarded with a nice QSO with W2SKY, Peter in Rochester, NY. My RST was only 339, but I was elated to grab a cross country QSO on my 1st attempt. Over Thanksgiving week, several more QSOs with MI, OH, PA, NC, GA, FL, and IL confirmed that my little vertical was performing as I expected. Enter Murphy's little brother, Marvin.

I was not able to hold a reasonable charge on my small gel-cell battery. It's 7 or 8 years old now (maybe more) and looks as though it had degraded quite a bit since last year when I used it on my Key West operations. Right now getting about 1 hour of operating time before the old gel-cel goes down below 11 volts. Usable, but it needs a replacement. Thanks, Marvin!

I was also noticing that I would have to choose my operating times to best take advantage of my "peanut whistle" signal in a world of high power and better antennas than my own. My best signals were early in the morning and early in the evening, right in the "gray line" and early evening being tops. Calling CQ in the QRP/SKCC part of the band (7.050-7.060 mcs) proved to be a better return on my calls. Still, only a week in, and I'm having good

luck and lots of fun on the air.

I'm setting my sights on the tall pine tree on the other side of the house. I brought along a slingshot and some sinkers and will soon have a wire up there. First things first, I'll be scouting out some other source of xcvr power here right away. Perhaps I'll get lucky and find an electronics supply store nearby. There's always the possibility of using a 12-volt battery from a car or golf carts, or a boat battery, which may be the best solution. A 12-volt marine battery will charge nicely from my solar panel and supply enough reserve juice for many evening operating hours. I may even go "hog wild" and order up a brand new gel-cel from one of the online suppliers. I'll use that plan as a last resort. A QRP die hard never gives up! There are ALWAYS alternatives!

Persevere, Overcome, Adapt, Win!

I still have many other QRP plans ahead. I brought along my homebrew "hockey stick" satellite antenna for some handheld operations. I just carefully bent all of the "coathanger" elements flat against the boom to pack it in the car's spare tire compartment. I did a little research and found out that there is a small corner of a semi-rare grid square, EL88 (the rest is water), just a short bicycle ride from here. Part of the Myaka state forest and Englewood. I'll be planning some QRP satellite operations very soon.

Stay tuned! More stories of QRP fun are coming next month. ■



Here's the 1/4 QRP Shack



Enjoying QRP CW on the porch

Get this book and get on six meters!

By Dan Romanchik , KB6NU

Capture the Magic of Six Meters: Average Antennas + Limited Antennas = Exceptional QSOS by Jim Wilson, K5ND. 2020. FREE!. <https://www.k5nd.net/wp-content/uploads/2020/08/Six-Meters-eBook-V3.pdf>

One of the things that I said I was going to do this summer was get on 6 meters and take advantage of sporadic E propagation. Of course, I never got around to it. If I'd seen this book last July, however, I might have done it. After all, according to the introduction:

It really doesn't take much on six meters — your existing HF+6 meter rig along with a simple antenna, even a dipole, will work.....It covers propagation, equipment, software, antennas, awards and contesting, as well as assistance in finding the magic. All of this is leavened with stories from my personal experience.

The book does a pretty good job of this, too. One thing that I take a little bit of exception to is that there's a heavy emphasis on the use of digital modes, but as on the HF bands, that's probably where a lot of activity is these days. For example, K5ND writes:

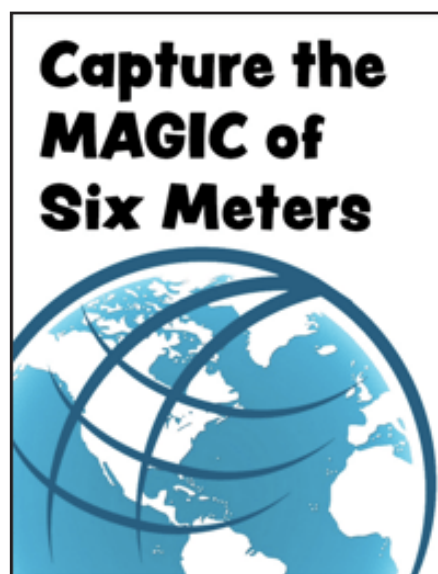
In the early days of ham radio meteor scatter they often used CW and eventually went to very high speed CW with the received signal recorded and then slowed down to try to catch glimpses of the call sign, etc. Since the advent of WSJT and now WSJT-X computer signal processing is used to accomplish the same thing. The early mode of FSK441 and the newer mode of MSK144 essentially send hundreds of messages packed into a several second transmission (15 seconds is currently the standard duration).

So, if you do want to make meteor scatter contacts, then I guess you really do need to be operating MSK144.

I also think that the book would be a little more useful if K5ND had gone into a little more detail on the antennas he writes about. This is just a minor quibble, though. There are plenty of books, blog posts, and YouTube videos that show you how to build various antennas. The author's descriptions of his experiences with the various antennas will certainly help you decide which antenna may be right for you.

Another thing that you really can't quibble with is the price. It's FREE! So, [get a copy](#) and get on 6 meters! ■

Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (KB6NU.Com/study-guides/), and often appears on the ICQPodcast (icqpodcast.com).



How to run a multi-station special event

By Dan Romanchik , KB6NU

Here's a guest post from Dr. Michael K. Gauthier, K6ICS. I like operating special event stations, both as an "activator" and as a chaser. I hope you find these tips useful....Dan

It's always fun to work a special event where there is more than one call sign or, the same call sign on several bands, required to receive an award. For the award seeker, this brings out the excitement of the chase. But many times, this excitement turns to frustration and disgust when it is found that all the required contacts are not reasonably available or even worse, they are not even on the air. Having been a ham since 1954, I have participated in many special events as both the award seeker and as the event operator. I have seen these problems too many times. Fighting unexpected mishaps, band conditions, QSB, QRN, and QRM is normal. Not having the special event stations working at their best is tragic.

The Problem

As an example of the problem, there are 5 stations to contact, over a 10-day period. You have worked 3 and realize that the other 2 you have not heard. Checking DX Summit and other spotting web sites you find that the 4th station you need has been on 160 meter SSB and 80 meter FT8 for about 4 hours over the past 4-days. When you check out the 5th station, you find no record of them even being on the air.

RATS! That makes you feel good. What a waste of time.

Pre-Event Analysis

- Do you have an event e-mail contact? Review e-mails several times a day, minimum.
- Do you have a website? Does it contain ALL special event information?
- Review the rules and regulations of your event and award(s).
- What is the time period over which the special event will take place? Does it conflict with other events?

- Planning the bands, modes, and times which will be best for the maximum number of contestants.
- When event stations operators can only operate limited times or bands. Add additional station(s) to cover open bands, modes, and times.
- Do you have backup operators?
- Emergencies: Power failures, equipment failures, operator illness, and other problems.
- After the event starts you need to fine tune your analysis, based on current operating conditions.
- Post-event QSLs and Award Certificates. Logging and reporting contacts. QSLs, Awards processing, and Delivery. "Not in Log" and other problems.

Recommendations

- Use the "most active" bands: 80 Night, 40 Night/Day, 20 Day. Other bands as open.
- Multiple stations using the same call on different bands and modes, at the same time.
- Use all bands/modes, unless it is a single band/mode event.
- Publish typical operating schedule so the stations can be more easily found.
- Suggest award seekers list contacts on DX Summit and other spotting sites.
- Process all QSLs and award certificates rapidly.
- KISS – Keep it Simple Stupid.

Notes

Be aware of band limits for all operators. Novices and Technicians are limited to CW only on a portion of 80, 40, and 15 meters. On 10 meters they do have CW, Digital, and SSB, but only a small portion of the band. General and Advanced classes have their own operating limits. Other countries have their own band limits. ■

Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (KB6NU.Com/study-guides/), and often appears on the ICQPodcast (icqpodcast.com).

How to prevent ESD damage

By Dan Romanchik , KB6NU

Here are some tips from Keysight Technologies, one of the leading electronic test equipment companies, on how to prevent ESD from damaging your electronics.

USE A GROUNDED WRIST STRAP whenever you are handling equipment or boards. Using a grounded wrist strap prevents your body from building up charge and causing damage when this built-up charge discharges into your equipment or test boards. Make sure to connect that alligator clip to ground!

USE GROUNDED WORK SURFACES OR MATS for your boards. Do NOT use static generating or insulating materials as a work surface. Non-grounded mats and static generating/insulated materials can inductively charge boards, especially exposed ones. When connecting a charged board to equipment, the board can cause damage by discharging into the equipment's inputs.

KEEP CHARGED MATERIALS AT LEAST 0.3 METERS FROM EXPOSED ASSEMBLIES. This includes plastics, foam, or other materials that can build up charge. Having a charged material near an exposed assembly can inductively charge the assembly. The assembly can then discharge into the equipment's inputs.

DISCHARGE YOUR CABLES BEFORE CONNECTING THEM TO YOUR EQUIPMENT. Electrostatic charges can build up on test probes and test leads, so it's important to discharge them before connecting them to your test equipment:

- Ensure your device is off.
- Connect your cable to your device.
- Attach a 50-ohm shunt to the open end of the cable.
- Remove the shunt and immediately attach your device to your equipment. This prevents the center conductor of your cable from discharging stored charge into your equipment. A charged assembly can charge connected cables.



USE BOARD STANDOFFS AS NEEDED. In some situations, you need board standoffs to provide extra insulation for your exposed assemblies. This prevents your grounded mats from making unwanted connections on your board.

NEVER USE "PINK" PACKING MATERIAL FOR BOARD TRANSPORT OR AS A WORK SURFACE. While many people think pink packing material is ESD safe, in most cases it easily builds up unwanted charge. Unless continuous, thorough testing is done, treat pink packing materials as charged.

CAP UNUSED EQUIPMENT INPUTS to avoid accidental ESD and physical damage. Damage often occurs by accidentally contacting equipment inputs. Capping unused inputs protects them from incidental ESD damage.

USE ESD-SAFE BAGS WHEN TRANSPORTING BOARDS. This protects boards from ESD damage while moving between ESD-safe locations.

DO NOT OVERDRIVE EQUIPMENT INPUTS. Start your testing at the least sensitive input setting and zoom in on your signal. Additionally, observe the maximum input levels for your specific equipment. The least sensitive setting is the most resilient, so starting there ensures that your inputs are at safe operating levels

See ESD DAMAGE, Page 15

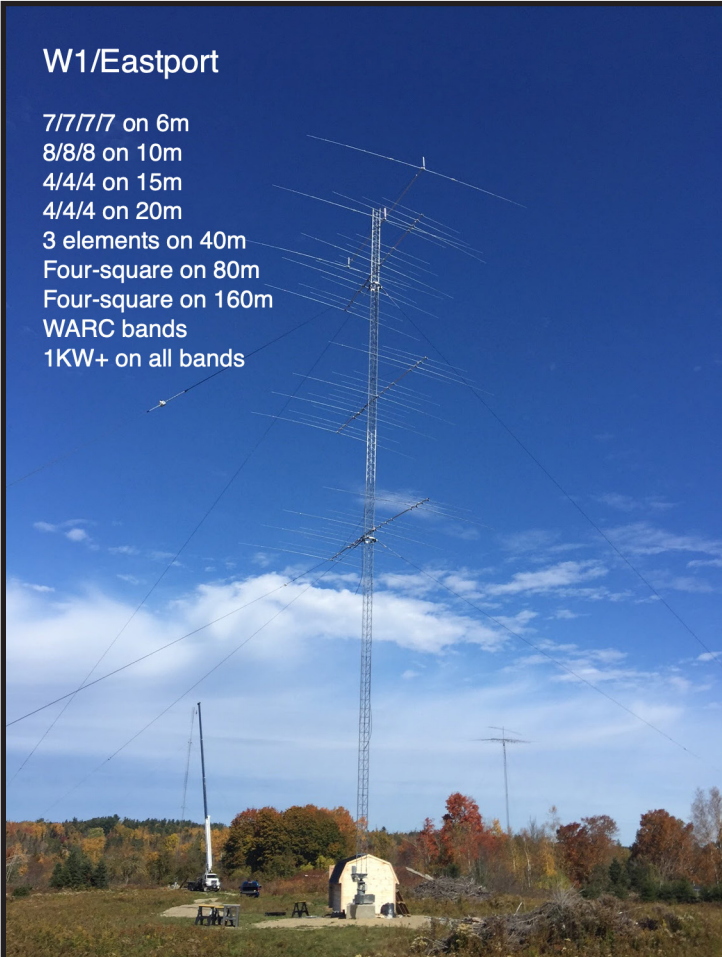
After I posted this to my blog, Dave, N8SBE offered some further tips. He writes:

- Grounded heel straps also help reduce static charge. Test them with a floor tester every time you put them on. The floor needs to be somewhat conductive—not metal, that’s a safety hazard—so use conductive wax on tiles, or conductive carpet to drain of electrostatic charges.
- Keep materials, such as styrofoam cups, that form electrostatic charges easily away from your workspace. A styrofoam cup can generate thousands of volts.
- Keep the humidity up in the workspace. That helps to keep static generation down as well.

- I like to think that I follow ESD-safe procedures, but there are a couple of things here that I hadn’t thought about before. For example, I’d never really thought about discharging test equipment cables before connecting them. I think that’s a good tip. ■

To learn more, go to <https://www.keysight.com/find/PreventESD>

Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the “No Nonsense” amateur radio license study guides (KB6NU.Com/study-guides/), and often appears on the ICQPodcast (icqpodcast.com). When he’s not worrying about electrostatic discharge, he teaches online ham radio classes and operates CW on the HF bands.



W1/Eastport

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8/8/8 on 10m
4/4/4 on 15m
4/4/4 on 20m
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Four-square on 80m
Four-square on 160m
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CMARC Contesting

The results are in for this years Field Day operations! This year was certainly trying for all of us, but thank you to all who participated.

2020 ARRL Field Day (June)

Total No. of Michigan Section Entries (266)

Total No. of Great Lakes Division Entries (842)

MI Sec	GLD	Name	Call	Class	# of Q's	Points
33rd	136th	Gregg Mulder	WB8LZG	1D	354	1,466
52nd	229th	Dave Vick	W8ZZX/M	1C	454	958
71st	264th	Ed Ozer	W8EO	1D	188	802
127th	407th	Dan Beuchert	WX8MOJ	1E	53	436
133rd	458th	Fred Payne	KD8RSH	1D	154	358
187th	620th	Clint Hannahs	KC8EHR	1B1	25	200
225th	719th	Chris Ranes	NS8Q	1D	19	122
231st	733rd	John Hosford	KC8QZB	1D	31	112

The above CMARC members submitted their logs to the ARRL with a "Central Michigan ARC" affiliation.

Soapbox: 2020 ARRL SSB November Sweepstakes

By: Dan Beuchert / WX8MOJ

In a year of many contesting firsts, our family worked SSB Sweepstakes from home. This is a contest that I've had a lot of fun with in the past at CMARC, but never in a way that's been so family friendly as this year. We used the same trusty camper as Field Day, and we put some new equipment to the test. I had been looking into buying a Yaesu FT-891 from Scott VanWalsum K8MTB and this seemed like a great test drive opportunity. Needless to say, with no offense meant to my FT-100D, it was an easy decision to buy this radio after the contest! We didn't break any records for sure, making 26 contacts over 18 sections total. We had fun helping Abby, who much prefers working digital modes, find her Phone voice. She was a little shy with the first couple contacts, but she ended up making it to 5 with the guidance of Dawn KD8MWA and myself. It's always a win when you can work a contest as a family, and fan the flames of a 5th grader, who is more determined to get her Tech by summer!



CENTRAL MICHIGAN AMATEUR RADIO CLUB BOARD OF DIRECTORS MEETING MINUTES

Saturday, October 3, 2020

Attendance

Board Members Present: S. Ranes (WA2NVK), D. Vick (W8ZZX), D. McLain (KB8RAD),
G. Mulder (WB8LZG), K. Fitzgerald (K9PC)

Board Members Absent: G. Smith (KE8JKS), D. Dembinski (KD8YDE)

Visitors: J. Doornhaag (KD8NNQ), D. Beuchert (WX8MOJ),
T. Rocheleau (WA8WPI)

Call to Order

- The meeting began at 7:05pm. In the absence of the President and Vice-President, Treasurer S. Ranes presided.

Club Business Discussed

- There was discussion of the day's VE Session at Moores park. Secretary Vick will be looking for an indoor venue that will allow the VE Team to have sessions throughout the winter months, assuming the Lansing Fire Dept. cannot let us use the Community Room at Station #4. John Doornhaag had Dan Beuchert take the November and December VE Session dates off the website calendar, until we know if and where the sessions may take place.
- There will be a flier printed & mailed to the Membership, to let members know we're thinking of them and reminding them that annual Club Dues are coming up, that nominations for the Board open at the October General Membership Meeting, and that the club is accepting donations to the Building Fund.
- Treasurer Ranes stated that the Non-Profit paperwork for 2021 has been filed.
- Dan Beuchert reported on the morning's APRSC-SET testing using the club station. Everything worked very well. He gave the Board further details on the upcoming second part of the testing, coming up on Saturday, Oct. 10th. He also shared that he has the recorded video from the past month's Skywarn presentation from Michael Boensch, and will edit it for interested parties to view. He will post it to the club's website.
- Dan Beuchert also stated that he had not had any information from Kevin regarding the possible sale of the clubhouse building. The realtors showed it this weekend, however no one has heard anything.
- Tom Rocheleau shared that the Eaton County VE Team would be testing on Saturday, Oct. 10th, 12pm at the Charlotte Church of Christ. Tom will speak to Mark Korroch about D. Vick and J. Doornhaag assisting.
- Nominations will be opened for four positions on the Board – Smith, Ranes, McLain, and Fitzgerald – at the upcoming General Meeting. Mulder, Dembinski, and Vick are

serving thru 2021. Discussion ensued regarding email voting; perhaps Dan Beuchert would be amenable to overseeing it?

- The Board discussed potential loss of the building, and whether it would be appropriate to consolidate club possessions in our storage space, in case we need to empty out the building this winter on short notice.
- Speakers - For post-meeting speakers, Dan Beuchert will present on the APRSC SET testing, and Gregg Mulder will show his QRP go-box.
- The next issue if the Scope will come out... "Hopefully soon?" G. Mulder will send Chris Ranes an article for it.
- Safety Plan: Treasurer Ranes stated that when we get back to meeting in person, we will need to have a Safety Plan in place. Secretary Vick will share COVID-19 safety plans from his theatre work with the Board, to help formulate a plan.
- Secretary Vick has sent the Zoom links & meeting room info out to the CMARC listserv and Facebook group. He will do this each month, henceforth.
- Further discussion ensued regarding meeting programs and giving members a reason to attend meetings, other than the business of the club.

Adjournment

- With no further business to discuss, it was Moved by McLain, seconded by Ranes to adjourn the October Board Meeting at 7:56pm.

Respectfully submitted,

Dave Vick, W8ZZX
CMARC Secretary

CENTRAL MICHIGAN AMATEUR RADIO CLUB GENERAL MEETING MINUTES

Friday, October 9, 2020

Attendance

Board Members Present: D. Dembinski (KD8YDE), S. Ranes (WA2NVK), D. Vick (W8ZZX), G. Mulder (WB8LZG), D. McLain (KB8RAD), K. Fitzgerald (N9PC)

Board Members Absent: G. Smith (KE8JKS)

General Members: KD8NNQ, K8KUF, K8TS, KD8VJD, NG8L, W8PDM, NS8Q, KC8QZB, KE8NJT, WD8OVL, WX8MOJ, WA8WPI, KD8ZPE, N8FZ, KB8DQQ

Visitors: T. Conroy (WB8HRO)

Call to Order

- The meeting began at 7:05pm
- Dan Beuchert (WX8MOJ) held the American Flag for the Pledge of Allegiance

Sign-In Sheets

- Secretary Vick (W8ZZX) took attendance from the Zoom meeting participant roster.

Cards & Flowers Report

- There was no report this month.

New Members & Visitors

- Tim Conroy (WB8HRO) of Okemos joined us again this month.

Treasurer's Report

- Moved by John Doornhaag (KD8NNQ), supported by Secretary Vick (W8ZZX) to accept the Treasurer's Report as published in the CMARC website. The motion carried.

Secretary's Report

- It was moved by VP Dembinski (KD8YDE) seconded by John Doornhaag (KD8NNQ) to accept the Secretary's Report as published in the CMARC website. The motion carried.

Interesting QSOs, QSLs, DX, & Other Contacts

- John Hosford (KC8QZB) worked a contact in Panama using a new EFHW antenna at his new home in Lansing.

Deferred Business

- Dan Beuchert (WX8MOJ) spoke about the APRSC SET tests running this month; he had mobilized the club's station in the net with the Board's permission, due to being prevented from using the Ingham County EOS by current pandemic-safety policy.

New Business

- Treasurer Ranes (WA2NVK) stated that the LCDRA meeting was cancelled until at least January, due to the coronavirus pandemic.

- Treasurer Ranes (WA2NVK) stated that she has sent out an informational mailing to all CMARC members. The mailing was sent to members first and Board Members afterward.
- Secretary Vick (W8ZZX) noted that Nominations for four seats on the CMARC Board of Directors were opening at this meeting, running through the November meeting. He nominated Gordy Smith (KE8JKS), Shannon Ranes (WA2NVK), Don McLain (KB8RAD), and Kelly Fitzgerald (N9PC) for re-election to the Board. All Nominees present at the meeting accepted their nominations. Secretary Vick would contact Gordy personally to ask if he would accept.
- Tom Rocheleau (WA8WPI) shared that the Eaton County VE Team was holding a test session this Saturday, October 10th at 12:00pm at the Charlotte Church of Christ. Secretary Vick (W8ZZX) and John Doornhaag (KD8NNQ) from the Ingham County VE Team were going out to Charlotte to assist, as the Eaton County team was missing a couple of members that day.
- Membership Chair John Doornhaag (KD8NNQ) reminded the club that 2021 Membership Dues were coming up, and could be mailed to him at his QTH.
- Vice-President Dembinski (KD8YDE) shared that member Matt Taylor (KD8JIA) was being moved out of his care facility in Owosso.
- Secretary Vick (W8ZZX) noted that ballots were out for the ARRL elections for Great Lakes District Director and Vice-Director. Make sure you get your ballots returned in time.
- Dan Beuchert (WX8MOJ) shared that he had the slide & video media from the recent Skywarn training session hosted by LCDRA, but that he had gotten a bit behind in editing them. He would be finishing the editing tasks up, uploading the media online, and posting links to them in the listserv and on Facebook.

Adjournment

- With no further business to discuss, it was Moved by Secretary Vick (W8ZZX), seconded by Don McLain (KB8RAD) to adjourn the business meeting at 7:38pm and move to the Presentation for the evening.

Tonight's Presentation

- Gregg Mulder (WB8LZG) displayed his QRP Go-Bag.

Respectfully submitted,

Dave Vick, W8ZZX
CMARC Secretary

CENTRAL MICHIGAN AMATEUR RADIO CLUB BOARD OF DIRECTORS MEETING MINUTES

Friday, November 7, 2020

Attendance

Board Members Present: G. Smith (KE8JKS), D. Dembinski (KD8YDE), S. Ranes (WA2NVK), D. Vick (W8ZZX), D. McLain (KB8RAD), G. Mulder (WB8LZG), K. Fitzgerald (K9PC)

Board Members Absent:

Visitors: C. Ranes (NS8Q)

Call to Order

- The meeting began at 7:09pm

Club Business Discussed

- VE Sessions: the Ingham County team is on hold. Secretary Vick stated he had spoken with the Lansing Center but the rental fee was too high. He had calls into the malls regarding using their food courts, but had no response. President Smith said he would speak to the staff at the Okemos Conference Center regarding a room. Secretary Vick said we should speak to John Doornhaag before making any concrete plans, since he is the VE Team Leader. Further discussion ensued.
- Paperwork: Treasurer Ranes stated that she had filed the 501(c)(3) paperwork regarding the club's non-profit status, as noted in last month's Board Meeting.
- Clubhouse: Treasurer Ranes stated she had asked Dan Beuchert if he had heard any news regarding the sale of the building. He had not, but he will touch base with Kevin to see if there is any new information.
- Nominations & Election: Secretary Vick asked if any Board members had received any further nominations for the upcoming Board of Directors Election; no one had. Nominations will be closed at the General Membership Meeting on Friday, Nov. 13. Treasurer Ranes has asked Dan Beuchert if he would serve as Election Inspector and run the upcoming election via email; he has agreed to do so. Details will be forthcoming at the upcoming meeting. In addition, Treasurer Ranes will send out an email to the club Listserv.
- Matt Taylor: Vice-President Dembinski shared that club member Matthew Taylor (KD8JIA) has changed addresses in Owosso. The club should get a card out to him.
- Tim Conroy: President Smith noted that our regular guest Tim Conroy (WB8HRO) in Okemos has a piece of equipment that needs to be soldered, and he would visit Tim and effect repairs.
- Good & Welfare Letter: Treasurer Ranes stated that she has received lots of feedback from the recent mailing, including lots of membership renewals for 2021.

- **Speaker:** Treasurer Ranes inquired whether we had a speaker lined up for the November General Membership Meeting. President Smith said he could demonstrate his new hot-air rework station.
- **Classes:** President Smith has his shop-studio set up, but is holding off on hosting any online classes until after the first of the year. He needs to write lesson plans and choreograph the video shooting.
- **Sweeps:** Gregg Mulder shared that he'd collected 35 contacts in 25 sections so far, during this weekend's CW Sweepstakes contest. Chris Ranes mentioned that the Phone Sweeps were coming up the weekend of November 21-23.
- **Club Rendezvous Frequency:** President Smith noted that he had been approached by member Carl Canfield (K8YHH) regarding a club rendezvous frequency, in case of blackout or emergency. The Board discussed existing VHF repeaters on 145.390 and 146.700, or just using the National Call Frequency in simplex mode, since it's likely that such an emergency would take the repeaters off the air. Chris Ranes commented that such discussion should include Dan Beuchert since the ARPSC would commandeer the LCDRA repeaters in case of emergency, if they are still working. Further discussion ensued.
- Gregg Mulder spoke about the possibility of changing the format of the Board Elections to have candidates run for specific offices, rather than the current practice of electing a set number of Directors and letting the Board assign specific jobs. Treasurer Ranes noted that this would require a Constitutional change. Further discussion ensued. The Board agreed to revisit the topic after the upcoming election, with an eye to making any such changes before the 2021 Officer Elections.
- Treasurer Ranes shared that Dan Beuchert has thirty copies of the CMARC Cookbook left, if anyone is interested in buying a copy. She believed they were priced at \$5 per copy. All proceeds go to help the club. A note could be put in the next issue of the Scope.
- Secretary Vick asked if there would be a Scope issue coming out this month. Chris Ranes said he had planned on getting it out the weekend of the 7th, but life got complicated.

Adjournment

- With no further business to discuss, it was Moved by Don McLain, seconded by Kelly Fitzgerald to adjourn the November Board Meeting at 8:15pm.

Respectfully submitted,

Dave Vick, W8ZZX
CMARC Secretary

CENTRAL MICHIGAN AMATEUR RADIO CLUB GENERAL MEETING MINUTES

Friday, November 13, 2020

Attendance

Board Members Present: G. Smith (KE8JKS), D. Dembinski (KD8YDE), S. Ranes (WA2NVK), D. Vick (W8ZZX), G. Mulder (WB8LZG), D. McLain (KB8RAD), K. Fitzgerald (N9PC)

Board Members Absent: N/A

General Members: W8MKB, NS8Q, KD8NNQ, K8KUF, K8TS, AC8YF, KC8QZB, KE8NJT, WX8MOJ, KD8MWA, N8LNU, KD8VJD, KE8FXG, KB8DQQ, N8FZ, KD8ZPE, W8EO, K8YHH, WA8FHI

Visitors: Tim Conroy (WB8HRO), Tom Glomsky

Call to Order

- The meeting began at 7:05pm
- VP Dan Dembinski (KD8YDE) held the American Flag for the Pledge of Allegiance

Sign-In Sheets

- Secretary Dave Vick (W8ZZX) took attendance from the Zoom register.

Cards & Flowers Report

- Jane Hosford (KC8FSK) sent a card to Toni Benson Smith after passing of her mother. She also sent cards to Matthew Taylor, Reza Beha, Ted Sadilek, and Leon Tillitson.
- It was noted by Bob Strobel (KB8DQQ) that local ham Mike Baird (N8NBZ) passed away on Nov. 7th from COVID-19. He was not a member of the club but was active in the local ham community.

New Members & Visitors

- We were joined by Tim Conroy (WB8HRO) and Tom Glomsky.

Treasurer's Report

- Moved by Secretary Vick (W8ZZX), supported by VP Dembinski (KD8YDE) to accept the Treasurer's Report as published in the CMARC website. The motion carried.

Secretary's Report

- It was moved by Secretary Vick (W8ZZX), seconded by John Doornhaag (KD8NNQ) to accept the Secretary's Report as published in the CMARC website. The motion carried.

Interesting QSOs, QSLs, DX, & Other Contacts

- John Hosford (KC8QZB) worked QSOs in Brazil on 20m and Grand Cayman on 40m with his new end-fed wire.

- Secretary Vick (W8ZZX) received a QSL card from Puerto Rico, from a station he worked Mobile on Field Day 2020, this past June.

Deferred Business

- Nominations: Secretary Vick asked for any other Nominations for the Board of Directors, to be elected in December for a two-year term. VP Dembinski nominated John Tyree (W8JTT), who declined the nomination. Having called for additional nominations three times with no others named, nominations were declared Closed. The official nominations for the four upcoming Board vacancies are Gordy Smith, Shannon Ranes, Don McLain, and Kelly Fitzpatrick.
- Election: Voting for the Board will be conducted by email. Dan Beuchert (WX8MOJ) will head up the Election Committee, accompanied by Michael Boensch (W8MKB) and Bob Strobel (KB8DQQ). An email will be sent out to all members regarding voting in the election. The Official email address for voting is <cmarcvoting@gmail.com>. All votes must be received not later than midnight Thursday, December 10th—the night before the December club meeting.

New Business

- Treasurer Ranes (WA2NVK) shared that we had thirty copies of the old CMARC cookbook available for sale, for \$5 per copy, as a club fundraiser.
- Gregg Mulder (WB8LZG) asked if any member had participated in the recent ARRL CW Sweepstakes contest, aside from himself, Chris Ranes (NS8Q) and Ed Oser (W8EO). It was noted that the ARRL Phone Sweepstakes would be running in two weeks, beginning on Saturday, November 21st.
- President Smith (KE8JKS) spoke about the current state of uncertainty surrounding the club building being for sale, and perhaps finding a donated building. Dan Beuchert (WX8MOJ) said he had not heard anything from the current building owner, and was hesitant to keep asking him too frequently. Dan also stated we have a lot of time and effort invested in the current building, and it'll take a lot of effort to relocate; maybe the club could reach an agreement with a new owner. John Doornhaag (KD8NNQ) stated that we don't know what the situation is, and it would be best if we gained more info before making any decisions. John also stated that we do have a contract with the building owner, giving us a 90-day notification in the event they do want us out, and any new owner has to abide by that. A potential dues increase was discussed informally via Facebook, with mostly positive points of view. Brian Vissers (KE8NJT) stated that he knows the owner, and the owner may want to know how long it would take us to vacate. Further discussion ensued. A Steering Committee (KE8JKS, WX8MOJ, KE8NJT, KD8YDE, N8FZ) was formed to evaluate the situation, get more information from our landlord, weigh any potential dues increases, and research the possibility of obtaining grants based on our 501(c)(3) status and our commitment to public service. Dan Beuchert (WX8MOJ) will liaise with the ARPSC. Russ Fitzgerald (N8FZ) stated we need to come up with a long-term strategy and some long-term goals before setting any dues increases, these strategies and goals should be considered as recruiting tools to increase our attractiveness to potential new members.

For the Good of the Order

- Ed Oxer (W8EO) spoke about the MSU Ham Club, noting the relationship between CMARC and the MSU club, and what the club is doing. He acknowledged that CMARC members had been participating in the MSU club's Thursday night UHF net, and spoke about their activities during this challenging academic year.
- * Michael Boensch (W8MKB) shared that the next LCDRA annual meeting would be in January via Zoom. LCDRA Board elections will be coming up for 2021.
- * Dan Beuchert (WZ8MOJ) noted that the next ARPSC meeting would be held via Zoom on Monday, November 16th at 7pm.

Adjournment

- With no further business to discuss, it was Moved by Secretary Vick (W8ZZX), seconded by Director McLain (KB8RAD) to adjourn the business meeting at 8:19pm and move to the Presentation for the evening.

Tonight's Presentation

- President Smith (KE8JKS) demonstrated his hot-air reworking station for soldering surface-mount components.

Respectfully submitted,

Dave Vick, W8ZZX
CMARC Secretary

CLASSIFIEDS

Gregg Mulder / WB8LZG
(517) 646-6257 after 1pm

\$425

Elecraft K1 HF XCVR Kit

UNBUILT, new in box, 4-bands with backlight, extras

\$200

**Yaesu SP-6 Speaker w/ built-in
Timewave DSP 599Y Digital Noise
Reduction**

FB Condx

\$125

TH3jr Tribander

*20-15-10m, oldie by a goodie,
disassembled, all there, could use a few
new trap seals (available from MFJ). Small
light-weight beam with a Big Signal.*

\$100

**Astron 12-volt 20-amp Metered
Transformer Power Supply**

Nice supply for your shack.

\$75

Hygain "Butterfly Beam"

*20-10m, disassembled and wrapped
up. Needs some TLC, cleaning,
and a couple of new stainless wire
spans which are included.*

\$45

J-38 Hand Key

\$25 each

Little Bugger Keyer

*Reed Relay keys any rig. Very tiny. 9v
operation.*

"Tick 4" Keyer

*Self-contained with 9v battery with 2
memories.*

MFJ "Grand Master II" Memory Keyer

*Keys any rig, has 8 memories, and
includes power supply.*

\$20 each

**"Freq Mite" audio frequency
enunciator kit**

Gives Freq. readout in Morse.

DIGITAL DIAL Kit from QRP Group

*Ponderance design, low power
consumption.*

\$15

Pixie II 40m QRP 50mW Xcvt

*Assembled and includes earphone
and crystal. No case.*

\$10

Weller soldering "GUN"

\$5 Each

Books

RSGB VHF-UHF Manual

Books by Bill Orr

VHF Handbook

Beam Antenna Handbook

New Old Stock Ten Tec TG24

Enclosures

Nice box for projects.

I have a large selection of parts: speakers,
coils, toroids, variable capacitors, diodes,
zeners, transistors, wire, coax, stainless
whips, plugs n' jacks, knobs, and many
other Homebrewer needs. Are you
building or repairing something? Call
me.

Ed Hude / WA8QJE

Cell: (517) 420-7550

ebhude@yahoo.com

\$100

Radio Shack HTX-10

*25-watt, SSB/FM Transceiver. Like new in
sealed unopened box.*

From the Estate of W8LKE

**Thomas Romanowski
(Non-Smoker)**

Ed Hude / WA8QJE

Cell: (517) 420-7550

ebhude@yahoo.com

No trades on Estate radios

\$800

Yaesu FT-950

*HF -50 Mhz rig, Yaesu
FP1030A power supply,
Yaesu SP2000 speaker with 2 filters and
Yaesu MD100ASX desk microphone. All
items are like new, and in matching boxes.
(Will not separate)*

\$350

Two (2) Kenwood TM-G707A

*Dual-band mobile radios with
programming software.*



CLASSIFIEDS

Jimmy Dunahoo / KD8IWQ
517-743-1604

\$125

MFJ-989C Versa Tuner V (3KW)

Covers 1.8-30MHz, including MARC and WARC Bands. Built-in 300w dummy load. Comes with manual.

\$25

Workman SX-144/430 SWR-Wattmeter

Covers 2m/440 (120-500 MHz). Dial has a cross-needle display. Meter has three ranges (10W, 100W, and 500W).

David Held / N8CFM
heldd@sbcglobal.net

\$50

Motorola FM Signal Generator

*Made for Motorola by Measurements Corp.
Model T1034B, Calibrated Output
Frequency Range 25mHz to 960 mHz
Accuracy +/-10%
Output .1mv to 100,000mv
Closing my service business.*



Shannon Ranes / WA2NVK

Cell: (517) 896-5368

wa2nvk@gmail.com

Need an item?

Make an offer!

A few name-brand laser printers, USB keyboards, and mice

Equipment is leftover after going through a company downsize.

The laser printers are 5-10 years old and some of them come with toner cartridges. The USB keyboards and mice are mostly Dell brand and are very comfortable and easy to use.





Central Michigan Amateur Radio Club

W8PLP/W8MAA

Membership Form

For Year (s) _____



For new CMARC applicants: Please complete all sections.

For existing CMARC members: Please include your Name and Call Sign along with only the information you would like changed.

Mail completed form to Membership Chairman (see address below) or take to Club meeting for processing. Please include payment if applicable. (Checks or Money Orders should be made payable to "CMARC").

John Doornhaag | 1165 South Ainger Rd | Charlotte, MI 48813-9540

Membership Type		<input type="checkbox"/> New	<input type="checkbox"/> Renewal
Full:	<input type="checkbox"/> Annual Dues: \$20.00 <i>Includes voting rights and an annual subscription to The Scope.</i>		
Associate:	<input type="checkbox"/> Annual Dues: \$5.00 <i>Includes an annual subscription to The Scope but NO voting rights.</i>		
New Licensee:	<input type="checkbox"/> Annual Dues: 1st Year Free		
Under 18:	<input type="checkbox"/> Annual Dues: Free		

Contact Information	
First Name: _____	Last Name: _____
Call Sign: _____	License Class: _____ Phone #: _____
Address: _____	Apt/Unit: _____
City: _____	State: _____ Zip Code: _____
Birthday: _____	Anniversary: _____
Email: _____	Sign up for the List Serv: <input type="checkbox"/> Yes <input type="checkbox"/> No
<i>Note: Email is used by club officers to communicate club business and may appear in the club directory for use by club members. CMARC does not share/sell contact information to other parties.</i>	

Club Communications	
Newsletter Preference (select only one option)	<input type="checkbox"/> I will download from the web site.
	<input type="checkbox"/> Please mail to my address (Note: Direct mailing increases postage costs.)
ARRL Affiliation	<input type="checkbox"/> I am an ARRL member

Lansing Civil Defense Repeater Association

Membership Form



For Year (s) _____

For new LCDRA applicants: Please complete all sections.

For existing LCDRA members: Please include your Name and Call Sign along with only the information you would like changed.

LCDRA oversees the operation and maintenance of all Lansing Area repeaters. Use of the repeaters does NOT require LCDRA or CMARC membership, but your support is welcome and appreciated.

Mail completed form to Membership Chairman (see address below) or take to a meeting for processing. Please include payment if applicable. (Checks or Money Orders should be made payable to "LCDRA").

Michael Boensch | 1897 Sunnymede Ln | Lansing, MI 48906-1356

**If you would like a membership card mailed to you,
please include an SASE with your payment. Thank you.**

Membership Type		<input type="checkbox"/> New	<input type="checkbox"/> Renewal
Full:	<input type="checkbox"/> Annual Dues: \$15.00 <i>Includes voting rights.</i>		
Family Mbrs:	<input type="checkbox"/> Annual Dues: \$7.50 ea. No. of Family Members: _____		
ARRL Affiliation	<input type="checkbox"/> I am an ARRL member Membership Card <input type="checkbox"/> Yes <i>(Please see above)</i>		

Contact Information	
First Name: _____	Last Name: _____
Call Sign: _____	License Class: _____ Phone #: _____
Address: _____	Apt/Unit: _____
City: _____	State: _____ Zip Code: _____
Birthday: _____	Anniversary: _____
Email: _____	
<small>Note: Email is used by club officers to communicate club business and may appear in the club directory for use by club members. <u>LCDRA does not share/sell contact information to other parties.</u></small>	

Central Michigan Amateur Radio
P.O. Box 54
Mason, MI 48854-0054

STAMP

To: