

W8KEA



MARC

MIDLAND AMATEUR RADIO CLUB
PO BOX 1049, MIDLAND, MICHIGAN 48641
www.w8kea.org

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LIFE MEMBERS

Don W8WOJ, Lee KC8ITI, Dennis N8ERF, Larry N8CGP, Denny WD8BPT, John WB8RCR

Midland County Public Service Net, Thursdays at 9 PM
W8KEA Repeater — 147.000 MHz+ PL 103.5 • W8QN Repeater — 443.325 MHz+ PL 103.5
W8KEA Digipeater — 145.090 MHz

Next ARES®/RACES Meeting — **Cancelled**
Law Enforcement Center, 2727 Rodd St.
Next CLUB Meeting — Thursday November 6, 2014, 7:30 PM
Salvation Army Building, 330 Waldo.
Talk-in 147.000+

November 2014

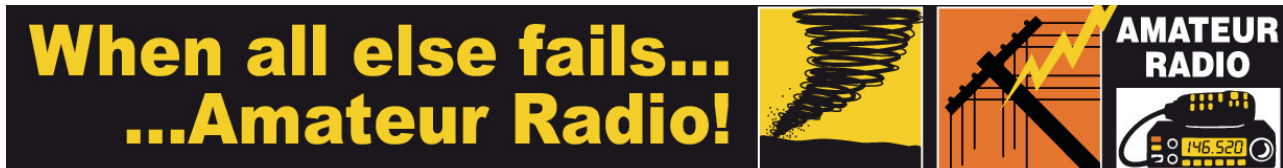
Static Discharge

Kevin Martin, KD8QAM

With winter quickly approaching, it's time to check everything over one last time. Getting out and checking connections and waterproofing can be a bit troublesome at times. I hope you all are ready for the winter. I hope this year isn't as cold as last year.

I hope to hear you all on the next Thursday night net.

Kevin KD8QAM



The meeting was called to order at 7:35 P.M. by John W8QN with 21 members and guests present. A sign-in sheet was passed around.

- John explained that due to member concerns the meeting schedule will be changed around a bit. For now presentations will be at the beginning of the meeting.

MARC MEETINGS

Mark Rodgers KC8GRQ, is in charge of special events and topics for the MARC monthly meetings. If you have any agenda items, or topics for the meetings, please contact Mark at (517 672-1060), or via e-mail: kc8grq@yahoo.com

COMMUNICATIONS

Pat Mullet, KC8RTW, is in charge of communications and publicity for the club. If you have any questions or ideas regarding these areas, please contact Pat at kc8rtw@arrl.net

EXAMINATION SCHEDULE

Saginaw - All future VE testing will be done on an appointment basis only.

Corunna - Contact Thomas Carpenter (517) 579-0599 ki8as@charter.net.

Bay City - All future VE testing will be done on an appointment basis only.

Isabella/Clare Counties - Contact Gus Glass, K8GUS at k8gus@arrl.net

With all examinations, your original license, a copy of that license, a second photo identification (drivers license, etc.) and a check or money order for \$15.00 made out to "ARRL/VEC" are required.

The address listed below gives testing sessions scheduled for Michigan. <http://www.arrl.org/arrlvec/exam-search.phtml?State=MI>

SUBMISSIONS FOR NEWSLETTER

Contact Pat Mullet, KC8RTW at kc8rtw@arrl.net if you want to submit anything for the newsletter.

I need your items by the 15th of the month. Anything received after that may not make it into the newsletter for that month.

If you prefer to download the MARC newsletter from our web site, or have trouble with delivery via USPS, contact John, W8QN at w8qn@arrl.net.

MEDIA HITS!

Have you seen or heard mention of the Midland Amateur Radio Club in the news or in the paper? If so, please forward it, or mention of it to either Pat, KC8RTW (kc8rtw@arrl.net) or Kevin (cherryrediroc@sbcglobal.net)

- Jack NX8A gave a very nice presentation on Midland's Search and Rescue team. Topics included how to join, training requirements and risks and costs. A question/answer session followed.

- John W8QN streamlined a treasurer's report, he says if anybody has any further questions about the treasurer's report please contact him.

- EC/RO -John W8QN mentioned upcoming SET operations. Traffic passing exercises are coming up. E-mail John for more information or if you would like to participate.

- Sad news- John Freeman N8ZE has passed away.

- More information about HR 4969 is on the ARRL Website.

- Seeking operators for a 10 K Marathon in Detroit on October 18th and 19th. E-mail John W8QN if you can help.

- Seeking operators for the Dirty Dog Run on October 4th.

- A Technician License Class starts on October 7th in room 321 on Tuesday and Thursday at the Midland High School. Contact Lee KC8ITI for more details.

- Dennis N8ERF reported on the Wednesday night High School Club meeting. At least 11 students will be introduced to satellite communica-

tions, high altitude balloon launches, fox hunts and building projects.

- Don't miss Dennis' N8ERF article in *QST* magazine.

- MARC Annual Fall picnic at Homer Township Park was lightly attended but fun for those who came.

- Dorie N8WTQ is hosting a Halloween Party at her home at 940 Stewart on Saturday, October 11th. Everybody is welcome. They'll be having food, games and a hayride. Come around dusk for a scary good time.

- Tim Allen, the actor from *Last Man Standing* earned his technician license.

NET Control:

Oct 9th Keith KB8SOE

Oct 16th John W8QN

Oct 23rd Doug KD8OIC

Oct 30th Kevin KD8QAM

A motion to adjourn was made by Keith KB8SOE and seconded by Cindy WD8BDM. Motion Passed. The meeting was adjourned at 8:25 P.M.

Respectfully submitted,
Linda KC8MUD

My Two Cents

Pat Mullet, KC8RTW

Walnut trees. You either love 'em or you hate 'em.

Granted, they're nice and tall, sturdy and make excellent supports for wire antennas, provided you can get the support ropes through the foliage—something best done either in the spring or fall when all you have to fight are the branches and the temperature. But hey, all antennas work best when they're installed in cold weather, right?

The downside to walnut trees may just outweigh their benefits as antenna supports. First, there are the

leaves. The leaves on a Black Walnut aren't the big, friendly patches of color that float to the ground and are easily tamed with a leaf-blower, oh, no. Instead, they're multi-lobed constructs that are attached to a central stem. When they fall, the leaf-lets detach from the stem, and then quickly shrivel. Leaf blowers handle the leaves just fine, but the stems are problematical, and if you resort to a rake, they clog the tines so you're forever stopping to clear them.

And then there are the walnuts. Lethal projectiles when falling from

Amateur Radio is a Contact Sport!

great heights, the green husks are soft and juicy, and if handled, stain your skin and your clothing an indelible nut brown. In this form they are heavy, tough to rake and nearly impossible to move with a leaf blower. Wait until the husks decay, and there's little area for the blower to act on, and while they are lighter than the fresh dropped version, now you have to watch your step, lest you step wrong and end up on your pratt.

So why, you ask, the soliloquy on the evils of the walnut tree, and what relation does it have with amateur radio? Two weeks ago, enough of the accursed fruits had made the drive such an obstacle course that it was getting difficult to take out the trash, much less get the daily mail. And, since Halloween will soon be here, we didn't want all the little ghoulies and ghosties and things that squeal in the night slipping and falling as they come to the door. So I set about sweeping the drive. Now, I know that

given my health, I couldn't do it all at once, so I planned on taking it easy, resting whenever I got tired or started breathing hard. I'd sweep the drive, and then do the walk the next day. I took my time, finished it up, then went in the house. I was tired, but I felt good having finished what I set out to do.

The next morning, my hips and back were so stiff I could hardly move. For the next week, I could barely sit in front of my radio for 15-20 minutes a night, and moving around became an adventure.

So, the moral to my tale is simply this: if you've yard work, fall maintenance, or even some antenna work you were putting off until you didn't have to fight the leaves, be careful, and don't do too much, lest you end up flat on your back doing nothing, instead.

Hope to catch you on the air.

73, Pat KC8RTW

ARES®/RACES John Wolters, W8QN

There will not be an ARES®/RACES meeting in November.

October 1st was the annual SET (Simulated Emergency Test). Because of multiple conflicts it was decided that Midland County would conduct their SET at 6 pm that day. At the appointed time a call was put out on the repeater for anyone available to participate and 8 people responded. After a quick roundtable 6 of us moved over to HF for an exercise utilizing digital modes and then VHF. All of us had a relatively easy time of it on HF but experienced

various challenges when it came to VHF. All in all it was a good test and we all learned from it. Look for future exercises to continue the learning.

The county of Midland will be conducting an exercise at the Midland Mall on Monday October 27th. Depending on how involved Amateur Radio is you may hear some interesting chatter on the repeater that morning. Remember, it is only a drill.

John Wolters – W8QN
ARE EC, RACES RO

From the Treasurer's Desk

In an attempt to make the meetings more interesting to other amateurs and less "business meeting" we are changing the format of the meeting.

1) The presentation for the meeting will occur at the start of the meeting. This way those that do not want to attend the "business meeting" portion are welcome to call it a night.

2) There will not be a monthly treasurer's report. The report will be moved to quarterly. That being said, the

financial information will be available on a monthly basis if anyone has a question.

We have received multiple suggestions on topics to be presented at club meetings and intend to act on them. If you have a suggestion please pass it on to any club officer.

John Wolters – W8QN
Treasurer

Upcoming Events	
12/5	MARC Christmas Party
12/5-6	Skywarn Recognition Day
12/31	Straight Key Night
Michigan Hamfests	
10/26	Madison Heights
12/7	Harrison Township
1/11	Hazel Park
2/14	Traverse City
2/15	Livonia
* Denotes date based on 2013 event	

Area Nets	
SVARA; Mn,	147.24 MHz, 2100 ET
Gladwin; Tu,	147.18 MHz, 2000 ET
BAARC; Tu,	145.31 MHz, 2100 ET
Isabella Co EOC	146.72 Mhz, 1900 ET
Canadian Lks, Wed,	146.8, 2100 ET
Edmore, Th,	146.8, 2000 ET
MARC; Th,	147.00 MHz, 2100 ET
District 3 ARPSC; Su,	145.31 MHz, 1830 ET
Mi VHF Trffc Net; MWF,	145.15 MHz, 0900 ET
TMMTN; Mon-Sat,	147.30 MHz, 2130 ET
MACS; Sun-Sat,	3953 kHz 1100 ET
MIARPSC; Su,	3932 kHz, 17:00 ET
UPN; Sun-Sat,	3920 KHz, 17:00 ET
MITN; Sun-Sat,	3952 kHz, 1800 ET
QMN; Sun-Fri,	3563 kHz, 1830 & 2200 ET
WSSBN,	3932 kHz, 1900 ET
UP-ARES; Fr,	3932 kHz, 1930 ET
GLETN; Sun-Sat,	3932 kHz, 2030 ET
SEMTN; Sun-Sat,	145.33, 2215 ET
MIDTN - 1900 local	Tu, Th, Sat 3.583
+waterfall, Oivia 8/500	

MARC MERCHANDISE		
T-Shirt	S- XL	\$10
	2X - 3X	\$12
Long-Sleeve Tee	S- XL	\$12
	2X - 3X	\$15
Crew Sweatshirt	S- XL	\$18
	2X - 3X	\$20
Hoodie	S- XL	\$24
	2X - 3X	\$26
Zipper Hoodie	S- 3X	\$30
Winter Coat	S- XL	\$42
	2X - 3X	\$45
Spring Jacket	S- XL	\$32
	2X - 3X	\$35
Hat		\$10
All garments are royal blue with white print and embroidered name and number. Extended sizes available.		
Please call Bill Lee at B&C Sportswear with questions @ (989) 839-4537.		

Repeater Maintenance

Replacement antennas and coax have been ordered and obtained. We are now waiting on the climbers to set a date. Hopefully soon!

Also while trying to reset the

pesky “power fail” message on the tail of the repeater it was discovered that there are additional problems with the repeater electronics. We have not quite tracked down the exact nature of

the problem but the investigation continues. In the meantime work continues.

John Wolters, W8QN

Fall 2014 Technician Class

The Fall 2014 Technician class started on October 7th. We have 5 students who started the class. I’m trying a new format for this class and it seems to be working well. I expect the class to finish up in the first part of

November with a testing session scheduled for November 15th. We’ve moved our classes to room 321 (the physics class room) at Midland High School. I expect that all of our future classes will be taught at Midland High School.

I’m working on a schedule to teach a General and Extra license class after the first of the year.

Lee – KC8ITI

SOS Animal Rescue “ Dirty Dog Run” 2014

Thanks to all of you who helped with this event on October 5th. Operators were: John, W8QN; Linda, KC8MUD; Dorie, N8WTQ; Chris, KB8UIH and Dennis, N8ERF.

This was a 10K run and a 5K run/walk through City Forest with participants competing with the

companionship of their canine friends. The weather started out chilly to say the least but at least we didn’t get the predicted rain. This has become an annual event and the sponsors really appreciate our efforts. The sponsors have received a couple of thank you letters complimenting them on how

well the event was run. The sponsors have pasted on their thanks to our group for our help and that it is greatly appreciated. Thanks to all of you for helping out on a brisk fall morning.

Lee - KC8ITI

Attenuator Construction Project

Stan, K8SB, and his wife Ruth, WB8AFO, came to Midland from their home in Trenton, Michigan on October 11th to lead members of the Midland High School Amateur Radio Club and the Midland Amateur Radio Club in a project to build some active attenuators which he designed. When you use a directional antenna to locate a hidden transmitter, the Fox, or some other source of an otherwise unwanted signal, problems arise when you get close to the signal source. The first problem is that you can overwhelm the receiver input and no matter which direction you point the antenna, the signal is too strong. By inserting an attenuator between the antenna and the re-

ceiver, most often an HT, you can reduce the signal level so you can discriminate the signal’s direction. However, when you get close enough, the signal can enter directly into the radio without going through the directional antenna or the attenuator. When that happens you no longer have any indication of direction whatsoever, even with a conventional attenuator in line.

This is where an active or offset attenuator can be very useful. The active attenuator also sits between the directional antenna and the HT. However, in addition to providing an adjustable level of attenuation, the active attenuator shifts the incoming signal, in this case, by 1 MHz. So, if the Fox is

transmitting on 147.42 MHz, the output of the active attenuator which is fed to the HT is at 146.42 MHz. So you tune your HT to 146.42 MHz and listen to the Fox on that frequency, which can only get to the HT via the antenna input jack. Since the Fox is transmitting on 147.42MHz, it doesn’t matter if that signal is getting into the radio because you are not listening to that frequency. You can add additional attenuation either before or after the Active Attenuator, if you wish.

Stan put a tremendous amount of work into the project for us. We ordered 20 of these units. Stan ordered all of the parts, including the circuit boards, drilled holes in the aluminum project

boxes and put an informative label on them. He also mounted the 1 MHz crystal oscillator on the boards. But the most time consuming part of the project for him involved the 4 short lengths of coax that he cut, trimmed, tinned, heat shrunk and terminated for each kit. That means that with 20 kits, 4 pieces per kit and 2 ends per piece, Stan terminated 160 coax ends! WOW, what a gift! And he did it at cost but we did throw in a little to help cover the cost of gas as he drove 2 hours, one way, from his home to get here and stayed overnight in a local hotel, so he wouldn't have to worry about traffic! There were

12 participants in the construction project with 11 kits being built. Dennis, WD8BPT manned the video camera, so didn't get to build one. The participants were; Zach, KD8ULE; Doug, KD8OLC; Stan, K6VWE; Mitchell, KD8VZT; Lee, KC8ITI; Kevin, KD8QAM; Steve, WA8Y; Kathy, KD0JHX, Art, K0ACP, Bob, W8LSS and Dennis, N8ERF. Eight of the remaining kits are spoken for, but there is one kit still available if you are interested.

Stan led us through the build with a printed set of instructions with pictures and diagrams as well as a PowerPoint presentation and Ruth acted as his trusty assist-

ant. The folks who were new to construction projects appreciated the step by step instruction provided by this former Physics teacher and electronics instructor. We old hands learned a few nifty tricks as well. It was a great joint activity for the two clubs. And as I said during the meeting, "When we were planning this I thought it was going to be a fun project, but it turned out to be a lot more fun than I had anticipated!"

Thank you Stan and Ruth!

Best Regards,
Dennis, N8ERF

Midland High School Amateur Radio Club News

The Midland High School Amateur Radio Club is now in its second year. The infrastructure is now in place. The antenna system is working well; the radio operating stations are in good shape. We have a new shelving storage system in place to keep all of our equipment in good order. The returning students are continuing their exploration of electronics and amateur radio. The new students are just beginning theirs. We had 10 students for the first meeting of the year. With the return of experienced students and new students, the challenge is to keep both groups interested. It is particularly gratifying to have some of the returning students teach some of the basics of amateur radio and electronics to the

new students. How cool is that! Lee, KC8ITI, has started a project with the returning students to build a 4-bit computer from scratch, well, almost scratch. That way they get the fun of building something and of understanding how the things work.

The new students have done a couple of electronics labs and have started building their crystal radio sets. John, AC8QF, is working on a program to introduce Satellite Communications to the mix. By the time you read this, I suspect we will have made our first satellite contacts. We also had a group construction project that involved both MHSARC and MARC members building Active Attenuators for Fox Hunting, designed by Stan, K8SB, who came

up from Trenton, MI to lead the event, which is described elsewhere in this newsletter. School Club Round Up is coming up next week as I write this. I am looking forward to that.

While I am delighted with the kids we have in the club, we could always use more students. If you know of any high school student in Midland County, who might be interested, encourage them to join the club. I want to thank and acknowledge the contributions of the following adult volunteers; Lee, KC8ITI; Denny, WD8BPT; John, W8QN; Andy, KD8ULJ; John, AC8QF; Art, K0ACP and Bill, N8FUZ.

Best Regards,
Dennis, N8ERF

Technical Topics and Information

(ARRL Contest Update—Sept. 24, 2014) Tuning an impedance matching network like

an L network to match a feed point impedance is fairly straightforward. But what about for an

antenna that you use on *two* bands? You could switch between different component values, such

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as by using a different tap on an inductor or adding a capacitor. Switching in coaxial stubs also works, but Doug W7KF found an [alternative solution](#) that he put to work on his Inverted L for 160 and 80 meters. The original idea came from an 1970s *QST* article by Wes Hayward W7ZOI ("Hints and Kinks" in the June 1977 issue) that lets the network switch itself in and out by using resonance. As Wes observes, while having the antenna be resonant on the lower band simplifies adjustment considerably, in the general case, the antenna doesn't need to be resonant on either band.

◆ Pasternak has a new online package of [RF calculator and conversion tools](#) developed by its engineering staff. Here are a few of the many interesting tools of interest to hams: balanced attenuator calculator, cascaded noise figure calculator, coaxial cable impedance calculator, RF power conversion calculator, RF power ratio conversion calculator, VSWR/return loss calculator and more. Broadcast engineers will find some just for them, as well! Each calculator includes diagrams and illustrations along with the formula in use. (Thanks, Eric W3DQ)

We have the [CW Skimmer](#) keeping an ear on the bands for us, do you think you can do better? If so, the [Morse Learning Machine Challenge](#) is for you! No word has been received as to whether the final evaluation will be done during CW Sweepstakes.

◆ There are quite a few low-cost online PC board fabricators that will deliver several boards in a batch but this can be expensive

if you only need a couple of boards made. There's another approach called a PC-board aggregator. These services combine your small order with the small orders of others and makes a composite board that is then sliced up and sent to the customers. You must submit a board design prepared with a layout package that generates Gerber files and pay a certain amount per square inch of board area. One such aggregator is [OSH Park](#) which charges \$5.00 per square inch for double-sided boards with a silkscreen. (Thanks, Brad AA1IP)

◆ There is a good [collection](#) of downloadable white papers on grounding and lightning protection from the Polyphaser company at the Smiths Power website. The list includes a paper specifically on grounding amateur stations. (Thanks, Bill KC4PE)

◆ If you use rope running through a pulley to hold up a wire antennas, it's important to move or shift the rope from time-to-time. Leaving the pull rope "setting" in one spot for extended periods of time causes excess wear, as the outer fibers are elongated/stretched more than the inner ones. Just a little movement 2-3 times per year will go a long way toward keeping that rope flexible and doing its job. (Thanks, Don K4ZA)

◆ While we may consider stainless steel to be the best of the best materials, it can corrode when deprived of oxygen and needs to be inspected like everything else. Sailors know corrosion as well as anyone and this [Cruising World article](#) describes the problem and how to check for

corrosion. (Thanks, Kirby AF6OP)

◆ Several useful gadgets and projects showed up recently on the Instructables website. The creator of this *Instructable* on [straightening and stripping wire](#) mentions the possible uses as "Antenna Construction". Too bad he didn't build a pipe and tower stretcher says Frank KR1ZAN! This [razor blade cutter](#) functions as a nifty mini-shear for wire and plastic - watch your fingers! And another builder made use of a switchmode dc-to-dc converter module to create a [bench-style power supply](#). It runs with 7-35 volts input power and outputs 1.25-30 volts at up to 3 amps depending on the heat sink. The project also demonstrates how to create an etched front panel.

◆ As the fall semester kicks into gear, you may have a STEM-oriented student in the family or know of one. This *EE Times* slide show features [10 technological elements](#), one of which is sure to hold the interest of your student. Some are intended for the school environment and some for individuals at home learning on their own.

Technical Web Site of the Week - Physics fans will be thrilled to learn that the famed [Feynman Lectures](#) have all been released free online. Covering a wide variety of topics, you can learn from a master physicist whose work garnered a Nobel Prize and inspired generations of students.

More Technical Topics and Information

(ARRL Contest Update—Oct. 8, 2014) The antenna design calls for tubing of size X but a check of your private boneyard turns up plenty of size Y! How can you adjust the design lengths so they remain resonant with the new

diameter elements? John KK9A directs us that "You can calculate the resonant frequency for any element diameter using the [W6QHS element spreadsheet](#)." These days, W6QHS is better known as W6NL.

◆ Another EDN online publication, The Workbench, provides a very useful list of "[alternative hacker boards](#)" beyond the usual Arduino and Raspberry Pi. One of these might be just the right fit for your talents and tools on the next

project.

◆ Your vehicle's power system is a surprisingly dynamic and often-hostile home for delicate electronics like radio gear. What's lurking on that "12 volt" connection? And how can you protect your gear against it? This online [paper](#) about automotive transient protection from Littelfuse goes into some detail about both topics. You'll need to enter your contact information but downloading the paper is free.

◆ Do you live near a public airport and wonder about height and marking requirements? If so, the free FCC online program [TOWAIR](#) tells you if you must register your antenna structure with the FCC and need to notify the FAA. There are some errors in the program's data set, but it is a good place to start. An alternative

would be to just send in FAA form 7460-1 to see what requirements might apply to your dream tower. (Thanks, Mike WV2ZOW)

◆ Electronics distributor, Digi-Key, has released a free online schematic editor. [Scheme-it](#) is a free online schematic and diagramming tool that allows anyone to design and share electronic circuit diagrams. It works natively in all major web browsers without requiring the use of any plug-ins. Of course, it links rather easily to the Digi-Key parts catalog!

◆ With so much variation between vehicles, it is inevitable that mounting a radio control panel or providing just the right spot for your handheld is a compromise. Until now, that is. This [In-structables](#) project shows how to make a custom mount for your gear - in this case a tablet com-

puter but the same techniques will work on radio stuff, too.

◆ Just a few days ago passed the 113th anniversary of the invention of the radio wave detector by J.C. Bose. (No, the noise-canceling ear trumpet was not one of his early inventions!) He founded the Bose Institute in Calcutta, India and trained many students, including S.N. Bose, a contemporary and collaborator of and with Einstein.

Technical Web Site of the Week - Remembering my initial confusion when introduced to the dB, this complete and thorough paper on decibels is a very welcome resource from the folks at Rohde & Schwarz. Whether you are learning about the dB yourself or tutoring someone else, you'll appreciate this publication.

MARC Vital Statistics

Memberships Expiring in October

None

Memberships Expiring in November

KB8RCR

Memberships Expiring in December

KB8TBI

N8MYS

Current Active Club Membership 49

Birthdays Celebrated in October/November

W8WOJ 10/3

W8ZSX 10/5

N8WTQ 10/10

KB8PGW 10/25

KC0CJC 10/31

KD8ZKG 11/4

K6VWE 11/13

KB8UIH 11/27

Anniversaries Celebrated in October/November

WB8RCR and Eileen 10/12

KB8SOE and Darcie 10/19

KB8LQM and KC8IHB 10/23

Information is from data received 9/14/2014

Any corrections or questions contact John, W8QN

Amateur Radio. . . We Do That!



Pat Mullet
Newsletter Editor
171 E. Orchard Ave.
Shepherd, MI 48883

If you desire to join the Midland Amateur Radio Club, the dues are \$20 per year for an individual membership. A family membership is available for an additional \$5 per year which covers all of the individual's family members. Family members must reside at the same address as the primary member to be eligible for the family member rate. The membership dues help to cover the operating expenses of the Club, and its radio systems. Membership includes Autopatch privileges on the W8KEA repeater (147.000+), voting privileges at MARC meetings, and a monthly newsletter. Please supply the following information:

Name: _____ Callsign: _____ License Class _____
Address _____
City _____ State _____ Zip _____
Home Phone (____) _____ Work Phone (____) _____
E-mail address _____
Spouse: _____ Callsign: _____ License Class _____
Birthday: (mm/dd) _____ Anniversary: (mm/dd) _____
Desired newsletter format: Paper copy via USPS _____ or via e-mail _____

Are you an ARRL Member? Y/N Do you want an ARES Application? Y/N

We request this information so we can communicate with you regarding MARC business, and periodically send you newsletters and congratulatory birthday & anniversary greetings. We do not sell this information nor will we knowingly publicize private information without your permission. Information that is publicly available may be distributed to Club members for various purposes, including membership lists, without prior notification.

You may give this completed form to the MARC treasurer, or you may mail it to:

MARC, PO Box 1049, Midland, MI 48641-1049