W8KEA
MARC
SPECIAL SERVICES CLUB
MIDLAND AMATEUR RADIO CLUB
PO BOX 1049, MIDLAND, MICHIGAN 48641
www.w8kea.org

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Field Day Committee	John Tallman KB8PGW (Ch)	(989) 859-0364
	Pat Mullet KC8RTW	(989) 828-6657
Swap Committee	Pat Russell W8PMR	(989) 832-2924
	Chuck Cribley WA8LQD	(989) 488-9409
	Keith Johnson KB8SOE	(989) 488-4337
	Pat Mullet KC8RTW	(989) 828-6657

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 — Thursday, August 2, 2018, 6:00 PM
Law Enforcement Center, 2727 Rodd St.
Midland ARC Meeting — Thursday, August, 2018, 7:30 PM
Salvation Army Bldg, 330 Waldo Ave.
Talk-in 147.000+

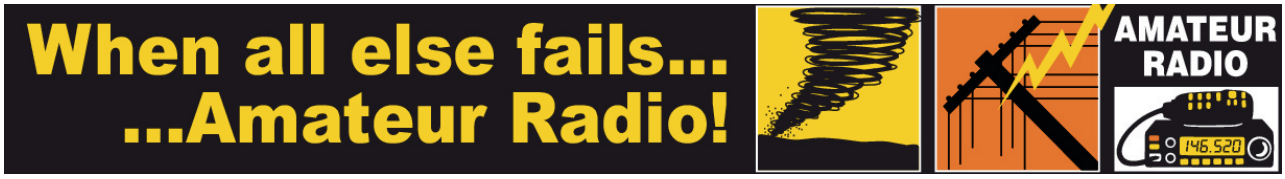
AUGUST 2018

Static Discharge — Al Bailey, AD8BA

As many of you know I will be leaving the area in late September. It has been a privilege to serve you and I don't want to leave without saying goodbye and thank you. Thank you for volunteering and rising to help with the many tasks that are needed to keep a radio club going. From walks to running nets, to serving on committees for new equipment, the list is truly endless. So thank you, for being who you all are. You really are great to work with.

New elections will be held in the September club meeting, so plan on attending both in August and in September. Hope to see you there.

AL Bailey, AD8BA



MARC Minutes — Linda Hodges, KC8MUD

Al, AD8BA brought the meeting to order at 7:03 pm with 30 members and guests present. A sign-in sheet was passed around and introductions were made.

Please bring any corrections or additions to the minutes to the attention of the secretary Linda, KC8MUD.

MARC MEETINGS

Art Peters, K0ACP, 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 Art at (989) 400-3745, or via e-mail: k0acp@arrl.net.

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 John (w8qn@arrl.net)

• Shout-out —Al, AD8BA— A special shout out from Al commending our Public Relations Officer Pat, KC8RTW for all his work promoting our club and amateur radio. And especially for our club's recognition at City Hall earlier this month. Great job and thank-you Pat, for all your hard work.

• Old Business— Art, K0ACP— Art presented Earl, N8ERO with the grand prize drawing from the swap.

• Show and Tell— Jack, K8GTG— Gave a great presentation about 3-D printing and how hams can use it. Other presenters were John, WB8RCR who had a light strip display; Earl, N8ERO showed a home brew clock and Dennis, N8ERF talked about solar panels.

• Swap — Keith, KB8SOE— Thanks to all who helped with running the swap. Especially Al, AD8BA and his daughter for ticket sales, Dennis, N8ERF and his VE team and Dorie, N8WTQ for selling tubes and manning the coffee table. Special thanks to Salvation Army Captain Brian Goodwill and Jim, KD8HIH for the use of the building and everything in it.

• Swap Finance Report— Larry, N8CGP— Thank-you to all those people who have renewed their memberships. Larry gave a report on how much money the swap made and spent. A motion on the floor by Al, AD8BA to donate $300.00 to the Salvation Army for the use of the building seconded by Dorie, N8WTQ. Passed.

• Repeater Committee Report—Larry, N8CGP— There is an ongoing investigation of equipment options. Next committee meeting is on July 10th. Questions and discussion followed.

• Officer Search Committee— Dennis, N8ERF— Working on roster of candidates to run for club offices

• Exec Mtg. — Al, AD8BA— There will be an Exec. Meeting in August. No date yet.

• Volunteers— Al, AD8BA— Lee, KC8ITI and Keith, KB8SOE will check on the radio Equipment at Homer township site.

NET Control:
July 12th Al, AD8BA
July 19th Paul, KE8GEM
July 26th Jack, K8GTG

• Comments—John, WB8RCR — John suggested contacting the newly licensed hams after a VE session to congratulate them would be nice.

• John, KB8PGW— John would like the club to consider searching for a larger venue in Midland for next year's Field Day.

• 2018 Field Day Report— Pat, W8PMR and Dennis, WD8BPT— Field Day in Saginaw went very well.

• Louie, N8LOU— Reported on a special events station at the Soo Locks at the end of June for Engineer's Day. Said he had a terrific time and said they do this every year on the last Friday in June. He got to see places that people don't normally get to see at the locks.

A motion to adjourn was made by Larry, N8CGP and seconded by Dorie, N8WTQ.

The meeting ended at 9:05 pm.

Respectfully submitted,
Linda, KC8MUD

Amateur Radio is a Contact Sport!

My Two Cents — Pat Mullet, KC8RTW

Field Day has come and gone for another year, and while I got a chance to get on the air, I wasn't able to be active for as long as I would have liked, what with other commitments on my time. Couple that with the fact that my auto-tuner is still not playing well with my Icom IC-718 and the poor band conditions, and I made a really lousy showing. Note to self: next time check your gear before the contest.

Other than Field Day, I spent considerable time working up plans for both a VHF and UHF yagi to allow me access to more repeaters in the area. Not having gotten up to speed with *EZ-NEC* or *4-NEC-2*, I went back to the basics…really back to the basics. Having a recent edition of the *ARRL Antenna Handbook*, I've got a copy of *Yagi for Windows (YW)* by Dean Straw, N6BV, as well as *YagiCAD* by Paul McMahon, VK3DIP and *YagiCalulator* by John Drew, VK5DJ. All these programs run under windows. I was also able to dig up versions of both *Antenna Optimizer (AO)* and *Yagi Optimizer (YO)* by Brian Beezley, K6STI. Both are DOS based programs, but I use *DOSBox*, intended to allow DOS game software to run under Windows, to perform the same magic for ancient ham software.

Digging into the documentation for these older programs, I began to understand the format and conventions for building antenna model .YAG files. My VHF antenna is modeled after the converted FM antenna that appeared in the July 1999 *QST*, incorporating an eight-foot boom and additional elements. I used *YagiCAD* to design a 10 element UHF beam. After writing up the .YAG files, I used *YO* to optimize the positioning of the elements and their respective lengths. I have the plans, now on to the materials.

I was able buy one of the baseline antennas for the *QST* conversion from Lee, KC8ITI, a pair of 8 foot long square aluminum tubes from one of the local big box stores, and inherited a small TV antenna for the extra elements. For the UHF antenna, I've acquired a set of Stauff polyethylene clamps to serve as insulators and will use solid aluminum rod for elements.

Best of all, I lucked into a used RadioShack ServoRotor antenna rotor on eBay. The ServoRotor is a five wire rotor utilizing a position reading potentiometer rather than the "thumper" type TV rotors that need to be re-aligned every so often, and it's strong enough to rotate small yagis, so I should be golden on that account.

I'm hoping to get my new antennas in the air before the snow flies so I have something to do on those dark winter nights.

See you on the air!

73, Pat, KC8RTW

Upcoming Events

Dirty Dog Run	August 25
GL HamCon	October 6-7

Michigan Hamfests

7/21	Gladwin
7/21	Shelby Township
7/28	Lansing
8/4	Escanaba
8/12	Port Huron
9/8	Wyoming
9/16	Adrian
10/6	Brooklyn
10/20	Muskegon
10/21	Kalamazoo
10/28	Madison Heights
12/2	Madison Heights

Area Nets

SVARA; Mn, 147.24 MHz, 2100 ET
Gladwin; Tu, 147.18 MHz, 2000 ET
BARTS; Tu, 145.31 MHz, 2100 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

ARES® / RACES — Al Bailey, KA9WCS

The summer is flying by and rapidly coming to a close. We will meet at the Law Enforcement Center on Aug 2nd at 6:00 pm. Bring your hand-held radios with you. If you have not come to a meeting before, feel free to come and see what things we can do with some of the equipment while practicing in case of an emergency here in Midland County.

Al Bailey, AD8BA

Amateur Radio—The Original Social Media!

The SOS-Dirty Dog Run

The Dirty Dog run is on Aug. 25th 2018. Volunteers are needed to man positions on the City Forest course for the 5K and 10K runs. Check-in will be at the North City Forest parking lot on Monroe just west of Eastman prior to 8 AM and operators should be on station by 8:30 AM. The first race starts at 9 AM. The event should be finished by noon. Assignments will be given when checking in. If you would like to help with this worthwhile event or need more information contact Lee, KC8ITI at (989) 486-3771 or email me at kc8iti@arrl.net.

Lee - KC8ITI

MARC Items for Sale

After the Cadillac and Midland swaps there is quite a lot of equipment still available. It doesn't benefit anyone sitting in my basement and garage so I will start listing what is available in the newsletter on a rotating basis. Here is the first group with suggested prices but if interested, let's talk. Email kc8iti@arrl.net or Phone (989) 486-3771.

Lee, KC8ITI
Club Quartermaster

Kenwood TS-450S transceiver w/
PS-53 power supply
MC-60 desk microphone
MC-43S hand microphone
$500.00

Kenwood TS-440S transceiver w/
MC-60 desk microphone
MC-43S hand microphone
ASTRON RS – 35A power supply
$450.00

Icom IC-761 transceiver w/
SM-10 desk microphone
Heil headset
$750.00

Kenwood TS-520 transceiver w/
520 VFO
SP 520 speaker
D-104 microphone
$400.00

Kenwood TS-950S digital transceiver w/
MC-90 microphone
IF-232C serial interface
$925.00

Kenwood TS-830S transceiver w/
HS-5 headphones
MC-50 microphone
PC-1 phone patch
SM-220 station monitor
SP-180 speaker
VFO-240
$800.00

40 ft Aluminum Tower 5 Sections $400.00

Cushcraft R-7000 Multiband Vertical $200.00

Heathkit SB-614 station monitor $75.00

W8KEA Repeater Update

As you know, there was a failure of the 147.000 repeater in late April. Fortunately, we had a backup unit, which, with some repairs, was able to serve in place of the failed unit. However, as the two units that we have are both 20+ years old, this opened the discussion of what we should do- buy a new repeater, or deal with repairs to the units we have. This led to a team being appointed to research and recommend to the Club a plan for the 147.000 W8KEA repeater. The team is chaired by Max Schneider, KE8DON, along with members John Wolters, W8QN; Lee Hodges, KC8ITI; Will Halphen, K8VFO; Pat Russell, W8PMR and Larry Macklin, N8CGP.

The initial meeting of this team was held in late May, and the goal was determine the scope and direction for the project. Based on an analysis of the system we have in place, these items were chosen to be in-scope for the project:

1. Replacement of the existing repeater unit.
2. Upgrade the 12 volt operational and backup power infrastructure.
3. Refurbish the existing duplexer.
4. Make improvements to the environment where the repeater is located, either by improvements to the building interior, or with an enclosed climate-controlled rack.

Other ideas were discussed, such as a new site or new tower, but it was decided to limit the project to these four areas, thus giving us the ability to address the most urgent items in a timely and reasonable-cost manner. From this scope, some guidelines were established:

We want to acquire new equipment, not used.

We would like to have a primary and backup (spare) repeater unit

The backup repeater doesn't have to be as "feature rich".

The repeater will be analog, and able to be upgraded later to digital. There are already several

other digital repeaters in the area.

The repeater must interface with the voter. We want to continue using remote receivers.

Desired features: Announcements; User control macros; CTCSS (PL) on both receive and transmit and Remote repeater control.

These features will probably require an external controller, as few basic repeaters have voice storage for announcements and user macros.

Assume the existing power amplifiers are OK, will confirm.

The next discussion was to determine which brand of repeater we wanted to acquire. We are concentrating on 3 manufacturers: BridgeCom, Kenwood, and Motorola.

Assignments were given to members of the team to research these brands, and we also began researching repeater controllers.

Larry Macklin, N8CGP, presented this information, as well as a tutorial on the components of a repeater system, at the June Club meeting. At the July Club meeting, Larry presented a brief summary of what we had learned about each of the three brands of repeaters. There were positive and negatives about each product, and the manufacturers themselves, so that there is not one system that is the obvious choice over the others.

The team met again in July, and worked on narrowing down the choice of repeater manufacturer and model, as well as creating a cost estimate for the project. The goal is to present this at the August Club meeting.

If you wish to provide input to this process, please feel free to contact any of the members of this team with your comments. But don't delay, as we will be making decisions and preparing a proposal in the next 2-3 weeks!

Larry Macklin, N8CGP
Repeater Trustee

(Addition information on Midland Area Repeaters: the W8QN and KC8ARJ (formerly WB8WNF) repeaters went dark when the former Dow Headquarters building was demolished. The KC8ARJ D-Star/Fusion repeater currently is on the air on a frequency of 442.950 MHz. with reduced coverage at its temporary site. Current plans are for the KC8ARJ repeater to be replaced with an ICOM D-STAR machine to be located at the Hospital. W8QN will return to the air once a new location is found for it. It is believed that the WB8WNF repeater will return to service as an analog machine when a new site is secured.—ED)

Michigan Section Report

Greetings to all the Amateurs of Michigan,

Retail stores are already getting geared up for “back to school” sales, and I feel like summer just really got started! I’m hopeful this note finds you all enjoying the warm weather, and staying “radio active”.

Field Day 2018

I personally did not operate much during Field Day, but I was invited to several Field Day sites and witnessed many amateur radio folks not only operating, but getting new people involved in the hobby. The GOTA (Get On The Air) stations and public information tables were very busy at the locations I visited. An important note to those groups already planning to extend an invitation for next year is to ask early, my calendar fills up quickly.

Great Lakes HamCon News

Speaking of calendars be sure to add the second annual Great Lakes HamCon, October 6th and 7th, 2018, to yours. There are a number of improvements already in the works to make this event even better than the inaugural showing, but I’m particularly proud and excited about the efforts that our government liaison team (Ed, WA8QJE and Larry, WB8R) made on improving the sales tax issues for vendors attending this venue.

Amateur radio examinations will be conducted on Saturday at HamCon, and this year all exams will be given at no charge. When you are buying or browsing equipment or parts from vendors, point them to the Great Lakes HamCon website (glhamcon.org) or our own section website for more details. Please encourage vendors to visit us in October!

Final Thoughts

As we add new amateur radio licensees to our ranks, so grow the need for Elmers to assist them in this fine hobby. For those already serving in that capacity, thank you; for those that need some encouragement, I ask you to jump in and help out! You’ll get the opportunity to build some great friendships, and share the spark of enthusiasm that got you involved.

There’s always something new in amateur radio, consider striking out during the last few months of summer and trying something different, perhaps working in the field, or chasing a contest.

Remember too that I’m always interested in hearing about your solutions for issues within our amateur radio community, the issues are sometimes easy to spot, but the solutions are just a bit more challenging. I welcome your input on how to tackle the tough problems.

I’m looking forward to hearing from all of you!

73
Jim, K8JK

James A Kvochick, K8JK
ARRL Michigan Sect. Mngr
k8jk@arrl.org

Fireman's Rule on HAZMAT Incidents

(ARES E-Letter — June 20, 2018) In re your article on HAZMAT responses in the April issue of the ARES E-Letter, I'd like to add that the Fireman's Rule of Thumb (pun intended) ensures that you're a safe distance from a HAZMAT incident:

If your extended thumb arm's length does not cover a HAZMAT scene, you're too close. If your thumb covers the scene you're between 1/4 and 1/2 mile away.

I keep an inexpensive monocular in the vehicle to read a HAZMAT placard from a safe distance. The Emergency Response Guide is available for an Android or iPhone here. The price is right - free - which fits all budgets. — *Lew Wallach, N9WL, Albuquerque, New Mexico*

Technical Topics and Information

(ARRL Contest Update—June 27, 2018) Knowing more about HF radio wave propagation can make for better contest operating strategy. The University Corporation for Atmospheric Research (UCAR) has a free course (registration required) *"Radio Wave Propagation"* to provide a solid basis of understanding of how radio waves are propagated through the ionosphere, and how solar events affect propagation. Propagation at higher frequencies is the focus of the *"Introduction to Electromagnetic and Electro-Optic Propagation"* course also offered by UCAR. (Bill, AE0EE)

♦ A couple of ways to reduce **birdies** you may be hearing from your computer's networking gear include using common mode chokes on all of the networking cables, and switching to higher-speed networking gear such as gigabit Ethernet to move some of the frequencies out of the HF bands. Sometimes changing the location and orientation of network cables also can help.

Bob, N6TV, writes:

"Rob Sherwood, NC0B, has measured the receive latency of several popular transceivers, including the IC-7300, IC-7851, IC-781, IC-756 Pro III, TS-990S, ADT-200A, ANAN-200D, Flex 6700, Flex 6600M, Apache ANAN-7000DLE and IC-7610. The results are published as a PDF file. The receive latency is displayed in the upper right corner of the scope traces.

Why does latency matter? It affects QSK performance and contest exchange timing, especially on CW and FT8. A long thread on this subject may be found in the IC-7610 discussion group, here (Groups.IO sign-on and group membership required)."

♦ Codec2, an open source project by David Rowe, VK5DGR, is the focus of a blog post comparing and contrasting low bit-rate audio CODECs. Using samples provided on the website, comparisons of different encoding bitrates are presented. Another researcher has used Codec2 bitstreams and a machine-learning based decoder to get quality that appears to rival bitrates that are nearly four times higher.

♦ Think of it as a cache for ... power. A company is proposing to combine carbon based ultra-capacitors with lithium batteries, to realize the advantages of both. A capacitor's faster charge and discharge rates can smooth over bursty energy demands. (Dennis, N6KI)

More Technical Topics and Information

(ARRL Contest Update—July 11, 2018) John, N8UR, has developed a means to provide VHF+ spots to the Reverse Beacon Network using RTL-SDR hardware, Raspberry Pi computers, and CW Skimmer software. The key is in emulating a multi-band HPSDR using some additional software by N1GP running on the Raspberry Pi. He describes his work in a slide presentation (PDF). By having more VHF+ capable nodes able to spot existing beacons, more band openings may be able to be detected.

♦ Analog devices has released a downloadable book, *Software Defined Radio for Engineers*, focusing on, well, SDRs. This 375 page tome covers theory as well as practice. Examples can be used with AD's ADALM-PLUTO SDR, and simulated with MATLAB.

♦ The WRTC 2018 Live Scoreboard's architecture uses Raspberry Pi computers and the Internet to keep all scores up to date. The architecture even anticipates and provides for backup methods to transmit the scores via SMS in the event of internet unavailability at some of the station sites.

♦ The history of the Nixie tube is described in this article from the IEEE *Spectrum*. Nixies were used for frequency display in a few Amateur rigs, including some made by SBE, and the Signal One CX7.

♦ Raspberry Pi computers are being used for all sorts of Amateur Radio applications, such as providing VPN functionality between distributed contest locations, live contest scoreboards, QSO information uploads, and so on. The Pi is normally powered by a USB-connector-attached power supply, or via pins on the expansion connector. PiSupply has introduced a UPS specifically for the Pi, using the Pi Hat form factor, which can provide 4-6 hours of power, or even more with a larger batteries. This might solve some problems the next time power quality is an issue during an operating event.

Operating Tip

Operate in the Days Before the Contest

Try to be active on the bands in the days before a contest to better understand band conditions, noise and signal levels, and equipment operation. Remember that you can utilize resources like the Reverse Beacon Network to verify band status if you don't hear any signals.

MARC Vital Statistics

Memberships Expiring in July

W8ZSX WD8BDM

Memberships Expiring in August

N8FUZ W8DOD N8NGT

Memberships Expiring in September

KD8QXL KB8J WB8WNF WB8FYR WD8ODG

Members in Good Standing

AC8QF	K8VFO	KB8SOE	KD8HID	KE8EOS	N8LBF	W8QN	WB8WNF
K0ACP	K8WSR	KB8UIH	KD8HIH	KE8GEM	N8NGT	W8RBF	WD8AXR
K2VMH	KA8EZT	KC0CJC	KD8MMH	KE8JNA	N8WTQ	W8WOJ	WD8BDM
K6VWE	KA9WCS	KC8IHB	KD8QAM	N8CGP	NX8A	W8ZSX	WD8BPT
K8AVJ	KB8AWE	KC8ITI	KD8QXK	N8ERF	W8DOD	WA8LQD	WD8ODG
K8GTG	KB8J	KC8MUD	KD8QXL	N8FUZ	W8LSS	WA8Y	WN8QGV
K8RI	KB8PGW	KC8RTW	KD8ULJ	N8JBW	W8NYO	WB8FYR	
K8VB	KB8RCR	KD0JHX	KE8DON	N8KRL	W8PMR	WB8RCR	

Current Active Club Membership 62

Birthdays Celebrated in July/August

KA8ORL 7/1	N8NGT 7/14	WB8RCR 7/21	N8LBF 8/17	KD8MRB 8/24	K8WSR 8/27
KB8RCR 7/2	AG8B 7/18	K8VFO 8/6	WD8BPT 8/18	WB8FYR 8/24	N8DHF 8/29

Anniversaries Celebrated in July/August

KE8CTI and Molly 7/8
K6VWE and Carolyn 7/16
KB8TBI and Margie 8/8
WB8FYR and WD8ODG 8/13
KD8ULA and Judy 8/14
K8VB and ??? 8/15
KE8DON and Marcia 8/18
K2VMH and Kathy 8/23

Information is from data received 7/12/2018
Any corrections or questions contact Larry, N8CGP

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