HE CHERRY JUIC



Newsletter of the

Cherryland Amateur Radio Club Traverse City, MI

ARRL AFFILIATED CLUB #1082

Hamfests / Swaps

2/11/2017

44th Annual Swap-N-Shop

8:00am - noon

Immaculate Conception Middle School

218 Vine St.

Traverse City, MI 49684

Talk-In: 146.86- (PL

114.8)

Sponsored By:

Cherryland Amateur

Radio Club

http://

www.cherrylandarc.com

Contact: Joe Novak

W8TVT

(231) 947-8555

jjnovakw8tvt@gmail.com

VE Exams

2/11/2017 - Traverse City, MI 9:00am (ARRL VEC)

Immaculate Conception Middle School

218 Vine St.

Traverse City, MI 49684

Contact: Hope Francisco

(231) 218-0622

aa8sn@arrl.net

Walk-Ins Allowed

MEMBERSHIP DUES!

CARC Membership Dues are \$24 each year. Now's the time to submit your dues payment for 2017.

The CARC is a 501(c)(3) tax-exempt nonprofit organization, so your dues may be tax-deductible.

GENERAL MEETING: JANUARY 24TH

Tuesday - 7pm

The Salvation Army - Basement Meeting Hall 1239 Barlow St., Traverse City, MI 49686 (at the intersection of: Barlow st. & Boon st.)

Program: CARC Elections!





8am-noon

Admission \$5.00 Table \$8.00

Immaculate Conception Elementary School

218 Vine Street Traverse City, MI 49684



Talk-In 146.860(-) W8TCM / R PL 114.8 / YSE

- VE Exams, Hamfests, Features
- Silent Key: KA6AYJ
- Cherryland ARC 2017 Elections
- The Purple Crystal
- MSPOTA
- Winter Field Day
- Trump's FCC advisor wants to eliminate most of the FCC
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- 9. Cherryland ARC Information 10. Cherryland ARC 2017 Swap Flyer
- 11. Equipment for sale

Ann E. Cyran, KA6AYJ CARC Silent Key - 2016.12.17

It is with deep personal regret that I inform you of the passing of Ann Cyran, KA6AYJ.

Ann passed away on Saturday December 17, 2016. She had been in a coma since November of 2015 when she sustained a head injury after slipping on some ice.

As many of you know, Ann was very active in the club previous to her injury. She was a regular on the 146.860 repeater and for years was the "voice" of the W8TCM MESH NET on Monday Nights. Ann came to as many CARC meetings as she was able, and almost always attended the annual swap, CARC Picnics, and other social events.

Ann was always happy to speak with people, a welcoming and kind soul. She would be the first

to welcome new people who happened by on the repeater. Ann was active on VHF as well as HF where she held several net operator positions over the years.

Ann was originally licensed in 1970 in Torrence, CA (near LA). Her Father Bill KA6CZL (SK) was a ham, and she is survived by her daughter Liz KE6PHJ. Ann loved animals and amongst other pets kept a Dog, Cats and an African Grey parrot.



Following is a link to the notice posted at the Gaylord Community Funeral Home

http://www.gaylordfuneralhome.com/notices/AnnE-Cyran

Ann's passing was announced in the Record Eagle on 12/26.

http://www.record-eagle.com/obituaries/deaths in the region/deaths-in-the-region/article 8dbb1e9e-c582-56ff-97c4-1a4289f4a88o.html

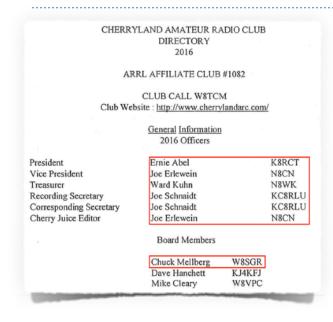
There is no service listed at this time, but we will pass along information we receive as this develops.

73 Ann, you will be missed,

de Joe N8CN

Cherryland ARC Elections for 2017: TUESDAY, JAN 24, 7PM!

Joe Erlewein, N8CN



currently filled by Chuck W8SGR is up for election.

Each year the CARC Board also recommends a "slate" of officers for the positions for election. For 2017, here is the list of officers the board has endorsed.

The board recommendation for officers is published as a recommendation; anyone may be nominated for any of the positions listed and will be voted on by the general membership at the January 24th meeting at 7pm. You can even nominate yourself!

Also new this year, if you read the board meeting minutes in past issues: Joe Schnaidt KC8RLU has been appointed Station Manager for the CARC room at the Salvation Army. Joe will be

As we do each year in January, it's once again time to elect the positions for the Cherryland Amateur Radio Club offices.

The CARC elects the offices of President, Vice-President, Treasurer, Recording Secretary, Corresponding Secretary and Cherry Juice Editor on an annual basis; each term is one year.

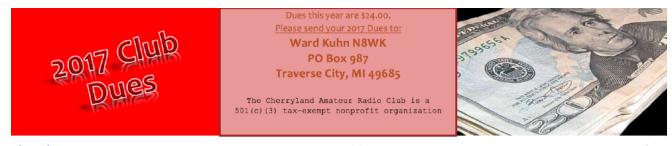
Each Board Member position is for a term of 3 years, which rotate. So each year one of the three positions comes up for re-election and must be voted on. There is a "secret decoder ring" for how to tell which Board Member position is up for re-election. The inside cover of your annual CARC Directory shows the officer roster. The most-recently-voted board position is at the bottom of the list. At the top of the list is the board position which is necessary to vote on for the next year, as the 3-year term has expired. This member may choose to run for election again or another club member may run for the position. The above list is what appears on the inside cover of the 2016 club directory. So, this year, the position

2017 CARC Officers	Proposed Slate, 1/3/2017
President	Joe Erlewein, N8CN
Vice-President	Ernie Abel, K8RCT
Treasurer	Ward Kuhn, N8WK
Recording Secretary	David Poinsett, WB8APT
Corresponding Secretary	Joe Schnaidt, KC8RLU
Board Member 1	Chuck Mellberg, W8SGR
Cherry Juice Editor	Joe Erlewein, N8CN

instrumental in keeping the stations operational and functional qualities and appearances in top-notch, well-oiled working order! Thanks Joe, We appreciate your acceptance of this position!

A reminder that in order to cast your ballot, you must be an active/paid member. There is information below on how to renew your membership and pay for dues for 2017. You may also do so in person at the club meeting on the 24th — just be sure to do so before it's time to vote!

73 de Joe N8CN



The Purple Crystal: A Column About Repeaters

Joe Erlewein, N8CN

Welcome to the fourth installment of The Purple Crystal! So far we've highlighted the W8BNZ 147.040+ repeater upgrade, the resurrection of the W8QPO 147.100+ repeater, and the proposed updates to the W8TCM 146.86- and 442.50+ repeaters.

For our first 2017 installment, a bit of bad news - the 147.380+ K8WQK repeater has been offline since around 12/25. The system owner Pete K8WQK is aware of the situation and is investigating. I don't have a lot of information at this time. The coverage area of the K8WQK repeater is valuable, and fills a gap in the northwest region. It has provided service from Traverse City, Elk Rapids, Bellaire, East Jordan, Grayling, Gaylord, Cadillac, Kalkaska. Several events in the northwest Michigan area are serviceable by this repeater exclusively (such as the White Pine Stampede) and area hams remain hopeful that the system can be returned to service soon. We're all thankful for this system and have enjoyed years of service and use of the system - and many thanks to go Pete K8WQK for maintaining it over the years. Thanks Pete!

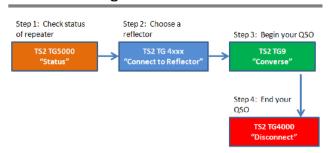
Not to make this a personal thing, but I'm scant for other content for this issue, so I'll write about some recent changes to the Traverse City DMR MotoTrbo repeater. The N8OUZ 442.2875+ MotoTrbo Digital DMR repeater has been online since 2012 and continues to service several talk groups on two timeslots, providing local, regional, statewide, nationwide and global use. For the "uninitiated," here is a brief overview: DMR "Digital" MotoTrbo uses TDMA (Time Division Multiple-Access) instead of FM or a variant (C4FM like fusion, or D-star). This means that for each signal on the air, there are two "time slots" for each single frequency in use, using the time division. Basically, it means two people can use the same repeater on different time slots at the same time, having completely different conversations. Yes, in full duplex, and without collision. A user on Time Slot 1 (TS1) will not interfere with a user on TS2.

Now that the Time-slot concept is sinking in, there can be different "talk groups" on each timeslot. For instance, on TS1, talk group 3 is "North America" while talk group 13 is "world-wide, english-speaking." There are several active talk groups on both TS1 and TS2. This has existed for several years.

In the coming months, we will be changing this system as the DMR-MARC network affiliation is moving to a more agile "linking" approach that will be very familiar for D-Star users. In the new system, all talk groups on TS1 will be "fixed" and either regional or local. TS2 talk groups will be more "variable" in this fashion: Similar to D-star, you will be able to transmit on TS2 TG5000 to check the link status. Then transmit on TS2 TG4639 to "establish" a link to "USA-Nationwide", then switch to TS2 TG9 to have the conversation. This link will stay active until cleared or another link established. There are more than a couple hundred available groups! This can be seen at http://www.dmr-marc.net/FAQ/dmrplus-america.html and is possible due to the partnership between DMR-MARC and the DMRPlus network.

The N8OUZ repeater will be one of a few "pilots" as the DMR-MARC network considers a migration to this new linking topology. It's an exciting and changing area of the hobby, and I'll of course be happy to answer questions or offer info about DMR in general, and

Connecting to Reflectors on DMRPlus



That's it for this installment of the Purple Crystal. If you have suggestions for a future article please email me at: joe@n8cn.org.

also about the DMR-MARC and other networks.

73 de Joe N8CN

MSPOTA: Michigan State Parks On The Air

ARRL Michigan Section News, January 2017

The upcoming Michigan State Parks on the Air is looming ever closer and the development team is hard at work getting the computer programs in order and ready to go. They are building a system whereby activators will load their logs into our database and that will power the leader board and honor roll. Chasers that want a QSL card from the parks will send an SASE for that card. We are looking for clubs to become a host sponsor for a park in their area. Be advised that there may be a significant delay in sending out cards as the sponsoring clubs will likely accumulate cards in order to process cards as a batch.

Speaking of QSL cards, each park is slated to have 500 cards that are specific to that park. Cards requested and issued beyond those 500 will be a generic State Park card. The park specific cards will be the holy grail of MSPOTA. I foresee a three year long scramble to get all parks contacted and collecting park specific cards for all parks! All Activators and chasers alike are encouraged to upload their contacts into LOTW as well.

DNR Parks and Recreation have delayed the beginning of the event to April 1. It is important to note that most state parks don't open until about that time frame. It is also important to remember that while we will be participating with the DNR Parks and Recreation Division our participation is dependent on their willingness to allow us to do so.

There has been some grumbling about why we have to do this on a schedule that suits DNR Parks and Recreation Division and why we can't just show up and operate without having to seek out a Park Ranger before setting up and operating. We owe the DNR Parks and Recreation Division folks the courtesy of playing by their rules. They are responsible to see that the park property is properly protected, that people follow the rules of the park, and that order is kept. In truth, these expectations are not significantly different than the rules that all park visitors must follow. MSPOTA is also a continuance of the relationship between Amateur Radio and the State of Michigan. DNR Parks and Recreation Division recognizes the relationship we have with the Michigan State Police and other agencies and is very interested in supporting and furthering that relationship with their partnership in MSPOTA.

Our goal here is twofold: Help the Michigan Parks and Recreations celebrate the 100th Anniversary of the Michigan State Parks system and to provide and organize a fun operating event that will include not only Michigan hams but hams across the country and to a certain extent, around the world. Let us not forget to consider MSPOTA as a giant EMCOMM drill which will allow us to hone and perfect our portable operations equipment and abilities.

You can keep track of MSPOTA activities and news at https://www.facebook.com/groups/MSPOTA

Winter Field Day is Just Ahead

ARRL Website, 1.4.2017

Field Day is not just for summertime anymore. Winter Field Day, sponsored by the Winter Field Day Association (WFDA), will take place over the January 28-29 weekend, and it can be a terrific time to prep for ARRL Field Day in June. The annual event's stated purpose is to encourage emergency operating preparedness in the winter, but it's also an excuse to get out of the house and enjoy the great outdoors. According to the WFDA, getting ready for emergency communication in a winter environment is just as important as the preparations and practice that take place each June during ARRL Field Day, and — let's face it — it's not cold and snowy everywhere during the winter months. Your local climate could be quite the opposite.

"Don't let those winter doldrums keep you locked up in the house," the WFDA says. "Get out and play some radio!" The WFDA said it believes that maintaining operating skills should not be limited to fair-weather scenarios.

The event, which got its start in 2007, is not restricted to North America. All Amateur Radio operators around the world are invited to participate, and there are three entry categories — indoor, outdoor, and home. The rules are similar to those for ARRL Field Day. Operation will take place on all HF bands except 12, 17, 30, and 60 meters, as well as on VHF, UHF, and satellite. The event runs 24 hours. US and Canadian stations exchange call sign, operating category, and ARRL or RAC section.

The WFDA encourages both group and solo operation, and if you're not up for an outdoor winter adventure involving Amateur Radio, you can operate from the comfort of your shack. As the WFDA says on its <u>Facebook page</u>, "The object is winter fun!"

President Trump's FCC advisor wants to eliminate most of the FCC

JON BRODKIN - 11/23/2016, via <u>ARSTechnica</u>

FCC should handle spectrum licenses, but nothing else, Trump advisor wrote.

A Donald Trump advisor who will help set a new direction for the Federal Communications Commission recently argued that most of the FCC should be eliminated.

The commission's role as an independent agency remains important in one area: licensing radio spectrum, Trump advisor Mark Jamison argued in a blog post last month titled, "Do we need the FCC?" That's because political interference in spectrum licenses would dampen investment "and could lead to rampant corruption in the form of valuable spectrum space being effectively handed out to political cronies," he wrote.

Any legitimate universal service concerns could be handled by others: States can subsidize network access as they see fit, the Department of Health and Human Services can incorporate telecommunications and Internet into its assistance to low-income households, and the FTC [Federal Trade Commission] and states can handle consumer protection and ex post regulation. A much smaller independent agency could be created to license radio spectrum, where a spectrum license would be a property right for use and not about content. (The license holder could lease its space to others or use it itself for content or other services.)

Thus, at the end of the day, we don't need the FCC, but we still need an independent agency.

Jamison is one of two officials appointed by Presidentelect Trump to advise him on the FCC during the presidential transition. Jamison is a visiting fellow at the Center for Internet, Communications, and Technology Policy at the American Enterprise Institute (AEI) and a professor and director of the Public Utility Research Center at the University of Florida. Jamison also used to manage regulatory policy at Sprint. Jamison is an opponent of net neutrality rules, we noted in a story yesterday. His arguments for dramatically scaling back the FCC were pointed out in a Washington Post article. Jamison told the Post that current FCC Chairman Tom Wheeler "has allowed politics to 'infiltrate the FCC a lot more than is necessary."

Most of the original reasons for having an FCC have gone away because "Telecommunications network providers and ISPs are rarely, if ever, monopolies," and in cases where they are monopolies, they can be regulated by the FTC and states, Jamison wrote in his blog post on whether the FCC is still necessary. The FCC's oversight of broadcasters isn't needed anymore because "content on the Web competes well with content provided by broadcasters," he wrote. Besides inertia and the difficulty of dissolving a federal agency, the FCC still exists because it "is valuable to businesses and interest groups that are benefitting from its activities: The recent work on net neutrality, business data services, and set-top boxes are bestowing benefits to some segments of the industry at the expense of other segments, and at the expense of customers, who ultimately bear the brunt of regulatory rent-seeking," he wrote.

In other recent blog posts, Jamison criticized Wheeler's leadership and argued that Democratic presidential nominee Hillary Clinton's push to provide universal broadband with subsidies "would be a drag on the economy."

In 2013, Jamison argued that seeking consumer input in the regulatory process can be harmful, claiming that "Public discussion inhibits open dialogue."

The FCC is required to seek public comment before issuing new regulations; net neutrality rules passed under Wheeler were influenced by 4 million public comments, most of them supporting stronger regulation of ISPs.

Wheeler obviously would disagree with Jamison's stance that the FCC should be dramatically scaled back. With the Democratic chairman on his way out, Wheeler urged Trump to protect consumers and "the broader common good" instead of doing the bidding of "incumbents preferring the status quo." Wheeler has also justified new regulations by saying there isn't enough competition in the US Internet market, with most customers having at best one choice for a provider offering modern broadband speeds.

ARRL Vows Continued Pursuit of the Amateur Radio Parity Act in the 115th Congress ARRL Website, 12.9.2016

The Amateur Radio Parity Act, H.R. 1301, died an unbefitting death as the 114th Congress of the United States drew to a close today. After having passed the House of Representatives on a unanimous vote, the bill stalled in the Senate due to the intervention of only one member, Sen. Bill Nelson (D-FL).

Over the course of the past year, Sen. Nelson has received thousands of e-mails, letters, and phone calls from concerned constituents asking for his support of H.R. 1301. Numerous meetings were held with his senior staff in an effort to move the legislation forward. Negotiations, which led to an agreement with the national association of homeowner's associations and publicly supported by CAI and ARRL, were brushed aside by Sen. Nelson as irrelevant.

In a final meeting with the Senator's staff earlier this week, it became clear that no matter what was said or done, the Senator opposed the bill and refused to allow it to move forward. Unfortunately, as the bill did not receive floor time, the only manner in which it could get passed in the Senate would be through a process that required unanimous consent, which means no one opposes the bill.

The legislation will be reintroduced in both houses of Congress after the 115th Session begins in January. We have already been in contact with the sponsors of the bill to allow for an early introduction, which will give us more time to obtain success. We believe that we can get his bill adopted given the fact that we were inches away from crossing the goal line. We will continue to need the support of the membership, particularly in Florida, as we go forward through the next year.

New "Amateur Radio Parity Act" Bill Introduced in US House of Representatives ARRL Website, 1.16.2017

H.R. 555 — a new "Amateur Radio Parity Act" bill — has been introduced in the U.S. House of Representatives. The bill's language is identical to that of the 2015 measure, H.R. 1301, which passed in the House late last summer but failed in the waning days of the US Senate to gain the necessary support. As with H.R. 1301, the new measure introduced on January 13 in the 115th Congress was sponsored by Rep. Adam Kinzinger (R-IL), with initial co-sponsorship by Rep. Joe Courtney (D-CT) and Rep. Greg Walden, W7EQI (R-OR). Walden now chairs the House Committee on Energy and Commerce, to which the new bill has been referred. H.R. 555 will get an initial airing in the Subcommittee on Communications and Technology. When H.R. 1301 came up in committee, Walden spoke forcefully in favor of the measure, which ultimately attracted 126 House cosponsors.

"Rep. Kinzinger has again stepped forward to introduce this important legislation," said ARRL CEO Tom Gallagher, NY2RF. "His commitment stems from exposure to what the Amateur Radio community brings to the service of all communities. The ARRL and radio amateurs nationwide owe Rep. Kinzinger a resounding 'Thank You!' for his efforts on their behalf."

H.R. 555 calls on the FCC to establish rules prohibiting the application of deed restrictions that preclude Amateur Radio communications on their face or as applied. Deed restrictions would have to impose the minimum practicable restriction on Amateur Radio communications to accomplish the lawful purposes of homeowners association seeking to enforce the restriction.

The ARRL Board of Directors is expected to discuss the pending legislation when it meets January 20-21.

Cherryland ARC sponsors Interlochen State Park MSPOTA event!MSPOTA Facebook Page, 12.15.2016

This via Laura Steinberger, WZ8C (ex W8JUZ) via the

our newest club sponsor! The Cherryland ARC will be

MSPOTA Facebook Page :

We would like to welcome the Cherryland ARC for being

Have you talked to your club about being a sponsor? We need clubs to help sponsor parks for this great event. For more information, email us at pr@mspota.org

sponsoring Interlochen State Park for the MSPOTA event!



CARC Board Meeting Agenda / Minutes - Jan 3, 2017

Joe Schnaidt, KC8RLU

Members Present: KC8RLU, N8CN, N8WK, K8RCT, W8TVT, W8SGR, KJ4KFJ, KD8REH, W8QKP, W8APT, W8VPC

- 1. Minutes from last month Approved
- 2. Treasurers Report Approved
- 3. Committee reports
 - a. Tower All bolts have been re-tightened or replaced if missing.
 - b. Still need a climb to install antenna Climber not found yet; wait until Spring(?).
- 4. Repeater system upgrade proposals
 - a. Battery purchase and installation Making progress per N8CN.
 - b. New Fusion repeater to replace 440 machine ordered and received N8CN has for programming.
 - c. Upgrade two meter Fusion repeater new firmware for WIRES-X Under consideration.
- 5. Gift Card to Don Parker done Listed under "Rent" of T. Report.
- 6. Repeater Controller investigation report from committee (N8CN & W8VPC & K8SGZ) RC210 vs ASCOMM 7330 Controller Still under consideration; expect to have a definite decision by the member's for the 02-2017 Board Meeting
- 7. Nominations for 2017 Board of Directors develop a slate of officers to present Motioned by N8WK, 2nd by KJ4KFJ. Approved.
- 8. CARC membership form discussion of digitizing the form For now, a simple version.
- 9. KA6AYJ (SK) Notify ARRL about Ann.
- 10. Swap report
 - a. Sign up volunteers 6pm libations at the Elks Club, 7pm setup at IC. Details on Flyer. Joe Novak taking volunteers (231.947-8555)
 - b. Sound system Investigating (TBD will test school sound system ahead of time)
 - c. Door prizes (N8CN) dual-band (Ed Fong) antenna, quad-band (6m, 2, 220,440) radio, one other item.
 - d. Refreshments Donuts & Coffee?
- 11. TBAREG report N/A; Meeting January 12th, rescheduled for Jan 18th.
- 12. White Pine Stampede? 1st February (Feb. 4th) 9a-2:3op; Mike W8VPC looking for volunteers
- 13. January program board elections, How about a photo program of the year in review?
- 14. Net control stations for Mesh Net Christian and Mike doing OK but would be nice to have another volunteer.
- 15. Adjourn Motioned by Chuck W8SGR, 2nd by Joe KC8RLU

CHERRYLAND AMATEUR RADIO CLUB - INFORMATION

Meetings:

Club Meetings:

The official CARC Club Meeting occurs on the Fourth Tuesday of each month. Anyone is welcome.

Board Meetings:

The CARC Board meets on the First Tuesday of each month.

Board meetings are open all.

Project Night:

The CARC meets for a "project night" on all other Tuesday nights at 7pm. Anyone is welcome to come and use the tools, parts, resources, and "elmers" in the project room / SATERN station.

Meetings occur at the Salvation Army building on Barlow St. (at Boon st.) in Traverse City.

The project room is on the basement level.

Membership:

To become a member of the CARC:

1. Fill out a membership form.

You may fill out a form at any meeting, fill out the form online via the website, or you can email cherrylandarc@gmail.com to receive a form via email.

2. Submit dues with your form.

Dues are \$24 per year and are due January 1 each year or with your membership form submission. (pro-rated) (Family Memberships available for \$26)

That's all for the January 2017 issue of The Cherry Juice!

As always, if you have any suggestions or comments, I'm all ears!

ioe@n8cn.org

73, Joe N8CN

Club Repeaters

W8TCM/R

146.86- (PL 114.8) W8ZTB Memorial Repeater

W8TCM/R

442.50- (PL 114.8) W8NGH Memorial Repeater

Club Officers

President

Ernest Abel, K8RCT

Vice President

Joe Erlewein, N8CN

Secretary

Joe Schnaidt, KC8RLU

<u>Treasurer</u>

Ward Kuhn, N8WK

Directors

Chuck Mellberg, W8SGR Mike Cleary, W8VPC Dave Hanchett, KJ4KFJ

Cherry Juice Editor

Club Radio Nets

MESH NET

Monday Evening Social Hour Each Monday, 8pm 146.86- (PL 114.8)

SMASH NET

Sunday Morning Amateur Social Hour Each Sunday, 9am 3.935 MHz







Amateur Radio

Swap-N-Shop

February 11th, 2017

8am-noon

Door Prizes!

Admission \$5.00 Table \$8.00

Immaculate Conception
 Elementary School

218 Vine Street Traverse City, MI 49684 VE

Exams

g am

Talk-In 146.860(-) W8TCM / R PL 114.8 / YSF



www.CherrylandARC.com

For information or table reservations, call:

Joe Novak W8TVT at (231) 947-8555

(or click here)

VE Exam Info: Contact Hope, AA8SN: hopeaa8sn@gmail.com or 231-218-0622



An ARRL-Sanctioned

Swap Event

Friday Night "**Eyeball QSO Gathering**" Social Event 6-7 p.m. at the Traverse City Elks Club #323 625 Bay Street, near the US-31/M-72 junction.

NO SALES!! This is a social event only. Great for those travelling up Friday Night, also a fun night for locals to meet and greet. Cash bar and food available.

The Cherryland ARC has lost several members in 2016, and has also had some equipment donations this year as well. The equipment listed below is expected to be for sale at the swap, either at the CARC table or at another table being sold on behalf of the family of the silent key.

Astron RS-35 Power Supply
Heathkit SA2060A Antenna Tuner
Ameritron AL84 Amplifier
Kenwood TS-430S
Astron RS-20A Power Supply
Kenwood MC-80 Mic
Icom IC-2AT 2m HT
Heathkit MA 201 (2m amp)
Micronta 12v Power Supply

Kenwood TS-450SAT HF Transceiver

Kenwood PS-50 DC Power Supply

Kenwood SP-430 Speaker

Kenwood MC-60 Desk Microphone

Kenwood SM-220 Station Monitor Scope

Kenwood SP-930 Speaker Console

Kenwood TM221A 45 Watt 2 Meter Mobile Transceiver

Heathkit HM-102 SWR Meter 200/2000 Watt

Kenwood PS-20 DC Power Supply

Icom IC-04 AT UHF Handheld Transceiver

MFJ 949C Antenna Tuner

Icom IC-271 2 Meter All-Mode Transceiver

Kenwood TS-430S HF Transceiver

Tripp-Lite PR-40 DC Supply

Tokyo HI-Power HL-82-V 2 Meter All-Mode Linear Amp

Icom IC-02AT 2 Meter Handheld

Icom IC-T7H Dual-band Handheld

Yaesu FT-415 2 Meter Handheld

5 element 2M Yagi beam

5 element 440 Mhz. Yagi beam

2 multiband HF vertical antennas

Yaesu FT-8900R Quad band mobile transceiver