

HAMATEUR CHATTER

The Milwaukee Radio Amateurs Club

March 2013 Volume 21, Issue 3

One of the World's Oldest Continuously Active Radio Amateur Clubs—since 1917



President's Letter

February was a very busy month for MRAC. We had our annual simplex contest, held a swapfest and had a dinner for our meeting. This year was another good contest with some new stations on the air. I do believe we need to do a better job of getting the word out and promote the contest. I know the weather wasn't the best this year with the fear of an ice storm.

This year was our third annual swapfest. We were about the same as last year for attendance. I heard good things from the vendors about sales which is always good news. We also had some attendees comment on how nice it was to actually see real radio equipment at a fest. Our free table was well received again. Plus we had people bring stuff to add to the free table. American Science and Surplus made their hamfest debut at our fest. There were so pleased that they are interested in doing more fests. We again provided free coffee, donuts and soda. We had a donation can put out and it covered the cost. Plus we had some refreshments left over for our food meeting. We also provided pizza for the clean up crew after the fest.

At the February meeting it was nice to be able to spend an evening socializing with our fellow hams over food. I want to thank Al KC9IJJ for working hard again to help make this happen. This was a big under taking to prepare and organize the food. I would also like to thank everyone who brought food to share. Now we just need to start planning on next year. It would be nice if we had a committee to help organize it.

This months meeting will be on HD broadcast radio. Our guest is Chris Tarr W9JOL and he is the chief engineer of WYMS. I have seen his presentation before and it is quite informative.

Just a reminder AES Superfest is April 5th&6th. We will again have a table and an updated club history. We can always use help staffing the club table.

Our April meeting is our annual elections meeting. We need a nomination committee to help find members interested in running for office. If you are interested in helping please let me know.

Dave KA9WXN

Tornado & Severe Weather Awareness Week—April 19 -23.

Subject: National Weather Service (NWS) state-wide tornado drill will be conducted

On Thu., April 22nd, the National Weather Service (NWS) state-wide tornado drill will be conducted, with a NWS test tornado watch being issued for all of Wisconsin at 1 PM and for Southeast Wisconsin the NWS test tornado warning will be issued between 1:20-1:25 P.M. The Milwaukee County outdoor warning sirens will be sounded at this time for 3 minutes.

There will be no "all clear" message. The National Weather Service will activate the warning tone on the National Oceanic and Atmospheric Administration (NOAA) Weather Radio Network. This announcement will be preceded and followed by the words, "This is a drill, I repeat, this is a drill".

If you have any questions regarding Tornado and Severe Weather Awareness Week or today's drill,

MRAC Officers:

Terms Expiring in 2014

- President – Dave, KA9WXN
- V-President– Dan, N9ASA
- Secretary – Mike, KC9CMT
- Treasurer – Joe, N9UX
- Director – Vacant

Terms Expiring in 2013

- Director – Al, KC9IJJ
- Director – Hal , KB9OZN

The Club Phone Number is: (414) 332-MRAC or

(414) 332- 6 7 2 2

Visit our website at:

www.w9rh.org

Mail correspondence to:

M. R. A. C.

**PO Box 26233
Wauwatosa, WI**

53226-0233

please call the Milwaukee County Sheriff's Office Emergency Management Bureau at 525-5770 with any questions.

Be prepared, stay informed about severe weather! Visit NWS at <<http://www.crh.noaa.gov/mkx/>>

For more preparedness information visit <<http://emergencymanagement.wi.gov/>>

Board of Director's Minutes

Board of directors meeting called to order at 7:00 pm by Dave Shank, KA9WXN club president.

Director's present: Michael KC9CMT, Dave KA9WXN, Hal, KB9OZN, Joe, N9UX, Al, KC9IJJ. Dan, N9ASA, Mark, AB9CD.

Absent: None.

Preliminary discussions:

The Board of Director's minutes were accepted as published in the January Chatter by a motion forwarded by AL, KC9IJJ seconded by Hal, KB9OZN. The Treasurers report was given by Joe, N9UX. The January balance ended with \$17,624 in our accounts. The phone bill has increased for the year of 2013. Dues and other income was deposited to our account on February 2nd. The swapfest generated a reasonable amount of income for the two clubs involved. Once again the swapfest can be considered a success for 2013.

Meeting programs: The months meeting will be the food gathering, since the swapfest was a success. Marches meeting program may be Chris Karr on HD radios, the subject of a program on oscilloscopes also is being worked on. April will be the Annual Election of club director's along with the digital mode presentation, APRS & PSK31. May will be the club auction. Field day falls after the membership meeting in June this year. Junes' meeting will be about setting up a computer sound card to access PSK31 programs, and other digital modes. The club needs to work on topics to educate the membership into electronics and radio topics. A special presentation with Gordon West has been discussed. This would be a special presentation on its' own day. There will be no meetings during July and August again this year. The topic of grounding equipment as a presentation has also come up.

Hamfest: The MRAC netted around \$650 profit from the swapfest. Expenses were just a little higher than in 2012, but, all-in-all the swapfest has been reported to the board as being a success. We anticipate being able to continue with this venture again next year. The same location should be available. The free food stand broke even this year. For next year we would like to work on Batteries America to attend our fest. They have not been attending hamfests for a number of years now. They have become a dedicated Internet sales company. The clubs will work on signage before next years event. The issue of advance tickets is being discussed. Does the club want to do that or not.

Next years swapfest is being scheduled to be on February 15th, 2014. The flyer needs to be updated for next year. We should progress with the flyers so that they are ready by at least the Ozaukee swapfest.

Special Project Committees & Committee reports: The club bought a beam for field day from an estate that Mark, AB9CD was liquidating. Cushcraft MA5B is the name of the beam. It can be rotated with a standard small rotator which the club already has. The club will be polled at the membership meeting whether some people can man special committees this year, such as the upcoming election committee, that the club needs for April. The club still wants to decide what to do with the storage space and equipment that exist at the pioneer village site. We did not talk to the pioneer village people in 2012. We intend as a group to run a free weekend on the air event at this site. We need more than one person to handle club affairs and maintain equipment stores.

Repeater Report: Dave, WB9BWP is the repeater trustee and had to intercede into a conversation taking place on the repeater that he though was inappropriate. The club would like more than one repeater trustee. We need to ask for volunteers at the membership meeting.

New Business:

Field Day: Pat Hoppe, with his group of students from Kenosha will be joining us at the MRAC field day site this year. They will be bringing their equipment and a van to the event. There is still some radio equipment that the MRAC owns that it would like to sell. A Kenwood TS-430 with power supply is one of the items. The club also has a beam that it would like to sell.

The budget constructed by Joe, N9UX for 2013, was approved by a voice vote of 6-0. Michael, KC9CMT made the initial motion to accept the budget with it was seconded by Dan, N9ASA.

The board of directors wants someone to work on club promotions. Writing out press releases along with working on presentations such Ham Radio PR at Malls, Discovery World, ETC. Publish CD with HamChatter Archives. Lots of materials related to club activities and history can be found on the DVD's that Dave, WB9BWP has been producing for the MRAC.

On the club website storage is listed as 5 GB. The club needs someone to take over programming of the club website. A volunteer will be asked for at the next membership meeting. Google voice has been mentioned by Joe, N9UX. More details on this will be forth coming. A Gmail account is required for Google voice service.

The FM simplex contest was on February 10th, please remember to submit your station log in time for it to be counted. The Wisconsin QSO party is coming in March, this event is sponsored by the West Allis Amateur Radio Club.

The May board meeting has been changed to the 20th of May instead of on Memorial day. At the AES SuperFest this year our club table will be next to the MAARS table. AES SuperFest is the first weekend in April this year.

A motion was made to adjourn the meeting at 8:48 pm by Hal, KB9OZN seconded by Michael, KC9CMT. Meeting adjourned at 8:50 pm. The room was returned to an organized condition as it was when the room was opened.

[DX Code of Conduct](#)

by [Larry W2LJ](#)

This post will deal with a phenomena that is occurring more and more frequently, I believe. But it hasn't been noticed by me alone, it was also noticed by Jim K9JV, who posted about it on QRP-L this morning. I touched upon this in my recent post about pile up behavior; however, this is a very important topic, so here we go [again](#).

Jim was trying to work both P29NO and 9M4SLL. The pileups were big and unruly. While it is [the domain](#) of the DX to try and control the pileups, it remains the responsibility of those trying to work the DX to do so in as "professional" a manner as possible. Jim pointed out that several stations continued to throw out their calls, even though the quarry was clearly calling for a station whose call was in no way similar to those of the perpetrators.

This is maddening! K9JV was furious (and justifiably so) that when P29NO was calling "K9?V", a KØ, a VE and a W2 kept plaguing the ether with their calls. I had a similar experience a few years ago when I was trying to work an Iraqi station. I was one of those competing in the pileup, and the Iraqi station suddenly began sending "W2L?" He meant yours truly of course, yet I was obliterated by a W4 station, and no, it wasn't a W4Lsomething (I could have accepted that) – the station didn't even have an "L" in their call at all! Jim was lucky as he ended up working P29NO. In my case, the Iraqi station subsequently went QRT and I never got him in the log.

What causes this kind of behavior? Are people truly that stupid and discourteous? I don't know the [answer](#) to that, although I am tempted to offer an unfounded and uncharitable guess.

But I think part of the problem may lay in the way that I think DX is encountered today. At the risk of sounding like a curmudgeon, in the days of old, we used to find DX by twiddling the dial and listening for it. You spun the dial knob, up and down – back and forth, straining your ears to find that foreign amateur radio op. If you were lucky, you were able to hear him, you worked him and you were good to go. Or you listened for a pileup, and you located the station they were all calling, determined if you needed him, and then you joined the fray. But in essence, YOU had to locate the DX station yourself, either by dial twiddling or by locating the goal of a pileup.

Today, things have gotten immensely easier; but at the same time, we have invoked "The Law of Unintended Consequences". Allow me to explain with this scenario:

A station twiddles the dial – he finds and hears (for example, we'll use a DXpedition that just concluded) TX5K. He works him. Then, proud of his accomplishment, he posts TX5K to the [Internet](#) (in the days of old, the PacketCluster), wishing to share the bounty. Immediately, on the screens of Amateur Ops the world over, it appears that TX5K has appeared on 18.073 MHz (for example).

Nowadays, with the myriad of the logging [programs](#) and rig control programs available, an Amateur Op can just point and click with his mouse and "Viola!" there they are, on TX5K's frequency.

I think the problem is, that many (but by nowhere near all) ops don't pause to listen to hear if they can actually hear TX5K. Or may be they can, but they hear him only marginally at best. In fact, they hear him so marginally that if they were tuning across the band on their own, they wouldn't have been able to tell that it was TX5K in the first place – but hey, their computers tell them that he's there, right? So what do they do? They start throwing out their calls in the hopes that somehow he'll magically get louder and that they'll be heard in return. Heck, in many cases they can't even tell that he's working split! So they call right on the listening frequency, which then invokes the ensuing cacophony of "UP"s and "LID"s being sent.

It gets to be one, big frustrating mess. And this doesn't even take into account the zoo that can occur if some quack, who literally enjoys jamming DX operations, gets involved.

So what should be done about this? Closely and completely adhere to the ["DX Code of Conduct"](#) – that's what!

The DX Code of Conduct was formulated by Randy Johnson W6SJ.

I will listen, and listen, and then listen again before calling.

I will only call if I can copy the DX station properly.

I will not trust the DX cluster and will be sure of the DX station's call sign before calling.

I will not interfere with the DX station nor anyone calling and will never tune up on the DX frequency or in the QSX slot.

I will wait for the DX station to end a contact before I call.

I will always send my full call sign.

I will call and then listen for a reasonable interval. I will not call continuously.

I will not transmit when the DX operator calls another call sign, not mine.

I will not transmit when the DX operator queries a call sign not like mine.

I will not transmit when the DX station requests geographic areas other than mine.

When the DX operator calls me, I will not repeat my call sign unless I think he has copied it incorrectly.

I will be thankful if and when I do make a contact.

I will respect my fellow hams and conduct myself so as to earn their respect.

Having wonderful tools at your disposal does not abrogate your responsibility to operate in an unselfish manner. You must still be courteous to your fellow Hams.

I am so taken by this credo, that I am posting the DX Code of Conduct badge on the side of this blog, to be a reminder to myself and others.

2013 Spring VHF/UHF Sprints

**Sponsored and organizationally supported by
the Central States VHF Society (csvhfs.org)**

hosted by John Kalenowsky, K9JK

It is our pleasure to announce the 2013 Spring VHF/UHF Sprints.

Everyone is encouraged to participate, even if only in a small way. The rules have intentionally remained simple, and the focus of these FIVE events continues to be for single operator, single transmitter entries, both "fixed", "rover" and "Rookie".

"Distance Scoring" will continue in 2013 for all 5 of the Spring Sprint Bands/events

The "Rookie" classification IS continued for 2013, to ENCOURAGE 'first-time' participants, from their own stations OR as "guest-op" at an "experienced" station to introduce newcomers to weak signal vhf/uhf operations which, hopefully, will 'whet' their interest in such and lead to their participation in the future. This is NOT intended to be multi-op, the "Rookie" operator is expected to be the voice behind the mic, hand on the key/keyer, hands on the keyboard, PTT, tuning knobs and rotor controls. When an experienced operator is present for a "Rookie", their role IS to be "Guidance", NOT operating. Clear identification of Rookie entrants is requested by comments in the SOAPBOX: lines for Cabrillo formatted logs or in the Comment area of the Summary Sheet for paper logs. The detail should identify who is the "Rookie" and list any "experienced" operator (s) who was (were) present.

Please note that, for 2013, the shortened log submission date windows remain and consider the following change an EVEN STRONGER encouragement for electronic log submissions using the Cabrillo format. While paper logs will continue to be accepted, the policy that any MAILED logs MUST be RECEIVED by the log deadline for each band that was started in 2009 continues, so those who submit by Mail MUST allow for the post office transit time (probably a week early to be certain, which still allows participants a full week to process logs from a 4 or 7 hour event). There have not been THAT many "paper" logs and generally, they've had smaller numbers of QSOs but I'd really appreciate if "paper" log submitters would at least CONSIDER TRYING the "Web-to-Cabrillo" as described in Rule 7.2.2. If you MUST mail your entry, DO NOTE the log submission MAIL address in 7.3.2.

This site contains information on the Spring Sprints. <https://sites.google.com/site/springvhfupsprints/2013-announcement-rules> The dates are listed here but be sure to follow the URL and read the rules. Note that all except 50 MHz are on local time.

1. Object: To work as many amateur stations in as many 2 degree by 1 degree grid squares as possible, using authorized amateur frequencies on the 50, 144, 222, 432, 902 MHz and above bands over five separate events during the "Spring" (April and May).

2. Contest Period:

2.1. - 144 MHz The 144 MHz Sprint will be from 7 PM until 11 PM local time on Monday, April 1, 2013.

2.2. - 222 MHz The 222 MHz Sprint will be from 7 PM until 11 PM local time on Tuesday, April 16, 2013.

2.3. - 432 MHz The 432 MHz Sprint will be from 7 PM until 11 PM local time on Wednesday, April 24, 2013.

2.4. - Microwave (902+) The Microwave Sprint will be on Saturday, May 4, 2013, from 6 AM until 1 PM local time. This includes all Amateur frequencies above 902 MHz. Please include band data in summaries and logs. NOTE: use of Liaison Frequency is encouraged.

2.5. - 50 MHz The 50 MHz Sprint will be from 2300Z Saturday, May 11, until 0300Z Sunday, May 12, 2013.

3. Exchange: Grid-square locator - PLEASE EXCHANGE and LOG SIX-Character Grid Locators where possible. Correct exchange of FOUR-Character Grid Locator (and call signs) is the minimum requirement for a valid contact but we'd REALLY like to see SIX-Character locators exchanged and recorded in the submitted logs.



Wishing you the very best of VHF! 73,

John Kalenowsky, K9JK

Severe Weather Preparedness

The Jet Stream - Upper air flow and Severe Weather

Understand that without upper air winds, a thunderstorm would grow vertically, the rain would fall down directly into the updraft, inhibiting the updraft or destroying it. So upper air winds are vital to long lived severe thunderstorms and tornadoes. This is why checking upper air maps is an important factor for chasers to watch carefully when chasing. Most of this data is gathered by weather balloons, and they are sent up only twice daily, 12 hours apart, at stations spread all over the US, many with hundreds of miles between them. This is one of the aspects about upper air that chasers and forecasters grapple with, the limited data due to times available for upper air updates.

Continuing since 1904 balloons are still sent up twice daily to gather needed information. Here are two photos from NOAA and the NWS showing the simple technology used to send up the data gathering instruments into air to get this data back to official at local offices.

PHOTO: Launching a radiosonde balloon from the Sterling WSFO facility.

Image ID: noaa6129, NOAA's Online World Collection

Credit: National Weather Service Forecast Office Washington, D.C.



Preparing to launch America's first "ballon-sonde." Since this first launch, literally millions of weather balloons have been launched by the National Weather Service and its predecessor organization. In: "The Principles of Aerography" by Alexander McAdie, 1917. Page 12.

Image ID: wea01136, Historic NWS Collection

Location: St. Louis, Missouri

Photo Date: 1904 September 15

CREDIT: National Oceanic & Atmospheric Administration (NOAA)



This infrequent gathering of information is part of the reason why predicting exactly where the storms will have the greatest potential for severe weather and tornadoes is so difficult. I have watched jet stream predictions change 100 miles or more in the 12 hours between balloon launches. Just read the jet stream prediction maps and then when that time actually arrives check to see where they actually are. You will find sometimes they are off by 100 miles, while other times they are dead on. Upper air winds can be stronger or weaker than forecast, move further north or south, drastically changing the storms life, intensity, and location.

On a good storm day, as storms build you will see thunderstorms leaning as they build, much like a small tree bending in a strong wind, being pushed about by the differing wind directions. This wind shear can be seen with the eye just by watching the storms grow sideways. This leaning allows the falling rain to fall away from the updraft, and not in it, thereby allowing the updraft to continue and even strengthen.

On some days the wind shear is so strong you will see storms leaning so much that their tops get blown off and then they are seen racing away from the rest of the cloud. As the storms strengthen they overcome this shear with enough force to keep building and stay together with the end result of strong shear within the storm, and often spin or storm rotation.

A spinning (rotating) thunderstorm is called a mesocyclone when it meets certain criteria. Properly used, mesocyclone is a radar term; it is defined as a rotation signature appearing on Doppler radar that meets specific criteria for magnitude, vertical depth, and duration. But with experience you will become able to pick out most mesocyclone storms with your eye as they are usually very evident to the seasoned chaser. Experience will help you identify them accurately.

Next, if a jet stream moves over the top of a building storm and pulls the top of the building storm away from the main updraft, it kicks the storms into high gear causing some of the most violent storms and tornadoes. Rather than the top of the storm flattening out you see it being pulled one direction, stretching the top out and elongating it sometimes for many miles.

(Don't try this at home, it makes a real mess and can be deadly.)

EXAMPLE: If there was a small fire in your fireplace and then something covers up the chimney. What happens? The smoke backs down the chimney into the house, it has no place to go. Same with storms. They build to a point and then hit a ceiling of air that stops them from growing.

Now if that same cover was removed from your chimney and what happens to the smoke? It can rise up and out freely again, just as strong upper air winds can allow storms to keep rising and building.

Now one more example. With nothing covering your fireplace chimney and the flue is wide open, and it is a windy day with winds of 40 or 50 miles per hour racing over the top of your chimney. What would happen then? Well if you have ever been by a fireplace when it is really windy you will see the fire burns hotter unless you restrict the updraft in the fireplace by closing down the flue. A powerful wind over your chimney makes the updraft stronger. The same with a strong jet stream placed over a storm, it speeds the updraft rates significantly.

So, a well positioned jet, will vent the storm, pulling the rising air up faster and away from the main body of the storm, letting the updraft strengthen. This kind of venting on storms is called divergent flow aloft, and is a main contributor to violent storms. I have seen storms like this and they act like giant vacuum cleaners, sucking all the clouds and moisture up and into them. I have seen clouds racing into the storm only to seem to disappear into it, but in reality are racing upward in the strong updraft of the storm.

One more area of added potential for violent storms is an area of maximum winds within the jet stream, called the jet "Streak" or jet "max". This area in the jet has a big impact on storm growth and development. The jet streak moves along the jet stream at a slower speed than the wind in the maximum area.

Severe Weather Preparedness

As jet stream air enters and leaves this area of high winds, the accelerations act to induced upper level divergence in the forward left quadrant (I), thus promoting convective activity. Rapid thunderstorm growth can be anticipated as the jet max approaches the warm sector of the surface low pressure area. (Barnes and Newton, 1983)

So keep an eye on upper air maps, where is the jet stream forecast to be, and where is the low pressure in relation to this. Look for an area of warm air that is being pulled into the low pressure area by the jet, and you may have the target location of the day.

(Much of this information was learned from Thomas P. Grazulis, "A chronology and Analysis of Events, Significant Tornadoes 1680-1991". (Available at most University Libraries) We learn through reading.

What Makes A Thunderstorm?



Heat and moisture are key to the formation of thunderstorms. In order to produce the thunder and lightning, you need a cloud tall enough to pull moisture up into the sub-freezing level over 5km/3miles high. These clouds are called cumulus they have a cauliflower like appearance. Cumulus clouds can form any time of the year as long as there is warmth below and coolness above. The process is called **convection**. Once cumulus clouds reach a height where ice crystals form they become cumulonimbus clouds. The upward motion gradually slows. The stronger upper level winds spread the cloud out at the top, and this formation is called an anvil. As the ice crystals form, they collide with each other and with still-unfrozen water droplets. Electrical charges are produced and eventually the cloud becomes an electric field. If the field becomes more intense lightning is produced.

Single-cell Thunderstorm

The single-cell thunderstorm (meaning a single updraft) develop and die quickly on summer afternoons. They do not last very long because lackadaisical upper winds which keep them becalmed. Once the rain begins, it cools the air below and cuts of the storms energy in less than half an hour. More single-cell storms can form along the cool air outflowing from older ones or several cells may form together to create the more developed **Multicell**.

Multicell Thunderstorm

Multicellular storms consist of a series of evolving cells. At low levels, cooler air diverging from the downdraft intersects the inflowing air along a gust front, creating a region of strong low- level convergence favorable for new updrafts. It is the presence of vertical wind shear that results in the "tilting" of the updraft and downdraft. Because of the tilting, the less buoyant downdraft air will not destroy the updraft and deprive itself up supersaturated updraft air. In any case, the movement of multicell storms systems is determined by combining the new cell development with the mean winds. Each individual cell typically moves with the mean winds, while new cells develop where the inflow meets the outflow in the region of strongest surface, or low-level, convergence. The multicell thunderstorm can drop small hail and produce heavier rain. When a strong cold front is marching through, a squall line may form. This band of connected cells moves through quickly with strong wind, heavy rain, small hail and perhaps even a small tornado.

Supercell Thunderstorm

The supercell is the biggest of the storm world. These powerful beasts only form when instability is quite strong and, typically, when upper-level winds strengthen with height. This keeps the storm moving and keeps the top of the storm ventilated, so that warm, moist air is pulled in from below . We define a supercell as a thunderstorm with a deep rotating updraft (mesocyclone). The major difference between supercell and multicell storms is the element of rotation in supercells. The supercell produces many elements of the strongest thunderstorms which include: Torrential rain, large hail, hurricane-force wind and violent tornadoes. The lifespan of a supercell can reach beyond six hours.

Mesoscale Convective Systems (MCS)

These are the largest thunderstorm groups on earth. These are a collection of storms – typically organized as a cluster or squall line which can span 100-200 miles and last for more than twelve hours! Partly due to the size of MCSs, they can produce huge amounts of precipitation (250mm/10 inches of rain can fall). MCSs can also generate vast amounts of lightning (Over 10,000 strikes per hour, or about 3 strikes per second). They are more known for the spider lightning they produce which stretches from horizon to horizon. MCSs favor the moist heat of the warm season across the mid-latitudes and tropics. In many places, they peak during overnight hours, as smaller storms merge and nocturnal low-level jet streams intensify. If an MCS forms or moves over an ocean, it can serve as the nucleus of a tropical cyclone.

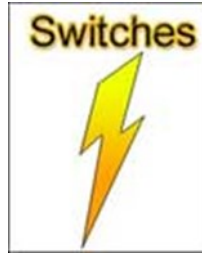


Toggle and Push-Button Switches

by Cole Dudley

Introduction

The ability to control an electric current is the foundation that modern electronics is built upon. It's not difficult to create a flow of electricity, but to harness that power and transform it into performing a practical function requires the use of circuits and components. One of the most fundamental components is a common passive electromechanical device known as a switch. These mundane but important devices are found in most electronic equipment, and are widespread in the art of [case modification](#) and computer customization. Switches can be found in many types and configurations; some common switch types are toggle, [push-button](#), rotary, reed, proximity, Hall-effect, momentary, pressure, rocker, magnetic, dip, slide, thumbwheel, key lock, etc. A switch is a device for making, breaking, or changing connections in an electric circuit under the conditions of a load for which it is rated.



Classification of Switches

Switches may be classified in several different ways:

- 1.) According to number of poles (SP, DP, 3P, etc.)
- 2.) According to number of closed positions (Single-throw, double-throw)
- 3.) Type of contact (Knife blade, butt-contact, mercury)
- 4.) According to number of breaks (Single or double)
- 5.) According to method of insulation (air-break, oil immersed)
- 6.) According to method of operation [Operating Force (Manual, Magnetic, Motor), Mechanism (Lever, dial, drum, snap)]
- 7.) According to speed of operation (quick-break, quick-make, slow-break)
- 8.) According to enclosure (open, enclosed)
- 9.) According to protection provided to circuits or equipment
- 10.) Type of service (power switches, wiring switches, control switches, instrumental switches)

Sorting through the vernacular describing switches and electrical components can be a daunting task; however, when speaking in terms of [case modification](#), one only needs to be concerned about the polarity and number of closed positions. A pole of a switch is that part of a switch which is used to make (or break) a connection and which is electrically insulated from other contact-making parts. A single-pole switch will make or break connections in only one conductor or leg of a circuit; a two-pole switch, in two legs, etc. Electrical circuits are always either open (off) or closed (on). Switches are available in on-off (single-throw/closed-open) configuration or on-off-on (double-throw/closed-open-closed) configuration.

[Push-button](#) momentary contact switches operate differently compared to toggle switches. Momentary contact switches are normally closed (N.C.) or normally open (N.O.). This type of switch cannot open and close a circuit, but rather, open or close a circuit.

To illustrate this type of action, visualize that the button of [the switch](#) must continually be pushed to perform the function (either momentary open or momentary closed). For example, if a fan is hooked up to a normally open switch, then whenever the button is pushed, the circuit will be closed and the fan will spin. When pressure on the button is relieved, then the fan will no longer spin. The opposite is true with a normally closed switch; the fan would normally spin, but once the button is pushed, it would stop spinning; the fan would start spinning once pressure on the button is relieved.

A computer uses this type of switch to power the machine on and off (assuming it is an ATX computer). A computer uses a normally open (N.O.) switch that when activated closes the circuit sending a signal to the motherboard. The motherboard handles on-off activity and sends a signal through the ATX cable to the power supply turning on the machine. The on-off switch is used in conjunction with the computer's electronics to handle shutting the machine off and turning it on.

Electrical Terms

Electricity: Electricity can neither be created nor destroyed. It can, however, be forced to move and thus transmit power or produce electrical energy. A [quantity of electricity](#) is measured in Coulombs (C). A coulomb of electricity comprises of approximately 6.0×10^{18} electrons. Charge can be found by multiplying current by time.

Current: Current is measured in amperes and is the rate of flow of electricity. Current is merely a shifting of electricity through a conductor, generally electrons. Current can be found by a variety of equations, one of the most common being Ohm's Law $\text{Resistance} = \text{Voltage} / \text{Current}$.
EMF (electromotive force) or Voltage: Voltage is the force or pressure that makes electrons move throughout a circuit. This is also known as the electric potential difference. Voltage can be found using electric power equations ($P = VI$) or Ohm's Law ($R = V/I$).

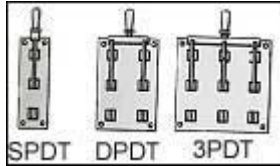
Resistance: Resistance is the name given to the opposition incurred in a circuit. This resistance converts electrical energy into heat in accordance to the formula $W = I^2 \times R$. All materials exert some form of resistance when a current is pushed through. Conditions that change the resistance include: cross-sectional area, material, temperature, and length. Resistance is measured in Ohm's, and can also be found using Ohm's Law. A resistor is an object having resistance inserted into a circuit to provide resistance. Rheostats are arranged so that the resistance can be varied.

Power: Power is measured in watts and can be found by multiplying the current by the voltage. Power goes into heat, mechanical work, radiated energy, or stored energy. These terms will come in useful when performing case modifications because many items have current, voltage, and power restrictions.

The Experimenters Bench

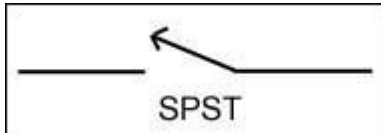
Toggle Switches

Toggle switches are the most familiar switches associated with computer customization. The simple toggle switch is available in various configurations depending on the number of poles and switching positions. This illustration using knife switches might give one a better understanding of how the terminals interact and work.



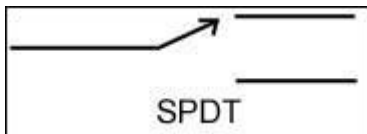
SPST

These switches are simply used for turning something on and off. They are handy for lighting, or complicated baybuses that need an on-off switch. This type of switch simply allows one to change the circuit between open and closed.



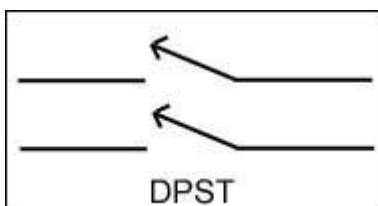
SPDT

SPDT switches are useful if you want to supply some instrument with two different voltages (such as a fan) or if you want a certain voltage to be directed at one item (maybe a fan) at one time, then once [the switch](#) is flipped the voltage is directed at another item. This type of switch allows one to switch between two different types of closed circuits and an open circuit.



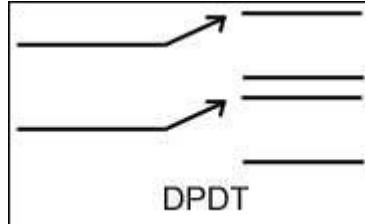
DPST

A Double-pole Single-throw switch is simply two SPST switches together. It allows you to switch two separate circuits on and off at once. This would be useful if you didn't want to use more than one switch for two items. 3PST, 4PST, and 5PST switches can also be found that work the same way.



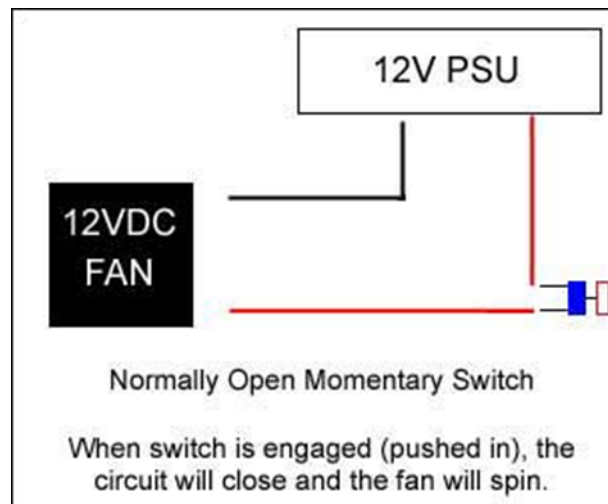
DPDT

DPDT switches have six terminals and allow one to switch poles between two different circuits. These may be useful for dual voltage baybuses as well as changing voltages in complicated circuits.

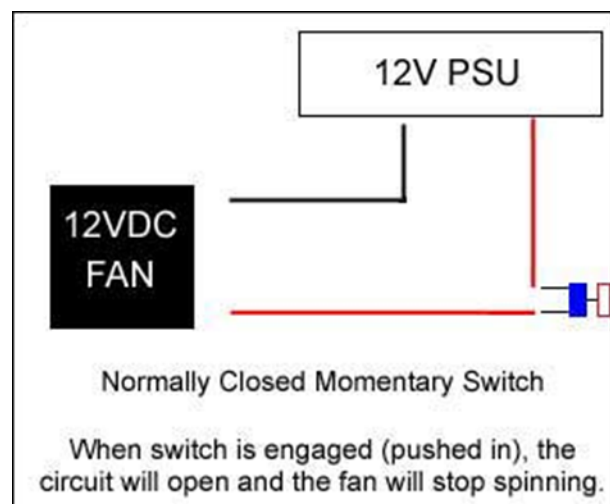


Momentary Contact/Push-Button Switches

Normally open switches are the type used to turn one's computer on and off. When the switch is pressed, the circuit becomes closed and functions. I always think of a car with nitrous injection capabilities; push a button and unleash 150 more horsepower.



Normally closed switches perform just the opposite function. When the switch is pressed, the circuit becomes open. One may use this type of switch to turn a fan off that is inconveniently located while opening a case.



Push button switches can also be found in SPST configurations and are a cool alternative to toggle switches. These type of switches work so that when the button is pressed it remains pressed until pressed again.

Conclusion and Final Thoughts

Switches, while often mundane and boring, are some of the most useful, common, and versatile electrical components. The fun doesn't stop with toggle and push-button switches: several other types are readily available for modification. One such switch is a [reed switch](#), which Dr. Michael wrote an article about. Relays, or electronically controlled switches, are a barrel of fun and could find a home in case modification. Potentiometers are quite common in the current crop of case modification products (variable speed fan controllers, volume controllers, etc.). The majority of case modifications involving electricity will need some sort of switch, so I hope this article will answer some of your questions.

References

Croft, Terrel. American Electrician's Handbook: Fourteenth Edition. McGraw-Hill Handbooks. 2002.
Horowitz, Paul. Hill, Winfield. The [Art of Electronics](#). Cambridge University Press. 1980.

Early Radio: Military Communications

A Majority of One

29 August 2005

Kregg Jorgenson

The live grenade fell within the five man Lurp team's tiny perimeter. Amid the noise and fury of the jungle battle, one among the small Cav recon unit reacted quickly to the new threat.

"GRENADE!" yelled PFC James F. McIntyre of Watertown, New York, as he threw his rucksack on the explosive then leaped a top it to deflect the blast.

"One man with courage makes a majority." Andrew Jackson

The sudden explosion hurled the 19-year-old Ranger up and back then slammed him down in a single violent motion. His head was pounding and his chest ached, and for a moment or so the firefight ceased to exist. It quickly swam back in to focus, as the young soldier scrambled back to his knees to assist his lightly wounded team mates in defending their position.

His legs hurt and the small burning shrapnel fragments left streams of blood flowing down his thighs. But he kept up the [return](#) fire, refusing to give in to the pain.

The team leader was calling for an extraction, and the rescue helicopter was 20 minutes out. The mission was compromised, and it was time to get out, even though the firefight had turned around in their favor.

"You okay?" the team leader asked the new Ranger, whose quick thinking had probably just saved the lives of the entire team.

McIntyre shrugged. "Yeah, I guess," he said, still covering the tangled wall of jungle to his front "Just flesh wounds," he added.

"Hold on. We'll be out of here soon," the team leader consoled, and then muttered, shaking his head to his assistant team leader, "Unbelievable!" The other team leader members nodded in stunned agreement, unsure how to praise the new guy for what he had just done.

Even later, as they found their appreciation, the quiet, self-effacing Ranger only shrugged off their compliments. The team leader didn't shrug them off, however. The veteran patrol leader had been so impressed with McIntyre's courage and coolness under fire that he explained in detail the entire sequence of events to their commanding officer, Captain George Paccereilli. The CO was impressed as well. Still new to H Company (Ranger), 1st Cavalry Division, Jim McIntyre found himself gathering a reputation for what Ernest Hemingway once described as "grace under fire" On McIntyre's first mission as a Lurp, while his team was being extracted from a jungle pick-up zone, their helicopter crashed, plummeting down through the hundred foot trees. The new Ranger was momentarily knocked unconscious, but when he came to he quickly helped the more seriously wounded from the wreckage. He then helped secure the perimeter until a medevac helicopter and a quick reaction force could arrive on the scene later that evening.

As the critically wounded were lifted out to a distant field hospital, McIntyre volunteered to fly to a nearby fire support base for treatment of his own injuries.

Cut and bruised and suffering from a mild concussion, the quiet Ranger didn't have time to recover fully, as NVA rockets and mortars began to fall over the small jungle outpost, causing cries of "MEDIC!" to ring across the battle ground.

When the shelling ceased, the bugles began to blare, signaling the beginning of the enemy's ground attack.

"We need help over here!" someone yelled. The cherry Lurp grabbed his rifle and sprinted towards the bunker [line](#) the enemy was trying to breach.

By sunrise the ground attack had failed. The perimeter defenses had held. Helicopter gunships circled the surrounding area as medevacs flew in and out removing the dead and wounded. When a helicopter finally arrived to take him out, McIntyre returned to the Ranger company area dead tired and still sore from his injuries.

"Captain Paccereilli wants to see you!" the first sergeant said. The Ranger nodded, dropped his rucksack and dusted off his uniform.

"You wanted to see me, sir?" McIntyre said, reporting as ordered, throwing in a reasonably acceptable salute.

Paccereilli returned the salute and offered him a seat. "I'm thinking about transferring you back to Signal."

"Sir?" came the reply. Did I do something wrong, sir?"

Early Radio: Military Communications

Paccerelli laughed, shaking his head. "No, you didn't. I was just thinking that you've had one hell of a first mission, and maybe you'd like to go back to your old unit."

"I'd like to stay, sir," he said.

"Carry on," the officer responded, dismissing the soldier but not his importance to the company, the importance that affirmed itself with this latest test of courage.

A few days later, before an H Company formation in Phuoc Vinh, McIntyre would receive a Silver Star for gallantry in action, a Purple Heart and a promotion to Sergeant E-5, at Paccerelli's insistence and with the division commander's concurrence.

Paccerelli said McIntyre's act was one of the quickest thinking responses he had ever heard of any soldier making when faced with such an impossible situation.

"It was an incredible act of heroism!" he said. "Hence you had a Ranger who saw a threat to his team and didn't hesitate to act, and when he did he was smart enough to use a full rucksack as a shield to help nullify the affects of the grenade."

On later patrols McIntyre would win several Bronze Stars for valour, but remained low keyed about the decorations. "I had good people around me."

Jon Varesko, of Rices Landing, Pennsylvania, an ex-Ranger who served with McIntyre in the 82nd Airborne at Fort Bragg, North Carolina, and who volunteered for H Company with the New Yorker in July 1969, shortly after their arrival in Vietnam, said it was "typical McIntyre. He wasn't a glory seeker and he didn't really care about medals. He just wanted to be a good Ranger."

By Varesko's and others' accounts that's exactly what McIntyre became. "He was a natural in the filed and quickly became someone we all looked up to."

Earning a position as a team leader a short time later and the call sign of "Slashing Talon 4-2," Mack, as he was better known, led successful long range patrols throughout War Zone C and along the Cambodian border deep inside enemy territory, ambushing enemy patrols or gathering much needed intelligence.

However, in mid November, 1969, in Song Be province, McIntyre's luck ran out...but not his courage. His five-man patrol suddenly came face to face with 45 North Vietnamese soldiers.

In the hectic jungle battle that followed, two of the young NCO's teammates were killed and a third wounded, while McIntyre and the remaining Lurp received minor wounds. Realizing there was nothing to do but keep fighting, McIntyre repeatedly charged small groups of enemy soldiers, tossing grenade after grenade and urging his surviving teammate to do like wise. Alternating between M-16, M-14 and M-79, McIntyre made the enemy believe they had encountered a much larger American force.

The tactic worked, and the enemy force withdrew.

When a quick reaction force arrived on station and were unable to rappel in the dark, the officer in charge told the team leader to leave his dead and to escape and evade to a landing zone 800 meters away.

McIntyre refused. "I won't leave my people," he said. "Either we all go or no one does."

"We'll recover the bodies in the morning," came the response.

"No," he said, flatly. Team members in life, they were still part of his team in death. The officer in charge tried giving the Ranger team leader a direct order. Again McIntyre refused, knowing that the opinion of the leader on the ground overrode the pilot's in the air. Meanwhile, another quick reaction force made up of fellow Rangers from H Company were racing to the team's location ready to rappel in and rescue their buddies.

At an impasse, McIntyre and the fifth Ranger were prepared to wait until the QRF from the Ranger company arrived. The matter was settled when the squadron commander for the 1st of the 9th Cav decided to use his personal helicopter to pull out the Lurp team. Hovering over the contact site, the crew chief lowered a jungle penetrator to the ground and brought up the team one at a time, with McIntyre coming up last, covering their escape under sporadic enemy fire.

McIntyre received a second Silver Star and another Purple Heart, but the medals weighted heavily on his conscience. He would never fully recover from the loss of his teammates, believing even years later that he could have done something more or different to change the final outcome. The self-doubt would haunt him for decades afterwards.

"There was nothing more he or anyone could have done," said the fifth team member. "We had just come out of a thick jungle and found the trail when the enemy force came around the bend. It was all action and reaction, and McIntyre didn't waiver. In fact, what he did was amazing. He was John Wayne and Rambo all rolled in to one. You have to remember we were up against 45 enemy soldiers and after the initial attack, when he had lost two people almost immediately, Mack took the fight to them. He was going to save the rest of us and he did. He was a real hero in the best sense of the word. Years later, I told him I was proud to have been on his team. I meant it then and I mean it now. He was the best Ranger I ever knew."

Varesko agrees. "He was the best we had in Hotel Company and maybe one of the real heroes of the Vietnam War."

On 24th June 1994, James Francis McIntyre collapsed after leaving a café in Watertown, New York. He never regained consciousness and died of a brain aneurysm. He was 44 years of age.

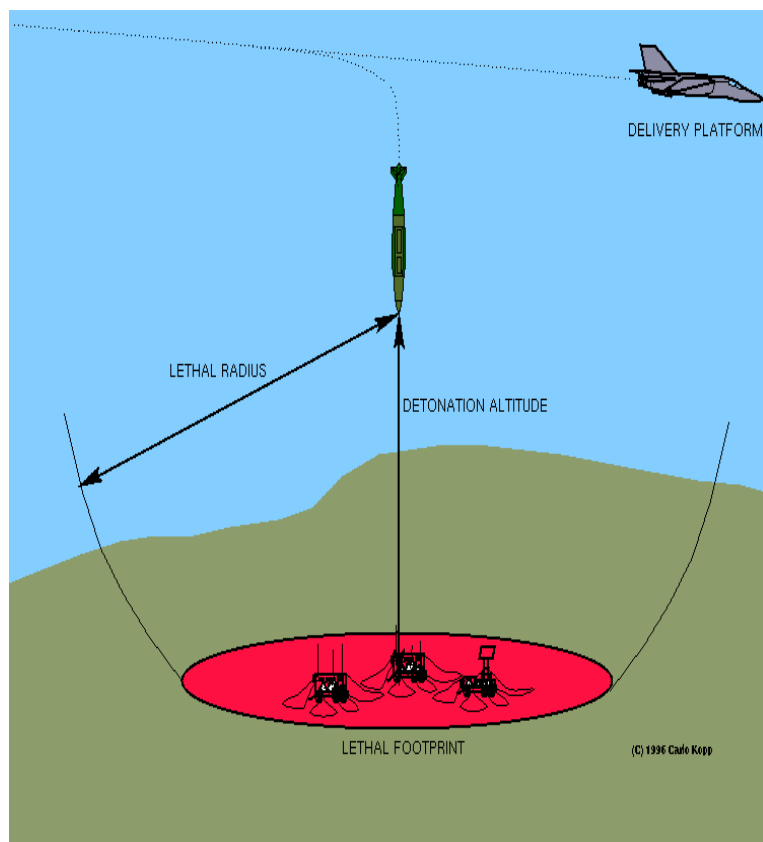


FIG.7 LETHAL FOOTPRINT OF LOW FREQUENCY E- BOMB IN RELATION TO ALTITUDE

Next Regular Meeting

The next meeting will be on Thursday, March 28th at 7:00PM. We meet in the Fellowship Hall of Redemption Lutheran Church, 4057 N Mayfair Road. Use the south entrance. Access the MRAC Yahoo group for important details about the February Meeting.

Meeting Schedule:

March 28th, 2013

April 25th, 2013

Please do not call the church for information!

Club Nets

Please check in to our nets on Friday evenings.

Our ten meter SSB net is at **8:00 p.m.** at **28.490 MHz USB** Our two meter FM net follows at **9:00 p.m.** on our repeater at **145.390 MHz** with a minus offset and a **PL of 127.3 Hz.**

Visit our website at: www.w9rh.org

Or phone **(414) 332-MRAC** or **332 - 6722**



Chatter Deadline

The **DEADLINE** for items to be published in the **Chatter** is the **15th of each month**. If you have anything (announcements, stories, articles, photos, projects) for the 'Chatter, please get it to me before then.

You may contact me or Submit articles and materials by e-mail at: Kc9cmt@earthlink.net

or by Post to:

Michael B. Harris

807 Nicholson RD

South Milwaukee, WI 53172-1447

Name of Net, Frequency, Local Time	Net Manager
<u>Badger Weather Net (BWN)</u> 3984 kHz, 0500	W9IXG
<u>Badger Emergency Net (BEN)</u> 3985 kHz, 1200	NX9K
<u>Wisconsin Side Band Net (WSBN)</u> 3985 or 3982.5 kHz, 1700	KB9KEG
<u>Wisconsin Novice Net (WNN)</u> 3555 kHz, 1800	KB9ROB
<u>Wisconsin Slow Speed Net (WSSN)</u> 3555 kHz, Sn, T, Th, F, 1830	N1KSN
<u>Wisconsin Intrastate Net - Early (WIN-E)</u> 3555 kHz, 1900	WB9ICH
<u>Wisconsin Intrastate Net - Late (WIN-L)</u> 3555 kHz, 2200	W9RTP
<u>ARES/RACES Net</u> 3967.0 kHz, 0800 Sunday	WB9WKO
* Net Control Operator needed. Contact Net Manager for information.	

VE Testing:

March 30th, 2013

April 6th, 2013

ALL testing takes place at: Amateur Electronic Supply
5720 W. Good Hope Rd. Milwaukee, WI 53223

Area Swapfests

**April 5th, 2013 [AES SUPERFEST 2013](#) Location: Milwaukee, WI Type: ARRL Hamfest
Sponsor: Amateur Electronic Supply
Website: <http://www.ashram.com>**

**April 13, 2013 [Madison Hamfest](#) Location: Stoughton, WI Type: ARRL Hamfest
Sponsor: Madison Area Repeater Association
Website: <http://www.qsl.net/mara/swapfest.html>**

**May 4th, 2013 [Ozaukee Radio Club's May Hamfest](#) Location: Cedarburg, WI Type: ARRL Hamfest
Sponsor: Ozaukee Radio Club
Website: <http://www.ozaukeeradioclub.org>**

MRAC Working Committees

95th Anniversary:

- Dave—KA9WXN

Net Committee:

- Open

Field Day

Dave—KA9WXN, Al—KC9IJJ

FM Simplex Contest

- Joe – N9UX
- Jeff – K9VS

Ticket drum and drawing

- Tom – N9UFJ
- Jackie – No Call

Newsletter Editor

- Michael-KC9CMT

Webmaster

- Mark Tellier—AB9CD

Refreshments

- Hal—KB9OZN



Membership Information

The Hamateur Chatter is the newsletter of MRAC (Milwaukee Radio Amateurs' Club), a not for profit organization for the advancement of amateur radio and the maintenance of fraternalism and a high standard of conduct. MRAC Membership dues are \$17.00 per year and run on a calendar year starting January 1st. MRAC general membership meetings are normally held at 7:00PM the last Thursday of the month except for November when Thanksgiving falls on the last Thursday when the meeting moves forward 1 week to the 3rd Thursday and December, when the Christmas dinner takes the place of a regular meeting. Club Contact Information

Our website address <http://www.w9rh.org>

Telephone (414) 332-MRAC (6722)

Address correspondence to:

MRAC, PO Box 26233, Wauwatosa, WI 53226-0233

Email may be sent to: w9rh@arrl.net . Our YAHOO newsgroup:

<http://groups.yahoo.com/group/MRAC-W9RH/>

CLUB NETS:

- The Six Meter SSB net is Thursday at 8:00PM on 50.160 MHz USB
- Our Ten Meter SSB net is Friday at 8:00PM on 28.490 MHz \pm 5 KHz USB.
- Our Two Meter FM net follows the Ten meter net at 9:00PM on our repeater at 145.390MHz - offset (PL 127.3)

The HamChatter is a monthly publication of the Milwaukee Radio Amateurs' Club.

Serving Amateur Radio for Southeastern Wisconsin & Milwaukee County Club Call sign – W9RH

MRAC Website: <http://www.W9RH.org>

Editor: Michael B. Harris, Kc9cmt, kc9cmt@Earthlink.net

Milwaukee Area Nets

Mon. 8:00 PM 3.994 Tech Net

Mon. 8:00 PM 146.865- ARRL Newsline

Mon. 8:00 PM 146.445 Emergency Net

Mon. 8:00 PM 146.865- Walworth County ARES net

Mon. 8:45 PM 147.165- ARRL Audio News

Mon. 8:00 PM 442.100+ Railroad net, also on EchoLink

Mon. 8:00 PM 442.975+ WARC W9CQ net also on EchoLink 576754

Mon. 9:15 PM 444.125+ Waukesha ARES Net on the 1st, 3rd, and 5th Monday of each month.

Mon. 9:00 PM 147.165- Milwaukee County ARES Net

Tue. 9:00 AM 50.160 6 . Mtr 2nd Shifter's Net

Tues. 8:00 PM 145.390- General Class

Tue. 7:00 PM 145.130 MAARS Trivia Net

Tue. 8:00 PM 7.035 A.F.A.R. (CW)

Wed. 8:00 PM 145.130 MAARS Amateur Radio Newsline

Wed. 8:00 PM 147.045+ West Allis ARC net

Wed. 8:00 PM 147.270+ Racine County ARES net

Wed. 9:00 PM MAARS SwapNet on AllStar link to FM-38

Thur. 8:00 PM 145.130- General Class

Thur. 8:00 PM 50.160, 6 Mtr SSB Net

Thur. 9:00 PM 146.910 Computer Net

Fri. 8:00 PM 28.490 MRAC W9RH 10 Mtr Net SSB

Fri. 9:00 PM 145.390 W9RH 2 Mtr. FM Net

Sat. 9:00 PM 146.910 Saturday Night Fun Net

Sun 8:30 AM 3.985 QCWA (Chapter 55) SSB net

Sun 9:00 AM 145.565 X-Country Simplex Group

Sun 8:00 PM 146.91 Information Net

Sun 8:00 PM 28.365 10/10 International Net (SSB)

Sun 8:00 PM 28.365 10/10 International Net (SSB)

Sun 9:00 PM 146.91 Swap Net

First Thursday of the month 8:00 PM 442.200+ Round Table Tech Net

2meter repeaters are offset by 600KHz - - 70 centimeter repeaters are offset by 5 MHz

SSB frequencies below 20 meters are LSB and for 20 Mtr and above are USB.

Billion Dollar Weather Disasters 1980 - 2010

